2009 Southeastern InfORMS Conference Proceedings

October 1-2, 2009
45th Annual Meeting
Hilton Myrtle Beach Resort
Myrtle Beach, South Carolina

informs
southeastern

Proceedings Editor
Albert E. Avery
Towson University

Program Chair
Shanan G. Gibson
East Carolina University

INVESTIGATION OF DISCREPANCIES IN THE COMPUTATION OF FINANCIAL RATIOS

Adel M. Novin, Clayton State University, Morrow, GA 30260, AdelNovin@Clayton.edu
Maria L. Bullen, Clayton State University, Morrow, GA 30260, MariaBullen@Clayton.edu

ABSTRACT

Several authors of accounting and finance textbooks have offered different formulas for the computation of the same financial ratio resulting in different results. This paper identifies, explores, and discusses some of these discrepancies in the computation of financial ratios.

INTRODUCTION

Ratio analysis is one of the most popular methods for the analysis of the financial statements of companies. Accounting and finance textbooks have introduced a number of financial ratios for the analysis of financial statements. The authors of this paper have noticed discrepancies in the suggested formulas for the computation of the same ratio in several textbooks. That is, the computation of a ratio produces a different answer depending on which author's suggested formula is used. This paper identifies, explores, and discusses these discrepancies in the computation of some of the financial ratios and its implications for the educators.

FINDINGS

To make our point we have chosen five ratios for our illustration. They are as follows:

1) Acid-Test Ratio (also known as Quick Ratio) is a more rigorous test of a company's ability to pay its current liabilities. It tries to measures the "instant" ability of the company in paying its current debt.

2) Inventory Turnover Ratio measures how quickly inventory is converted into sales.

3) Number of Days' Sales in Inventory (the average sale period) is a rough measure of the length of time (in days) that it takes to sell the merchandise after they are purchased or produced.

4) Average Collection Period (number of days' sales in receivables) is an estimate of the length of time (in days) that it takes to collect a credit sale.

5) Profit Margin is a measure of the profitability of the company obtained by relating either net income or operating income to revenue.

Normally these ratios are covered in the first introductory accounting course (Principles of Financial Accounting), the second introductory accounting course (Principles of Managerial Accounting), and the required finance course for the BBA degree. To better explain the discrepancies and the potential confusion confronting the students, we have examined the problem from the perspective a student that has used different textbooks in the above three courses. Three widely used accounting textbooks are shown below. A student may take the two different financial and managerial introductory courses using different textbooks, and then use yet a different text for his or her finance course. Consider the following scenario:

- In the first introductory accounting course (Principles of Financial Accounting), the student uses one of the following accounting principles textbooks for his or her first accounting principles course, Principles of Financial Accounting: *Accounting Concepts and Applications* by Albrecht, Stice, Stice, and Swain [1] , *Financial and Managerial Accounting* by Warren and Reeve [2] or *Fundamental Accounting Principles* by Wild, Larson and Chiappetta [3].

- The student uses a different one of the above textbooks in the second introductory accounting course (Principles of Managerial Accounting).

- The student then uses *Fundamentals of Financial Management* by Brigham and Houston [4] textbook in the required finance course for the BBA degree (Corporate Finance).

This student would have learned to calculate the ratios in the three courses using as follows:

	Financial and Managerial Accounting by Warren and Reeve	*Accounting Concepts and Applications* by Albrecht, Stice, Stice, and Swain	*Fundamentals of Financial Management* by Brigham and Houston	*Fundamental Accounting Principles* by Wild, Larson, and Chiappetta
1) Acid Test Ratio or Quick Ratio	(Cash + Marketable Securities + Receivables) divided by Current Liabilities	N/A	[Current Assets – Inventories] divided by Current Liabilities	(Cash + Short-term investments + Current receivables) divided by Current Liabilities
2) Inventory Turnover Ratio	Cost of Goods Sold divided by Avg. Inventory	Cost of Goods Sold divided by Average Inventory	Sales divided by Inventories[1]	Cost of Goods sold divided by Avg. Inventory
3) Number of days' sales in inventory	Inventory end of year divided by average daily cost of goods sold	365 divided by Inventory Turnover Ratio	N/A	(Inventory end of year divided by cost of goods sold) multiplied by 365
4) Average Collection Period	Accounts Receivable end of year divided by Average daily net sales	365 divided by Accounts Receivable Turnover Ratio	Receivables divided by Average sales per day	(Accounts Receivable divided by Net Sales) multiplied by 365
5) Profit Margin	Income from Operations divided by Sales	Income from Operations divided by Revenue	Net Income divided by Sales	Net Income divided by Net Sales

---

[1] Brigham and Houston claim that some established compilers of financial ratio statistics such as Dun & Bradstreet use the inventory turnover ratio in the format stated by them in the textbook.

To demonstrate the discrepancies, we have computed the above five ratios for Johnson Company for year 2008. The financial statements for Johnson Company are displayed in Exhibit I.

	Financial Accounting by Warren and Reeve	*Accounting* by Albrecht, Stice, Stice, and Swain	*Fundamentals of Financial Management* by Brigham and Houston	*Fundamental Accounting Principles* by Wild, Larson, and Chiappetta
1) Acid Test Ratio or Quick Ratio	0.79 to 1	N/A	0.96 to 1	0.79 to 1
2) Inventory Turnover Ratio	8.4 times	8.4 times	14.4 times	8.4 times
3) Number of days' sales in inventory	48 days	43 days	N/A	48 days
4) Average Collection Period	15 days	13 days	15 days	15 days
5) Profit Margin	8.33%	8.33%	4.17%	4.17%

IMPLICATIONS AND CONCLUSION

The discrepancies in the computation of certain financial ratios have created confusion among the students that have learned a ratio under different formulas in different courses. From the academic point of view, it would be useful to identify and recognize these discrepancies and explore the logic and perhaps to reach a resolution.

REFERENCES

[1] Albrecht, W.S., Stice, E.K., Stice, J. D., and Swain, M.R. (2008) *Accounting, Concepts and Applications* (10th ed.). Thomson South-Western.

[2] Warren, C.S. & Reeve, J. M. (2007). *Financial and Managerial Accounting* (9th ed.). Thomson South-Western.

[3] Wild, J.J., Larson, K.D., & Ciappetta, B. (2008). *Fundamental Accounting Principles* (18th ed.). McGraw-Hill Irwin.

[4] Brigham, E.F. & Houston. J.F. (2007) *Fundamentals of Financial Management* (5th ed.). Thomson South-Western.

Exhibit I

Financial statements for Johnson Company

Johnson Company
Statement Of Financial Position
As of 31-Dec

	2008	2007
Cash	400	780
Marketable securities	300	500
Accounts receivable (net)	1,200	900
Office Supplies	200	120
Prepaid expenses	200	100
Inventories	2,000	1,600
Total current assets	4,300	4,000
Land	500	500
Building and equipment (net)	4,700	4,000
Total long-term assets	5200	4500
Total assets	$9,500	$8,500
Accounts payable	$1,400	700
Wages payable	1,000	500
Total current liabilities	2,400	1,200
Long-term debt	3,000	4,000
Total liabilities	5,400	5,200
Common stock, $10 par	3,000	3,000
Additional paid-in capital	100	100
Retained earnings	1,000	200
Total stockholders' equity	4100	3300
Total liabilities and equities	$9,500	$8,500

Johnson Company
Income Statement
For the Year Ending December 31, 2008

Sales (all on account)	$28,800
Cost of goods sold	(15,120)
Gross margin	13,680
Operating expenses	(11,280)
Net operating income	2,400
Interest expense	(400)
Net income before taxes	2,000
Income taxes (40%)	(800)
Net income	1,200

TAX ISSUES RELATED TO THE ADOPTION OF IFRS IN THE UNITED STATES

John L. Stancil
Florida Southern College
111 Lake Hollingsworth Dr.
Lakeland, FL 33801
(863) 701-1968

ABSTRACT

There is a great deal of effort toward replacing U. S. GAAP with accounting standards promulgated by the International Accounting Standards Board. The SEC has outlined a roadmap in order to accomplish this task. If the International Accounting Standards are adopted, it will create a number of changes in how accounting is performed in the United States. It appears that, rather than adoption, there may be a convergence of the two sets of standards. This paper examines the issues related to the adoption, or adaption, of international accounting standards in the United States in the area of income taxes.

INTRODUCTION

There has been much discussion of, as well as movement toward, adoption of International Financial Reporting Standards (IFRS)in the United States, replacing the Financial Accounting Standards Board pronouncements as generally accepted accounting principles (GAAP).

On August 27, 2008, the Securities and Exchange Commission (SEC) announced its roadmap toward eventual adoption of IFRS for financial reporting in the United States [1]. This roadmap contains a proposal for a limited number of U. S. public companies to elect to adopt IFRS as soon as 2009. These companies would have to meet the screening process established by the SEC to qualify for adoption. Over a three-year period, the SEC would monitor progress against certain established milestones. The pool of eligible companies is 110 of the largest publicly-held companies in the United States, representing approximately 14 percent of the U. S. market capitalization [1].   Newly installed SEC Chair Mary Schapiro extended the comment period for the roadmap by two months and has expressed reservations about the independence of the IFRS and the quality of the rules coming from that body. She has also expressed concerns about the roadmap itself, especially the pace toward adoption [8].

At the conclusion of this three-year period in 2011, the SEC would consider whether to require use of IFRS by all U. S. public companies. Assuming a decision to proceed, implementation would be phased in between 2014 and 2016 [1]. It would appear that a positive decision to proceed would be forthcoming at this point. It is hard to imagine that companies representing up to 14 percent of U. S. market capitalization would follow a new set of accounting standards, then be compelled to switch back

to U. S. GAAP in only a few short years. While it once appeared a foregone conclusion that the U. S. would move in this direction, there are signs that full adoption may not occur. Some remain opposed, while others have moved toward convergence with IFRS, rather than adoption.

An additional factor from the income tax perspective is the March 31, 2009 release of the IFAS Exposure Draft on Income Taxes. This document, if adopted, would replace IAS 12 and move the IFRS closer to FAS 109 and FIN 48. This paper will compare tax differences in FASB standards with IAS 12 and the Exposure Draft. No date has been set for adoption of the new IFAS standard, but the current timetable is to issue the new standard in the second half of 2010. Normally, the effective date for a new IFRS standard is six to 12 months after adoption, so it would likely take effect sometime in 2011 [4]

WHAT IS THE IFRS?

The International Financial Reporting Standards (IFRS) are issued by the International Accounting Standards Board (IASB), which grew out of the International Accounting Standards Committee (IASC). IASC standards were issued between 1973 and 2001. In April 2001, the IASB adopted all outstanding pronouncements of the IASC (International Accounting Standards or IAC) and continued development of a body of international standards [17].

Presently, IFRS is used in over 100 countries for filings by listed companies. [10]. IFRS is generally considered to be a principles-based body of standards, as opposed to the rules-based standards of U. S. GAAP. As such, IFRS contains a less extensive body of literature than U. S. GAAP and does not contain a large amount of industry-specific guidance. IFRS does not include detailed implementation guidance, therefore giving rise to more circumstances where application of IFRS standards will require exercise of professional judgment.

IFRS STATUS IN THE UNITED STATES

The move toward convergence of U. S. GAAP with IFRS had it formal beginnings on October 29, 2002, with the adoption of the Norwalk Agreement. This document, agreed to by the FASB and the IASC, was a commitment by both organizations to work toward convergence of U. S. and international accounting standards. This two-page document, referred to as a "Memorandum of Understanding," set four areas as "high priority."

- Short-term projects aimed at removing a variety of individual differences between the two sets of standards.
- Removing other differences through coordination of future work programs.
- Continue progress on joint projects currently underway.
- Encourage their respective interpretative bodies to coordinate their activities [7]

Consequently, the two organizations have worked together on convergence since that time, making progress toward a unified body of accounting standards. However, there has become increased interest in not just convergence, but adoption of IFRS by the United States. In July and August, 2007 the SEC formally considered allowing foreign filers to file financial statements with the SEC in accordance with IFRS rather than GAAP. It also asked whether domestic filers should be permitted to use IFRS. Action was taken on this issue the following December when the SEC issued Release No. 33-8879

permitting foreign private issuers to file financial statements in accordance with IFRS. No reconciliation with GAAP was needed [10].

Subsequently, in an SEC roundtable, participants discussed the potential IFRS adoption process in the United States. Three points emerged as dominant in this discussion:

- The objective should be a single set of high-quality, globally accepted financial reporting standards.
- Both U. S. GAAP and IFRS are high-quality standards but much of the world has followed IFRS.
- The SEC should set a "date-certain" for application of IFRS by U. S. public companies. [10]

Since that time, SEC actions and proposals have made it clear that the appropriate set of standards must be IFRS as issued by the IASB.

SEC ROADMAP

In addition to the timeline set by the SEC in announcing its roadmap for adoption of IFRS by the all U. S. public companies, the roadmap established four milestones. The first of these milestones is "continued improvement in IFRS and progress toward convergence of U. S. GAAP and IFRS." [10] This would seem to indicate some concern about the quality of IFRS in its present state. It might also signal a desire to incorporate certain aspects of U. S. GAAP as a part of IFRS.

The second milestone deals with IFRS accountability and funding stability.   There is some concern about the financial viability of IFRS, as its operations have been financed largely through voluntary contributions from companies, accounting firms, international organizations, and central banks. The roadmap seeks a funding mechanism that would enable the IASB to remain a stand-alone, private sector organization with the necessary resources [3].

Third, the SEC seeks improvement in the use of interactive data by IFRS. The SEC has invested heavily in XBRL and would expect IFRS information would be provided to the SEC in this format. The fourth milestone is somewhat related, as it deals with education and training in regard to IFRS. [3].

WHY IFRS?

Although there are significant obstacles to overcome, it would seem that the SEC regards IFRS as the wave of the future and is likely to be adopted in the United States. This is one compelling reason why the adoption of IFRS is seen by many as inevitable. There are two additional reasons why it is likely to happen.

A U. S. move to IFRS would place United States Accounting Standards in company with over 100 other nations that have adopted or permit these standards. This is a second reason why IFRS is likely to become the standard in the United States.   With such widespread acceptance, IFRS is well on the way to being the single set of high-quality accounting standards desired by global market participants [2].

Third, adoption of IFRS is seen as necessary for the United States to compete in the global marketplace. Having the same set of accounting standards as much of the world would attract subsidiaries of foreign corporations to the U. S. It would facilitate the location of branches of U. S. companies on foreign soil. International investors would be more attracted to U. S. investments and it would become easier to make valid comparisons of U. S. and foreign entities [12].

TAX CONSIDERATIONS WITH IFRS

There is no doubt that adoption of IFRS would create change in the way financial accounting is done in the United States. The impact would be widespread over a number of financial statement items. This paper will survey some of the major effects that adoption of IFRS in the United States will have on the tax scene. There are five areas that will be covered by this paper – share-based payments, uncertain tax positions, inventory valuation method, interim reporting, and intraperiod allocations. These area are not exhaustive of the differences in IFRS and U. S. GAAP, but they are among the more important issues. As mentioned, the existing IFRS standard will be examined, along with changes proposed in the Exposure Draft. Many of the important changes in the ED are related to uncertain tax positions [4].

EXPOSURE DRAFT TO REPLACE IAS 12

On March 31, 2009, the IASB published an Exposure Draft of a new standard designed to replace IAS 12. This proposal covers a number of topics related to accounting for income taxes. It is not the intent of this paper to deal with these changes, however they will be discussed as they relate to the topics covered in this paper. Two areas have pervasive impacts on the entire area of accounting for income taxes and will be covered briefly.

The new definition of tax basis in the Exposure Draft places less emphasis on management intent. Under the proposal, the tax basis of an asset is determined by the tax consequences of selling it for its carrying amount at the reporting date. Measurement of the tax basis is determined by tax law. This is a departure from the current practice of reflecting the manner in which the entity expects to recover the asset [4]. This brings the IASB more into line with current practice under U. S. GAAP.

Additionally, the Exposure Draft changes the IFRS definition of temporary differences. Under IAS 12 a temporary difference is the difference between the carrying amount of an asset or liability in the statement of financial position and its tax base. The Exposure Draft reflects that the tax basis is the amount that the entity expects will affect taxable profit when the carrying amount of the asset or liability is recovered or settled. The difference in IFRS and U. S. GAAP lies in the definition of a temporary difference [4].

SHARE-BASED PAYMENTS

Under U. S. GAAP deferred tax benefits are recorded for share-based payment awards that are expected to be deductible for tax purposes based on the amount of compensation expense recorded for the share award. This is true even if the award has no intrinsic value. IFRS recognizes deferred tax benefits only for those awards that currently have an intrinsic value that would be deductible for tax purposes [12]. The Exposure Draft makes no change in this approach.

Additionally, an award that becomes exercisable based on the achievement of a service or market condition is treated as a single award under U. S. GAAP. Under IFRS, such an award is treated as two awards with different service periods and fair values. Compensation costs associated with the service component would be reversed under IFRS if the condition was not met [12].

In transactions with non-employees U. S. GAAP allows valuation based on either the fair market value of the goods or services rendered or the FMV of the equity instrument. IFRS specifies that valuation should be based on the value of the goods or services rendered. The FMV of the equity instrument can be used only if the value of the goods or services cannot be reliably determined [13].

Both standards allow compensation cost awards to be recognized on an accelerated basis. U. S. GAAP, however, allows straight-line recognition. Each award must be separately measured under IFRS, but U. S. GAAP allows measurement of the whole in addition to separate measurement [13].

In cases where the award has an equity repurchase feature with an option by the employee, U. S. GAAP does not require recognition of a liability under certain circumstances. IFRS requires recognition of such liability in all cases [13].

The amount of deferred taxes to be recognized under GAAP is based on the cumulative GAAP expense recognized and trued up or down upon realization of the tax benefit. If the tax benefit exceeds the deferred tax asset, the excess is credited to shareholder equity. Any shortfall of tax benefit below the deferred tax asset is charged to shareholder equity, then to tax expense when the amount of benefit reaches zero. IFRS calculates the deferred taxes based upon the estimated tax deduction determined at each reporting date. If the tax deduction exceeds cumulative compensation expense, the deferred tax based on the excess is credited to shareholder equity. If the deduction is less than the cumulative compensation expense, deferred taxes are recorded in income [13]. At this time, there are no convergence activities in this area.

UNCERTAIN TAX POSITIONS

FIN 48 utilizes a two-step procedure for recognizing uncertain tax positions. This approach separates recognition and measurement. First, the entity must determine whether recognition of an uncertain tax position is appropriate, then the amount of the uncertain position must be measured. Measurement utilizes a cumulative probability model [14]. Uncertain tax positions are not currently explicitly recognized under IFRS as there is no specific guidance. The Exposure Draft contains no recognition threshold but requires the company to review and measure **all** uncertain tax positions [5]. This would likely result in more tax positions being recognized under IFRS than under U. S. GAAP.

Measurement under the Exposure Draft would use a probability-weighted average of expected outcomes, which differs from the cumulative-probability approach of FIN 48 [12]. The differences in these approaches are illustrated in Table 1.

TABLE 1

IFRS Probability Weighted-Average Approach

Estimated Outcome	Individual Probability	Probability-weighted Calculation
$1000	10%	$100
$ 750	20%	$150
$ 500	30%	$200
$ 300	30%	$ 90
$ 0	10%	$ 0
		$540 Amount Recognized

FIN 48 U. S. GAAP Cumulative Average Approach

Estimated Outcome	Individual Probability	Cumulative Probability
$1000	10%	10%
$ 750	20%	30%
$ 500	**30%**	**60% (over 50%)**
$ 300	30%	90%
$ 0	10%	100%
	100%	

Detection risk is not considered in the probabilities under GAAP or in the Exposure Draft. Also in line with FIN 48, re-measurement could only be done based on new information and not on a new interpretation of the facts [5]. Disclosures of uncertain tax positions (UTP) under IFRS are currently limited to "disclosing tax related contingencies such as disputes with tax authorities. [5]. This is expanded somewhat under the Exposure Draft to include:

- A description of the uncertainty.
- An indication of the UTP's potential financial effects on the amounts recognized and the timing of those effects.
- The effect of tax rates, enacted or substantially enacted, after the end of the reporting period on all current and deferred taxes and liabilities.
- The effect on deferred tax expense of any change in the possible outcomes of a review by tax authorities [5].

Other disclosures mirror or closely resemble those under FIN 48. It should be pointed out that FIN 48 is much more prescriptive in the nature of the required disclosures. One observation on the IFRS disclosures is of note. IFRS allows inclusion of "substantially enacted" tax rates while FIN 48 is limited to enacted rates.

Regarding recognition of deferred tax assets (DFA), U. S. GAAP states that they are to be recognized in full. However, a valuation allowance is allowed to the extent that an amount is not expected to be realized. IAS 12 recognizes deferred tax assets to the extent that it is probable that taxable profit will be available to utilize the DFA. The amount is reassessed as of each balance sheet date. The Exposure Draft moves from the one-step approach to a two-step approach including a valuation allowance

such as with U. S. GAAP. Additionally, the standard for recognition has been changed from "probable" to "more likely than not," reflecting the approach of FIN 48.

In calculating the amount of the deferred tax asset or liability, FIN 48 specifies that the enacted rates must be used while IAS 12 permits substantially enacted rates as of the balance sheet date. The Exposure Draft makes no change here, but it does clarify the definition of "substantially enacted" to indicate that for U. S. jurisdictions "substantially enacted" equates to when tax laws are enacted [13]. In this instance it would appear that convergence has been obtained by making the definition broad enough to fit U. S. practice.

Present rules under IFRS specify that all deferred tax assets and liabilities are classified on the balance sheet as non-current regardless of the underlying items to which they relate [9]. U. S. practice mandates that they are classified as current or non-current based on the nature of the related asset or liability. The Exposure Draft brings the IFRS in line with U. S. practice using a current/non-current classification system. However, it also specifies that any deferred tax item not related to an underlying asset or liability should be classified according to the expected reversal date [5].

INVENTORY COSTING

Much of the attention in inventory costing has been focused on the lack of LIFO inventory valuation in IFRS. The IFRS Exposure Draft makes no changes in this area. It would appear that this issue will be a moot point in any convergence issues between U. S. GAAP and IFRS. President Obama included LIFO repeal in his 2010 budget proposal. This would take effect in 2012 and is estimated to increase tax revenues by $61 billion through 2019 [Whitehouse]. Regardless of the method utilized, IFRS requires that the same cost formula be applied to all inventories. U. S. GAAP does not explicitly make this requirement [13]

In terms of measurement, IFRS allows inventory to be carried at the lower of cost or net realizable value (NRV). NRV is the best estimate of the net amounts that inventories are expected to realize. This may or may not equal fair value. U. S. GAAP utilizes the lower of cost or market approach, in which market is defined as current replacement cost but not greater than NRV. IFRS allows a reversal of previously recognized impairment losses while U. S. GAAP takes the position that write-downs create a new cost basis that cannot be reversed [13]. It should also be noted that the Obama budget calls for the repeal of the lower of cost or market for tax purposes [15].

A final significant difference in inventory methodology relates to the use of the retail inventory method (RIM). U. S. GAAP specifies that permanent markdowns do not affect the gross margins used in applying RIM. These markdowns reduce the carrying cost of the inventory. Under IFRS permanent markdowns do affect the average gross margin calculation [13].

FAS 151 was issued by FASB in 2004 to address the issue of accounting for inventory costs in regard to abnormal amounts of idle facility expenses, freight, handling costs, and spoilage. This was intended to address a difference between U. S. GAAP and IFRS in this area. No additional convergence efforts in this area are planned at this time [13].

INTERIM REPORTING

There are more similarities than differences between U. S. GAAP and IFRS for Interim Financial Reporting. It should be observed that the U. S. standard precedes the Financial Accounting Standards Board as Interim Financial Reporting is covered in APB 28. The FASB has plans to address the issue of presentation and display of interim financial information. The IAS anticipates an Exposure Draft on this topic in the second quarter of 2010 with a new IAS to be issued in 2011 [18].

This statement, along with IAS 34, requires that the same accounting policies that were used in the prior year be used in the interim statements, subject to adoption of new policies that are disclosed. Neither standard mandates which entities are required to issue interim statements.

U. S. GAAP views interim periods as integral parts of an annual cycle, allowing certain costs to be allocated among the interim periods that benefit more than one of those periods. IFRS takes a discrete-period approach to interim financial statements, treating them as separate and distinct accounting periods. IFRS specifies that income taxes are accounted for based on an annual effective tax rate. This is similar to treatment by U. S. GAAP [12].   With both bodies examining this issue, it should be anticipated that the differences will be eliminated or reduced.

INTRAPERIOD ALLOCATION OF DEFERRED INCOME TAXES

There are three elements to the U.S. GAAP approach for intraperiod allocations of deferred income taxes as outlined in FAS 109:

- The effect of a change in the valuation allowance from the beginning of the year is included in income from continuing operations.
- The effect of a change in deferred tax assets or liabilities due to a change in the tax rate is included in income from continuing operations.
- All items should be considered in determining the amount of tax benefit that results from a loss from continuing operations [11].

The IFRS approach under IAS 12 includes the tax in profit or loss unless the transaction is recognized directly in equity. Any changes in amounts originally recognized directly in equity are also recognized in equity. The Exposure Draft adopted the FAS 109 approach but also included an alternative.

CONCLUSION

Someone once said that the only constant is change. This statement certainly applies to accounting standards as we know them in the United States. Based on recent events, it would appear that convergence is more likely than a blanket adoption of IFRS. It would seem that the Exposure Draft to replace IAS 12 is a precursor of things to come. Under this scenario, IFRS seems to be moving toward adapting to the "best" of U. S. GAAP. In cases where U. S. GAAP cannot be adapted or it is seen as not feasible to adapt, IFRS broadens its definitions to include U.S. GAAP under its umbrella. There will be changes in accounting for income taxes in the United States. Specifically what these changes will be, or the extent of the changes, can be known only as they unfold.

BIBLIOGRAPHY

[1] American Institute of CPA's, "SEC Unanimously Approves Exposing Proposed IFRS Roadmap for Public Comment," downloaded from ifrs.com, September 22, 2008.

[2] Cabrera, Lisa, "Widespread Acceptance of IFRS Continues," *The CPA Journal,* March, 2008.

[3] Ernst & Young, "IFRS Outlook, September, 2008.

[4] Ernst & Young, "ED Income Tax A Proposal to Replace IAS 12," April, 2009.

[5]Ernst & Young "Proposed Changes to Accounting for Income Taxes Under IFRS," webcast, May 14, 2009.

[6] Financial Accounting Standards Board, "Convergence with the International Accounting Standards Board (IASB), www.fasb.org, downloaded September 22, 2008.

[7] Financial Accounting Standards Board, "The Norwalk Agreement," www.fasb.org, downloaded September 22, 2008.

[8] Johnson, Sarah, "SEC Pushes Back IFRS Roadmap," *CFO.com,* February 4, 2009. Retrieved May 14, 2009.

[9] IAS 1 *Presentation of Financial Statements*, www.iasb.org, retrieved August 10, 2009.

[10] KPMG, "KPMG Faculty Forum Webcast," September 4, 2008.

[11] KPMG, "U. S. Implications of Adopting IFRS: Accounting for Income Taxes," June 2009.

[12] PriceWaterhouseCoopers, "IFRS and US GAAP, Similarities and Differences," September, 2008.

[13] PriceWaterhouseCoopers, "Income Tax Accounting under IFRS:A look ahead," 2009.

[14] Stancil, John L., "An Analysis of Disclosures Under FIN 48," Proceedings of SEInfORMS Annual Meeting, 2007.

[15] Stancil, John L., "A Look Ahead at Possible Tax Changes," *Polk County Business Journal,* July 20, 2009.

[16] Whitehouse, Tammy, "Obama Budget Proposes LIFO Repeal Starting in 2012," *Compliance Week,* March 19, 2009, downloaded August 8, 2009.

[17] Wikipedia, "International Financial Reporting Standards," www.wikipedia.com, downloaded September 22, 2008.

[18] www.iasb.org

The Green behind Going Green: A Financial and Ethical Analysis of the Eco-Revolution

Abstract

The objective of the paper is to provide an examination of the financial and ethical factors that affect corporations in determining sustainable business practices. Sustainability is defined as the interactions between social, economic, and environmental factors that aim to fulfill current needs while preserving the environment for the needs of future generations. Increased awareness concerning worldwide issues such as global warming and toxic pollution have intensified the demand for large corporations and industries to comply with more environmentally-conscious methods of production and reporting. The technology industry was the focus of the project due to the overall emphasis on emissions disclosure and the product life-cycle analysis (LCA). A five-year case study covering the 2004-2008 fiscal periods was conducted for each of the five major companies that were selected. The companies' annual corporate responsibility reports and financial reports served as the major resources for the analysis.

Literature Review

Sustainability/ External Pressures on Sustainability

Sustainability can be generally defined as the "assurance that development meets the needs of the present without compromising the ability of future generations to meet their own needs" (Gray 281). The concept assumes that through sustainable practices, society can continue thriving at a rate that will not affect its future generations' equal ability to thrive. The collective goal for society is to live in a way that the present generation "cleans up" after itself instead of leaving a mess for its descendents to handle. Sustainability is composed of an analysis of the actions between interdependent social, environmental, and economic factors (also known as the "triple bottom line") that exist between society and the physical environment. Therefore, sustainability represents a gauge that can be used to measure the severity of human actions and their consequences on the planet.

The concept of sustainability is a newer one, the term itself originating in the Brundtland Report ("Our Common Future") in 1987 that focused on the consequences of human development on the environment and the 1992 Earth Summit; some dispute still exists concerning whether sustainable development is a relevant cause to modern society (Bartlemus 1). The concept as a whole conflicts with Western culture, which is dependent on ideas such as consumerism and the belief that humankind has complete sovereignty over its external environment. Naturally, since the Western civilization is considered more economically advanced compared to other cultures of the world, some argue that the success of sustainability relies on the ability of the Western civilization to address the

issues at stake. "Economic wealth is needed to fund the remediation and investment necessary to achieve 'green' economic activity" (Gray 285). However, the economic growth needed to create sustainable development originates from the same force that caused many of the earth's growing issues.

For example, the spread of American culture to other countries has caused an explosion in consumerism. Tom Burke, co-founder of the group Third Generation Environmentalism states, " [B]y 2030, we will have gone from a world of two [Americas] to a world of eight or nine" (Friedman 56). The concept of consumerism, the affinity for the American lifestyle conflicts with the idea of sustainable growth and environmental stewardship. A society cannot easily take into account its impact on the environment when its culture causes a great accumulation of waste for its "cheap, fast, and easy" products: the trash generated from fast food wrappers, electronics that are quickly made obsolete and contain harmful chemicals, and the vast amounts of paper used and thrown away during normal daily activities. Therefore, the rise of organizations and businesses that are promoting sustainability in the United States provides an interesting outlook on changes in the American perspective dealing with its external relationships with the environment.

Sustainability is a considerably vague concept that encompasses a multitude of factors and does not provide any generally accepted periods or means to measure sustainable growth concerning unsustainable growth. Therefore, sustainability is used as a broad framework for which many organizations such as the Environmental Protection Agency and Ceres have specified a variety of indicators for measurement. Those indicators rely on the measurement of critical natural capital (the essential elements of the

environment that must remain unharmed), other natural capital (elements of the environment that are renewable) and artificial capital (elements of the environment that were created by humankind) in relation to one another (Gray 290). Organizations are measuring sustainable growth by using indicators ranging from the Ecological Footprint to the life-cycle analysis of certain products.

Many external factors have pressured and shaped the need for sustainable development. The most obvious factor would be the rising concern about global warming, especially the level of human involvement in its development. Although some argue that the earth's temperatures have normally fluctuated over the ages, there is a strong correlation between society's actions and the effect on the ozone layer. "By pumping man-made greenhouse gases into the atmosphere, humans are altering the process by which naturally occurring greenhouse gases . . . trap the sun's heat near the earth's surface before that heat radiates back into space" (Friedman 35-36). Therefore, humans are causing an "enhanced" greenhouse effect, which is to blame for factors of rising concern including increased temperature changes, the melting of glacial regions in the Artic, and natural disasters such as hurricanes.

However, a myriad of other applicable environmental risks exists affecting the relationship between man and nature. Other issues involving environmental stewardship include limited natural resources, the increased cost of energy, pollution, health problems and risks caused by unsustainable growth, and the generally rising awareness about global issues (Hitchcock 13-14). However, the true problem is not the identification of these critical issues, but the resolution of them. Involvement with sustainability in relation to improving the environmental condition has increased over the years but a wide

range of reactions (including the "ostrich with its head stuck in the sand" mindset and the full-hearted acceptance and promotion of the "green lifestyle") to the concept exist in society.

Sustainability may seem irrelevant by some because humankind itself is not a sustainable species taking in consideration the number of humans that die from environmental disasters including famine or floods. The issue is very critical because the world population is rising at alarming rate as well; Michael V. Hayden, the director of the Central Intelligence Agency, stated that his analysts now believe that the most worrying trend in the world is not terrorism but demographics (Friedman 29). "By 2053, the United Nations projects that there will be more than nine billion people on the planet, thanks to improvements in health care, disease eradication, and economic development" (Friedman 28). In general, the planet will become extremely crowded which in itself is a critical societal problem that must be dealt with immediately. A higher level of population will result in the higher generation and accumulation of waste. The rise in population will also cause a related growth in the demand for certain resources, which are already becoming depleted in the present generation.

Corporate Sustainability

Sustainable business procedures have been a major concern for companies due to the extent of the environmental impact from their production and manufacturing. Corporations also have a large external impact financially; "the combined sales of the world's top two hundred corporations are bigger than the combined outputs of all but the world's top ten richest countries" (Savitz 55). However, corporations faced a standard

measure of uncertainty. "Business and industry face the very real problem of a fundamental dichotomy between their power to act in the environment and their ability to predict the consequences of those actions through science and technology" (McKinney 99). Unless businesses could develop a sturdy methodology to assess and predict key performance indicators, it would be impossible to gauge any level of environmental impact and make any improvements. From shareholders, nongovernmental organizations (NGOs) to environmental lobbyists, pressure has been placed on companies to adopt more environmentally-acceptable means of operations. Consumer feedback is also a central influencing factor in business decisions. Based on the second annual Edelman goodpurpose survey that included 6,000 respondents from ten countries, "consumers say that if two products are of the same quality and price, commitment to a social purpose (42%) trumps factors like design/innovation (30%), and brand loyalty (27%)" (Edelman 3). Therefore, sustainability can be used to establish a competitive business advantage.

However, the choice to go "green" is not one based solely in the desire for expand company morals; sustainable business development can benefit company wellbeing and profitability. The findings to a Towers-Perrin questionnaire found that "CSR-related activity accounting for 3 of the top 10 drivers on employee engagement. The same study found that a 5% increase in engagement was equal to a $47.2 million financial gain" (ADC Partners 8). Therefore, "sustainable companies find areas of mutual interest and ways to make 'doing good' and 'doing well' synonymous" (Savitz 21). By embracing an environmental agenda, companies can improve both employee engagement and financial returns.

Environmental Ethics

The human species is able to abstain from instant gratification for the sake of harvesting a possible greater good in the future (Ferré 3). Sustainability is a matter that involves human morality and therefore involves the matter of ethics, namely environmental ethics. Humans are considered the stewards of the earth (especially in religious terms), making the concept of sustainability a very applicable concept. "Environmental ethics research began hesitantly in the 1970s as philosophers made tentative efforts toward the creation of a field with professional philosophy. It gained speed at the end of the decade with the founding of the journal *Environmental Ethics*" (Hargrove 16). In 1970, the United States Environmental Protection Agency was created and in 1974, the German scientist Paul Ehrlich wrote *the End of Affluence* which included a prediction that society would face energy crises and a shortage circa 1985 (Sagoff). With the growing awareness about the consequences, it became increasingly important for society to start monitoring its impact on the environment.

There is also a conflict that exists between the fields of philosophy and science in respect to environmental ethics. The concept of sustainable development involves both the scientific qualitative and quantitative assessments of environmental impacts as well as issues of morality and environmental stewardship that are two vastly contrasting fields of thought. "The values embedded in the economic way of thinking are often at odds with the way of thinking of biologists, ecologists, and other physical scientists. Economists value nature in terms of its benefits for human consumption and its usefulness in promoting economic growth" (Nelson 135). In 1970, the environmental economist Allen

Kneese even testified in Congress that "the economist doesn't think about ought," which supports the idea that the environmental status should be proven through data instead of ideas (Hargrove 20). Economics focuses more on the human aspects and not the environmental aspects (which are central to sustainable development) and normally concerns the ideas of substitutes and opportunity costs (which neglects "priceless aspects of which nature is considered), treating the environment as a factor in production, and the opposition to the "social infrastructure of production" and governmental interference (Nelson 138-139, 149). One example of a philosophical and scientific conflict could be found in biodiversity surveys that have been distributed in the past:

> "Through such surveys, environmental professionals can determine with great precision that while $2.37 per household is an acceptable amount to justify protecting an endangered species, the addition of another penny might be so excessive that it would be best to just let the unfortunate species go, on the grounds that protecting it is just too expensive" (Hargrove 19).

However, there are some correlations that can be found to support both fields. For example, the "increased economic activity and enhanced trade can certainly increase a nation's carrying capacity, although that increase comes at the expense of other resources (Meyer 13). Therefore, using concepts of morality to create a cost-benefit analysis would be plausible. In addition, it has been estimated that it is possible for the ignorance of climate change could cause damages that are equivalent to 5% of global GDP (Esty 39). Environmental laws have shown to include both instrumental values and values that are considered pleasing (Hargrove 27).

Environmental Accounting

Traditional accounting procedures ignore certain factors that are crucial to sustainable business procedures; accounting "is the basis for success or efficiency" so an incomplete accounting system hinders the ability of management to handle important environmental situations (Gray 21). One example that has been noted for decades is the bias towards the depletion of natural resources. As stated in a WRI report, "a country could exhaust its mineral resources, cut down its forests, erode its soils, pollute its aquifers, and hunt its wildlife and fisheries to extinction" without recording this against its income (Repetto et al., 1989, Ditz 13).

There are a number of areas where green accounting has improved the field; the separate disclosures of different emissions and environmental expenditures, increased reception to the fast-paced changes in the environmental agenda, increased external reporting, and the development of new information systems (Gray 11-12). After all, "environmental issues are business issues. . . . from straightforward cost and P&L issues, to competitive advantage and cost efficiency, to the more complex issues in asset values, contingent liabilities and environmental risk" (Gray 3). Green accounting systems also provide key performance indicators that allow business people to gauge the effectiveness of their policies and strategies (Gray 10). Because environment costs are rising, the raised awareness about environmental costs is very helpful to businesses. "Consider what happens when inaccurate cost allocations misrepresent costs, thus sending the wrong signals to managers and other decision-makers inside the company" (Ditz 18). However, the more sustainable solution is often overlooked; "because measures of profitability

depend on projected revenues and projected costs, and because environmental costs are so frequently misallocated, products with relatively higher environmental costs are often subsidized by those with lower ones" (Ditz 31). Through further improvements in environmental management accounting, companies can receive a more accurate lens into the financial and environmental implications of their operations.

Environmental Reporting

"More than three thousand corporations now issue a periodic environmental or social responsibility report, and over seven hundred and fifty voluntarily use the reporting guidelines issued under the auspices of the GRI" (Savitz 211). Companies that use reporting methods are experiencing competitive advantage over companies that do not. "If properly and aggressively used along with stakeholder engagement, the GRI can enable you to spot emerging economic, social, and environmental issues before they become crises" (Savitz 219). The GRI is commonly accepted due to "the rapid increase in the number of companies around the world adopting GRI standards and issuing corporate sustainability reports, along with the fact that the GRI works closely with the United Nations," (Ballou 3). "Sustainability reports are almost exclusively optional, and, even in cases where individual State's jurisdictions require their obligatory publication the only international standards for their drafting are the work of private research bodies" (Manetti 289). Although the GRI can only be accepted with generally limited assurance, it still provides an outlook on corporate involvement in sustainable business procedures.

The Environmental Audit

The environmental audit is the analyses of all the interactions and impacts a business has on the environment (or society in general) through the full scope of its operations. The analyses include "the system perspective" survey of a business of which all the inputs and outputs are recorded (Gray 84-85). Some companies choose to perform the environmental audits by themselves with the creation of auditing teams, some with the help of special consultants, and others with a balance of the two (Gray 87). The audit is essential for establishing and managing an environmental management system.

Eco-Labeling

The draft regulations for the "eco-label" and the "eco-audit" were created in 1991 (Gray 95). It was initially created as a voluntary program. Companies earn eco-labels for the products and processes that show the most responsibility in respect to operations and life cycle. Although many types of eco-labels exist for multiple countries, one of the most notable is the ENERGY STAR Program. The ENERGY STAR program is a partnership between the United States Environmental Protection Agency (EPA), the United States Department of Energy and technology companies with the purpose of creating office equipment that is more energy efficient. The program estimates that "if every home office product purchased in the U.S. this year (2009) were ENERGY STAR qualified, Americans would save $200 million in annual energy costs while preventing almost 3 billion pounds of greenhouse gases – equivalent to the emissions of 250,000 cars" (ENERGY STAR). Through taking product design actions like lowering the watts used by idle

computers and adjusting processor speeds, technology companies can have a major impact on product environmental impacts.

Supplier Audits

The purpose of supplier audits is to ensure that suppliers comply to a similar level of corporate responsibility that the central company or corporation follows. The audits force companies to recognize both the upstream and downstream impacts of their activities, especially in the means of life-cycle assessments (Gray 100). Areas for supplier audits include the restriction of certain chemicals, environmental waste and emissions, and employee welfare. Supplier audits usually involve compliance signatures, surveys, and audits performed by a third party.

The EICC (Electronic Industry Citizenship Coalition) was created in 2004 with the purpose of improving the environmental and working conditions of global supply chains. The members of the industry coalition include Apple, Dell, HP, IBM, and Intel. It was the first corporate responsibility collaboration in the industry. Through the EICC, members improve CSR supply chain reporting and develop tools to monitor supplier performance. The tools include a supplier audit program that is conducted by a third party, a risk assessment tool used in monitoring supplier compliance, a self assessment questionnaire for suppliers to fill out annually, and an electronic tool for accountable supply chains (E-TASC) that aids in the management of data (EICC). Through the involvement of the EICC, environmental responsibility has become an industry standard for technology companies.

Accounting for Energy

Energy consumption remains one of the central environmental issues. Through the reduction of energy usage, businesses can reduce generated waste, harmful emissions (especially the emissions that are indirectly created by the utility companies themselves), and the fuel usage of transportation while decreasing energy costs. Although energy can be found in renewable (wood, wind, solar, hydro sources), Western society attains its fuels primarily from nonrenewable (oil, gas, coal, nuclear) sources (Gray 111). The nonrenewable sources are harmful to the environment because it depletes a natural resource and uses a great deal of energy when they are transported and processed (which creates waste, heat and emissions).

Also, "*per capita* consumption of energy in the developed countries is approximately seven times higher than in the lesser developed countries" (Gray 112). Therefore, the developed countries should be the focus of energy reform; energy is used in greater volumes often for reasons other than necessity and a large proportion of it is generally wasted. There are already a number of energy-related coalitions and organizations in the United States (the EPA's "Climate Change" program for example). Companies take the initiative and in many cases, have cost savings that compensate for their energy programs in the long run. "Organizations, if they do not ignore the matter altogether, seem to follow one of three routes: piecemeal, in-house initiatives; a comprehensive top-down approach; or a combination of the two" (Gray 116). One of the most important primary steps in improving energy efficiency and lowering energy costs is to create a method to monitor all flows of energy in and out through the scope of all existing business operations. Energy costs should also be isolated in the accounting procedures and treated as a separate cost instead of general overhead; through this

method, accountants can even raise energy awareness from employees and management

(Gray 119). Energy units (a better measurement of should also be measured as well as

the costs so that the company has reliable data when it assesses its energy consumption;

the idea of using energy units in bookkeeping originated in the 1970's (Gray 120).

One way of accounting for emissions is through the use of a "cap and trade"

program which is a "market-based approach in which 'allowances' or 'credits' are used to

provide incentives to companies to reduce emissions by assigning a monetary value to

pollution (Fornaro 1). For example, a single allowance may be equivalent to the

allowable emissions of one ton of CO_2.

Accounting for Waste, Packaging and Recycling

The minimization of the waste and packaging used by companies can lead to

substantial financial savings. "Under typical management accounting practices, many

costs avoided. . . are not credited to the successful manager, so pollution prevention

projects often compete on an unequal footing with projects reliant on the existing

pollution control and waste disposal infrastructure" (Ditz 33). With the reduction of

waste, companies can also reduce the increasing disposal fees and governmental fines. A

key aspect of reducing waste is reducing the amount of resources used in business

operations (Gray 130). By using fewer resources, there is less material that will be

converted into waste. The first step is to assess the inflows of resources in relation to the

outflows of waste in an environmental audit. There are three major ways of addressing

the issue: change policy to correspond with desired changes in actual and potential costs,

record the physical quantities of waste, and charging waste costs to line management (i.e. the "Polluter Pays Principle) to motivate management to reduce waste (Gray 133-5).

Innovations in packaging, including resource substitution and material minimization, can also create savings for businesses. Since the packaging is typically useless to a company after it is shipped, it is essential to reduce its cost. Although recycling is an important issue for companies to address, the ratio of products sold to products recycled remains rather low.

Environmental Management

The goal of environmental management is to adjust policies and systems to reflect the benefits and consequences of business procedures. Steps for optimal environmental management systems include using cross-functional teams, maintaining full managerial support, benchmarking successful plans, and using total quality management (TQM) tools to identify and execute plans (EPA 21-22). One of the most important factors of an environmental management system is the environmental review that is used to make assessments (especially focusing on the key performance indicators). Based on the reviews, companies can create information systems (which deals with the problem of the lack of raw data that would have existed otherwise). Important functions of the environmental management system is to reduce operational costs and environmental expenses, identify and reduce risks, increase revenue through more environmentally-friendly products, and to create intangible brand value (Esty 103-104). Successful environmental management procedures can help a company establish a competitive advantage over other companies in the industry.

Sustainable environmental management is not merely a short-term public relations stunt to garner attention. It is a commitment that must be embraced all the way up to senior management, 'the tone from the top.' Unless the higher levels of management accept the principles, the change required to maintain more sustainable procedures would be difficult to attain. "The openness of the organizational culture has usually been the determining factor of successful developments along these lines" (Gray 49). One of the first steps for a company pursuing corporate responsibility is to create an (worldwide) environmental policy as well as charters. The environmental policy should serve the purpose of supporting the general mission and policies as well as providing additional policies in its area (Gray 61-62). Therefore the company can tie the environmental aspects of its operations to its most central causes.

The ISO 14001, released by the International Organization for Standardization, is the most commonly accepted standard for environmental management systems in the technology industry. The management tool requires companies to " identify and control the environmental impact of its activities, products or services, and to improve its environmental performance continually, and to implement a systematic approach to setting environmental objectives and targets, to achieving these and to demonstrating that they have been achieved (ISO). The ISO 14001 standard provides a general overview of acceptable environmental management systems, but is not aimed to address the needs of each specific industry.

Life Cycle Analysis

The life cycle analysis (LCA) became very well-known in the 1990s. It is defined as "an objective process used to evaluate the environmental burdens associated with a product, process, or activity. . . ; extracting and processing of raw materials; manufacturing, transportation and distribution; use/re-use/maintenance; recycling; and final disposal (Fava 1991, 19, Gray 165). "It is easy for materials managers to overlook environmental costs and benefits during decision making because they tend to occur upstream or downstream of the immediate decision, e.g., a purchasing action can have materials handling, storage, and disposition repercussions" (EPA 17). All aspects of the product's impact, including energy, ecological consequences, emissions, disposal, packaging and all inputs and outputs, must be considered. One of the major improvements in the LCA is dematerialization; "dematerialization is based on the surprising-yet ultimately obvious- realization that consumers don't necessarily *want* the physical materials used in manufacturing, shipping, and using many products" (Savitz 239). The reduction of materials and volume in earlier stages of the life cycle of a product greatly impact the environmental impacts that the product has during its intended and in disposal or recovery.

The three stages in the LCA methodology are life cycle inventory (initial review of impacts), life cycle impact analysis (identification of impacts) and the life cycle improvement analysis (improving the LCA) (Gray 168). Therefore, companies need a standard approach for assessing and reviewing factors in the life cycle. Some possible complications of the LCA include bounding the system, attaining and handling the information, and scientific uncertainty (Gray 172). Although the LCA may seem complicated, improvements can be made by simply taking a pen and paper and drawing

all the possible interactions and impacts a product has from the development of raw materials to its end-of life.

Thesis

Companies that release annual corporate responsibility reports have more awareness over issues such as emissions and hazardous waste (since these issues are used as key performance indicators (KPIs) in the actual reports). Therefore, the companies listed with the Global Reporting Initiative (Dell, HP, IBM, and Intel) will have more environmentally-related savings than companies that are not GRI-listed (Apple); even though Apple has been using environmental practices since 1990, the company could improve its management and accounting databases by creating and issuing sustainability reports. Even though Apple is releasing "greener" Macbooks, it trails behind the other companies in terms of sustainable business practices.

Methodology

The technology company was chosen to provide the opportunity to study the life cycle of its products; technological products become obsolete and are disposed at a very rapid rate, so it is important for the manufacturers to keep end-of-life in mind while designing newer products. Four major American technology companies were selected from the Global Reporting Initiative's Reports List. Apple was chosen as the fifth company for research for several reasons: it does not release GRI-listed annual reports although it has been promoting sustainability for nearly two decades, Apple has received

one of the lowest ratings on Greenpeace's "Guide to Greener Electronics, and its sustainability efforts have come under fire by Dell.

Through the conducted literature review, several key areas were chosen for analysis; environmental management systems, corporate accountability and ethics, the life-cycle analysis, energy and emissions, hazardous and nonhazardous waste, water management, and supplier audits. All of the information used for the purposes of the project were found in the company's annual sustainability reports (fiscal years 2004-2008), company websites, the U.S. Securities and Exchange Commission (SEC) annual 10-K financial files, and websites of sustainability-related organizations (such as the EPA, REACH, and RoHS). Using the company information, a five-year case study was compiled for each company. After the studies were conducted, inventory turnover ratio/ Scope 1 and Scope 2 greenhouse gas (GHG) emissions ratios were calculated in attempt to determine a correlation between inventories and the levels of related emissions. The final form of analysis was the examination of the company rankings that were conducted by the Greenpeace and Climate Counts organizations.

Company Highlights

Corporate Accountability

All five companies follow a "tone from the top" method; sustainability principles are embraced by corporate management. Environmental policies and goals have been set and monitored. The companies aim to promote an acceptance of environmental ethics and global citizenship.

Apple released its environmental policy in 1990. Apple does not release an annual corporate responsibility report; however the company's performance has recently become indexed by the Global Reporting Initiative (GRI) Sustainability Reporting Guidelines.

Dell's goal "is to create a company culture where environmental excellence is second nature." Dell's key goals for sustainable business function include working with management to identify the corporation's environmental and social impact, engaging stockholders, creating key indicators that will allow for monitoring and measuring impacts, and working with internal groups to set goals to reduce the environmental impacts and improve the social impacts. The Soul of Dell is the name of Dell's corporate philosophy. The key factors of the Soul of Dell are "customers, the Dell Team, direct Relationships, global citizenship, and winning (with integrity)." During 2007, Dell made the ambitious goal of wanting to become the greenest technology company on the planet.

Even during the 1940s, Dave Packard was interested in the relationships that the company held with its employees, customers, suppliers, and society in general. The focuses of the global citizenship objective are the environment, privacy, and e-clusion and education.

Intel follows Corporate Business Principles (CBPs) as well as its Principles for Responsible Business. To stay on track with GRI listing, Intel has a special policy set.

In 2003, IBM founded the Global Leadership Network for Corporate Citizenship with nine other companies. From 1999-2005, IBM invested $278 million in capital and $546 in operating expenses to reduce its environmental impact.

Environmental Management

A focus on the ISO 14001 certification is central to the environmental management systems of the five selected companies. The systems are composed of specialized teams and groups that are focused on the different aspects of sustainable development. The companies also have an ethics committee that is capable of dealing with matters related to sustainability.

Apple's management system became ISO 14001 certified in 2000. Environmental management has been supported by the founders of the company. Although Former Vice President Al Gore Jr. has been involved with the company, the amount of information available remains very limited.

Dell's sustainability management system consists of five teams; the Reporting Core Team, the Asset Recovery Core Team, the Public Affairs Sustainability Team, the Sustainability Policy Team, and Employee Teams. Dell has a Global Ethics Council, which is supported by Regional Ethics Committees. The five committees that are most

related to sustainability efforts are the Environmental, Sustainability, Ethics, Audit, and Diversity committees. ISO 14001 was adopted by the company during 2005-2006 The purpose of Dell's EHS management is to identify potential risks, set goals and measure progress, set means to reduce risks, improve communication and training, maintain documentation, and audit performance (2005).

HP's business groups are the Customer Solutions Group, Imaging and Personal Systems Group, and the Technology Solutions Group. The Environmental Strategies and Sustainability Council is key for assessing corporate responsibility issues. There is also an Ethics Committee. HP has an environmental, health and safety management system that is based on ISO 14001 and OHSAS 18001.

Intel has an Ethics and Compliance Oversight Committee (ECOC) as well as a Business Practice Excellence (BPX) training program for its employees. During 2004, the Working Group took the responsibility of improving Intel's environmental impacts; the group includes community members, critics, environmentalists, and Intel's representatives. In 2008, Intel created a Corporate Sustainability group run by a vice-president. Dell's EHS organization created the vision "Protecting Today, Creating a Better Tomorrow, Together." It announced that in 2008, employee compensation will be calculated as a factor of company environmental performance.

IBM had a Corporate Citizenship Council, which focuses on the sustainability aspects across the company's divisions. IBM has standardized process flow documentation and tests its control points of over one hundred processes quarterly. Internal controls include on demand scorecards to help monitor its systems. The company has followed a written code of conduct since the 1960s.

Life-Cycle Analysis

Through the life-cycle analysis, the companies can monitor the impact of their products at every stage in their life. The five companies follow similar procedures in assessment, although the four GRI-listed report the LCA in much greater detail. The most emphasis on the LCA stages is placed at design, production, logistics, and end-of-life.

 Design

With the rise of European legislature such as REACH (Registration, Evaluation, Authorization and Restriction of Chemical substances) and IPP (Integrated Product Policy) industries are required to continually improve their performance. In addition, due to the global nature of most manufacturing processes, monitoring the product life cycle has become complicated.

Apple's production accounts for 95% of its total emissions and business operations account for the other 5%. Apple's life cycle analysis procedure has been verified by the highly qualified Fraunhofer Institute in Germany. Apple is the only electronics company that discloses detailed Product Environmental Reports for each of its products.

To address these issues, Dell has created a Design for the Environment (DfE) Program to analyze the environmental impacts at each stage of a product's life. The products are graded with a scorecard that evaluates the packaging, energy use, and environmental impact. Dell believes in product dematerialization and materialization methods (i.e. chassis models and multifunctional printers) which reduce the amount of

resources used during production. Product integration allows for a longer facility life-span, reduced waste, and increased factory capacity.

HP had an early start on its Design for Environment (DfE) program that was developed in 1992; its focuses are energy efficiency, materials innovation, and recyclability. The HP TouchSmart IQ 500 series PCs uses 55% less metal and 37% less plastic than standard PCs. Since 1989, the HP Nonstop server has delivered more than 80 times the performance per mass. HP uses recycled polyethylene terephthalate (RPET), which is made from recycling print cartridges and plastic bottles, in certain products. During 22004, 40.6 tonnes of RPET was used in production. HP also uses bioplastics that contain vegetable polyactic acid. To allow more product recyclability HP has improved product designs including using snap-in features instead of adhesives, dematerialization, using single plastic polymers, and using molded-in colors instead of paint.

The ENERGY STAR Program

The Energy Star Program is a joint program between the U.S. Environmental Protection Agency (EPA) and technology companies to decrease the power consumption of office products. Cooling accounts for more than half of the power needs of a data center and cooling power savings can amount to 5,000 tonnes of carbon dioxide emissions a year.

All of the MacBooks that are shipped comply with EPEAT and ENERGYSTAR 4.0 standards; Apple's products have met ENERGYSTAR requirements since 2001. In 1992, Apple was even a founding member of the program. During its idle mode, the 13 inch MacBook consumes less than a fourth of the energy that would be required by a 60W light bulb. The MacBook Air power adapter uses less than .2W (during no load).

The Apple website has an Energy Usage Calculator to help customers figure how much energy their products are using.

Dell has been a member in the program since 1993. The reduction of power consumption decreases harmful carbon dioxide emissions and the enhancement of the global warming process. In 2007, Dell implemented the Energy Smart program to provide information to customers. In 2008, Dell had 15 desktops, 9 notebooks, 70 monitors, and 5 workstation systems that met the Energy Star 4.0 requirements.

More than 1000 HP products have received ENERGY STAR ® certification. HP has worked with the ENERGY STAR guidelines since 1992. More than 94% of the Personal Systems Group products and 98.5% of the Imaging and Printing Group products are qualified. While the program's limits for power usage are 15 watts, HP's laptops use less than a watt of power in low power mode. "Instant on technology" reduces the amount of heat needed for the LaserJet toner and has saved an estimated 6.5 million tonnes (1.4 million cars) of carbon dioxide emissions between 1993-2007. Power management features save up to 381 kWh per monitor and 294 kWh for a desktop PC each year; for every 12 consumers, the savings is equal to removing an automobile from the road.

Intel has been working on the power efficiency of its products. Through its Our Instantly Available PC (AAPC) technology, PC energy use has been reduced up to 71%. Between 2002-2010, the EPA estimates that this technology will reduce 159 million tons of carbon dioxide emissions (equal to the emissions of 5 million cars. The EPA made a prediction that Intel's strategy would reduce electricity usage more than 16 billion kWh,

reduce over 10 million tons of CO2 annually, and have annual cost savings of $1.25 billion.

In 2004, 100% of IBM's personal computers met ENERGY STAR requirements. The BladeCenter products have virtualization capabilities to allow multiple workloads on a single server that annually saves 300 square meters and $300,000 per year. IBM has PowerExecutive software, which lets clients measure the power usage of their data centers. The "airgap" process used in manufacturing microprocessors saves 15% in energy. Cooling doors on server heating exchanges reduces server heat by 60%. Through Project Big Green, which was announced in 2007, an additional billion is donated to improving energy efficiency. Also during 2007, the Inaugural Green500 list ranked nine of IBM's computers in the "top ten most energy-efficient supercomputers in the world."

LCD Technology

LCD technology has helped in the process of sustainable production. A normal 24-inch television weighs the equivalent of 2.68 23-inch LCD (light-crystal display) televisions. The use of LCD displays instead of other types of displays reduces energy usage by as much as 30%. Less material, energy, and mercury are reasons why companies have been switching from manufacturing (cathode-ray tube) CRT displays (which contain two pounds of lead) to manufacturing LCD displays (which contain a few grams of lead).

In 2006, Apple was the first to completely replace CRT displays (which contain lead) with the more efficient LCD displays.

Dell is saving a considerable amount of material in the production of LCD televisions. As announced in the 2004 CSR, Dell was working to reduce and eliminate the mercury included in the monitor backlight.

Restricted Chemicals

The companies have faced pressure from the European Union's REACH and RoHS regulations to reduce or remove certain chemicals and substances from the production of its products. Most of the companies have stated that they have taken extra precaution and have phased out certain harmful materials before some regulations were even in effect.

Apple's products have complied with the European Union's RoHS Directive and REACH program concerning harmful substances since 2006 (initial phase out started in 2004). Apple has phased out materials such as lead in cables (1999), cadmium in cables (1999), PVCs in packaging (1995), and lead batteries (1991). The MacBook, MacBook Pro, and MacBook Air (the world's thinnest notebook) are manufactured with recyclable aluminum and glass as well as materials that are free of PVCs, BFRs, mercury, and arsenic. In 2007, the MacBook Pro was the 15.4 inch LED display in the industry that did not contain mercury.

Dell has restricted more than fifty harmful substances from use in production to meet both legal requirements and customer satisfaction. In 2002, a chemical management process was created and in 2003, corporate goals regarding the materials were created. In 2005, Dell created a chemical use policy. Dell planned to meet the requirements of the European Union's Restrictions on Hazardous Substances (RoHs) before July, 2006. The two main substances that have been focused on in the electronics industry are lead and

bromine. Dell planned to meet the requirements of the European Union's Restrictions on Hazardous Substances (RoHs) before July, 2006.

HP's first fully RoHS compliant products were shipped in 2005. PVC is only used in wires and cables; substitutes are costly but HP is researching alternatives. In 2006, HP made BFR-free external cases and PVC-free packaging. HP is also compliant with the European Union REACH program concerning chemicals. The PVC content of inkjet tripacks have been replaced with recycled plastic (1,100 tons of PVC were replaced with 300 less tonnes of PET plastic). From 2005-2007, over 200 million HP inkjet print cartridges were made with 2,300 tonnes of recycled plastic.

In 2005, Intel announced that it had reached its goal of eliminating 95% of the lead used in its products, which was reached. Intel has been working with the European Union's Restriction of Hazardous Substances since 2000. In 2007, Intel replaced isopropyl alcohol (IPA) due to its tendencies to create smog. It also announced the reduction of halogens in its products, setting a goal that most of its 44nm processors would be halogen free by the end of 2008.

All products that IBM released after July 1, 2006 were compliant with RoHS standards. IBM also uses powder coatings instead of paint on its metal covers (which avoided 870,000 pounds of volatile organic materials in 2004). From 1993-2005, IBM reduced the levels of chemicals on the U.S. Toxic Release Inventory list by over 85%.

Logistics and Packaging

Air transportation creates approximately eight times as much harmful emissions as ground transportation. Therefore, companies are focusing on logistics to reduce the amount of transportation needed for product shipments.

Dell has improved its ground networks as well as created a manufacturing facility in North Carolina (2005) to reduce the need for air transportation. The company is also a member of the EPA's SmartWay Program, which focuses on transportation. During 2004, 90% of the U.S. shipments were made through SmartWay certified carriers. Dell reported in 2004 that it had reduced air transportation from 25% to 14% of its parcel tonnage. During 2008, 86% of the IBM shipping in the Americas was spent with SmartWay carriers.

Packaging

The companies have started packaging reduction programs to decrease packaging spending. All of the companies listed below have employed engineers to perform tests and assessments on the efficiency and durability of their packaging materials and innovations.

During 2005, Dell replaced its wooden pallets with plastic (recyclable) slips. In 2005, it was estimated that in two years "this program will account for over 25,000 tons of wood reduced, and shipping reductions of over 6500 truck trips, over four Pacific ocean vessel trips, and over 30 full trains moving across the United States."
In 2008, the size of the slips were reduced 14%, which will save 720 tons of material annually. Another shipping innovation, the Eco-Delivery Project is a reusable crating system for large deliveries. Using the system has reduced the deployment time from four days to 2.5 hours and has saved $22 per shipment.

During 2004, HP saved more than 10,000 tonnes of materials by using "clamshell" packaging made of 30% recycled material for its inkjet cartridges. During 2004, HP also saved more than $1 million by using a new polyethylene packaging

method for some of its cameras. In 2005, HP published a packaging study guide and the ROSe (Robust Orientation Size effect) calculator for its engineers.

In 2004, Intel saved more than $1.5 million dollars from its 70 packaging projects, which led to the reduction of more than 250,000 pounds of paper, 2,000 pounds of plastic, approximately 34,000 pounds of wood, and 47,000 of non-recyclable material. Fuel consumption was decreased due to the 66% increase in product shipment.

IBM created Packaging Guidelines in 1990 with the goal of minimizing waste. IBM uses bundling solutions to reduce the space needed for its products. For over ten years, the company has restricted the use of PVCs, free-flowing cushioning materials, and in most instances, commingled packaging. IBM is also involved with the EPA's EPEAT (Electronic Products Environmental Assessment Tool).

End of Life

All of the companies in the project provide recycling programs for the majority of their consumers. Recovery and recycling reduce electronic waste (which is often shipped overseas and disassembled in unsafe working conditions). Through the programs, the companies can use a fraction of the recycled materials in the manufacturing of newer products.

Since 1994, over 83 million pounds of Apple's electronic waste has been diverted from landfills. In 2007, the annual recycling rate increased 57% as Apple collected almost 21 million pounds of electronic waste; the recycling rate for the year was 18.4%. In 2008, Apple recycled 30.5 million pounds of products with a recycling rate of 38% (a 47% increase over 2007). Product end-of-life management is available in 95% of the countries that sell Apple products. There is a free recycling program for United States

customers for old products with the purchase of a Mac. The free iPod recycling program accepts all models and manufacturers (and even cell phones) and offers customers a 10% discount on new models.

Dell's motto for its consumer awareness campaign is "No computer goes to waste" and the company has been offering recovering services since 1991. Dell offers asset recovery services, donations, recycling events and lease returns. Dell has consumer recycling days to promote the recovery of its products (including printers).

Since 1987, HP has been recycling computer and printer hardware. HP offers asset recovery and leasing services. In 1997, HP created a recycling program for its inkjet cartridges. In 2003, HP provided postage-paid envelopes with its inkjet cartridges. The HP Planet Partners program operates in more than 40 countries. All of the materials in the inkjet cartridges are recycled and used to make new products as well as trays, hangers, shoe soles, roof tiles, and wire spools. The HP Renew Program earns more than $500 million from remanufactured products. HP is compliant with the 2005 European Union Waste Electrical and Electronic Equipment (WEEE) legislation.

Intel participated in the new EPEAT (Electronic Product Environmental Assessment Tool) which helps federal purchasers measure the environment effect of electronics products. In 2005, Intel teamed with eBay to create a way for customers to recycle their electronics. Intel also announced that it follows the European Union's Waste Electrical and Electronic Equipment (WEEE) Directive. During 2007, Intel collected more than 2 million pounds of waste. In 2008, Intel collected more than 1.5 million pounds of electronics from nine events.

IBM offers asset recovery services in more than 57 countries , which includes overwriting, refurbishing, and recycling. During 2007, 44,332 metric tons of products were recycled and was equal to 42.4% of the new products made and sold. During 2008, 42,302 metric tons of products and product waste was processed; 96.9% of it was salvageable.

Energy and Emissions

There is a correlation between energy consumption and harmful emissions because most of the energy is used and most of the emissions are released during production. All of the companies have discovered innovative ways to reduce energy through facility improvements or the participation in green energy programs.

Apple started disclosing its emissions information for each of its products in October 2008. During 1992, Apple started plans for phasing out harmful CFC emissions. Since 2006, the company has been monitoring greenhouse gas emissions as part of the life cycle analysis of its products. Apple does not use ozone-depleting substances (ODCs) in any of its functions. Since 2006, the improvements in the efficiency of lamps and lighting motion sensors (which trigger automatic shut-off) has save more than 2 million KWh. Apple has been a part of the "Green Choice Power Program" for more than a decade. Around 44 million KWh of renewable energy was produced in the last five years, which is equivalent to 29 million kilograms of carbon dioxide emissions.

All of Dell's facilities have environmental-impact measuring technology. Its greenhouse emissions mainly come from product energy consumption, manufacturing energy consumption, product distribution and employee transportation. During 2004, Dell

addressed the issue through reducing the testing of emergency generators, purchasing at least 10% (6.2 million KWh and an avoidance of 94.2 million pounds of CO2) of its energy sources from the Green Choice Program, and promoting carpooling. Global energy reporting was added to the CSR in 2005. The new North Carolina manufacturing facility incorporated several key energy saving features, including energy efficient lighting fixtures, a system to reclaim heat from the air compressors to assist in heating the facility during cooler months, state of the art air compressor controls and equipment, and a high-performance building automation system for controlling heating and cooling.

More than 85% of the company's climate impact comes from electricity use and 97% from energy use in general. HP plans to reduce its impact through lighting, heating, IT, ventilation and cooling improvements. HP's goal is to reduce electricity use by 50 GWh a year (equal to powering the Eiffel Tower for nearly seven years). In 2006, Carpet is being replaced with carbon-neutral tiles and the carpet is being recycled. HP joined the EPA's Green Power Purchase program and purchased 11 million kWh of renewable energy. In addition the company made contracts with SunPower Corp (which will install 5,000 solar panels in the California site that will save 454 tonnes of carbon dioxide emissions per year) and Airtricity (estimated to save 40,000 tonnes of carbon dioxide emissions annually).

In 2005, Intel began to publish quarterly EHS indicators, declared a focus on energy efficient (and reduced LCD energy consumption by 40% and reduced 15% consumption per unit), reduced lead, and recycled 57% of its chemical waste and 75% of its solid waste. In 2004, Intel spent more than $4 million on energy conservation projects that were projected to have a five-year cost savings of $7.4 million as well as reductions

of 25.5 million kWH of electricity usage and 226.6 cubic meters of water consumption. Intel became a member of the Chicago Climate Exchange (CCX), which is the world's only voluntary and binding reduction registry. It requires 2010 reductions that are 6% below the baseline of average emissions from 1998-2001. In 2008, Intel received recognition from the EPA's Green Power Partnership when the company decided to start buying renewable energy certificates (RECs) as a part of a contract. The EPA recognized Intel as the largest national purchaser of green power for the year.

IBM's operations do not lead to significant greenhouse gas emissions, although it recognizes the impact that its electricity that is provided from utilities causes an indirect release of carbon dioxide. From 1998-2004, IBM saved more than $115 in energy costs and stopped more than 1.28 million tons of carbon dioxide emissions (equivalent to 51,600 cars traveling 10,000 miles per year). IBM is also a member of the EPA's Climate Leaders Program. The company outperformed the program's 2000-2004 goal of 4% when it reduced its emissions by 6.4%. In 2008, IBM purchased 8.6% (450 million kWh) of its electricity from renewable energy sources. IBM is also investing in solar technology, appropriating its scrap silicon wafers to be used in solar panels, and smart grids (which can be used with wind or solar energy). During 2008, carbon dioxide emissions were reduced by 3.4%.

Business Transportation

The transportation of employees in regard to work and business conferences creates significant emissions. The companies listed below have addressed the issue and have created methods to reduce the need for employee travel through methods such as carpooling and web conferences.

Apple has transit programs including the Apple U.S. Commute Alternative program which offers rewards like a transit subsidy (up to $100 a month) to promote carpooling. The transit programs have saved an equivalent to the emissions (53, 523 kilograms) of 4,500 cars on the road every business day.

In 2007, HP joined the EPA's SmartWay program. It was estimated that in 2007, 36,000 tons of GHG emissions were avoided through the company's logistics programs.

In 2004, Dell was named the top company in the EPA's list "Best Workplaces for Commuters from the Fortune 500 Companies" for its available carpooling and transit options, which reduce the climate impact.

To reduce the impact of transportation, IBM has carpooling (which saved an estimated 63,000 tons of carbon dioxide emissions) and working-at-home programs for its employees. In 2005, IBM was ranked 17th on the EPA's Top 20 Best Workplaces for Commuters list. In 2006, the working-at-home program saved an estimated 8 million gallons of fuel. During 2007, over 1,000 web conferences were held, saving the fuel that would have been used in travel.

Waste

All of the companies have addressed waste as an important concern of their facilities. The companies have used various techniques ranging from reducing paper towel use to reselling salvageable portions of their waste.

Although there is not a considerable amount of solid and hazardous waste, Apple has recycling and composting programs to reduce the amount of waste.

Dell is concerned with its levels of nonhazardous waste, which includes cardboard, paper, plastic, cans, pallets, and bottles. The company has a Reduce, Reuse,

and Recycle (R3) program to reduce waste. Each manufacturing facility has implemented the R3 program to deal with its nonhazardous waste. During 2005, the reuse/recycling rate was approximately 85%. During 2006, the recycling rate was 79% and the reuse rate was 11%. In fiscal year 2005, Dell's Round Rock campus began replacing its existing carpet with recycled carpet. By the second quarter of fiscal year 2005, it is our goal to remove and recycle 1 million square feet of carpet (weighing approximately 423.5 tons), thereby diverting it from Austin area landfills. The new carpet being installed has non-

PVC backing and can either be completely reused or recycled.

HP's Dilute ink waste evaporation systems reduce waste by 44% (more than 700 tonnes of incinerated waste). During 2006, HP saved $4.9 million by recycling more than 87% of its solid waste. During 2005, 37,000 tonnes of paper (560,000) trees was recycled which avoided 1 billion liters of water and 170 GWh of electricity. HP urges employees to use reusable mugs and cups and has reduced paper napkin use by nearly 24%. 60 tonnes of coffee grounds are used by a coffee recycling program for landscaping. In 2005, tool reuse systems were improved and more than 600 wafer fabrication process tools were reused which along with other reused tools avoided 650 tons of waste.

Intel found a way to dry and sell the copper oxide portion of its waste. 55% of all chemical waste was recycled and more than 1 million gallons of waste was reused. In 2006, 80 tons of food was composted and more than 110 tons of material were reused as packing supplies. Intel supported a fuel substitution for chemical recycling.

In 2005, IBM's hazardous waste output had been reduced 19% from 2004 (847 metric tons). During the year, 43% of its waste was recycled. From 2006-2007, hazardous

waste indexed to output was reduced by 8.4%, avoiding 302 metric tons of waste. However, hazardous waste generated increased 14% due to the management of contaminated soil and sludge. During 2007, 78% of the waste was recycled.

Supplier Audits

The companies all believe that sustainable practices should apply to their suppliers. All of the companies have Supplier Codes of Conduct and are members the EICC industry collaboration.

During 2005, Apple initiated its Supplier Code of Conduct for which suppliers are required to comply. The code is similar to the EICC code but is more regulatory in several ways. All final assembly suppliers were required to create quarterly reports focusing on 23 key performance indicators (KPIs).

Dell applies its environmental and sustainable practices to the suppliers that the company chooses. The Dell Supplier Principles were first introduced in March 2004; the principles focus on the environment, employee health and safety, and labor rights. In 2006, Dell introduced a BPI (Business Procurement Improvement) methodology, which involves skilled Dell manager being teamed with global suppliers to identify and analyze issues and actions. During 2008, BPI was expanded to 17 additional facilities. All Tier 1 suppliers are required to sign an EICC code commitment letter. A Supplier Review Board was created in 2008 to handle supplier noncompliance issues.

HP has a $53 billion supply chain; the company's top 500 suppliers (which represent 99% of the total amount spent) are the main concern of the Supply Chain Social

and Environmental Responsibility (SER) Policy. During 2008, HP audited 142 suppliers. In 2008, HP was the first IT company to disclose a list of its top suppliers.

Intel has been placing expectations on suppliers since 1998. Supply Chain management consists of 3 vice presidents and 12 directors. Intel has annual Supplier Days and Supplier Awards to promote awareness. In 2006, Intel chaired the EICC coalition and provided training and review for its suppliers. In 2008, Intel performed a top-tier site assessment and 84% of the suppliers were medium-low risk.

IBM has a $39 billion global supply chain with suppliers in over 60 countries. The company manages its supply chain through the establishment of standards and communication, supplier assessments, industry collaborations, and compliance and improvements. IBM spends nearly $2 billion a year on supplier diversity. In 2004, the IBM's Supplier Conduct Principles were released. In 2009, the company plans to exchange its code for the EICC code of conduct and will perform audits according the EICC Validated Audit Process.

Inventory Turnover Ratio/ Emissions Analysis

Corporate sustainability reporting is a relatively new practice; there are few means of measurement that exist for cross-industry comparison. The objective of the analysis was to determine whether a correlation existed between the inventory turnover ratio and the level of emissions (Scope 1 and Scope 2) that are related to electricity usage or operations. The inventory turnover ratio is defined as a measurement of how quickly a company can sell and replace its inventory; it is calculated by dividing cost of goods sold by average inventory. The reason that the calculation of the inventory turnover ratio was selected is that companies that are able to manage inventories better would have lower rates of emissions (because company reports stated that approximately 90-95% of all electricity consumption is directly related to manufacturing and the majority of emissions are directly related to electricity consumption).

Inventory Turnover Ratio/ Emissions Trends
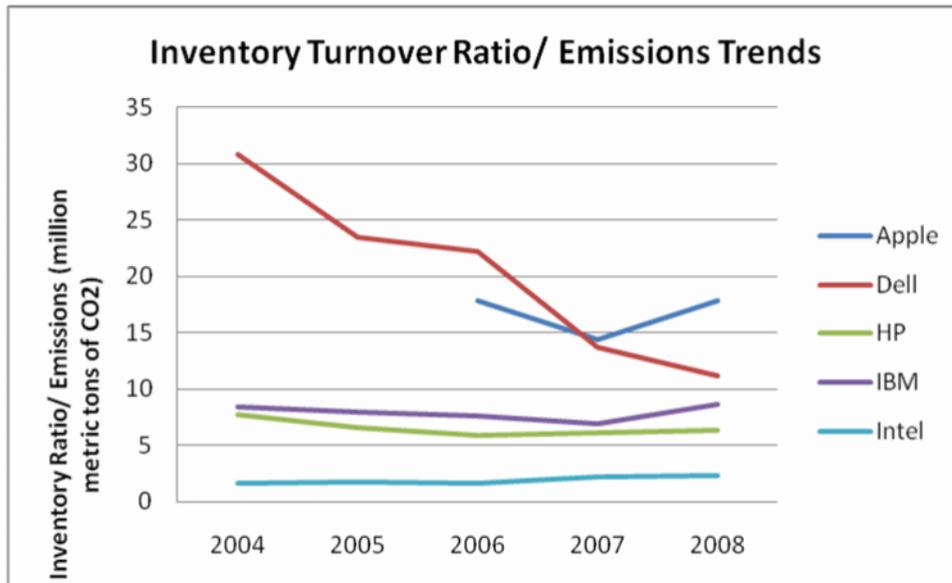
Dell has a direct business model and therefore has a lower inventory turnover rate in comparison of the overall technology sector. Over the five year period, the relationship between Dell's inventory turnover rate and emissions was negative and showed a significant decrease, a sign that Dell has been improving its emissions on the basis on its inventory management. HP, IBM, and Intel were stable during the period. Of the five companies, Apple had the lowest performance. It is assumed that Apple does not have a strong ratio because it did not measure emissions prior to 2006 and therefore has less experience with dealing with emissions reductions than the other companies.

Rankings Analysis

Greenpeace and Climate Counts are two organizations that maintain company rankings and include all of the focus companies except for Intel. The findings of the two organizations were chosen for examination to provide a basis of company assessment outside of the corporate sustainability reports that may provide a new perspective on the companies.

Greenpeace releases its "Guide to Greener Electronics" multiple times a year. The guide focuses on fifteen different factors that are mostly involved with the life cycle analysis. Dell, HP, and Apple are included in the rankings. HP and Dell have been penalized in 2009 for not meeting their goals concerning PVC and BFR phase-outs. Apple's only good score for June 2009 concerned BFR and PVC phase-out and the company's overall score was 4.7/10. The bad scores include no use of recycled plastic content, no global GHG emissions reduction support, and no amounts of renewable energy used. Dell's ranking was a 3.9/10. The company's strongest points included the precautionary principle, chemicals management, GHG emissions reduction commitment, and amount of renewable energy used; the worst points were the timeline for PVC and BFR phase-out, timeline for additional substances phase-out, and global GHG emissions reduction and support. The score for HP was 3.5/10. The strongest points included the precautionary principle, chemicals management, and carbon footprint disclosure; the worst points were no PVC and BFR-free models, timeline for additional substances phase-out, and global GHG emissions reduction and support.

Climate Counts has ranked IBM, Dell, Hewlett-Packard and Apple from 2007-2008. Climate Counts measure 22 areas in categories concerning review, reuse, report, and policy stance specifically regarding emissions. IBM was the strongest company with a score of 77/100 (+7 increase from 2007). HP received a 68 (+9) and Dell received a 49 (+8). Apple performed the worst with a score of 11 (+9). Apple received no point for the review and policy stance sections and low points for the reuse and report sections.

Conclusion

As awareness concerning critical environmental issues continues to rise, corporations will face more pressure to reduce the environmental impacts of their operations and manufacturing: multinational regulations, shareholders, nongovernmental organizations (NGOs), and environmental lobbyists are only a few of factors that influence company policies and business standards. However, there is a serious "green" behind corporations "going green." All five of the selected companies experienced a range of financial benefits from choosing to adopt sustainable business practices. From the decrease in harmful chemicals which helps avoid environmental fines, the recycling of waste in production that reduces the need for the purchase of new raw materials, to reduced product packaging that increases the efficiency of each shipment, sustainability benefits are only limited by the amount of innovation each company invests. However, a completely "sustainable" technology product does not exist yet. Considering the rankings of Greenpeace and Climate Counts, there is room for a great deal of improvement from these companies. These companies are on the right track by addressing and assessing corporate responsibility, but there is a long road ahead for the optimization of green technology.

Works Cited

Books

Ditz, Dan, Janet Ranganathan, and R. Darryl Banks, eds. Green Ledgers: Case Studies in
     Corporate Environmental Accounting. Washington, DC: World Resources
     Institute, 1995.

Esty, Daniel C., and, Andrew S. Winston. Green to Gold: How Smart Companies Use
     Environmental Strategy to Innovate, Create Value, and Build Competitive
     Advantage. New Haven: Yale University Press, 2006.

Ferré, Frederick. "Where Are We Going?" Environmental Ethics. Ed. Dorinda G.
     Dallmeyer, and Albert F. Ike. Athens: University of Georgia Press, 1998. 1-6.

Friedman, Thomas L. Hot, Flat, and Crowded: Why We Need a Green Revolution- and
     How it Can Renew America. New York: Farrar, Strauss and Giroux, 2008.

Gray, Rob. Accounting for the Environment. New York: M. Wiener Pub., 1993.

Hargrove, Eugene. "Take Environmental Ethics Seriously: The Challenge before Us."
     Environmental Ethics. Ed. Dorinda G. Dallmeyer, and Albert F. Ike. Athens:
     University of Georgia Press, 1998. 16-30.

Hitchcock, Darcy, and Marsha Willard. The Business Guide to Sustainability: Practical
Strategies and Tools for Organizations. Earthscan: Sterling, 2006.

McKinney, William J. "On the Value of Thought Experiments in the Industrial
Marketplace." Environmental Ethics. Ed. Dorinda G. Dallmeyer, and Albert F.
Ike. Athens: University of Georgia Press, 1998. 98-113.

Sagoff, Mark. "Is the Economy Too Big for the Environment?" Environmental Ethics.
Ed. Dorinda G. Dallmeyer, and Albert F. Ike. Athens: University of
Georgia Press, 1998. 31-61.

Savitz, Andrew W., and Karl Weber. The Triple Bottom Line: How Today's Best Run
Companies are Achieving Economic, Social, and Environmental Success- And
How You Can Too. San Francisco: John Wiley and Sons, Inc., 2006.

Articles

United States. Environmental Protection Agency. An Introduction to Environmental
Accounting As A Business Management Tool: Key Concepts And Terms.
Washington: US EPA, 1995.

Manetti, Giacomo, and Lucia Becatti. "Assurance Services for Sustainability Reports:
Standards for Empirical Evidence." Journal of Business Ethics 87 (2009): 289-
298.

Nelson, Robert H. "Sustainability, Efficiency, and God: Economic Values and the
Sustainability Debate." Annual Review of Ecology and Systematics 26
(1995): 135-154.

Web Articles

ADC Partners. "Sustainability and Branding: The Imperative of Continuity." 2009.
Greenbiz.com. 15 June, 2009 <http://www.greenbiz.com/resources/resource/
sustainability-and-branding-imperative-continuity>.

Ballou, Brian, Dan L. Heitger, and Charles E. Landes. "The Future of Corporate
Sustainability Reporting: A rapidly growing assurance opportunity."
2006. Journal of Accountancy. 30 July, 2009 <http://www.journalofaccountancy
.com/Issues/2006/Dec/TheFutureOfCorporateSustainabilityReporting.htm>.

Bartelmus, Peter. "Measuring sustainable economic growth and development."
Encyclopedia of Earth. Ed. Cutler J. Cleveland. 5 July, 2009
<http://www.eoearth.org/article/Measuring_sustainable_economic_growth_and_
development>.

Edelman. "The Second Annual Edelman goodpurpose Study." <u>Goodpurpose</u>. 15 June, 2009 <http://www.goodpurposecommunity.com/study.html>.

Fornarno, James M., Kenneth A. Winkelman, and David Glodstein. "Accounting for Emissions: Emerging issues and the need for global accounting standards." 2009. <u>Journal Of Accountancy.</u> 30 July 2009 < <u>http://www.journalofaccountancy.com/</u> Issues/2009/Jul/20081312.htm>.

Web Sites

Apple, Inc. "Apple and the Environment." <u>Apple</u>. 1 July 2009 <http://www.apple. com/environment/>.

Climate Counts. "Sector Scorecards: Electronics." <u>ClimateCounts.org</u>. 1 July, 2009. <http://climatecounts.org/scorecard_sectors.php?id=13>.

Greenpeace. "Guide to Greener Electronics- 12." <u>Greenpeace.</u> 1 July, 2009 < http://www.greenpeace.org/usa/press-center/reports4/guide-to-greener-electronics-12>.

QUALITY COSTS – AN ACCOUNTING CHALLENGE

Richard E. Crandall, Professor
Appalachian State University
College of Business, Raley Hall
Boone, NC 28608
TEL: 704-262-4093
FAX: 704-262-6190
E-mail: crandllre@appstate.edu

Oliver Julien, Lecturer
Appalachian State University
College of Business, Raley Hall
Boone, NC 28608
TEL: 704-262-7445
FAX: 704-262-6190
E-mail: julienom@appstate.edu

ABSTRACT

What are the costs of not having perfect quality in your business? If you don't know, you may be surprised to hear researchers who have studied this area estimate that the costs of poor quality in manufacturing companies average around 15%, with a range from 5-35% of your sales dollar, depending on product complexity. In service organizations, it averages 30%, with a range from 25-40%. For most managers, this is significant enough to get their attention. Unfortunately, many, if not most, companies do not really know what their quality costs are because of the difficulty in measuring them.

QUALITY COSTS – AN ACCOUNTING CHALLENGE

What are the costs of quality in your business? Or, put another way, what are the costs of not having perfect quality in your business? If you don't know, you may be surprised to hear researchers who have studied this area estimate that the costs of poor quality in manufacturing companies average around 15%, with a range from 5-35% of your sales dollar, depending on product complexity. In service organizations, it averages 30%, with a range from 25-40% (Juran 1993; Krishnan 2006). For most managers, this is significant enough to get their attention. Unfortunately, many, if not most, companies do not really know what their quality costs are because of the difficulty in measuring them (Feigenbaum 1991; Schiffaueroya 2006).

WHY ARE QUALITY COSTS IMPORTANT?

Aside from the fact that poor quality may represent a large portion of total costs, there are other reasons to be interested in quality costs.
- Quality, along with costs, response time and flexibility, is a critical success factor (CSF) for most businesses. High quality is necessary to survive.
- Because some quality costs are hidden or intangible, they are difficult to control and, in some instances, could cause a crisis in a company.
- The quality concept continues to evolve; as a result, the standard by which we measure quality keeps changing.
- Finally, there are differences between product quality and service quality. As companies increase their mix of product and services, they need to differentiate between the two insofar as measuring quality.

WHAT ARE QUALITY COSTS?

The American Society of Quality (ASQ) defines quality costs, or "the cost of quality," as follows:
The "cost of quality" is a term that's widely used – and widely misunderstood. It isn't the price of creating a quality product or service. It's the cost of NOT creating a quality product or service.   Any cost that would not have been expended if quality were perfect contributes to the cost of quality. Quality costs are the total of the cost incurred by investing in the prevention of nonconformance to requirements, appraising a product or service for conformance to requirements, and failing to meet requirements. The sum of these costs represents the difference between the actual cost of a product or service and what the reduced cost would be if there were no possibility of substandard service, failure of products or defects in their manufacture. (ASQ 2008).

The APICS Dictionary defines quality costs as "the overall costs associated with prevention activities and the improvement of quality throughout the firm before, during, and after production of a product. (Blackstone 2008)

These definitions suggest quality costs can be associated with products and services, an area of responsibility usually assigned to accounting. However, being able to define cost elements and actually reporting them in a usable format are two different things.

TANGIBLE QUALITY COSTS

Both ASQ and APICS classify the tangible quality costs as internal failure, external failure, appraisal and prevention costs. This classification is widely accepted as the prevention, appraisal and failure (PAF) model (Schiffaueroya 2006). The following examples of these costs are taken from Juran (1993) and are similar to definitions by Feigenbaum (1991) and other writers.

Internal failure costs are those costs associated with defects (nonconformance) that are found prior to shipment of the product to the customer and are costs that would disappear if there were no defects. Examples include scrap, rework, failure analysis, scrap and rework supplies, sorting inspection, reinspection and retesting, avoidable process losses, and downgrading.

Internal Failure Example

In the early nineties, when a sweeper manufacturer was in the process of implementing Phil Crosby's Quality Improvement Process, the engineers hit upon a way to detect and then eliminate internal failures. We made sure that every workstation had an air grinder. Every time we heard the air grinders' characteristic screams, we investigated and set up a team to eliminate the cause. Gradually the screams became less frequent; however, it took almost a year before we could safely eliminate the air grinder from the list of required workstation tools. Because we had reduced structural variances, we were able to increase output by one-half a sweeper a day with no increase in labor costs! QUALITY PAYS!

External failure costs are costs associated with defects that are found after product is shipped to the customer and include warranty charges, complaint adjustment, returned material, and allowances.

External Failure Example

A major automotive manufacturer implemented a reliability improvement: replacing ignition points with an electronic module that provided the same function. After approximately six months of production (500,000 vehicles), modules were being returned under warranty by the dealers, but they were "non-defective". (That is they tested OK in the lab). More importantly, the customers' problems were not fixed! At the same time we were having intermittent fuel filter clogging. Both of these failures produced the same symptom: the car stops running, but only for an hour or so! Then it goes again! In order to solve everyone's problems (customers, dealers & our company), we invented a tester that identified the culprit and provided testers to 6000 dealers. This saved all of us significant emotions, bad press and untold expenses. Moral of the story? Identify quality issues early and eliminate them, even if it takes an invention! QUALITY PAYS!

Appraisal costs are costs incurred in determining the degree of conformance to quality requirements, and include: incoming inspection and testing, in-process inspection and testing, final inspection and testing, product quality audits, maintaining accuracy of testing equipment, inspection and testing of materials and services, and evaluation of stock (inventory) for degradation.

Appraisal Example

In the late seventies, snowmobiles had a notorious reputation for poor reliability. There were even barroom jokes about them. A major manufacturer decided to implement significant reliability improvements to its product line. In addition to an increase in prototype testing, we took the opportunity to completely restructure the assembly process. This opportunity existed because the business was seasonal so the plant remained unused for half of the year. Instead of a serial process, we set up sub-assembly operations with integral inspection operations. Therefore we knew that all final line components were OK before we installed them on a unit. End-of-line failures and warranty costs were reduced significantly in the following year! QUALITY PAYS!

Prevention costs are costs incurred in keeping failure and appraisal costs to a minimum. They include quality planning, new product review, process control, quality audits, supplier quality evaluation, and training.

Prevention Example

In the late eighties, a manufacturer of forestry equipment identified an opportunity to dramatically reduce warranty costs and assembly time. Forestry equipment is subjected to one of the worst operating environments in the industrial world!   After less than 6 months in operation, an operator could not even determine the original color!   We implemented just-in-time practices, reducing the need for inventory storage. We had to redesign many of the structural components, nest the flame cutting patterns based on model needs instead of by part numbers and only prep and paint sub-assemblies needed for the final line. By clustering all the parts needed for a given model we reduced the number of different thicknesses of steel from 9 to 4: resulting in additional savings through smart buying.   We could buy from the mill (instead of from the distributor), because of the size of our orders. Investment velocity was increased because we could now produce any of our models in eight work days, instead of the previous best time of 28 work days. Customers could also receive their complex tractors in 2 weeks instead of 2 months. These improvements required significant labor flexibility, engineering creativity, organizational revisions and commitment by everyone during the nearly 2 years of planning and implementation. Result? Both our customers and our holding company accountants loved us!   In addition, we did not need to work as hard because we reduced most of our variances. QUALITY PAYS.

These costs are tangible; however, as we describe later, not always easily determined.

INTANGIBLE, OR HIDDEN, QUALITY COSTS

In addition to the tangible PAF costs, there are hidden, or intangible, costs. Krishnan (2006) warns that conventional accounting systems have been inadequate to accurately report the costs of poor quality. He lists some of the hidden costs, originally reported in Juran (1993) as:

- potential lost sales
- costs of redesign due to quality reasons
- costs of changing manufacturing processes inadequate to meet quality standards
- costs of software changes due to quality reasons
- costs included in standard costs because they were considered inevitable
- costs for space and inventory changes
- scrap not reported
- costs of errors made in support operations such as order filling and production control
- costs of poor quality within a supplier's plant

Freiesleben (2004) also cites management time as a hidden cost. Problems of any sort require the time of managers at all levels to resolve and few, if any, systems record how CEOs spend their time.

In addition to the hidden costs reported above that may be difficult to dig out of accounting systems, there are other intangible costs that are even more difficult to determine. They include costs associated with sales lost when a company's acceptance in the marketplace may be eroded because of product recalls, or bad publicity from association with suppliers operating sweatshops or child labor factories.

The pressure to get products to market quickly may also contribute to hidden costs of quality. In the trade-off between speed to market and designed-in quality, the more tangible pressure to get the product to market may overshadow the loss in quality (Ball 2006).

In addition to social acceptance considerations, customers may also consider quality failures to be products containing hazardous or non-biodegradable materials, or processes with high carbon or harmful waste emissions.

COSTS VERSUS LEVEL OF QUALITY

An area of great interest is the behavior of the PAF costs as quality improvement efforts bring about change. The consensus among researchers is that increased spending on prevention costs will bring about decreases in internal failure and external failure costs. This appears logical – as quality improves, there will be fewer failures. The effect on appraisal costs is less certain. Most researchers agree that appraisal costs follow failure costs. If failures increase, appraisal costs, largely inspection, will increase. On the other hand, if failures decrease, appraisal costs will also decrease, because less inspection will be required.

The early versions of the cost of quality (COQ) model described companies with less well-developed quality improvement programs where failure costs were high (60-70%), appraisal costs moderate (20-25%) and prevention costs were low (5-10%) (Feigenbaum 1991). There was a need to increase prevention costs to reduce failure costs. However, the feeling at that time was that total quality costs would decrease to a minimum point and then begin to increase as the prevention costs began to increase faster than failure costs decreased. Figure 1 shows this relationship (Juran 1993).
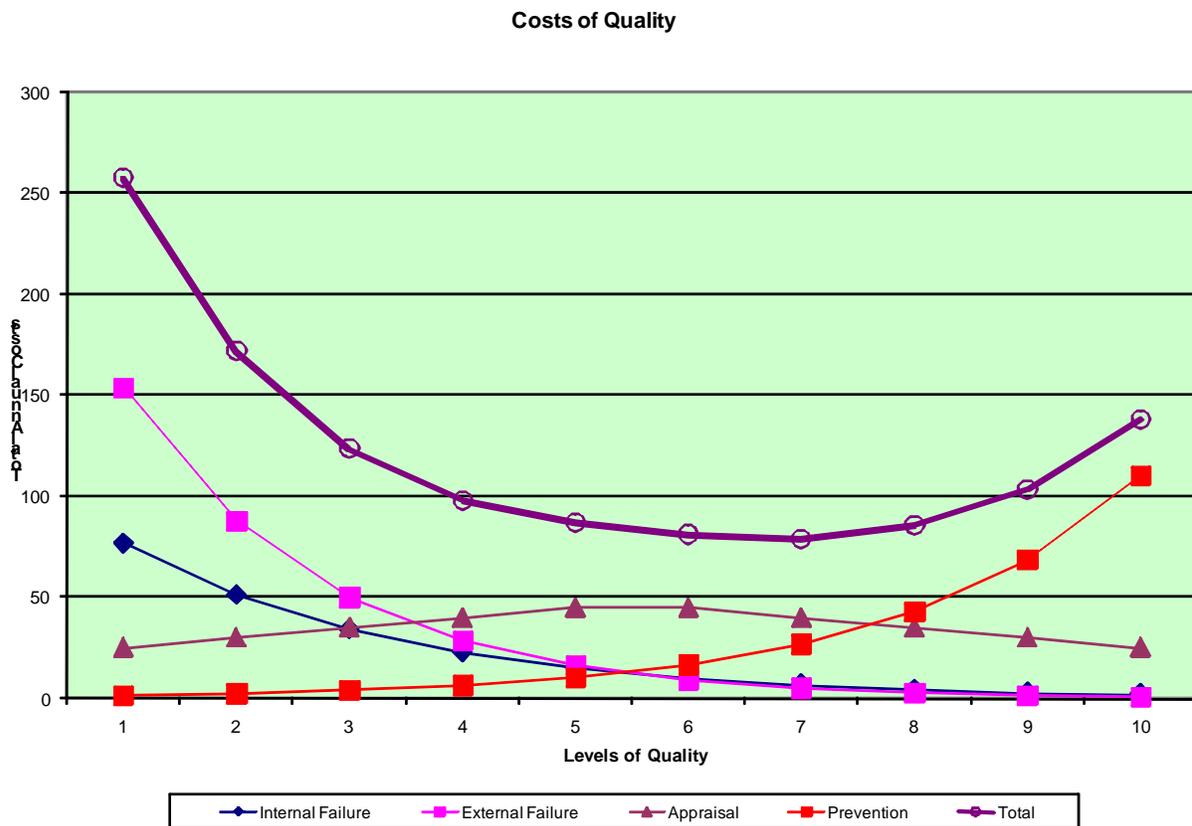
Costs of Quality


Figure 1. Cost of Quality (COQ) Model (Original)

As quality programs improved toward the end of the 20th century, and the goal became zero defects, or perfect quality, this early COQ model presented conflict, because it suggested the optimum quality was less than perfect quality. This was resolved by concluding that, as quality programs improved, the total quality cost curve could reflect this improvement, as shown in Figure 2, where the total quality cost curve continues to decrease as quality approaches perfection. Juran (1993) calls this the COQ curve in emerging processes. Freiesleben (2004) also endorses this new version and attributes it to the learning process and discovery of root causes in quality programs.
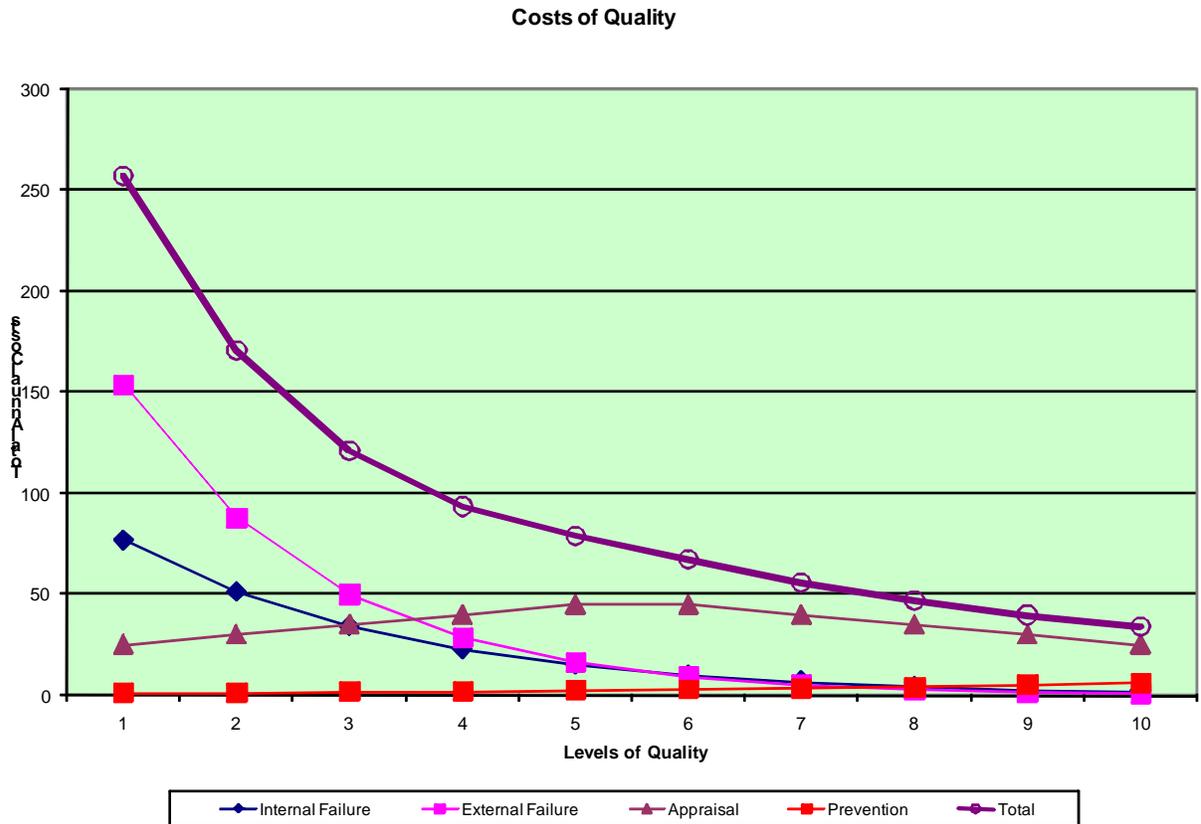
Costs of Quality

Figure 2. Cost of Quality (COQ) Model – Contemporary

However, Freiesleben (2004) warns that COQ models are not adequate for determining an economically optimal quality level, and that increased profit must be considered in addition to reduced cost benefits. We show this conceptual relationship in Figure 3. Initially, total quality costs decrease until prevention costs begin to increase faster than failure costs decrease. Eventually, as quality continues to improve and increased revenues result, profits from improved quality eventually increase faster than total quality costs increase.
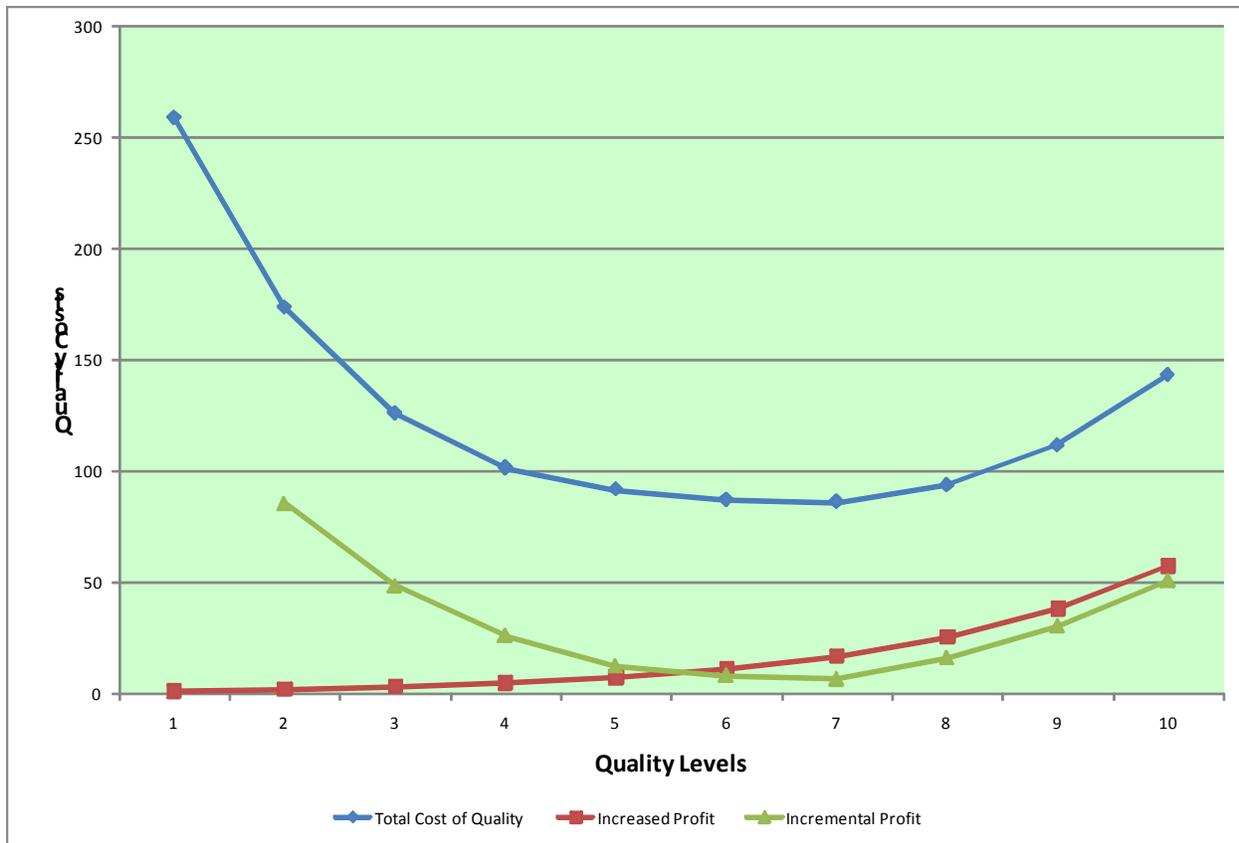
Figure 3. Incremental Profit as Quality Levels Increase

The quality cost curves shown in Figures 1, 2 and 3 represent the behavior reported by most researchers. However, there are few well-documented case histories in this area.

CRISIS MANAGEMENT

In some cases, the cost of quality failures can be catastrophic, resulting in the need for crisis management. In these cases, the considerations are more than economic; they include permanent damage to the company's capability to continue in business. Most of the attention in a crisis is focused on the reaction of customers or the public; often overlooked is the effect on the company's employees and the possible erosion of their confidence in the company and their continued willingness to stay with the company. Companies should always spend some time in trying to prevent this type of quality costs by anticipating and avoiding their occurrence. Keeping a focus on this is a test of good top management.

DETERMINING QUALITY COSTS

While conventional accounting systems may have the pieces of the total quality cost puzzle, they rarely put them together into a completed picture. Activity-based-costing (ABC) systems help because they provide more specific classification of costs than can be assembled into composite reports; however, they are not the total answer because some costs are difficult to assign to a quality problem versus to some other cause. (Evans and Lindsay 1999) Sower (2004) points out the ERP systems also can facilitate the identification and analysis of quality costs. However, some costs, such as lost sales, are not included in any type of accounting system.

Ball (2006) points out that COQ systems can be designed from the top-down or the bottom-up. He cautions that only a bottom-up system will yield actionable data and a sufficient understanding for driving operational decisions.

While a perfect quality cost reporting system may be elusive, companies should recognize they could identify the major quality costs – the vital few – and begin to measure them. They should recognize that this is only a partial solution, but it is a step toward a more complete solution (Cheng 1976). Donovan (2006) describes such a partial system for a company that makes specialty chemicals for maintenance and repair professionals.

Usually, it takes a special study or a specific system to isolate and summarize quality costs. Eldridge, Balubaid and Barber (2006) designed a quality cost classification system to provide a way for researchers to investigate quality cost behavior in a well-structured environment. However, it appears that few companies have progressed to the point of having comprehensive quality cost reports being produced on a regular basis.

Quality costs, as described earlier, represent a wide variety of cost accounts. Table 1 shows possible sources of the tangible quality costs – internal failure, external failure, appraisal and prevention. It also shows how the absence of perfect quality can adversely affect revenues and even have catastrophic consequences for a business.

Table 1. Location of Quality Costs in a Chart of Accounts

Revenue and Cost Elements	Tangible Quality Costs				Intangible Quality Costs		
	Internal failure	External failure	Appraisal	Prevention	Lost Sales	Lost Customers	Crisis Mgmt
Revenues					Easy	Moderate	Difficult
Direct costs							
Direct materials	Easy						
Direct labor	Easy			Easy			
Factory Overhead Labor							
Inspection			Easy				
Quality Assurance			Easy	Easy			
Manufacturing Engineering		Moderate	Moderate	Moderate			
Human Resources				Moderate			
Design Engineering				Moderate			Difficult
Other Factory Expenses							
Transportation		Moderate					
Returns and replacement		Easy			Moderate	Moderate	Moderate
S, G and A Labor							
Mktg. Customer Relations		Difficult			Difficult	Difficult	Difficult
Marketing - Product Design				Difficult			Difficult
Legal Services		Moderate					Difficult
Top Management		Difficult				Difficult	Difficult
S, G and A Expenses							
Warranty claims		Easy					Easy
Lawsuits		Easy					Easy
Fines and penalties		Easy					Easy

Degree of difficulty to obtain costs：Easy　Moderate　Difficult

The accounts designated in Table 1 are somewhat arbitrary; they will vary among companies. Even though the quality cost may originate in the accounts shown, they will not be the entire account cost. Every account would have to be searched to identify that portion of costs to be assigned as quality costs. Activity-based-costing systems may help; however, they are not designed to identify quality costs, as described in this paper. Although identification of quality costs is theoretically possible, it will probably prove to be unrealistic with today's accounting systems.

QUALITY COSTS AND IMPROVEMENT PROGRAMS

Companies actively pursue a number of improvement programs. Do these programs help in the assessment of quality costs?

- **Six Sigma** is one of the most active improvement programs these days. However, Six Sigma is associated with the completion of discrete projects, each of which may help to reduce quality costs or improve revenues and the contribution is usually quantified. However, Six Sigma does not normally have preparation of quality cost reports as a prime objective.

- **Lean production** is another improvement program that requires quality improvement to be successful. Eliminating waste is an objective of lean programs. Waste includes product and service failures, components of quality costs. Therefore, reducing quality costs is an integral element of lean production; however, as with Six Sigma, lean production systems do not necessarily require quality cost reports.

- **Customer relationship management (CRM)** is a program to improve the retention of good customers. Customer retention usually requires good customer service and consistently high quality products; consequently, CRM is a program that supports quality improvements.

- **Product lifecycle management (PLM)** attempts to preserve the quality of information about products throughout their life cycles. This requires product designs that maintain value throughout their useful lives and a compatibility with sustainability considerations, such as reuse and recycling. PLM also strives for information integrity that can be used by multiple parties as the product moves through both its forward and reverse life cycles. (Crandall 2008)

- **Supply chain management (SCM)** requires the reduction of variances throughout the supply chain. One of the major variances is often product or service quality. To assure a smooth flow of physical goods, information, and funds through all participants, quality must be improved.

These, and other, programs encourage, even require, the improvement of quality. If companies are to confidently participate in these programs, they must assure themselves that improved quality reduces the cost of poor quality. Ford (2008) studied a multi-division company and classified the divisions participating in a quality improvement program as enthusiastic (positive), ceremonial (passive), and dissident (resistors). He found that the enthusiastic participants had much greater improvements than the dissident groups.

FUTURE

What does the future hold for quality costs? Competition will require continued improvement in quality levels, probably even greater than those achieved so far. Improved quality will be important, not only to reduce the tangible quality costs but also in reducing or preventing the hidden, or intangible, quality costs.

Sustainability issues will become more closely linked with quality, because of the need to reduce waste. When sustainability becomes a major driver of change, companies will be forced to pursue reductions in quality costs and will need to design systems that assure them improved quality will have an economic benefit.

Accounting will have to develop better systems. Up to now, financial, or external, accounting requirements have been more important than internal, or management, accounting needs. If companies are to continue to progress in their improvement efforts, they will have to have performance measurement systems that help them identify improvement opportunities, such as in quality costs.

Top management will have to support an integrated approach. Localized improvement programs will no longer suffice. While they are beneficial in many cases, they may actually cause increased costs in areas other than where the improvements are being made. Quality costs thinking used to involve the trade-offs between prevention and failures. Today, the consensus is that there should be continued pressure to improve quality levels to the ultimate level – to perfection. Only top management can require cross-functional participation or endorse decisions that may not have complete tangible justification.

REFERENCES

1. ASQ. 2008. www.asq.org/learn-about-quality/cost-of-quality/overview/overview.html.

2. Ball, Steve. 2006. Making the cost of quality practical. *Strategic Finance*. Vol. 88, No. 1, p. 34, 8 pgs.

3. Blackstone, John H, APICS Dictionary (12th Edition), APICS – The Association for Operations Mangement, 2008.

4. Cheng, Philip C. 1976. A conceptual analysis of quality control cost for industrial management decision making. *Industrial Management*. Vol. 18, No. 2, p. 28.

5. Crandall, Richard E. 2008 The evolution of product life cycle management, from engineering tool to business concept. APICS Magazine, Vol. 18, No. 5, pp. 21-23.

6. Donovan, Susanne. 2006. Using cost of quality to improve business results. *American Society of Quality*. www.asq.org,

7. Eldridge, Steve, Mohammed Balubaid, Kevin D Barber. 2006. Using a knowledge management approach to support quality costing. *The International Journal of Quality & Reliability Management.* Vol. 23, No. 1, p. 81, 21 pgs.

8. Evans, James R. and William M. Lindsay. 1999. *The Management and Control of Quality* (Fourth Edition). South-Western College Publishing.

9. Feigenbaum, A. V., 1991. *Total Quality Control* (Third Edition), McGraw-Hill, New York.

10. Ford, Matthew W. 2008. Adoption of quality practices in a multidivisional environment: A longitudinal study. *The Quality Management Journal*. Vol. 15, No. 4, p. 7, 11 pgs.

11. Freiesleben, Johannes. 2004. On the limited value of cost of quality models. *Total Quality Management & Business Excellence.* Vol. 15, No. 7, p. 959.

12. Juran, J. M. and Frank M. Gryna. 1993. Quality Planning and Analysis (Third Edition). McGraw-Hill, New York.

13. Krishnan, Suresh Kumar. 2006. Increasing the visibility of hidden failure costs. *Measuring Business Excellence*. Vol. 10, No. 4, p. 77.

14. Schiffauerova, Andrea, Vince Thomson. 2006. A review of research on cost of quality models and best practices. *The International Journal of Quality & Reliability Management.* Vol. 23, No. 6, p. 647.

15. Sower, Victor E. 2004. Estimating external failure costs: A key difficulty in COQ systems. *Quality Congress. ASQ's Annual Quality Congress Proceedings.* Vol. 58, p. 547, 5 pgs.

CLASSROOM 2.0: TEACHING INNOVATION OR GIMMICK

Ali Nazemi, Roanoke College, Salem, VA, (540) 375-2217
Nazemi@Roanoke.edu

INTRODUCTION

Those of us who have been teaching for many years are at a threshold of new era in higher education. The infusion of technology in every aspect of our students' young lives has produced new challenges for many faculty members. The fact that information can be instantly acquired from a multitude of sources, and with relative ease, has made it even more difficult to continue with traditional methods of teaching. One of the main challenges is to what extent should we incorporate the internet tools and applications into our courses. What is meant here is not simply using the internet as a research tool and/or creating web-based course material, rather using the internet's Web 2.0 features such as RSS, Wiki, Podcast, Twitter, Blogs, You Tube and alike as a means to deliver course material and to get students actively engaged. Obviously, how such tools are utilized would depend not only on the particular discipline but the level of instructors' understanding of such tools. I have selected my Information Systems course in which to implement these tools primarily because it is naturally more conducive to using innovative technologies, and also because students' can readily access computers in lab and school's network.

The question is therefore twofold; first to what extent should these new tools become a part of delivery of material; and more importantly how effective would these methods be as compared to traditional methods of instruction delivery. In other words, would using such techniques be a true innovation in the classroom or is it simply another gimmick. In addition, it would be interesting to observe the extent to which students would reject or embrace such methodologies.

Experiment Design

To answer these questions, I have developed an experimental course in which many of the aforementioned tools are utilized. For this, the course material and lesson plans for an existing course has been redesigned to incorporate several internet-based tools. The course will be taught during summer 2009 session and results are reported in this paper in the Observations and Recommendations section. To set up such a course several factors were taken into account. These include:

- Course Content
- Communications Methods
- Collaboration

- Evaluation and Outcomes Assessment
- IT Access and Support

Course Content

One of the main reasons for this experiment was to see if we can eliminate the textbook for the entire or at least part of the course. The idea here is to let students develop the course material. This especially important for IS courses were textbook material becomes quickly outdated. The attempt was made to make part of the course material available in digital form and have students collaborate on other material. Therefore reading material came from two sources. Since a portion of the course deals with hands-on microcomputer applications, the original intent was to use my existing set of notes make them available in PDF format. Unfortunately, I could not update and modify them in time for the summer course and had to use the textbooks that I had picked for the course. I intend to make them available for the fall term. In addition to the regular content, the notes contain a series of links that will be interwoven into the document and will point the student to the appropriate websites and/or RSS feeds. The following shows an example for portion one of these documents with embedded link.

These documents would be available on BlackBoard or other internet-based sources such as Google Reader. All students will be required to create an account on Google in order to have access to all Google tools.

The second part of the course material covers the Information Systems Concepts or what I call the nuts and bolts of computing. In past, a textbook was assigned as reading material for this portion but it became progressively more difficult to keep up with the newer technologies as these text where at least one to two years behind the curve. This presented an opportunity to see if the content can be kept fresh and be generated through existing web-based sources. To accomplish this, a series of Wiki topics were started. These would usually contain several images and a brief description of the topic. The following is an example of one of these wikis.
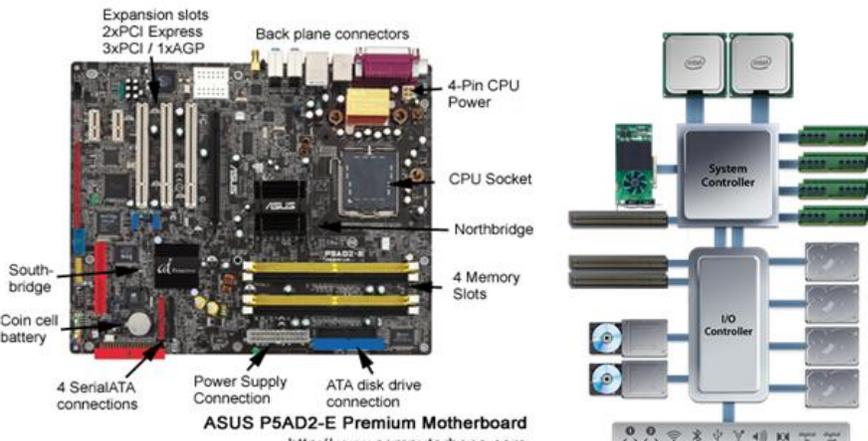
As a part their assignments, students were asked to provide additional information about the topic by adding to the wiki's content through comments. Part of the assignment grade was the extent to which each student contributed to the topic. This was made possible through the use of Wiki Tool available on BlackBoard. This tool allows for version control and can be set up so that students are able to add to the content but not be able to delete the comments. It was set up for a specific timeframe providing a built-in deadline for assignments an each comment was automatically date stamped. To make sure that students did not receive credit after the deadline,

a copy of each wiki was made. This particular wiki received 7 comments that are presented in the Appendix A.

There were 10 wikis for the course and following image shows how they appear on Wiki Tool. Note that the "Processing Hardware" wiki was selected.

Search

Search

Site Navigation

01. Data Vs. Information
02. Computer System
   Components
03. The Internet Revolution
04. Computer Software
05. Processing Hardware
06. Storage Devices
07. Input & Output Devices
08. Database Management
   Systems
09. Networks
10. Impact of Technology

Toolbox

Page List
Export Site

At the beginning students were a bit confused about what was actually required but quickly caught on. For example, one criterion for adding comments to wikis was not to repeat what others have already contributed so the earlier a student contributed the easier the assignment would be. Unfortunately, for the first assignment, a student answered all the questions in the wiki and left nothing for other students to contribute. Just to make it more interesting, after all students made comments on the wiki they were quizzed on the content. This created an unintended consequence for both instructor and students. Students soon realized that to get better grade, they needed to make their comment more substantive. This, however, created more material for quizzes as the comments accumulated. Students eventually started tempering their comments and do less copying and pasting. The instructor faced a similar dilemma. On one hand, it was good to get students involved but at the same time, on occasions, the amount of material become unbearable.

Wikis were managed by the instructor throughout the semester and simple stats were available easily. The following show the portion of BlackBoard's Wiki Tool that allows for updating the wiki and keeping track of comments.

Page

Edit
New
Delete
History
Print (w/ comments)

Page Stats

Views: 54
Edits: 4
Contributors: 1
Comments: 8

Page Contributors

Ali Nazemi

In addition to contributing to wikis, each student had to start and maintain a blog throughout the term. To research topic was left to students but all had to focus on the impact of technology on our lives. Students are asked to provide information including images, video and audio files about the particular topic. The image in the following page shows a portion of one of the student's blog.

At the end of the course, the blog information was consolidated into a research paper and an eight minute presentation. One difference between this method and traditional paper assignments was that other students could comment on the blogs and could help their fellow students with reference sources and relevant information. BlackBoad Blog Tool allows for keeping track of comments was set up to keep comments from being deleted. This only happened in one occasion as the students were pressed for time

Impact of Technology on Surgery (permalink) -edithistorydelete
Created on Friday, 07/10/2009 1:45 PM by Gregory Cooper
Updated on Wednesday, 07/15/2009 5:23 PM by Gregory Cooper

Arthroscopic Surgery

During my senior year of high school I tore my anterior cruciate ligament (ACL) in my knee playing basketball. This injury requires a complex surgery in which the ligament is reconstructed. Many years ago, to fix this injury the surgeons had to cut apart the entire knee to be able to see inside the joint. This left massive scars and lead to many possible complications. Today, after having my surgery a few years ago, I only have one small incision scar and two port hole scars to show for it. Due to technological advances, ACL reconstruction can be done through arthroscopic surgery. Arthroscopic surgery is a minimally invasive surgical procedure in which an examination and sometimes treatment of damage of the interior of a joint is performed using an arthroscope, a type of endoscope that is inserted into the joint through a small incision. This allows the surgeons to see inside the joint as displayed on a video monitor, and make the necessary medical procedures to the ligament. This procedure allows for alot quicker recovery time and leaves less room for errors or complications. After my surgery I was off crutches in a matter of a few weeks and no complications arose.
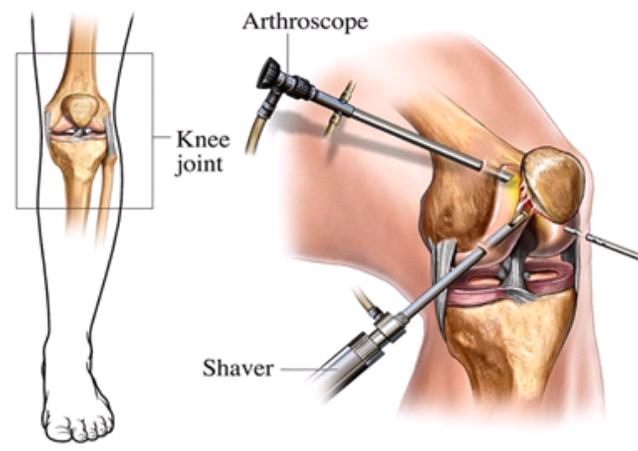
Communication Methods

Since the course relates to information technology, classes usually met in the PC lab. This allowed students to have an opportunity to work on their assignments under instructor's supervision. In the next iteration of this course, I intend to use several other ways to communicate with the students such as BlackBoard's Collaboration Session and Discussion Board. I am also working on several short lecture audio recordings that can be Podcasted and downloaded to any cell phone or MP3 player. For example, syllabus and course outline information and some of the course requirements will be available as an audio file. I also maintain FaceBook and Twitter accounts but have not decided how to incorporate them in this course. The following image shows BlackBoard's communication tools that were (will be) utilized in the course.
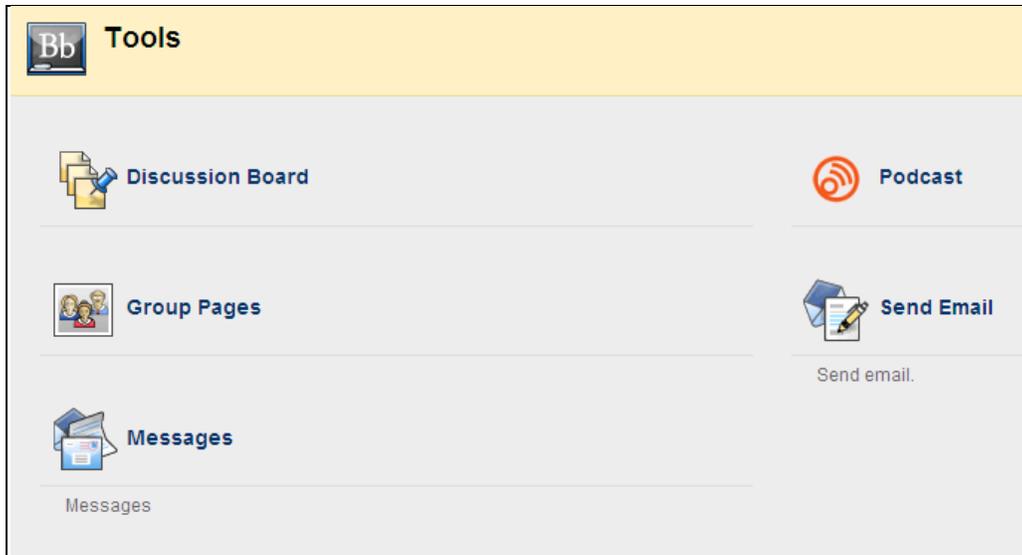
Collaboration

The course was designed to make collaborative efforts easier for students. The fact that students could comment on each other's work and contribute to their fellow students' research creates a new paradigm for collaborative learning. Also, there are two group projects in which students were required to work in teams. BlackBoard allows for setting up Group Pages in which students can exchange files and work on the projects. For real-time collaboration students are encouraged to use Collaboration Session on BlackBoard or use free online programs such as Google's Knol and Orkut. Following image shows some of the collaborations tools that are available to students.
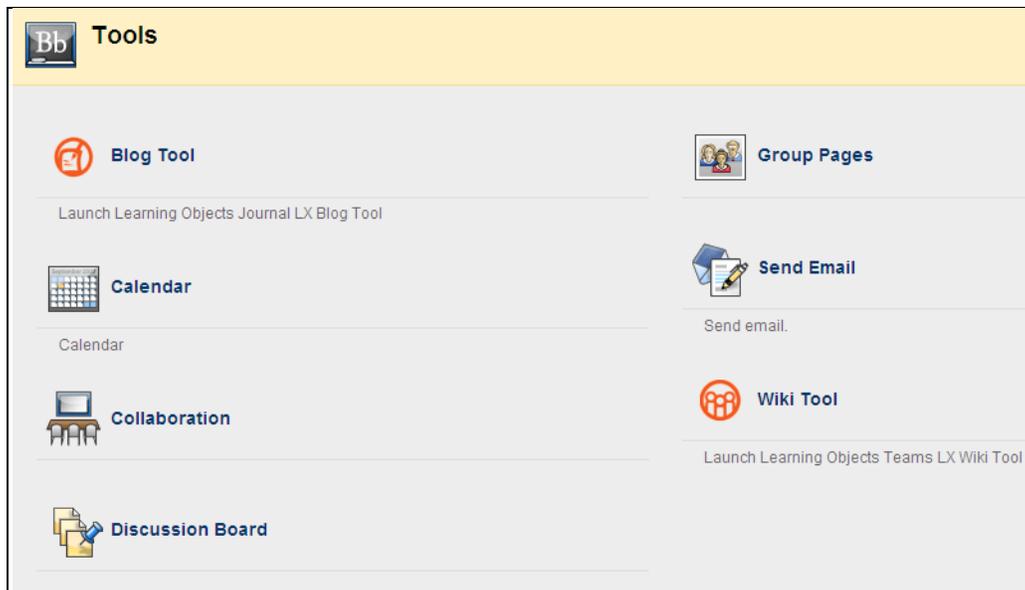
Evaluation and Outcomes Assessment

It was anticipated that this part of the course to be most challenging. This turned out to be easier than anticipated. One fear was that the collaborative nature of the course and cross-pollination in research efforts and team projects would create communal effect when grading assignments. This did not happen as students were too busy with their own material to help others. Also, there was enough variation in comments that very few if any of them repeated the same material. One difficulty was trying to quantify students' contribution to Wiki pages and Blogs. This was accomplished by comparing comments and assigning points based on amount of contribution, quality of what was added to wiki and how recent was the information provided. Tests and quizzes were used as usual to measure of students' comprehension of material. Quizzes were administered using BlackBoard's Test Manager. One of the objectives of this experiment was to see whether or not these methods are effective as compared to the traditional techniques. This was done by comparing student grades for this course with those of the similar course taught last summer. The average grades for this course was 5% higher than that of a similar course last year. The quiz average that tested students knowledge of wikis was actually 7% lower than last year's. This was probably because they had to read more material. Students, however, did not mind not having a text and most managed to get the information they needed from online sources.

IT Access and Support

This course has always been taught in a computer lab so students have always had a hands-on experience. What makes this new approach different is that students are now required to contribute to the course content and aid each other's learning. They can also access course material through multiple media and at any time. The institution has provided a very effective IT infrastructure for doing this and has encouraged faculty to utilize new technologies in the classroom. I am a member of a group of faculty who is selected to investigate the use of touch PDAs for instructional technologies. I intend to use this opportunity to get feedback from other group members on the most effective ways to utilize mobile devices in higher education.

Expected Outcomes

The purpose of this experiment was to establish whether or not the new internet-based technologies can enhance or replace the traditional teaching methods. Four basic outcomes were expected:

1. Students will embrace this method and the course will be popular.

This actually happened for two reasons. First it was a very unique way of engaging them in the course and to get them to contribute. The other reason was that students invariably appreciate going on line and searching for relevant information. They also appreciated seeing other students' contributions and comparing them with their own contribution.

2. Students will learn about and will become proficient in utilize new information system technologies.

   This happened to a certain extent. Students did not have any difficulty accessing and adding to the course content but it is not clear whether or not they learned how it works or they will continue utilizing the technologies outside the class.

3. Students will gain a deeper understanding of information systems through collaboration.

   If this happened, it surly was not apparent. The collaboration efforts were kept to a minimum and students did not seem to have time to help each other. This could be a function of teaching the course during summer term. The course was condensed and met every day. One notable item here is the fact that students tended to find highly up-to-date material and in that respect you may claim that they gained a better understanding of information system.

4. These methods would be more effective than traditional instructional methods in students' comprehension of course material.

   I based my comparison on two areas; one was how students performed in quizzes and assignments and the other was on their research project. This is a highly unscientific way of assessing the effectiveness of the new methods since many other factors could have contributed to grade fluctuation. However, it does provide a preliminary indication of the impact of the new methodology on student learning. As was mentioned before, students' grades in quizzes decline by 7% while the grade for the projects increased by 19% compared to similar class last year. The average grade for the course increased by 5% compared to last year's class.

   The better indication was how good the research topics were and the quality of blogs. I noticed that students were a bit more diligent in their research and in writing things up as they go. This was mainly due to the fact that all blogs were public and instructor and other students could see each others' progress.

Observations and Recommendations

Even though this experiment was limited in nature, few observations were made. These include the following:

1. The time commitment for setting up the course by far exceeded my expectations.
2. At the beginning of the course, the new approach was a bit confusing for students.
3. Students seemed to enjoy playing with some new tools.
4. Collaborative efforts were non-existent.
5. Students let wiki contribution and blog entries drift and rush to complete them at the last minute.
6. The number of wiki entries grew rapidly even though the class size was small.
7. Quality of research papers and presentation increased dramatically.

Based on these observations, the following recommendations can be made:

1. Allow ample time for course design.
2. Get familiar with all Web 2.0 tools prior to start of the course.
3. The requirements and expectations have to be clarified early in the semester.
4. Tight timelines are required to keep student on task.
5. The amount of material generated has to be managed.
6. Create situations that forces students to collaborate on projects.
7. Must be careful with larger classes since the wiki entries can get out of and quickly.

Appendix A – Comments on Wiki #5: Processing Hardware

The mother board is the main circuit board inside your PC. Every components at some point communicates through the motherboard, either by directly plugging into it or by communicating through one of the motherboards ports. The motherboard is one big communication highway. Its purpose inside your PC is to provide a platform for all the other components and peripherals to talk to each other. The motherboard contains many connections for all type of components. Motherboards contain expansion slots such as the ISA, PCI, AGP and DIMM sockets. It also contains external connections for your onboard sound card, USB ports, Serial and Parallel ports, PS/2 ports for your keyboard and mouse as well as network and Firewire connections. So the motherboard has a massive part to play in the workings of your PC. Components that you buy all rely on the motherboard to have the correct connections are available and working. Its best to buy a decent motherboard especially if you plan on buying extra's in the future. http://www.pantherproducts.co.uk/Articles/What_is/What_is_Motherboard.shtml This website also explains the types of motherboards, what to look for when buying a motherboard, measuring the speed of a motherboard, and the motherboard chipset.

Monday, 07/06/2009 2:22 PM by Jillian Fiumara | Delete

Random-access memory (usually known by its acronym, **RAM**) is a form of computer data storage. Today, it takes the form of integrated circuits that allow stored data to be accessed in any order (i.e., at *random*). The word *random* thus refers to the fact that any piece of data can be returned in a constant time, regardless of its physical location and whether or not it is related to the previous piece of data.[1]

http://en.wikipedia.org/wiki/Random-access_memory

Tuesday, 07/07/2009 12:47 PM by Cynthia Garman | Delete

Power supply- A power supply is a hardware component that supplies power to an electrical device. It receives power from an electrical outlet and converts the current from AC (alternating current) to DC (direct current), which is what the computer requires. It also regulates the voltage to an adequate amount, which allows the computer to run smoothly without overheating. The power supply an integral part of any computer and must function correctly for the rest of the components to work.

Tuesday, 07/07/2009 3:54 PM by Michael Rouhana | Delete

Power supply- A power supply is a hardware component that supplies power to an electrical device. It receives power from an electrical outlet and converts the current from AC (alternating current) to DC (direct current), which is what the computer requires. It also regulates the voltage to an adequate amount, which allows the computer to run smoothly without overheating. The power supply an integral part of any computer and must function correctly for the rest of the components to work.

Tuesday, 07/07/2009 3:54 PM by Michael Rouhana | Delete

Complementary metal–oxide–semiconductor (CMOS, is a technology for making integrated circuits. CMOS technology is used in microprocessors, microcontrollers, static RAM, and other digital logic circuits. Two important characteristics of CMOS devices are high noise immunity and low static power consumption. The main function of CMOS is to store BIOS memory and keep the system time.
Wednesday, 07/08/2009 10:21 AM by James Saunders | Delete

Abbreviation for *central processing unit* , and pronounced as separate letters. The CPU is the brains of the computer . Sometimes referred to simply as the *central processor* ,but more commonly called *processor*, the CPU is where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system .

On large machines, CPUs require one or more printed circuit boards. On personal computers and small workstations, the CPU is housed in a single chip called a *microprocessor*. Since the 1970's the microprocessor class of CPUs has almost completely overtaken all other CPU implementations.

The CPU itself is an internal component of the computer. Modern CPUs are small and square and contain multiple metallic connectors or pins on the underside. The CPU is inserted directly into a CPU socket, pin side down, on the motherboard. Each motherboard will support only a specific type or range of CPU so you must check the motherboard manufacturer's specifications before attempting to replace or upgrade a CPU. Modern CPUs also have an attached heat sink and small fan that go directly on top of the CPU to help dissipate heat.

http://isp.webopedia.com/TERM/C/CPU.html

Wednesday, 07/08/2009 10:22 AM by Gregory Cooper | Delete

A chipset or "PCIset" is a group of microcircuits that orchestrate the flow of data to and from key components of a PC. This includes the CPU itself, the main memory, the secondary cache and any devices situated on the ISA and PCI buses. The chipset also controls data flow to and from hard disks, and other devices connected to the IDE channels. While new microprocessor technologies and speed improvements tend to receive all the attention, chipset innovations are, in fact, equally important. The following charts the evolution of the Intel chipsets over the years.

Chipsets Menu

- >> CHIPSETS
- Intel Triton Chipsets
- Intel 440 Chipsets
- 810 AGPset
- Intel 820 Chipset
- 815 chipset
- 850 chipset
- i845 chipset
- Intel E7205 Chipset
- Intel 875P chipset
- Intel 865 chipset
- Intel 925X PCI Express Chipset
- Intel 915 Express chipsets
- Intel 945 Express chipsets
- Intel 955X Express chipset
- Intel 965 Express chipset
- Intel 915P to P965 Chipset Comparison Chart

http://www.pctechguide.com/13Chipsets.htm

Wednesday, 07/08/2009 8:33 PM by Patrick Guzi | Delete

Super I/O Controller Functions

The Super I/O controller is a single chip that, much like the system chipset, performs many functions that used to take several pieces of hardware in the past. This standardizes and simplifies the design, and thus reduces cost. The Super I/O chip typically is responsible for controlling the slower-speed, mundane peripherals found in every PC. Since these devices have been mostly standardized, they are virtually the same on every PC and it is easier to integrate these into a commodity chip instead of worrying about them for each motherboard design.

The major functions of the Super I/O controller chip are:

- **Serial Port Control:** The Super I/O chip controls the serial ports and includes the UARTs that make the ports function. Almost all modern chips provide the high-performance 16550A UART, which includes a 16-byte FIFO buffer.
- **Parallel Port Control:** The Super I/O chip provides the circuitry to drive the parallel port. This includes support for the newer parallel port types such as EPP and ECP.
- **Floppy Disk Drive Control:** Support for floppy disk drives is provided by the super I/O chip. Newer models support the higher 1.0 MB/sec transfer rate, and provide support for 2.88 MB floppy drives, although these never did catch on. Floppy-based tape drives also use the same interface; see here for more on the floppy controller and floppy interface.

Newer PCs sometimes integrate the functions even more, and include in the Super I/O chip not only the functions above but also the real-time clock, keyboard controller, and in some cases even the IDE hard disk controllers. It is far more common to find IDE controllers implement through the system chipset, however, especially in newer systems.

National Semiconductor makes a large number of these chips, and they can sometimes be identified by looking for their name or logo on the surface of the chip.

Note: On older PCs there is no super I/O controller chip; the interfaces to the serial and parallel ports, and the floppy disk drives, are provided by an I/O controller card (which often also controlled the hard disk drives).

http://www.pcguide.com/ref/mbsys/chip/super.htm

Thursday, 07/09/2009 9:21 AM by William Bolling | Delete

Unicode is a computing industry standard allowing computers to consistently represent and manipulate text expressed in most of the world's writing systems. Developed in tandem with the Universal Character Set standard and published in book form as *The Unicode Standard*, Unicode consists of a repertoire of more than 100,000 characters, a set of code charts for visual reference, an encoding methodology and set of standard character encodings, an enumeration of character properties such as upper and lower case, a set of reference data computer files, and a number of related items, such as character properties, rules for normalization, decomposition, collation, rendering and bidirectional display order (for the correct display of text containing both right-to-left scripts, such as Arabic or Hebrew, and left-to-right scripts).[1]

The Unicode Consortium, the non-profit organization that coordinates Unicode's development, has the ambitious goal of eventually replacing existing character encoding schemes with Unicode and its standard Unicode Transformation Format (UTF) schemes, as many of the existing schemes are limited in size and scope and are incompatible with multilingual environments.

Thursday, 07/09/2009 10:54 AM by Christopher Kaczmarsky | Delete

Using Collaboration Tools in Teaching

by

Rick Weible

Marshall University

Division of Management and Marketing

419 Corbly Hall - One John Marshall Drive

Huntington, WV 25755

email: weible@marshall.edu

phone: 304-696-2673 fax: 304-696-6013

Abstract

This research investigates the use of collaborative activities in teaching. Collaboration is the process where two or more people work together to accomplish a common goal. Teaching by its nature is a collaborative process. Group projects are a common ways students must collaborate with each other. Many new technology tools make collaboration easier and cheaper than in the past. Google Docs, Email, Calendar; Facebook; Microsoft Live; Dropbox; Twitter; and others make time and place less important than any time in the past. How do new tools change the nature and way teacher and students collaborate. This exploratory study will examine how these collaborative tools impact the teaching/learning process.

Introduction

By its very nature, teaching is a collaborative process. Professors collaborate with students to teach and ideally, professors collaborate with each other to exchange ideas and make certain the connections they make with students are as effective as possible. The desire to create synergic learning where students are engaged, motivated, and fun.

Technological advances offer unparalleled opportunities for collaboration, but among both faculty and students using new technology is often treated like a trip to the dentist.

This research will explore attitudes towards technology and offer solutions for making it accessible for hesitant students and faculty alike.

Many collaboration tools are available to students, such as WebCT/Blackboard, Microsoft's SharePoint, Google docs, and others on the internet. It is imperative that instructors learn the capabilities of these tools and how they can be used in teaching, if we are to prepare our students for life in the 21st century.

What tools are available and how are they being used for teaching?

Definition

"Collaboration is a recursive process where two or more people or organizations work together intersection of common goals — for example, an intellectual endeavor that is creative in nature—by sharing knowledge, learning and building consensus. Collaboration does not require leadership and can sometimes bring better results through decentralization and egalitarianism. In particular, teams that work collaboratively can obtain greater resources, recognition and reward when facing competition for finite resources" (Wikipedia).

Literature Review

Investment in collaborative software tools to enhancement productivity is at the top of the list for IT investment for many firms in 2009. For example, Microsoft SharePoint, Microsoft's premier collaboration tool, is the fastest growing program in Microsoft's history, with an estimated 300 million users worldwide, and a whopping 67% growth in 2008. "SharePoint is the fastest-growing ECM solution in the world and in fact is Microsoft's fastest-growing product ever."(Rodcray, 2008)

The "Collaboration Convergence" taking place in today's enterprise is creating high stakes opportunities and serious risks that can profoundly transform your organization for better or worse. Learn how real businesses are using a new generation of unified collaboration solutions from Oracle to improve productivity and competitiveness. Understand why your existing collaboration technology may be exposing you to runaway infrastructure costs, regulatory risk and organizational chaos. Oracle Beehive, the only unified collaboration system built for the enterprise, can help you master the "Collaboration Convergence" , cut your hard dollar costs and foster the best-in-class performance your organization needs to cope with these challenging times. (Oracle Web Cast)

Research Questions

How can these tools be used to enhance the teaching and learning process?

The following table lists the types of resources and web sites where they are available.

Topic	Title	Address
Blogs	Free Blog Hosting	http://okayblog.net/
Blogs	Google Search	http://www.google.com/search?q=free+blog+hosting&ie=utf-8&oe=utf-8&aq=t&rls=org.mozilla:en-US:official&client=firefox-a
Blogs	Blog.Com	http://blog.com/
Blogs	Aeonity	http://www.aeonity.com/
Blogs	Google's Blogger	http://www.blogger.com/
Blogs	WordPress	http://wordpress.com/
Blogs	Wikipedia Description	http://en.wikipedia.org/wiki/Blog
Calendars	Google Calendars	https://www.google.com/accounts/ServiceLogin?service=cl&passive=true&nui=1&continue=http%3A%2F%2Fwww.google.com%2Fcalendar%2Frender&followup=http%3A%2F%2Fwww.google.com%2Fcalendar%2Frender
Calendars	Yahoo Calendars	http://calendar.yahoo.com/
Calendars	Windows Live Calendar	http://www.windowslive-hotmail.com/calendar/default.aspx
Cloud Storage	Live Drive	http://www.livedrive.com/
Cloud Storage	Mozy - 2GB free	http://mozy.com/free/?ref=0811cfe9&gclid=CJKf8dqzzJsCFQxM5QodSS10MA
Cloud Storage	Windows Live - Sky Drive - 25GB	http://login.live.com/login.srf?wa=wsignin1.0&rpsnv=11&ct=1247269606&rver=5.5.4177.0&wp=MBI&wreply=http:%2F%2Fmail.live.com%2Fdefault.aspx&lc=1033&id=64855&mkt=en-US
Discussion Boards	Quick Topic	http://www.quicktopic.com/
Discussion Boards	Google Groups	http://groups.google.com/
Discussion	Pro Boards	http://www.proboards.com/

Boards		
Email	Gmail	mail.google.comhttp://mail.google.com
Email	Others	http://email.about.com/od/freeemailreviews/tp/free_email.htm
Email	AOL	https://my.screenname.aol.com/
Email	Yahoo Mail	https://login.yahoo.com/
Email	Hotmail	http://login.live.com/login.srf?wa=wsignin1.0&rpsnv=11&ct=1247269606&rver=5.5.4177.0&wp=MBI&wreply=http:%2F%2Fmail.live.com%2Fdefault.aspx&lc=1033&id=64855&mkt=en-US
Free Courses	Stanford	http://itunes.stanford.edu/
Free Courses	University of California, Berkeley	http://webcast.berkeley.edu/courses.php
Free Courses	ccLearn Creative Commons - Find Educational Resources -ccLearn is a division of Creative Commons dedicated to support open learning and open educational resources. Our mission is to minimize barriers to the creation, sharing, and reuse of educational mate	http://learn.creativecommons.org/education-search-engines/
Free Courses	MIT Open Courseware - Over 1900 Free Courses by the summer of 2009	http://ocw.mit.edu/
Free Courses	Education-Portal - List of Universities with the Best Free Online Courses found the articles, information, and resources.	http://education-portal.com/articles/Universities_with_the_Best_Free_Online_Courses.html
Free Courses	Utah State University	http://ocw.usu.edu/
Free Courses	Carnegie Mellon University	http://oli.web.cmu.edu/openlearning/
Google Docs	Google Docs	http://docs.google.com/
Google Docs	Windows Office Live	http://www.officelive.com
Instant messaging	MSN	http://mail.live.com/mail/MSNWebIMDecomm.aspx
Instant messaging	MySpace	http://www.myspace.com/
Instant messaging	AIM	http://www.aim.com
Instant messaging	Google Gmail	http://talk.google.com
Instant messaging	Meebo - Login to multiple IM sites	http://www.meebo.com/
Libraries	The Internet Public Library	http://www.ipl.org/
Libraries	Qyestia - Subscription Based	http://www.questia.com/Index.jsp
Libraries	The Online Book Page	http://onlinebooks.library.upenn.edu/
Libraries	Google Books - Free online books	http://books.google.com/
Libraries	The Gutenberg Project	http://www.gutenberg.org/wiki/Main_Page

Mash ups	Netvibes - Combine news, RSS feeds, search results, etc. into your personalized web portal.	http://www.netvibes.com/
Online White Boards	Scriblink is a free digital whiteboard that users can share online in real-time. Sorta like pen and paper, minus the dead trees, plastic, and the inconvenience of being at the same place at the same time.	http://www.scriblink.com/
Online White Boards	SKRBL - Simple and easy online multi user whiteboard, start skrbl, give out your URL & start working together.	http://www.skrbl.com/
Online White Boards	Dabbleboard is an online collaboration application that's centered around the whiteboard. With a new type of drawing interface that's actually easy and fun to use, Dabbleboard gets out of your way and just lets you draw.	http://www.dabbleboard.com/
People	Will Richardson, "Learner in Chief" at Connective Learning and the author of Blogs, Wikis, Podcasts and Other Powerful Web Tools for Classrooms	http://weblogg-ed.com/about/
People	Don Tapscott - Author of Wikinomics	http://en.wikipedia.org/wiki/Don_Tapscott
People	Daivd Wiley - Chief Open Content	http://davidwiley.org/
People	Clay Shirky - author of Here Comes Everybody: The Power of Organizing Without Organizations	http://en.wikipedia.org/wiki/Clay_Shirky
People	Rick Weible - creator of this web site	http://www.rwe1.com
Photo Sites	Flickr is a huge, diverse bunch of people masquerading as a photo-sharing website.	http://www.flickr.com
Photo Sites	Picasa - Looking for a simple way to get photos from your camera and computer on the web? Picasa Web Albums provides 1 GB of free storage that makes sharing your photos quick and easy.	http://picasaweb.google.com/
Photo Sites	Photolava.com is a photo and image hosting service that allows you to easily upload, link and share your photos and images on MySpace, eBay, Xanga, LiveJournal, blogs and message boards.	http://www.photolava.com/
Photo Sites	Image Shack	http://imageshack.us/
Photo Sites	Photo Bucket - Upload all your photos, videos, and images for free. Make photo slide shows to share pics with friends. Host and share videos with us - we are one of the most popular video hosting sites in the world. Plus, find and share the best MySpace i	http://photobucket.com/

Reference Sites	Technorati was founded to help bloggers succeed by collecting, highlighting, and distributing the global online conversation. Founded as the first blog search engine, Technorati has expanded to a full service media company providing services to the blogs	http://technorati.com/
Reference Sites	The Top Ten Internet Collaborative Tools	http://lone-eagles.com/collab.htm
Reference Sites	Collaboration Tools in Online Learning Environments - Jim Clark	http://www.aln.org/publications/magazine/v4n1/clark.asp
Reference Sites	ERIC ? Education Resources Information Center - World?s largest digital library of education literature	http://www.eric.ed.gov/
Resources	Social Media Classroom - The Social Media Classroom (we'll call it SMC) includes a free and open-source (Drupal-based) web service that provides teachers and learners with an integrated set of social media that each course can use for its own purposes—int	http://socialmediaclassroom.com/index.php/download
Social Networks	LinkedIn	http://www.linkedin.com
Social Networks	MySpace	http://www.myspace.com
Social Networks	Facebook	http://www.facebook.com
Social Networks	Twitter	http://www.twitter.com
Tagging	Delicious	http://delicious.com/
Telephone Calls	Skype	http://www.skype.com
Videos	Thomas L. Friedman - speaks at MIT on his book - The World is Flat	http://mitworld.mit.edu/video/266
Videos	Dan Tapscott on Wikinomics 2007-02-26 at Cambrian House	http://video.google.com/videoplay?docid=5065262745272895737
Videos	YouTube	http://www.youtube.com
Videos	Christine Borgman - lead investigator for the Center for Embedded Networked Systems (CENS) at the National Science Foundation (NSF) and chaired the NSF's Task Force on Cyberlearning. - Columbia University Libraries - Scholarly Communications Program	http://scholcomm.columbia.edu/scholarship-digital-age-information-infrastructure-and-i

Videos	CouchSurfing: What one website reveals about the future of the net Daniel Hoffer, Founder and Chairman of CouchSurfing, is peppered with questions by Berkman Faculty Co-Director and Professor of Law Jonathan Zittrain, along with a provocative audience	http://blogs.law.harvard.edu/mediaberkman/2009/04/08/couchsurfing-what-one-website-reveals-about-the-future-of-the-net/
Videos	Clay Shirky - Discusses his book, Here Comes Everybody, spoke at Harvard Law School	http://blogs.law.harvard.edu/mediaberkman/?s=shirky
Videos	Stephen Wolfram discusses Wolfram|Alpha: Computational Knowledge Engine	http://blogs.law.harvard.edu/mediaberkman/2009/04/29/stephen-wolfram-discusses-wolframalpha-computational-knowledge-engine/
Wikis	Wetpaint	http://www.wetpaint.com

IDEAS
Students sharing Power Points
Student combined exam key
Student Blogs
Student groups papers on Wiki
Student videos on YouTube
Student make map of subject and use photos on flickr, video on youtube, padcasts and audio to connect map to topics
Make a video to place subject in perspect – fly in from outerspace.
Make video to summarize topic

Use cell phones
Use video conferencing
Use second life
Use skype

MUOnline/WebCT/Blackboard features

Tools

Organizational Tools	Communication Tools	Student Learning Activities	Content Tools	Student Tools
* Calendar * Search * Syllabus	* Announcements * Chat * Discussions * Mail * Roster * Who's Online	* Assessments * Assignments * Goals	* Learning Modules * Local Content * Media Library * SCORM * Web Links	* My Files * My Grades * My Progress * Notes

Selected References

"Enterprise Collaboration- Gold Mine or Money Pit?" Oracle WebCast, May 21, 2009 02:00 PM ET, found at Computerworld http://www.computerworld.com/ action/webcast.do?command=viewWebCastDetail&contentId=9131685

"Come Together Carefully: How to Select Collaboration Tools to Match Your Needs", Sue Hildreth, Computerworld, December 19, 2005 http://www.computerworld.com/ action/article.do?command=viewArticleBasic&articleId=107155

Beimborn, D., Joachim, N., Schlosser, F., Weitzel, T. (2008). *"A Social Linkage View on the Business Value of IT,"* Proceedings of JAIS Theory Development Workshop.

Thijssen, J.P.T., Gijselaers, W. (2007). *"Closing the Generation Gap between Youth, Business School and Business through Learning-by-Sharing Combining Academic Rigor and Practical Relevance,"* University of Amsterdam, Netherlands.

Li, Q., Heckman, R., Allen, E., Crowston, K., Eseryel, U.Y., Howison, J., Wiggins, A. (2008). "Asynchronous Decision-Making in Distributed Teams," Syracuse University, USA.

Dennis, A.R., Venkatesh, V., Ramesh, V. (2003). "Adoption of Collaboration Technologies: Integrating Technology Acceptance and Collaboration Technology Research," Indiana University, USA.

Rennecker, J., Dennis, A.R., Hansen, S. (2005). "*'Invisible Whispering': Instant Messaging in Meetings*," Case Western Reserve University, USA . *Sprouts: Working Papers on Information Systems*, 5(24). http://sprouts.aisnet.org/5-24

Rodcray, Gayle, (2008). "SharePoint Growth Leads to Scarcity of Experts," **Windows IT Pro**, September 24, 2008, InstantDoc #100389, http://windowsitpro.com/article/ articleid/100389/sharepoint-growth-leads-to-scarcity-of-experts.html

Proposal for Workshop

Southeastern INFORMS Annual Meeting, Myrtle Beach SC, 10/1-2/09

Workshop: Integrating Experiential Service Learning Projects across the Curriculum

Description of Workshop:

Background

The Carolina Service-Learning Initiative at the University of South Carolina seeks to engage students, faculty, and community organizations in service-learning (SL) partnerships by offering support in creating intentional service experiences that are integrated into curriculum across disciplines. In the summer of 2008, the workshop facilitators were awarded Center for Teaching Excellence grants to develop innovative SL initiatives within their classes. This workshop focuses on two developments from the SL cohort activities: introducing new SL into existing classes and expanding SL projects to two groups of students in different classes to enhance their experiential learning.

Workshop Goals and Objectives

- Describe SL initiative benefits for the instructor, students, and community partner
- Share experiences and results from two specific joint SL initiatives
- Outline strategies for introducing and expanding innovative SL initiatives within the classroom
- Map service learning student engagement levels to curriculum
- Network with other instructors about SL experiences.

Workshop Schedule and Activities (1.5 – 2 hours depending on conference schedule)

(20 min) Presentations by each team of facilitators highlighting their joint course SL projects including the planning, implementing, monitoring, and results.

(10 min) Group discussion on how service learning activities enhance learning outcomes

(30 min) Breakout sessions led by each facilitator (depending on number of workshop participants):

1. Introducing SL into existing classes
2. Expanding SL initiatives in existing classes
3. Developing joint SL initiatives across multiple classes
4. Mapping SL experiential learning outcomes across the curriculum.

(15 min) Group Reports, Summary, and Future Action

Each workshop participant would receive the '*Workshop SL Resource Workbook.*'

Workshop Target Participants

- Faculty who are interested in including SL initiatives in their classes to enhance experiential learning outcomes of their students.
- Faculty who currently have SL projects, but are looking for innovative ways to increase the experiential learning outcomes.
- Faculty who would like to learn more about SL benefits.

Benefits of Workshop:

- Learn about SL benefits to the instructor, students, and community partner of SL initiatives

- Learn about the experiences and results of two specific joint SL initiatives

   o *'Experiential Service Learning Using Real Client Projects in a Capstone IT Course'*

   o *'When the Process Is as Important as the Project: Service and Learning in Communication'*

1

- Develop strategies for either introducing or expanding SL initiatives within the classroom

- Learn how to map service learning student engagement levels to your curriculum

- Network with other instructors about SL experiences

- Keep the *'Workshop SL Resource Workbook.'*

Workshop Facilitators:

Lynn B. Keane Technology Support & Training Management College of Hospitality, Retail, and Sport Management University of South Carolina lkeane@sc.edu	Karen P. Patten Technology Support & Training Management College of Hospitality, Retail, and Sport Management University of South Carolina pattenk@sc.edu
Karen L. Mallia School of Journalism & Mass Communications University of South Carolina kmallia@sc.edu	Lisa Sisk School of Journalism & Mass Communications University of South Carolina lisasisk@sc.edu

2

STRATEGIES FOR FUTURISTIC THINKING IN INFORMATION SYSTEMS, OPERATIONS/PRODUCTION, PROJECT MANAGEMENT AND SUPPLY CHAIN MANAGEMENT

Paper submitted for Symposium

45TH ANNUAL MEETING OF SE INFORMS

PANEL MEMBERS

Thomas W. Garsombke, Associate Professor of Management, School of Business
Claflin University, 400 Magnolia Street, Orangeburg, South Carolina 29115, tgarsombke@claflin.edu
CONTACT PERSON

Diane J. Prince, Associate Dean and Professor of Management, School of Business
Clayton State University, Morrow, Georgia, dianeprince@mail.clayton.edu

Richard Fulton, Associate Professor of Management, Troy University – Augusta, Georgia 30909
rfulton33574@troy.edu

Gwen Hanks, Director of Applied Research, University of Georgia – Athens, Georgia

Martin H. Mbarabari, Assistant Professor of Management, Claflin University, Orangeburg, South Carolina
mmbarabari@claflin.edu

TRACT

Educational Innovation

August 10 2009

STRATEGIES FOR UTILIZING FUTURISTIC THINKING IN INFORMATION SYSTEMS, OPERATIONS/PRODUCTION, PROJECT MANAGEMENT AND SUPPLY CHAIN MANAGEMENT

ABSTRACT

Today's challenge is how do professors keep students engaged and teach them what they need to know for tomorrow's careers in information systems, operations/production, project management and supply chain management. In current operations/production, project management and supply chain management education, the researchers have developed a pedagogical model based on the theory of dialectical inquiry, integrating online software tools and future business trends that can ensure business students gain necessary skills and tools.

INTRODUCTION

Often teaching focuses on past proven theories and concepts and not enough on anticipating and adjusting to current and new marketplace changes. Obviously, this is a challenge for all educators in the environment of constant and rapid changes. With the rapid increase in the rate of technological changes, especially in operations/production, project management and supply chain management, faculty members are challenged not to just keep abreast of the technological changes, but additionally, to anticipate the economic, political, and social changes of the future. Leaders particularly need to proactively address the future and think about tomorrow [4, p. 397]. Guillory [8, p. 91] specifically says faculty should teach students how to lead 'futureperfect organizations' in the 21st century. In addition to the content, industry and environmental changes educators need to address, there are new teaching and learning theories emphasizing analysis and integration of material which pose a formidable challenge to course design. Sometimes teaching students how to think and placing them in situations where that can be expressed is key.

Although employers and educators are aware of this constant ongoing tension created by these rapid changes, there is very little written about bridging the gap in this disconnection. The authors have reviewed pedagogical and business related literature and conducted some experiential exercises in teaching undergraduate and MBA level information systems, operations/production management, project management and supply chain management courses to observe the impact on student's learning. Pedagogical underpinnings of the "futuristic thinking" exercises and assignments contribute to ensuring that students can develop higher order skills such as future-oriented thinking and integrate them into operational technologies and processes. These exercises and assignments can also better prepare students for the rapid marketplace changes that are sure to assail them in the future.

THEORETICAL AND PEDAGOGICAL BACKGROUND

There are many tools and techniques used to simulate actual decision making among students while they are still developing their discipline-based skill set. Case analysis and exercises are two primary tools utilized for enhancing experiential learning among students, whether in the classroom, or in on-line learning situations. Most experiential learning techniques attempt to

engage the student [10], making it more vivid, and eliciting reactions or decisions based on realistic or real world situations and circumstances [10] [11]. Specifically, any time a student can be placed in the role of a decision maker, for purposes of learning, the results seem to be more profound and meaningful [7]. In technical fields, like operations/production, project management and supply chain management, there is a critical need in higher education not to simply teach students information and methods/techniques, but to teach students how to think critically in a dynamically changing environment [3] [5] [9].

NEED FOR FUTURISTIC THINKING

The business challenges in the workplace have been escalating, forcing organizations and their leaders to anticipate "discontinuous change" [13, 1999, p. 146]. As opposed to simply learning about the past and gaining insight from historical decisions, managers and employees will need to "anticipate the future" [14, p. 55] [4]. To be successful, today's leaders must be able to seize upon opportunities, stay abreast of changes, remain flexible and "visualize futures" [6, p. 107] [3]. Students preparing for future careers must be able to "critically analyze the position of a firm and envision where *future value* can be created for customers" [1, p. 48].

Looking toward the future, successful organizations increasingly are realizing that they must increasingly "adapt or even anticipate (quantum-thinking) future transformation in organizational operation" [8, p. 91]. In their research of accounting students, Springer and Borthick [12, p. 19] examined differences in student exam scores for those who were exposed to the traditional dialectical learning process of lecturing, with those who experienced coverage of accounting concepts in a more innovative learning process of higher order learning, where students are asked to comprehend and respond to business dilemmas with future strategies/action plans. As a group, the students are challenged to use higher order skills to "analyze the effects of assumptions on decisions", to present their scenarios, and to defend their ideas against "competing viewpoints" scored significantly higher than those who were asked to find the correct answer to the typical accounting problem, which is the traditional "intellective task". In a similar fashion, research by Mukherjee [9, p. 174] gives examples how faculty in MIS/CIS classes use higher order thinking skill exercises to promote critical thinking and problem analysis. 'Scenario planning' is another technique used by faculty to teach marketing strategy skills by Van Doren an dSmith [13, p. 146]

SUMMARY OF THE SYMPOSIUM

This Symposium will explore how educators need to intentionally shape course content and delivery. Through careful course and pedagogical design, students can become astute critical thinkers. Panelists will illustrate how they structure learning for students through the choice of experiential exercises that are aligned to specific higher order critical thinking skills, based on the theoretical framework of Bloom [2]. Through their assignments, panelists will show how to build student skills from comprehension and analysis to synthesis and evaluation, in their various discipline areas. In addition, the research provides anecdotal evidence of the success of this pedagogical technique using online platform tools. The Symposium Session will conclude with a section soliciting ideas, suggestions, recommendations and experiences from the faculty audience who teach courses that utilize operations, production, project management, and supply chain management concepts and skills, and how they can benefit from the futuristic thinking framework model.

REFERENCES

[1] Ackerman, David S.; Gross, Barbara L.; and Perner, Lars (2003). Instructor, student and employer perceptions on preparing marketing students for changing business landscapes. *Journal of Marketing Education,* (April), 25, 1, 46-56.

[2] Bloom, Benjamin S.; Englehart, Max D.; Furst, Edward J. Hill, Walker H.; and Krathwohl, David R. eds., (1956). *Taxonomy of education objectives: The classification of educational goals.* Vol. 1, Handbook 1: *Cognitive domain.* New York, NY: David McKay.

[3] Bostrom, Lena and Lassen, Liv M. (2006). Unraveling learning, learning styles, learning strategies and meta-cognition. *Education & Training,* 48, 2/3, 178189.

[4] Dalton, Linda C. (2001). Thinking about tomorrow. *Journal of the American Planning Association,* 67, 4, 397-401.

[5] Dehler, Gordon E.; Welsh, M. Ann; and Lewis, Marianne W. (2001). Critical pedagogy in the 'New Paradigm'. *Management Learning,* (December), 32, 4, 493-511.

[6] Eisenhardt, Kathleen M. and Sull, Donald (2001). Strategy as simple rules, *Harvard Business Review,* (January), 79, 107-116.

[7] Fiol, C. Marlene and O'Connor, Edward J. (2004). The power of mind: What if the game is bigger than we think? *Journal of Management Inquiry,* 13, 4, 342-352.

[8] Guillory, William A. (2007). The futureperfect organization – leadership for the twenty-first century: Part 2. *Industrial and Commercial Training,* 39, 2, 91-99.

[9] Mukherjee, Arup. (2004). Promoting higher order thinking in MIS/CIS students using class exercises, *Journal of Information Systems Education,* (Summer), 15, 2, 171-179.

[10] Powell, Stephen G. (2004). Active learning, *ORMS Today.* (August), 31, 4, 28.

[11] Rodrigues, Carl A. (2004). The importance level of ten teaching/learning techniques as rated by university business students and instructors, *The Journal of Management Development,* 23, 3, 169-182.

[12] Springer, Carol W. (2007). Improving performance in accounting: Evidence for insisting on cognitive conflict tasks. *Issues in Accounting Education,* 22, 1, 1-18.

[13] Van Doren, Doris C. and Brannigan Smith, Darlene (1999). Scenario planning: A new approach to teaching marketing strategy. *Journal of Management Education,* (August), 21, 146-155.

[14] Werbach, Dave (2001). The winds of change. *Assessment Journal,* (July/August), 8, 3, 55.

COMMUNITY COLLEGE FACULTY RETIREMENTS: THE SEARCH FOR QUALIFIED REPLACEMENTS

Timothy DuPont, MBA, College of Business and Public Affairs
Lander University, Greenwood, SC 29649, tdupont@lander.edu

ABSTRACT

Two-year colleges have grown in both number of institutions and number of faculty. Many faculty members are at or near retirement age. Two-year colleges must recruit qualified faculty for normal growth and to replace those nearing the end of their careers. This paper examines the efforts at one two-year college to find new faculty. Two senior administrators were interviewed to determine the severity of the problem, the recruiting actions taken, and the successfulness of recruiting efforts. Efforts include advertising nationally, increased advertising on the college's website, recruiting from other websites, and recruiting "in-house." Recommendations for policy are also provided.

INTRODUCTION

Daugherty (2003) states that "community colleges are one of the most important sectors of U.S higher education" (p. 75). Generally designed to increase access to higher education without burdening four-year colleges, community college enrollments boomed in the 1950s after World War II as a result of the G.I. Bill. In the 1960s and 1970s, demand again increased when baby boomers began to reach college age and Vietnam War veterans returned to use the G.I. Bill benefits. Others in America looked to colleges as a way to avoid service in the Vietnam War (Kane and Rouse, 1999).

With an increase in demand for services, the number of community colleges increased at a rapid rate. This rapid increase in numbers required hiring additional faculty and staff. "Faculty members hired during the great expansion of community college education in the 1950s and 1960s are now reaching retirement age, and after many years of hiring freezes, reductions in force, and restricted growth, community colleges today are recruiting increasingly large numbers of new faculty to fill retirees' positions" (Winter & Kjorlien, 2000). The purpose of this qualitative study is to investigate the actions of one community college in South Carolina, as administrators recruit replacements for retiring faculty and prepare for future vacancies. This study will be guided by two questions: 1) what is the severity of the problem at this community college and 2) what actions are being taken to find replacements for retiring faculty members?

BACKGROUND

Table 1 provides the most recent data of change in the number of two-year colleges and faculty over the period 1975 – 2005.

Table 1: Two-Year Colleges and Faculty: 1975 to 2005

Item	1975	1985	1995	2005
Number of colleges[a]	1,128	1,311	1,462	1,694
Instructional staff (Lecturer or above)[b]	161	211	285	373

Source: U.S. National Center for Education Statistics
[a] Includes branch campuses. [b] Number in thousands

The number of two-year colleges and branch campuses increased 50% between 1975 and 2005. During this same timeframe, the number of faculty increased 132%. Upon closer examination, the percent change in the number of two-year colleges increased 16% between 1975 and 1985, while in the decade 1985 to 1995, the number of two-year colleges increased 12%. Between 1995 and 2005, the number of two-year colleges increased 16%. The increase in the number of two-year college faculty was quite different. Over each decade of the period 1975 through 2005, on average, the percent difference of faculty increased 32%. Based on these findings, two-year colleges must be concerned with recruiting qualified faculty for normal expansions. Table 2 shows the most recent data of percentages, and total numbers of two-year faculty by age group.

Table 2: Two-Year Faculty Age in 2004

Age of faculty	Percent of Total	Total[a]
Under 55	35	790
55 or above	65	422

Source: U.S. Department of Education, National Center for Education Statistics, 2004 National Study of Postsecondary Faculty (NSOPF:04).
[a] Number in thousands.

Roughly 65% or 422,000 two-year college faculty members are at or nearing the age of retirement. "One-quarter (25 percent) of faculty members fifty-five or older reported that they were very likely to retire in the next three years. An additional one-quarter (24 percent) were somewhat likely to retire. Nineteen percent of all full-time instructional faculty and staff had at least some plans to retire" (Martin Conley, 2005, p. 17). Given this, many two-year colleges should prepare to recruit qualified replacements for those retiring now or that may be retiring in the near future.

METHODOLOGY

Two senior administrators of one two-year college, located in the South Carolina Upstate region, were asked to participate in a short survey regarding the severity of the faculty retirement problem and the extent of their faculty recruitment efforts. One administrator responded to the survey questions during a phone interview with the researcher. A second administrator completed the survey and returned their responses directly to the researcher electronically. These participants were asked three open-ended questions: a) what is the extent of the problem of retiring faculty at your institution; b) What actions are being taken by your institution to find replacements for these retiring faculty members; and c) what successes are you finding with these actions? The findings presented are based on the results of these survey responses.

FINDINGS

The problem of retirements may not be as bad now as it was earlier in the decade. South Carolina has the Teacher and Employee Retiree Incentive program (TERI) program which eased the burden as replacements were recruited and hired. According to the South Carolina retirement systems (2007) website, under the TERI program, if an individual is an active employee who is eligible for service retirement, the employee may elect to participate in the program. TERI allows an individual to retire and begin accumulating retirement annuity on a deferred basis without terminating employment; the employee must enroll in the program at the time of retirement.

The main action taken by this institution has been to double recruiting efforts. Before 2000, this two-year college primarily recruited from within the state of South Carolina. Now, they recruit nationally, not through the Chronicle of Higher Education, but through lesser known publications due to cost considerations. They have also advertised through several trade publications specific to the disciplines from which they wish to recruit. Recruitment is also conducted through the use of their web site.

In health programs, specifically nursing, the problem is not only finding replacements for retiring faculty, it is simply hiring new faculty for expanding or specialty programs. The Dean of Nursing will often watch and recruit from clinical sites. Another action taken by this two-year college to attract new faculty for these programs has been to pay for advanced degrees for hard-to-recruit faculty such as nursing instructors. This two-year college began using its Foundation to provide financial assistance for its employees to earn advanced degrees many years ago. In recent years, significant increases have been allocated for employees pursuing a Masters in nursing degree.

An individual possessing a Bachelors of Science, Nursing (BSN) degree will be hired and placed into an assistant teaching slot for the Licensed Practical Nursing (LPN) program. While working in this capacity at the two-year college, they will receive financial assistance from the college Foundation to work toward completing their Masters degree. Upon completion of the Masters of Science in Nursing (MSN) degree, the employee is placed into a faculty position in the Associate Degree Nursing program. Once into a faculty position, the individual is bound to a five-year employment agreement. If the faculty member leaves during the first five years, they must repay the Foundation a pro-rata share of the assistance that they received.

CONCLUSION

This paper has examined the problem of faculty retirements in two-year colleges from the perspective of one South Carolina two-year college. Overall, roughly two-thirds of two-year college faculty members are at or nearing the age of retirement. Within the last four decades, two-year colleges have continued to grow at a rate of approximately 15% each decade. The growing problem is two-fold; two-year colleges must be concerned with recruiting qualified faculty to replace those nearing the end of their careers and also recruit for normal growth.

The impact of the problem for this two-year college has been eased through the Teacher and Employee Retiree Incentive (TERI) program for most disciplines. One response to the problem of recruiting to specialty areas such as nursing has been to double recruiting efforts and expand active searches outside the state of South Carolina. Another response has been to increase monitoring and recruitment of qualified instructors from clinical websites. A third effort is the offer of financial assistance to nurses holding baccalaureate degrees in nursing and having the potential to become effective instructors. This offer enables these individuals to gain their MSN while teaching at the college. In return, an obligation to

continue to teach at the college is expected. Collectively, these efforts have proven highly effective and, with the exception of four or five slots, the college is fully staffed.

IMPLICATIONS FOR POLICY

Based on this research, two-year college administrators should consider lobbying legislators to implement state incentive plans to encourage faculty eligible for retirement to continue their service to ease the burden. An aggressive recruitment effort using multiple venues is another aspect of the solution. Two-year colleges may also wish to consider looking within for potential replacements for faculty. Individuals with the talents and skills needed to be quality faculty members may be in service, but lack the academic credentials. This may be due to a lack of funding for advanced degrees. Two-year colleges should consider policies that address the issue of funding the academic efforts of top candidates in an effort to secure future qualified faculty.

FUTURE RESEARCH

While this study was conducted on a local level, it may be beneficial to expand the focus to the regional or national levels as well. Additionally, an examination of the various programs offered by other states, such as the South Carolina TERI program, may add another dimension to the options available to community colleges as they recruit new faculty members. Finally, since community colleges are expanding their programs into hard-to-staff specialty areas such as nursing, an examination of the efforts to sway legislators at the state and national level to increase funding for the purpose of recruiting and retaining quality faculty may be an interesting study.

REFERENCES

Dougherty, K. (2003). The community college: The origins, impacts, and futures of a contradictory institution. In B. Townsend & D. Bragg (Eds.) (2006), *ASHE Reader on Community Colleges*, 3rd ed. Boston, MA: Pearson Custom Publishing.

Kane, T. J. and Rouse, C. E. (1999). The community college: Educating students at the margin between college and work. In B. Townsend & D. Bragg (Eds.) (2006), *ASHE Reader on Community Colleges*, 3rd ed. Boston, MA: Pearson Custom Publishing.

Martin Conley, V. (2005). Demographics and motives affecting faculty retirement, *New Directions for Higher Education, Winter*(132), 9-30.

South Carolina Retirement Systems. (2007). *Teacher and employee retention (TERI) program.* Retrieved April 6, 2008 from http://www.retirement.sc.gov/teri/default.htm.

Winter, P., & Kjorlien, C. (2000). Community college faculty recruitment: Effects of job mobility, recruiter similarity-dissimilarity, and applicant gender. *Community College Journal of Research & Practice, 24*(7), 547-566.

TEACHING MANAGERIAL ACCOUNTING: DESIGNING A DIRECT-VERSUS-ABSORPTION PROBLEM WITH EASY-TO-TRACK COMPARISONS

W. Joseph Pollard, Stanly Community College, Albemarle, NC 28001, wpollard4980@stanly.edu
William B. Pollard, Appalachian State University, Boone, NC 28608, pollardwb@appstate.edu

INTRODUCTION

Concepts in accounting are sometimes presented with numbers that are far too cumbersome, which can distract from, rather than aid the learning process. Whenever possible, numbers in an illustrative problem should be unique to a singular item and easy to manage – such that the numbers are neither distractingly large nor too small. (Later, in problems at the end of the chapter, numbers need not be quite as well developed as the first set of numbers used to illustrative the new material.) In this paper, a problem is presented which focuses on direct versus absorption costing. This problem was developed as a supplement to a textbook illustration that used the same dollar amount for several per-unit cost items, and a couple of large, unwieldy numbers for total costs and was quite confusing, even for the professor. The illustration presented in this paper was well received by the students since the purposely-designed and uniquely-assigned numbers mapped a clearer pathway through the problem.

OVERVIEW OF DIRECT VERSUS ABSORPTION COSTING

The direct method (or variable method) of costing products views only the variable costs of production as costs that should be inventoried if the product is not sold. Accordingly, all fixed costs, including fixed overhead costs, are not considered product costs, but costs of the time period under investigation and are consequently expensed in their entirety when incurred. On the other hand, even though fixed selling and administrative expenses are also expensed as incurred under the absorption method, fixed overhead is not. The absorption method views fixed overhead as a necessary cost of production and, as such, is unitized into production and expensed when the product is sold. (In other words, each unit produced must "absorb" its fair share of fixed overhead into its product cost which becomes an asset until sold.) Consequently, the difference between net income figures under the direct method versus the absorption method will be the fixed overhead per unit times the change in inventory (assuming all costs remain constant). The absorption method is the procedure required for external reporting, while the direct method is the usual choice for internal analysis for many business decisions due to its focus on cost behavior patterns (where variable production costs per unit and fixed overhead in total remain constant over all levels of production within the relevant range for the business). Accordingly, both procedures, while different, are important in the making and reporting of business decisions.

DATA FOR THE PROBLEM

The following problem is a typical direct versus absorption question. In Part I, the cost-volume-profit assumption of no change in inventory is in force. Accordingly, 10,000 units are produced and sold. In Part II, there is one change in the data: 10,000 units are produced, but only 9,000 units are sold, which results in a finished goods ending inventory of 1,000 units.

Direct-Absorption Company manufactures super widgets which it sells for $50 each. Direct-Absorption has the following data available for its first year of operations:

Direct Materials	=	5 pounds per unit at $1.60 per pound
Direct Labor	=	1/2 hour per unit at $14 per hour
Total Manufacturing Overhead	=	$110,000, of which $60,000 is fixed
Total Selling Expenses	=	$70,000, of which $40,000 is fixed
Total Administrative Expenses	=	$30,000, of which $20,000 is fixed
Number of Units Produced	=	10,000

Required: Prepare income statements for the year using both the direct and absorption methods.

Solution:
The first step is to create a data presentation framework that is readily usable to solve the problem. The numbers presented above can be extended and/or subdivided, as follows:

Direct Materials	=	5 pounds per unit at $1.60 per pound	= $8 per unit
Direct Labor	=	1/2 hour per unit at $14 per hour	= $7 per unit
Total Manufacturing Overhead	=	$110,000, of which $60,000 is fixed	= $60,000 fixed
	=	$50,000 is variable	= $5 per unit
Total Selling Expenses	=	$70,000, of which $40,000 is fixed	= $40,000 fixed
	=	$30,000 is variable	= $3 per unit
Total Administrative Expenses	=	$30,000, of which $20,000 is fixed	= $20,000 fixed
	=	$10,000 is variable	= $1 per unit

Note that the numbers on the far right are each unique and not too cumbersome. Even though a variety of numbers were used at the start of the problem, by the time the data is rearranged, it has the relevant numbers of $1; $20,000; $3; $40,000; $5; $60,000; $7; and, $8. Also, 10,000 units were sold in Part I (and 9,000 will be sold in Part II). Even fixed overhead per unit is $6 (which is needed in Part II). This, of course, does not mean the problem is easy. It means that the difficulty of the problem has not been unnecessarily increased by numbers that are too identical or overly cumbersome. Therefore, students should feel comfortable focusing on the concepts of direct costing and absorption costing and how they are similar and how they differ, rather than on having the additional task of focusing on keeping numbers that are too similar or too complex straight. The corresponding income statements for direct versus absorption costing, based on the numbers above, are as follows:

Part I: Direct Costing – 10,000 Units Produced and Sold

```
Sales                     10,000  x  $50  =              $500,000
-Variable Costs:
   Direct Materials       10,000  x  $8   =  $80,000  ⎤
   Direct Labor           10,000  x  $7   =   70,000  ⎬──────→  (Variable Cost of
   Variable Overhead      10,000  x  $5   =   50,000  ⎦           Goods Sold)
   Variable Selling       10,000  x  $3   =   30,000
   Variable Administrative 10,000 x  $1   =   10,000      240,000
Contribution Margin                                      $260,000
-Fixed Costs:
   Fixed Overhead                     $60,000
   Fixed Selling                       40,000
   Fixed Administrative                20,000            120,000
Net Income                                               $140,000
```

Part I: Absorption Costing – 10,000 Units Produced and Sold

```
Sales                     10,000  x  $50  =              $500,000
-Cost of Goods Sold:
   Direct Materials       10,000  x  $8   =  $80,000
   Direct Labor           10,000  x  $7   =   70,000
   Variable Overhead      10,000  x  $5   =   50,000
   Fixed Overhead         10,000  x  $6*  =   60,000      260,000
Gross Margin or Gross Profit                             $240,000
-Selling and Administrative Expenses:
   Variable Selling       10,000  x  $3   =   30,000
   Fixed Selling                              40,000
   Variable Administrative 10,000 x  $1   =   10,000
   Fixed Administrative                       20,000      100,000
Net Income                                               $140,000
```

*Note: Fixed Overhead Per Unit = $60,000 ÷ 10,000 Units = $6 Per Unit
However, since all units produced were sold, the net incomes were identical under the two methods.
(Under the direct method, $60,000 total fixed overhead cost was expensed. Under the absorption method, $6 per unit x 10,000 units = $60,000 fixed overhead was expensed and $-0- was inventoried since there were no produced, but unsold units.)

Part II: Direct Costing – 10,000 Units Produced and 9,000 Units Sold

Sales	9,000 x $50 =			$450,000	
-Variable Costs:					
Direct Materials	9,000 x $8 =	$72,000			
Direct Labor	9,000 x $7 =	63,000			
Variable Overhead	9,000 x $5 =	45,000			
Variable Selling	9,000 x $3 =	27,000			
Variable Administrative	9,000 x $1 =	9,000	216,000		
Contribution Margin			$234,000		
-Fixed Costs:					
Fixed Overhead		$60,000			
Fixed Selling		40,000			
Fixed Administrative		20,000	120,000		
Net Income			$114,000		

Direct Materials, Direct Labor, Variable Overhead → Variable Cost of Goods Sold

Part II: Absorption Costing – 10,000 Units Produced and 9,000 Units Sold

Sales	9,000 x $50 =		$450,000	
-Cost of Goods Sold:				
Direct Materials	9,000 x $8 =	$72,000		
Direct Labor	9,000 x $7 =	63,000		
Variable Overhead	9,000 x $5 =	45,000		
Fixed Overhead	9,000 x $6* =	54,000	234,000**	
Gross Margin or Gross Profit			$216,000	
-Selling and Administrative Expenses:				
Variable Selling	9,000 x $3 =	27,000		
Fixed Selling		40,000		
Variable Administrative	9,000 x $1 =	9,000		
Fixed Administrative		20,000	96,000	
Net Income			$120,000	

*Note: Fixed Overhead Per Unit = $60,000 ÷ 10,000 Units = $6 Per Unit

The difference in Net Incomes = Fixed Overhead Per Unit x Change In Inventory

= $6 per unit   x   1,000 units   = $6,000

**Also note that the more traditional way of calculating Cost of Goods Sold would be:

-Cost of Goods Sold:			
Direct Materials	10,000 x $8 =	$ 80,000	
Direct Labor	10,000 x $7 =	70,000	
Variable Overhead	10,000 x $5 =	50,000	
Fixed Overhead		60,000	$60,000 ÷ 10,000 Units = $6 Per Unit
		$260,000	
+Beginning Inventory Work-In-Process	=	-0-	
-Ending Inventory Work-In-Process	=	-0-	
+Beginning Inventory Finished Goods	=	-0-	
-Ending Inventory Finished Goods	=	26,000	1,000 units at $26 per unit
Cost of Goods Sold		$234,000	

SUMMARY AND CONCLUSIONS

This paper illustrates the benefits of using number scenarios in problems such that the numbers are not distracting, but are unique to the point that they can be easily tracked through the problem to help illustrate the points being made. Unique, easy-to-manage numbers can also be a plus for exams – such numbers not only help students, they can also make the exams easier to grade. Accordingly, designing accounting problems that use easy-to-track, yet non-distracting numbers can enhance the learning process and prove beneficial to both students and professors.

TEACHING PRINCIPLES OF ACCOUNTING: HELPING STUDENTS IDENTIFY TEN DIFFERENCES WHEN COMPARING A TRIAL BALANCE, AN ADJUSTED TRIAL BALANCE AND A BALANCE SHEET

William B. Pollard, Appalachian State University, Boone, NC 28608, pollardwb@appstate.edu

INTRODUCTION

Beginning principles of accounting students can sometimes find the features of the trial balance, the adjusted trial balance and the balance sheet hard to differentiate. The consequences can be devastating if the first exam offers an alphabetical listing of accounts and asks for a balance sheet, but a trial balance or an adjusted trial balance is presented instead. However, with a focus on the differences between the very similar trial balance and adjusted trial balance, yet very different balance sheet, the likelihood of confusion can be minimized. In this paper, ten differences between the trial balance, the adjusted trial balance and the balance sheet are presented (in no priority ordering). By focusing on these differences, the confusion for students will hopefully fade to the point that, by exam time, the asked-for item will be readily distinguishable and accurately prepared.

TEN DIFFERENCES BETWEEN THE TRIAL BALANCE, THE ADJUSTED TRIAL BALANCE AND THE BALANCE SHEET

Since there are numerous differences between the trial balance, the adjusted trial balance and the balance sheet, the listing in this section is not to be considered all-inclusive. However, the ten items listed below (in no priority ordering) can too frequently show up incorrectly on exams and are thus ten differences to watch for (or perhaps ten miscues to avoid) on exams.

1. Even though the trial balance, the adjusted trial balance and the balance sheet are all dated on the last day of the time period under investigation, only the adjusted trial balance and balance sheet have "up-to-date" (adjusted) figures. The account balances on the trial balance have not had end-of-period adjustments.
2. Only the trial balance and adjusted trial balance have the words "debit" and "credit" on them.
3. Only the balance sheet has the labeling "assets," "liabilities," and "stockholders' equity."
4. A contra account is not shown in its "offset" position on the trial balance and adjusted trial balance, but is shown in an "offset" position on the balance sheet. (This causes the total amount for the "debit" column on the adjusted trial balance to be a different number from the amount listed for "total assets" on the balance sheet.)
5. The trial balance and adjusted trial balance have revenues and expenses listed on them, but revenues and expenses are not listed on the balance sheet (but are listed separately on the income statement).
6. Dividends (or Drawings) are listed on the trial balance and adjusted trial balance, but are not shown on the balance sheet but are shown separately on the statement of retained earnings (or the statement of owner's equity).
7. Under the periodic inventory system, beginning inventory is listed on the trial balance and adjusted trial balance, but ending inventory is listed on the balance sheet. (This assumes that updating the inventory is accomplished as part of the closing process.)
8. Under the perpetual inventory system, the inventory amount listed on the trial balance and adjusted trial balance likely equals the ending inventory listed on the balance sheet – but only in textbooks. In "real world" situations, ending inventory still has to be counted under the perpetual

system and compared to the amount listed in the ledger. If the amount counted is different from (usually less) than the amount "in the books," the difference is either added (if positive) or written off to theft, breakage or other inventory "shrinkage" events (if negative).

9. Beginning Retained Earnings (or Capital) is listed on the trial balance and adjusted trial balance, but ending Retained Earnings (or Capital) is listed on the balance sheet.

10. Lastly, (and this time a similarity instead of a difference) – it is often tempting for principles students to debit or credit "cash" in the adjusting entries. However, since adjusting entries do not involve cash (unless a replenishment of the petty cash fund is considered an adjustment) the balance in the ever-important cash account should be the same on the trial balance, the adjusted trial balance and the balance sheet.

AN ILLUSTRATION OF THE DIFFERENCES FOR STUDENTS

University Clothing Company, Inc. has the following chart of accounts (in alphabetical ordering rather than ledger sheet sequencing) and wants to take the necessary steps to close its books for the year ending December 31, 2009. Each account is unadjusted and has its "normal" balance:

Account Title	Amount
Accounts Payable	$ 14,000
Accounts Receivable	20,000
Accumulated Depreciation	11,000
Advertising Expense	18,000
Cash	80,000
Common Stock	100,000
Dividends Paid	20,000
Inventory	30,000
Miscellaneous Expenses	5,000
Notes Payable	40,000
Office Equipment	50,000
Prepaid Insurance	8,000
Purchases	78,000
Rent Expense	12,000
Retained Earnings	15,000
Salaries Expense	49,000
Sales	190,000

Based on these numbers, the trial balance for University Clothing Company, Inc. on December 31, 2009, is as follows:

University Clothing Company, Inc.
Trial Balance
December 31, 2009

Account Title	Debit	Credit
Cash	$ 80,000	
Accounts Receivable	20,000	
Inventory **	30,000	
Prepaid Insurance	8,000	
Office Equipment	50,000	
Accumulated Depreciation		$ 11,000
Accounts Payable		14,000
Notes Payable		40,000
Common Stock		100,000
Retained Earnings**		15,000
Dividends Paid	20,000	
Sales		190,000
Purchases	78,000	
Salaries Expense	49,000	
Rent Expense	12,000	
Advertising Expense	18,000	
Miscellaneous Expenses	5,000	
Totals	$370,000	$370,000

**Remember that on the trial balance and the adjusted trial balance, the Inventory amount is <u>Beginning</u> Inventory and the Retained Earnings amount is <u>Beginning</u> Retained Earnings.

The following information is needed to make the end-of-year adjustments for University Clothing:

> Depreciation on Office Equipment for 2009 is $3,000.
> Salaries of $1,000 are owed, but unpaid on December 31, 2009.
> Interest of $2,000 is owed (but not due) on the Notes Payable on December 31, 2009.
> Insurance cost for one year of $8,000 was prepaid on April 1, 2009.
> Ending Inventory on December 31, 2009 is $40,000.

Adjusting entries would be made as follows (assuming that updating of inventory is not part of the adjusting process, but part of the closing process):

1. The journal entry necessary to record the adjustment for depreciation of office equipment is:

> Depreciation Expense   3,000
>   Accumulated Depreciation   3,000

2. The journal entry necessary to record the adjustment for salaries is:

> Salaries Expense   1,000
>   Salaries Payable   1,000

3. The journal entry necessary to record the adjustment for interest is:

Interest Expense	2,000	
Interest Payable		2,000

4. The journal entry necessary to record the adjustment for prepaid insurance is:

Insurance Expense	6,000	
Prepaid Insurance		6,000

Based on these adjustments, the following is the adjusted trial balance for University Clothing Company on December 31, 2009:

<div align="center">

University Clothing Company, Inc.
Adjusted Trial Balance
December 31, 2009

</div>

Account Title	Debit	Credit
Cash	$ 80,000	
Accounts Receivable	20,000	
Inventory **	30,000	
Prepaid Insurance	2,000	
Office Equipment	50,000	
Accumulated Depreciation		$ 14,000
Accounts Payable		14,000
Notes Payable		40,000
Salaries Payable		1,000
Interest Payable		2,000
Common Stock		100,000
Retained Earnings**		15,000
Dividends Paid	20,000	
Sales		190,000
Purchases	78,000	
Salaries Expense	50,000	
Rent Expense	12,000	
Advertising Expense	18,000	
Miscellaneous Expenses	5,000	
Depreciation Expense	3,000	
Interest Expense	2,000	
Insurance Expense	6,000	
Totals	$376,000	$376,000

For University Clothing Company, Inc. to prepare its balance sheet for December 31, 2009, the following steps must be taken:

Calculate the total for cost of goods sold on December 31, 2009:

	Beginning Inventory	$ 30,000
+	Purchases	+ 78,000
	Goods Available	$ 108,000
-	Ending Inventory	- 40,000
	Cost of Goods Sold	$ 68,000

Prepare an income statement and statement of retained earnings for 2009:

University Clothing Company, Inc.
Income Statement
For the Year Ending December 31, 2009

Sales		$190,000
- Cost of Goods Sold		68,000
Gross Profit		$122,000
- Selling and Administrative Expenses:		
Salaries Expense	$ 50,000	
Rent Expense	12,000	
Advertising Expense	18,000	
Depreciation Expense	3,000	
Interest Expense	2,000	
Insurance Expense	6,000	
Miscellaneous Expenses	5,000	96,000
Net Income		$ 26,000

University Clothing Company, Inc.
Statement of Retained Earnings
For the Year Ending December 31, 2009

Beginning Retained Earnings	$ 15,000
+ Net Income	+ 26,000
Subtotal	$ 41,000
- Dividends Paid	– 20,000
Ending Retained Earnings	$ 21,000

Finally, prepare a balance sheet for December 31, 2009:

University Clothing Company, Inc.
Balance Sheet
December 31, 2009

Assets

Cash		$ 80,000
Accounts Receivable		20,000
Inventory		40,000
Prepaid Insurance		2,000
Office Equipment	$50,000	
Less Accumulated Depreciation	14,000	36,000
Total Assets		$178,000

Liabilities

Accounts Payable	$14,000	
Notes Payable	40,000	
Salaries Payable	1,000	
Interest Payable	2,000	
Total Liabilities		$ 57,000

Stockholders' Equity

Contributed Capital		
Common Stock	$100,000	
Retained Earnings	21,000	
Total Stockholders' Equity		121,000
Total Liabilities and Stockholders' Equity		$178,000

SUMMARY AND CONCLUSIONS

When first learning the accounting cycle sequence of events, it is not unusual for principles of accounting students to confuse some of the features of the trial balance, the adjusted trial balance and the balance sheet. Often asked to prepare a balance sheet on the first exam, it can be costly if a trial balance or an adjusted trial balance is prepared instead. Specifically identifying several of the differences, as was done in this paper, can alert students to the potential dangers of confusion and help them focus on determining exactly what goes on which presentation.

The personality and learning styles of Coastal Carolina Business students.

Nicholas W. Twigg, Coastal Carolina University, _ntwigg@coastal.edu_, 843-349-2241

Staci Willette, Coastal Carolina University

Abstract

This paper will examine the learning styles and personality types of Coastal Carolina University business students and give recommendations as to an andragogy (Knowles, 1977) that will enhance delivery of college of business courses. Students at Coastal Carolina University have different feelings about teaching and learning, different reactions to classroom environments, and different levels of motivation in regards to their education (Felder & Brent, 2005). The more instructors understand these differences the easier it will be for them to meet the diverse educational needs of students. Two factors which have demonstrated importance in teaching and learning are students learning style and personality (Carrell & Monroe, 1993).

INTRODUCTION

Bokoros, Goldstein and Sweeney (1992) designed a study to determine the common factors in five measures of cognitive style. The five measures that were used were Jung's model of personality, the Gregorc style indicator, decision style inventory, Kolb's learning style inventory, and Lifescripts. The study consisted of 143 students and faculty members aged 17 to 72 years. They completed all five measures and a factor analysis was completed on the results.

The theory of personality developed by Jung (1923, 1971) focuses on three distinct dimensions; the judging dimension, the attentional dimensions, and the perceiving dimension

(Bokoros, Goldstein, & Sweeney, 1992). His theory is the foundation for the Myers-Briggs Type Indicator (MBTI) which is used by many in counseling and educational settings.

The Gregorc Style Indicator is a measure of four different learning styles categories. These are based on the crossing of sequential or random processing (dimension one) with abstract or concrete date (dimension two) (Gregorc, 1982). Gregorc's theory defines concrete as the experience of any new information, while abstract refers to the mental version of this experience. As a result there are four kinds of learners defined:

Concrete sequential learner: this learner is structures, predictable, and thorough

Abstract sequential learner: this learner is logical, analytical, and conceptual

Abstract random learner: this learner is sensitive, sociable, and expressive

Concrete random learner: this learner is original, intuitive, and investigative

Although there have not been any studies directly comparing these two measures, there have been similarities found between the results of both tests (Kirton, 1976).

The Decision Style Inventory (DSI) is based on the earlier work of Driver (Driver & Rowe, 1979). His model examines the dimensions of cognitive complexity; which is a person's tolerance for ambiguity and environmental complexity; which measures a persons concern for people or task oriented work. There are four styles determined by this measure. These are Conceptual, Behavioral, Analytical, and Directive. They are described as:

Conceptual: creative, insightful, and intuitive

Behavioral: supportive, receptive, and people-oriented

Analytical: task-oriented, logical, and abstract thinkers

Directive: present-oriented approach and practical, prefer structure

Kolb's Learning Style Inventory is a based on Kolb's learning cycle model (Kolb, 1984). His cycle is another way to classify cognitive processing. His theory has an abstract and a concrete dimension. A person with abstract conceptualization focuses on using logic and concepts. They are more focused on thinking. Someone with concrete conceptualization focuses

on experiences and personal communication. Their emphasis is on feeling rather than thinking. Kolb also examines active and reflective experimentation. He describes active experimentation as grasping information by either a concrete experience or an abstract conceptualization. He describes reflective experimentation as transforming information through active manipulation or internal reflection. His four styles are defined by the intersection of the two dimensions.

Christensen's (1980) Lifescripts measure was designed to be used in management consulting. The four scales defined by the measure are Analyzer, Controller, Supporter, and Promoter. These are related to social interaction and not cognitive styles like the other measures. He defines the scales as follows: Controllers are looking for results. They are task oriented and will ensure the job gets done. They are good at making decisions, like to be in control, and are extraverted minded. Analyzers are introverted and reserved. They like things to be logical. They are friendly, sympathetic and enjoy people. Promoters are very outgoing and socially skilled. They want harmony and are loyal. Supporters are also loyal and prefer to avoid drama. They are idealistic as well. The activating function would determine the general focus of attention and coordinate the expression of style in close relationships. The results demonstrated that the executive cognitive function would control cognitive operations and arriving at decisions. The receiving function would determine the general focus of attention and coordinate the expression of style in close relationships. Therefore, learning style and personality are associated.

Jung's theory is the foundation for the Myers-Briggs Type Indicator (MBTI) (Myers & McCaulley, 1985), an instrument widely used in educational and counseling settings. The MBTI attempts to identify an individual's preference and habitual use of perception and judgment (Carrell & Monroe, 1993). The theory of personality developed by Jung (1923, 1971) focuses on two general areas; mental activity and mental processes (Borg & Shapiro, 1996). Jung divided mental activity into two distinct dimensions; perception which includes sensing and intuition and judgmental which includes thinking and feeling. Mental processes included the extroversion and introversion dimensions (Bokoros, Goldstein, & Sweeney, 1992). the judging dimension, the

attentional dimensions, and the perceiving dimension (Bokoros, Goldstein, & Sweeney, 1992). The fourth scale used in the MBTI was added later. This is the style of dealing with the world (Carrell & Monroe, 1993). The two ends of this fourth scale are judging and perceiving.

Each of the four scales (E/I, S/N, T/F, and J/P) represents opposites. The theory behind the instrument assumes that every person uses both of the opposite poles of each scale, but their responses on the instrument indicate their preference. The attentional dimension defines ones preferences for internal versus external forces. The attentional dimension is broken into two opposing preferences; extravert or introvert. Someone who is an extravert focus on the external forces in their life. Someone who is an introvert focuses on their internal mental processes. The perceiving dimension is associated with how we initially process information. On one end of this scale is Sensation and on the other end is Intuition. Sensing individuals are practical and realistic. They prefer details, facts, and structure. Intuitive types are imaginative and look for relationships in information. The judging dimension is associated with decision-making. This is either accomplished by Thinking or Feeling. Thinking is defined as the use of objective, logic-oriented evaluation. Feeling is defined as a personal and value-oriented evaluation. People on this end of the range prefer collaborative efforts.

Felder and Silverman (1988) conducted a study to examine the dimensions of various learning styles and what techniques teachers can use to address these styles. Students learn in so many ways; hearing, seeing, reflecting, acting, visually and otherwise. Teachers use various methods to present information for their students to learn. It is obvious there is a mismatch between the common learning styles and the traditional teaching styles. This leads to some large problems for a teacher when trying to ensure that all students learn and comprehend the information they are presenting.

Learning is a two-step process: reception and processing of information. In reception external information it is observed through the senses and internal information arises from introspection. This is where a student decides what information to process and what to ignore.

The learning-style model classifies students based on where they fit on a scale related to how they receive and process information. There is a model that coincides with the students learning process is the teaching-style model. This rates instructional methods based on how they address the various styles of learning.

Felder and Solomon's (n.d.) Index of Learning Style Questionnaire is a 44-item survey that can be completed and scored on the Web. This instrument is based on the learning-style model which classifies students based on four scales (Felder & Silverman, 1988). These scales measure the way an individual receives and processes information. The four scales are active versus reflective learners, sensing versus intuitive learners, visual and verbal learners, and sequential and global learners. Some individuals score at one end or the other on any of these scales; however a balance between the two ends is preferable.

Active learners tend to like group work and reflective workers prefer working alone (Felder & Silverman, 1988). Active learners prefer to try and discuss, apply, or explain what they are learning and reflective learners prefer to think about it first. However, sitting through a class and only taking notes is hard from both learning styles, but is particularly hard for active learners.

Sensing learners (sensors) like facts and intuitive learners (intuitors) prefer possibilities (Felder & Silverman, 2005). Sensing learners like using established methods to solve problems and intuitive learners like new ideas. Sensing learners are good with details and memorizing and intuitive learners are good at understanding new ideas and abstract concepts. Sensors do best in classes that are tied to the real world. Unlike intuitors, they do not do well in classes where there is a lot of memorization and routine work.

Visual learners perform better when they can see pictures, diagrams, and timelines (Felder & Silverman, 2005). Verbal learners perform better when they are using written and spoken words. College classes where lectures are used and little visual presentations are utilized are challenging for visual learners. Most college classes rely on lectures and unfortunately most people are visual learners (Felder & Silverman, 2005).

Sequential learners like to learn by following the logical steps in a process and global learners like to absorb large amounts of material without any apparent connections (Felder & Silverman, 2005). Sequential learners need to follow steps to reach a solution and take their time. Global learners on the other hand tend to jump to a conclusion or solution quickly. Most students are sequential learners (Felder & Silverman, 2005) and having an instructor who moves around from topic to topic in no logical order presents a challenging learning environment. Fortunately, most college classes are taught sequentially (Felder & Silverman, 2005).

Students have very different levels of motivation, and different attitudes and responses to teaching styles as well as classroom environments (Felder & Brent, 2005). As a result college students have very diverse learning needs. Instructors need to be aware of this diversity and find ways to teach them.

METHODS

Business students at Coastal Carolina University completed a modified Myers-Briggs Type Indicator (MBTI) test and a Learning Style Indicator Questionnaire (Soloman & Felder, n.d.). The results of these two measures were then analyzed.

Participants – Sophomore, junior and senior college of business students sampled. They were students in organizational behavior and theory classes and a section of Decision Analysis. Three classes were sampled with a total of 91 students responding out of 107 for an 85% response rate.

Measures

 A 70 item modified version of the MBTI was administered as part of the course. The version was adapted from the entrance examination at McNeese State University. The E/I dimension consisted of a set of ten items whereas the other 3 dimensions of S/N, T/F, and J/P consisted of 20 items each. The MBTI was administered in class and the scoring results were logged by the students and the scoring sheets were turned in to the professor. The participants were then directed to take a learning styles survey online. As part of the learning styles online survey a results sheet was generated and turned in to the professor.

The students were directed to write a three page paper with at least two scholarly sources comparing their individual results of the MBTI and Learning Styles Inventory. The student papers were graded for a potion of their grade in the course. The results are presented in table form below.

RESULTS

The results of the MBTI show that the vast majority of students heavily favored the E, S, T, and J dimensions. The results of the learning styles show a bias towards the active, sensing, visual, and sequential learning styles.

MBTI Results

Analytical Thinking		Systemic Thinking	
E	**545**	I	365
S	**1114**	N	706
T	**1006**	F	814
J	**1134**	P	686

Learning Styles Results

Analytical Thinking		Systemic Thinking	
Active	**96**	Reflective	24
Sensing	**72**	Intuitive	17
Visual	**64**	Verbal	16
Sequential	**54**	Global	33

DISCUSSION

Understanding the personality and learning styles of our students is very important. Professors want to create the best learning classroom environment for all of their students. However, it is hard to design a classroom environment to match each students learning style. Therefore, understanding your students will make this process easier.

Knowing the personality and learning styles of the students in a course can give the professor an indication of what delivery system may be best for adult learning to take place. The left hand sides of the MBTI and Learning Styles surveys are indicative of an analytical style of thinking. An analytical style is evidenced by very linear, visual, cognitive, cause and effect manner of understanding. The right hand sides of the MBTI and Learning Styles surveys are more indicative of a relational style of thinking. Relational thinking is very systems oriented and non-linear, intuitive, and affective. That the majority of this sample is ENTJ and Act, Sen, Vis, and Seq indicate that the students would be well suited to a simple teach and test pedagogy rather than an open researching style of andragogy.

Another major area where the University classroom (as differentiated from a K-12 classroom) can benefit from using the personality and learning styles of students is through a model of andragogy vice pedagogy. Andragogy is the art and science of teaching adults (Forrest & Peterson, 2006). Andragogy includes basic assumptions that are concerned with learning instead of a pedagogical emphasis on teaching (Forrest & Peterson, 2006; Knowles, 1977). Adult types of learning use self-directed learning, experiential learning, and performance centered learning, and the most important assumption is a willingness to learn (Forrest & Peterson, 2006).

LIMITATIONS

These are self-reporting preliminary data and as such are susceptible to inflation due to social desirability. The data are cross sectional and cannot be used to make and inference as to causality. The delivery style is very sensitive to the subjects to which the style is directed. Students may be introverted in personality and have a reflective learning style which may indicate to the professor that an open self-directed style of classroom activities would be warranted, yet the students may be time pressed and under pressure to get this course "out of the way" in order to graduate a semester early. Even introverted and reflective students would not necessarily respond to the indicated classroom environment.

REFERENCES

Ashkanasy, N. (2006). Introduction: On the need for a more mature approach to Management Education. *Academy of Management Learning & Education,5*(1), 82-83.

Bokoros, M. A., Goldstein, M. B. & Sweeney, M. M. (1992). Common factors in five measures of cognitive style. *Current Psychology, 11(2),* 99-109.

Carrell, P. L. & Monroe, L. B. (1993). Learning styles and composition. *The Modern Language Journal, 77,* 148-162.

Christensen, T.D. (1980). Lifescripts. South Bend, IN: STS Management Resources.

Driver, M.J., & Rowe, A.J. (1979). Decision-making styles: A new approach to management decision making. In C.L. Cooper (Ed.), Behavioral problems in   organizations,141-182. Englewood Cliffs, NJ: Prentice-Hall.

Felder, R. M. & Brent, R. (2005). Understanding student differences. *Journal of Engineering Education, 94(1),* 57-72.

Felder, R. M. & Silverman, L. K. (1988). Learning and teaching styles in engineering education. *Engineering Education, 78(7),* 674-681.

Felder, R. M. & Soloman, B. A. (n.d.). Learning styles and strategies, Retrieved from www4.ncsu.edu/unity/lockers/users/f/felder/public/ILSdir/styles.htm on September 24, 2008.

Gregorc, A.F. (1982). An adult's guide to style. Maynard, MA: Gabriel Systems

Jung, C.G. (1923). Psychological types. New York: Harcourt, Brace and Co.

Jung, C.G. (1971). Psychological types. Bollingen series. XX. The collected works of C.G. Jung, Vol. 6. Princeton, NJ: Princeton University Press.

Knowles, M. (1976). Separating the Amateurs from the Pros in training. *Training & Development Journal, 30*(9), 16.

Knowles, M. (1977). The modern practice of adult education: Andragogy versus pedagogy. New

York: Association.

Myers, I.B. & McCaulley, M.H. (1985). Manual: A guide to the development and use of the

Myers-Briggs type indicator. Palo Alto, CA: Consulting Psychologists Press.

Kolb, D.A. (1984). Experiential learning. Englewood Cliffs, NJ: Prentice-Hall.

Soloman, B.A. & Felder, R.M. (n.d). Index of Learning Styles Questionnaire, Retrieved from

http://www.engr.ncsu.edu/learningstyles/ilsweb.html on September 24, 2008.

THE PROS AND CONS OF ACCREDITATION: FACULTY AND STUDENT PERCEPTIONS

Susan B. Shurden, M.P.A.
College of Business and Public Affairs
Lander University
321 Stanley Avenue
Greenwood, SC 29649
Phone: 864 388-8224 or 8232
sshurden@lander.edu

Deborah Natvig, Ph.D.
College of Business and Public Affairs
Lander University
321 Stanley Avenue
Greenwood, SC 29649
Phone: 864 388-8232
dnatvig@lander.edu

Michael C. Shurden, DBA
College of Business and Public Affairs
Lander University
321 Stanley Avenue
Greenwood, SC 29649
Phone: 864 388-8703 or 8232
mshurden@lander.edu

THE PROS AND CONS OF ACCREDITATION: FACULTY AND STUDENT PERCEPTIONS

ABSTRACT

The process of accreditation is designed to be "a statement to students, parents, and faculty and staff that a school has met important standards and is fully qualified to be an institution of higher learning" (www.ncarts.edu). Various accrediting organizations exist, and they set requirements and standards that have to be met and maintained in order for the program, department, or college to continue to operate under the "umbrella" of prestige that they provide. However, the entire process is lengthy and costly, not only to the schools that are being accredited, but also to the faculty involved. In addition, the question arises as to whether or not students are even aware of the benefits that accreditation provides them, both now and in the future. The purpose of this paper is to analyze the "pros and cons" of the accreditation process and to obtain feedback from both faculty and students as to the relevance provided by accreditation. Approximately four hundred students at a public, southeastern university were surveyed as to their knowledge of accreditation and its relevance to their future. In addition, various faculty members were interviewed as to their opinion of the accreditation process and benefits that it provides. In this paper, the authors will analyze the material gathered through these interviews and surveys and present an analysis of the accreditation process that is both informative and relevant.

INTRODUCTION AND LITERATURE REVIEW

McKenna, Cotton, and Auken (1997) presented a brief history of accreditation indicating that the American Assembly of Collegiate Schools of Business (AACSB) played a significant role in the formulation of standards for business schools for approximately twenty five years. The catalyst whereby this influence was felt in the USA was in the publication of the Ford and Carnegie Foundation reports which gave AACSB a certain amount of credibility (Gordon and Howell, 1959; Pierson, 1959). Prior to the publication of these reports, four year business programs were considered to be "vocational" in nature and not regarded in very high esteem within higher education. The AACSB established a minimum level of performance for business schools that set standards then, continuing into the present, for faculty in areas of qualifications for teaching, research and publication, curriculum development, and continuing assessment of students. As of 1997, approximately 250 schools had achieved AACSB accreditation; however at that time, there were several hundred that distanced themselves and chose not to become a part of the "prestigious" body, which has been referred to as the "member's only" club (McKenna, Cotton, Auken, 1997).

The debate over accreditation and its relevance to a genuinely "good" education for students has been continued by Julian and Ofori-Dankwa (2006:225) in their critique of the accreditation process. In an analysis of these authors' work, Ashkansasy (2008:244) gives them credit for saying that "accreditation is an intrinsically flawed process because, by asking accreditation applicants to meet a set of prescribed standards, accreditation necessarily reduces options for flexible change, and this is incongruent with today's turbulent economic environment" (Ashkanasy, 2008) Therefore, the question of whether or not accreditation is beneficial to business schools has become a concern for the authors. In an attempt to gain some insight, the

faculty and students of a small southeastern public university have been interviewed and surveyed, respectively.

METHODOLOGY

The study was both quantitative and qualitative in nature. The quantitative portion consisted of a brief seven question survey which was distributed by members of the business faculty in an AACSB accredited program to their respective classes at the mid-point of the semester. Enrollment for the fall 2008 semester was 459 students, and of that number, 396 surveys were compiled and analyzed. This is an 86% response rate. Students who were taking more than one course in the business program were asked to respond to the survey only once.

Demographic information regarding gender, class, major/minor, emphasis, status, graduation plans, and number of semesters attending the university were also asked. Table 1 is a compilation of this demographic information. The majority of the students were full-time, female students, who were juniors majoring in business. The response rate by emphasis was consistent with the distribution of business majors enrolled in each emphasis area of the program. Sixty-Five percent of the students surveyed plan to work after graduation. Thirty-three percent plan to attend graduate school, while two percent were undecided.

Table 1

Demographic Information on Student Information Survey—Accreditation—Fall 2008

Gender		Class		Business	
Males	47%	Freshman	17%	Major	92%
Female	53%	Sophomore	24%	Minor	8%
		Junior	33%		
		Senior	26%		

Emphasis		Status		Plans	
Accounting	20%	Full-time	96%	Work	65%
Econ/Fin.	8%	Part-time	4%	Graduate School	33%
Health Care	24%			Other	2%
Mgmt/Mkt.	45%				

Table 2 consists of analysis of the quantitative data of six simple questions regarding student's knowledge of accreditation. The purpose of the survey was to determine to what extent the students were aware of accreditation.

Table 2
Student Information Survey—Accreditation (n=396)

Questions	Yes	No
1. Prior to this semester, did you know what it meant for a business school to be accredited?	56%	44%
2. Do you currently know what it means for a business school to be Accredited?	82%	18%
3. Do you know what The Association to Advance Collegiate Schools of Business (AACSB) is?	57%	43%
4. Prior to this semester did you know that the XXXX School of Business was AACSB accredited?	47%	53%
5. Was your decision to attend XXXX influenced by the XXXX School of Business being AACSB accredited?	17%	83%
6. Do you believe that it will be beneficial to you to have graduated from an AACSB accredited business school?	96%	4%

Question 1 and 2 pertained to the student's knowledge of accreditation both prior to fall semester and at the time of survey. Fifty six percent of the students indicated they were aware of accreditation prior to this semester, and 82% indicated they were currently aware of what accreditation meant. Questions 3 through 6 relate to AACSB accreditation, which is the accrediting body for this business department, although the university as a whole falls under the "umbrella" of SACS accreditation. Fifty seven percent indicated they currently knew what AACSB accreditation was, while only 47% indicated they knew that this university was accredited by AACSB. What is of interest is that only 17% of the students were influenced to attend this university because of its being AACSB accredited, yet 96% believe this form of accreditation will be beneficial to them. It is assumed that some of these students who responded positively to the benefits of accreditation will be attending graduate school. In fact, the

demographics indicate 33% of the 396 students plan on attending graduate school. An additional question was added in Table 3 which was a "tie in" to question five. Of the 4% who did not believe that accreditation would be beneficial to them, their reasons for attending this small university varied.

Table 3
Reasons for attending XXXX University (n=274) _____

Question	Near Family	Lower Cost	Parental Influence	Friends Attend	Other
If answer to number five was No, why did you attend Lander?	26%	16%	7%	9%	42%

_____

The qualitative aspect of the study consisted of interviews with the university provost, dean, and department chair, as well as interviews with three faculty members. The following interview questions were asked.

1) What has been your experience with the accreditation process either with AACSB or SACs?
2) Do you believe that the benefits of accreditation outweigh the costs involved?
3) How essential do you think it is for a business school to be accredited?
4) What benefits are there to being an accredited department of business?
5) What benefits do you believe there are for the students to be a part of an accredited department of business?
6) What benefits do you believe there are for the faculty to be part of an accredited department of business?
7) Do you believe in any way that accreditation is a detriment either to faculty or the department as a whole?

An additional interview was conducted with a previous faculty member who has since left the university to be employed at a small, private, college which is only SACs accredited.

In compiling information for the completion of this paper, one of the authors attended two sessions at an AACSB conference in fall, 2008. One session was a "roundtable" discussion of teachers from various accredited and unaccredited universities. The focus was on questions by faculty members from unaccredited universities who were seeking information and guidance from peers who had been through the process of obtaining accreditation. The other session focused on the assessment process and "closing the loop" meaning that the goals, objectives, and

strategies developed to meet the school's mission are adequately assessed, and modified as needed, to assure program effectiveness.

FINDINGS AND CONCLUSIONS

The findings of the quantitative data indicate the majority of the students were aware of what accreditation was both prior to the semester of the surveys (56%) and at the time of the surveys being administered (82%). However, only 17% of the students indicated they were influenced to attend this university because of it being an accredited institution. Obviously, the institution would prefer that accreditation would make a difference in recruiting students, yet this was not the case at this particular university. Students were influenced to attend this institution for various reasons as indicated in Table 3. The majority of those reasons (42%) were in the "other" category, which may include scholarships, both academic and sports related and/or the sports programs offered in general. The second reason that most students attended this institution was to be near family.

A definite "pro" for the students is indicated in question six, 96% indicate that they believe accreditation will be beneficial to them in the future. Question five in the interview questions also asked "What benefits do you believe there are for the students to be a part of an accredited department of business?" Answers to this question were as follows:

1. The accreditation process gives students more of a role in the formation of programs within the university.
2. Graduates should make more monetarily and be more successful in their careers
3. Graduation from an AACSB accredited school should provide them with a better advantage when they apply to graduate school.
4. Students benefit from the improvements made in the content of their courses and in the way that the courses are taught.
5. AACSB accreditation provides students with more recognition from other universities, as well as employers.
6. Changes in the curriculum and program activities occur based on the data collected from assessments, and not from the "whims" of faculty members.
7. Students receive the benefits of programs that have recognized standards.
8. AACSB accredited universities have to prove evidence of learning through assessments.
9. Curriculums are improved because of the accreditation process.

Question six asks "What benefits do you believe there are for the faculty to be part of an accredited department of business?" Various responses to this question are as follows:

1. It provides standards for faculty in the areas of teaching, research, and the assessment of program outcomes.
2. There is a benefit in using AACSB standards to determine whether or not faculty applicants meet academic and/or professional qualifications during the hiring process.

3. Faculty is involved in making program changes because the accreditation process is "faculty-driven".

4. Faculty receives recognition from other universities once it is discovered that they teach at an AACSB accredited school.

5. Faculty learns how to work effectively as a team through the accreditation process.

6. Faculty should receive higher salaries when teaching at accredited schools.

7. Having teaching experience in an AACSB accredited program should make it easier for a faculty member to move from one accredited university to another.

8. Faculty development is allowed to flourish through enhanced resources, technology and opportunities.

9. Faculty is empowered with more responsibility over the educational process.

From the authors' perspective regarding faculty, they recognize that accreditation standards impose more stringent requirements in terms of furthering intellectual contributions to their profession and maintaining academically or professionally qualified status; however, faculty is more empowered in the responsibility for delivering a high quality educational program. Additionally, after having been employed by an accredited university, job recognition is enhanced increasing mobility from one university to another.

Other benefits or "pros" do exist for universities in becoming accredited. A faculty member referred to benefits as being "political" in nature, which could be indicative of the competition for students in the area where this university is located. One professor indicated that accreditation actually allows smaller universities to "run with the big dogs." Therefore, accreditation may be beneficial in recruiting high potential students into the university's business program.

So, are there any detriments or "cons" to either the faculty or the department regarding accreditation? One of the biggest shortfalls of accreditation identified by respondents is the high cost, both monetarily and in terms of opportunity cost. An analysis of the budget of the university surveyed revealed that the financial aspects of accreditation include annual fees of approximately $11,000, with travel expenses for three to four faculty members to attend AACSB meetings contributing another $9,000 per year. The breakdown for the fees consisted of the six year review fee of $3,800, and annual accreditation fee of $4,500, and membership dues of $2,550. The annual fees are confirmed on the AACSB International current accreditation fee page with the Initial Business Application fee of $11,000, and the annual accreditation fee showing as $3,800 per year (www.aacsb.edu). A combined total of the fees and travel expenses for faculty can put a substantial burden on small universities, especially in dire economic times when state budget cuts threaten the ability of business schools to continue to provide the "quality" standards that are promoted by AACSB. Additionally, accreditation standards require that universities hire AQ (Academically Qualified) faculty who command higher salaries than

faculty members who do not meet the educational and publication requirements for AQ status, thus driving up the salaries for business faculty. Particularly during the current economic downturn, these hiring strategies impose tremendous "stress" for the administration and on interdepartmental relationships especially if faculty positions in other departments are not filled or if employees are being terminated in other areas in order to meet budget.

Another "con" of accreditation is the time involved in becoming and maintaining accreditation. In relation to time, one faculty member indicated that not only does one have to consider the initial time involved in obtaining accreditation, but the "opportunity costs" of lost time that could be used in improving class preparation, working with students outside of class, and interacting with internal and external stakeholders. Faculty spend a substantial amount of time developing strategies, creating assessment tools, collecting and analyzing data, developing new interventions, writing reports, and attending meetings to ensure the accreditation process is progressing well.

In conclusion, the major pros of accreditation are the benefits it provides to students in terms of improved curriculum and classroom experiences, entering a good graduate program, and possibly obtaining employment that pays significantly better. A second benefit to the university is that accreditation allows them to compete more effectively with other universities to maintain and increase enrollment of high quality students. A third benefit to faculty is that they become involved in the process of providing a quality education and being an active participant in the curriculum process, as well as enhancing their intellectual contributions to their profession. The overall detriment to the accreditation process is the cost, both monetarily and in terms of opportunity costs. Smaller schools, which are limited financially, may find the costs to be prohibitive in their seeking accreditation. One individual mentioned the law of diminishing returns where the time and effort needed to maintain the process becomes difficult, especially in terms of hours needed to prepare for teaching multiple classes with several preparations. However, faculty members indicated that withdrawing from the process once accreditation has been attained could have a detrimental impact on the students, the faculty, and the reputation of an institution. Consequently, the scales of judgment must be used to weigh the pros and cons of accreditation, and while benefits do exist, each school must determine if they outweigh the costs of the accreditation process.

REFERENCES

Ashkanasy, Neal M. (2008). Introduction: Is accreditation good for business (schools)? *Academy of Management Learning and Education (7)*2:244.

Association to Advance Collegiate Schools of Business, *2009-2010 Accreditation Fees.* Retrieved August 10, 2009 from http://www.aacsb.edu/accreditation/fees0910.asp.

College SACS Information. Retrieved October 23, 2008 from
http://www.ncarts.edu/forms/SACS/faq.html/.

Gordon, R.A. and Howell, J.E (1959), *Higher Education in Business,* McGraw-Hill, New York, NY.

Julian, S. D., Ofori-Dankwa, J. C. (2006). Is accreditation good for the strategic decision making of traditional business schools? *Academy of Management Learning & Education,* 5:225-233.

McKenna, J.F., Cotton, C.C. & Van Auken, S. (1997). The new AACSB accreditation standards: A prospect of tiering? *Journal of Organizational Change Management (10)*6:491-502.

Student Perceptions of Teaching Evaluations: Continuation

Linda Ann Carson Lander University 320 Stanley Avenue Greenwood, SC 29649
Meredith Uttley Lander University 320 Stanley Avenue Greenwood, SC 29649

ABSTRACT

Accountability continues to be an issue in all areas of academia from the accreditation of the institution to student evaluations of their professors. Accountability ratings can impact continued employment, tenure and promotional decisions, and probation for an institution. The goal of this study is to explore student perceptions and attitudes regarding the evaluation of the teaching process and how that may be related to a professor's personality. About three weeks after evaluations were completed, a short survey using Likert-scale questions was distributed to assess students' seriousness and perceptions regarding those student evaluations of teaching. The questionnaire was administered to students in the College of Business and Public Affairs, home to Business, Political Science and Sociology majors. Not surprisingly, students did not take evaluations completed on day two as seriously as those completed on day one of the evaluation period. Fewer students this year than last believe that the instructors took the results of the IDEA evaluation seriously. Over two-thirds of students believe that the IDEA instrument is an accurate means of providing feedback about class teaching objectives to the administration as well as to the professor. In contrast, only slightly more than half of the students perceive that the administration is serious in its use of the evaluation. As expected, students agreed that they are more likely to rate a professor positively if they like the professor, and negatively if they do not like the professor. Student evaluations were also influenced by the subject matter of a class. Slightly less than half of the students believe that the most effective instructors receive the best evaluations, a discouraging result.

INTRODUCTION

Accountability is increasing in all levels of academia from the accreditation of the institution to student evaluations of their professors. Faculty evaluations of their chairs, deans, and the president of the institution are common. Students are now referred to as consumers (Gursoy and Umbreit 2005 and Schnieder et al. 1994) and are being given the power that other types of consumers have when dealing with all types of suppliers (Read, Rama and Raghunandan 2001; Haskell 1997). Student evaluations of teaching (SETs) were originally designed to help instructors improve the quality of their instruction and courses, a formative function (Germain 2005; Birnbaum 1999; Haskell 1997; Rifkin 1995). SETs continue to provide formative feedback for instructors (Aultman 2006), but increasingly they are used by administrators for faculty reappointment, tenure, promotion, and pay increase recommendations, a summative function (Onwuegbuzie et al. 2007; Read, Rama and Raghunandan, 2001; Jackson et al. 1999; Seldin 1999; Pike 1998; Cashin and Downey 1992). Student evaluations are now being used in other countries to assist administrators in their quest for accountability (Burden 2009 and Leite et al. 2006). Student evaluation forms may be designed by individual instructors, by departments, by colleges, or increasingly by outside agencies. Regardless of the instrument used, research in the past, has supported the assumption that students make valid and reliable estimates of their learning (Hoyt and Perera 2000; Cashin 1995; Seldin 1993). SETs should be highly influenced by variables demonstrated to be strongly associated with effective teaching. Unfortunately, researchers have reached no consensus on a definition of quality or effective teaching (Onwuegbuzie et.al. 2007; Germain and Scandura 2005; Okpala and Ellis 2005; Marsh 2001; Jackson, et al 1999; Clayson and Haley 1990). Researchers have addressed student perceptions related to characteristics of effective teaching (Onwuegubzie et al. 2007; Surrant and Desselle 2007; Marsh 2001), dimensions of student perceptions of teaching effectiveness (Brown, 2008; El Hassan 2009; Leite et al. 2006 and Jackson et al. 1999), and student perceptions of learning (Sprinkle 2008;

Addison, Best and Warrington, 2006; Gursoy and Umbreit 2005). Grayson (2004) found that perceived professor performance influenced general student satisfaction with a university program.

Gursoy and Umbreit (2005) and Marsh (2001) explored definitions of good and bad workloads assigned to students. Students define workloads by the amount of time they spend on productive, valuable activities related to the course. The myth is that less workload for students leads to higher student ratings. Gursoy and Umbreit (2005) and Marsh (2001) found that students valued, thus giving positive ratings, for a high good workload and negative ratings for a high bad workload (activities that students did not believe were productive for learning in the course). Of course, there is a point where too much good workload was just too much, thus lowering the rating. Cashin (1995) suggests that evaluations based on workloads support the validity of student ratings, but Cashin does not distinguish between "good or bad" workloads. Lenient grading and its impact on positive ratings has been the focus for a number of researchers, but results have been mixed (Surratt and Desselle 2007; Marsh 2001; Jackson et al. 1999; Cashin 1995). There is a general positive correlation between grades, either expected or actual, and student evaluations of teaching (Nerger et al. 2007; Millea and Grimes 2002; Johnson 2002; Marsh 2001; Greenwald and Gillmore 1997; Jackson et al. 1990; Cohen 1981), but Marsh and Roche (2000) caution that good grades can come from higher motivation and greater interest in the subject matter and need not constitute bias. In fact, "workload, expected grades, and their relations with SETs were stable over 12 years" (Marsh and Roche 2000). However, Addison, Best and Warrington (2006) found that students rated instructors more favorably when a course was easier than expected, but gave a less than favorable evaluation if the course was harder than the student expected.

Age (Sprinkle 2008; Horner, Murray and Rushton 1989), race (Burden 2009; Schulze and Tomal 2006; Anderson and Smith 2005) and gender (Basow 1995; Kierstead,, D'Agostino and Dill 1988) of both the instructor and the student have an impact on the students' perceptions. According to Sprinkler (2008), "As respondents' age increased, they were more likely to believe instructors over age fifty-five were more effective than younger instructors, whereas younger respondents were more likely to state that instructors under fifty-five were more effective." Further, "Older respondents (*non-traditional students*) were more likely to take responsibility for their own learning and grade, rather than place the burden upon the professor/instructor" (Sprinkle 2008).

Schulze and Tomal (2006) determined that there were also perceptual differences among students of professors' competence based on gender and race. According to Kierstead, D'Agostino and Dill (1998), what students expect from professors depends, in part, on students' gender expectations. Females receive positive ratings for smiling while male professors receive negative ratings for smiling. Others have found that the age, race and gender of both instructor and student have shown mixed results in their impact on SETs (Surratt and Desselle 2007; Davidovitch and Dan Soen 2006; Okpala and Ellis 2005; Millea and Grimes 2002; Cashin 1995). Several researchers have attempted to distinguish how instructor's other non-verbal behavior impacts student perceptions of teaching quality (Babad, Avni-Baad and Rosenthal 2004 and Kierstead,, D;Agostino and Dill 1988).

Cashin (1995), reported that an instructor's personality was "not related to student ratings". Other researchers, however, have used a variety of personality traits of both the instructors and the student raters in an effort to explore and identify the most influential variables of personality (Helterbran 2008; Nerger et al. 2007; Clayson 2005; Clayson 1999; Kryzstofiak, Cardy, and Newman 1988). Students value, and thus give higher ratings to positive traits they define as caring for students, fairness related to grading, and accessibility (Hills, Naegle and Bartkus 2009; Surratt and Desselle 2007; Onwuegbuzie et al. 2007; Clayson and Sheffet 2006; Okpapa and Ellis 2005; Gursoy and Umbreit 2005; Jackson et al 1999; Hinkin 1991; Clayson and Haley 1990). Other valued personal qualities, include "exhibiting interest, if not passion, in one's teaching job, enthusiasm for teaching and the field of education, a sense of humor, and being approachable or "human" (Helterbran 2008). Students identify email with the instructor as a sign of social contact or a social relationship. Sheer and Fung (2007) found that "email communication affects teaching evaluations directly and feeds interpersonal relationships, which in turn, positively influence

teaching evaluations". Krzystofiak; Cardy and Newman (1988) studied many dimensions of college professor behaviors, showing that the relationship with students was paramount in impacting SETs.

Student perceptions have a direct impact on student attitudes when completing teaching evaluation forms. According to Curran and Rosen (2006), "course topic has just as strong an influence on attitude as does the instructor." Student attitudes regarding evaluations of teaching also depend on the student perceptions of the evaluation's use (El Hassan 2009; Brown 2008; Leite et al. 2006). Helterbran (2009) noted that students "have called for university generated formal student evaluation data to be put online for everyone to view." Students, desiring to express their perceptions of teaching quality for the use of other students, actively use the computer site Rate My Professor (www.ratemyprofessor.com) (Brown, Baillie and Fraser 2009; Felton, Mitchell and Stinson 2004).

According to Felton, Mitchell and Stinson (2004), "the sexier the instructor, the more difficult his or her class can be while obtaining high-marks on student evaluations." Riniolo et al. (2006), noted that "ratings for professors perceived as attractive rarely dropped below an average score (only 6 out of 211 scored below an average rating of 3 on a 5-point scale)." Carr, Davies and Lavin (2009) reported that, "the professional appearance and attire of the professor has a positive impact on the students' perceptions of a number of traits that are often considered in the evaluation of an academician."

Past researchers have shown that SETs are multidimensional and ratings are influenced by a number of external factors, beyond the control of any instructor (Johnson 2002; Read, Rama and Raghunandan 2001; Chasin 1995). There are three dimension clusters that appear consistently in SETs: "(a) instructor presentation of material, (b) facilitation of learning and (c) regulation of learning" (Jackson et al. 1999). Various other researchers have accepted and used these dimension clusters when developing or testing SETs to assist in producing the multidimensional aspect of the rating system (Onweugbuzie et al 2007; Marsh 2001). Researchers have identified various additional dimensions that impact SET results. Student mood (Munz and Fallert 1998) was correlated with both instructor and course ratings.

Our ongoing interest in student evaluations of teaching is their increasing importance in terms of faculty success and the lack of control that faculty members have over many of the factors that affect these evaluations. Our first research focused on identifying differences in student perceptions of distance education (DE) classes taught through videoconferencing. As we expected, remote-site students gave lower ratings to their DE classes than did originating-site students, and they were less satisfied with the classes in general (Uttley and Carson 2006). The goal of our next research was to identify external factors that influence SETs among faculty members teaching multiple sections of the same class. We concluded that if instructors wanted to maximize their evaluations, they would not teach more than two sections of a class in one semester. Counterintuitively, they would teach classes that meet early on Monday, Wednesday, and Friday mornings and they would never teach at 10:00 AM or 11:00 AM, two of our most popular class times. They would also teach upper level classes that are relatively large, and they would hope for a relatively low response rate on the SETs (Uttley and Carson 2007).

An additional element in the equation of SETs that is beyond the control of an instructor and only recently attracting attention is how seriously students take the evaluations when completing them. Onwuegbuzie et al. (2007) point out that the "lack of knowledge of the actual process that students use when they respond on TEFs (teaching evaluation forms) makes it difficult to claim that studies have provided sufficient evidence of substantive validity regarding TEF ratings" (p.118). Surratt and Desselle (2007) found that pharmacy students saw the SETs as an opportunity to express their opinions regarding a number of aspects of a course. Consistent with our interest in course factors beyond the control of instructors, and because of the lack of research regarding how students approach the teaching evaluation process, last year we began exploring two questions: "What are students' perceptions of teaching evaluations and do they take the evaluations seriously?" Given a couple of confusing questions (Carson and Uttley 2008) and additional literature, we are continuing the topic of student perceptions and attitudes this year. Further, this year we are exploring the impact on SETs of several additional variables:

(1) whether or not students like the instructor,
(2) whether students feel strongly about the instructor,
(3) whether students think the instructor teaches especially well or especially poorly,
(4) whether students are influenced by the subject of classes, and
(5) whether students think that the most effective instructors receive the best evaluations.

METHODOLOGY

This research continues our examination of student perceptions and attitudes regarding student evaluations of teaching (SETs). In 2004, Lander University adopted the Individual Development and Educational Assessment (IDEA) instrument to collect student perceptions of all of their classes. The College of Business and Public Affairs (COBPA) began using this instrument in the fall of 1998. Unlike the other three colleges at Lander, our college has always used a unique strategy for conducting these student evaluations of teaching. On a particular two days, about 2/3 of the way through the semester, all classes in COBPA are evaluated. A faculty member, other than the class instructor, administers the evaluations at the beginning of class. The vast majority of the students in our college take four to six classes per semester, which means that by the end of the second day, a student has seen the same evaluation instrument for up to six times. As part of our continuing research into the impact of factors that are beyond an instructor's control on their Student Evaluations of Teaching (SETs), we asked students about their perceptions of the IDEA instrument and the process used by the College of Business and Public Affairs.

The IDEA instrument provides three summary measures for each class. The first measures effective teaching in terms of progress made on particular course objectives, which instructors pick from a list of 12 possible course objectives, designating each as essential, important, or not important to the particular course. Those objectives deemed essential are double weighted in the IDEA assessment calculations. Regardless of the objectives chosen by each instructor, the IDEA instrument is identical. Objectives are organized into six categories: *Basic Cognitive Background; Application of Learning; Expressiveness; Intellectual Development; Lifelong Learning;* and *Team Skills* (www.idea.ksu.edu). Most categories include multiple possible objectives, rated by students on a five-point scale from *no apparent progress* (1) to *exceptional progress* (5):

Basic Cognitive Background
1. Gaining factual knowledge (terminology, classifications, methods, trends)
2. Learning fundamental principles, generalizations, or theories

Application of Learning
3. Learning to *apply* course material (to improve thinking, problem solving, and decisions)
4. Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course

Expressiveness
6. Developing creative capacities (writing, inventing, designing, performing in art, music, drama, etc.)
8. Developing skill in expressing oneself orally or in writing

Intellectual Development
7. Gaining a broader understanding and appreciation of intellectual/cultural activity (music, science, literature, etc.)
10. Developing a clearer understanding of, and commitment to, personal values
11. Learning to *analyze* and *critically evaluate* ideas, arguments, and points of view

Lifelong Learning
9. Learning how to find and use resources for answering questions or solving problems
12. Acquiring an interest in learning more by asking questions and seeking answers

Team Skills
     5.   Acquiring skills in working with others as a member of a team.

The second measure is based on the single statement, "Overall, I rate this instructor an excellent teacher." Response options range from *definitely false* (1) to *definitely true* (5). The third measure is based on the single statement, "Overall, I rate this course as excellent." The responses are the same as those used for the second measure. For each measure, the IDEA center calculates raw and adjusted average scores, recommending that the adjusted scores be used for comparisons. Scores are adjusted on the basis of students' professed desire to take the course, expressed effort put forth, and perceived amount of work required.

While the literature includes other studies of student perceptions of teaching evaluation instruments and student ideas about what should be included in evaluations of teaching, we designed our study specifically to focus on the evaluation instrument and process used at Lander. Within our college (COBPA) in the fall 2008 semester, faculty taught 82 classes from which to collect data. Since only COBPA employs the two-day evaluation process, we eliminated lower level general education courses (Anthropology 104, Sociology 101, Political Science 101 and 103, and Economics 101), which are taken by students from all colleges at Lander. We invited all college faculty to participate and distributed surveys to those who agreed. Approximately two-three weeks after the completion of the evaluation instruments, surveys were distributed to students. We asked that each student complete only one survey. Thus, as the distribution time lengthened, an increasing number of students from any specific class had already completed the survey. On the survey forms, we asked students to indicate whether they were at least 18 years old and whether we had permission to use their data in our analyses. A few students were evidently younger than 18 and a surprising number did not give permission for us to use their data. On last year's survey, these two questions were placed on a single horizontal line. We thought that students had just missed the second question giving us permission to use their survey because of the page layout. This year, we placed the question asking for permission to use the data below the question asking about age. We were confident that almost everyone would give permission to use their data. However, 62 students still did not give permission to use their data. Again, we eliminated those surveys, which left us with 353 usable surveys from students in 34 classes. Based on new literature, we added six new research questions. Our survey consisted of twelve perception questions and two demographic questions:

    1.   I believe the IDEA evaluation form is an accurate way for students to provide feedback to administrators about their professor's teaching objectives for the course.
    2.   I believe the IDEA evaluation form is an accurate way for students to provide feedback to professors regarding their teaching objectives for the course.
    3.   I believe the administration takes the IDEA evaluation results seriously for faculty retention, promotion, and salary increases.
    4.   I believe faculty take the results of the IDEA evaluations seriously.
    5.   I respond to the first IDEA evaluation on the first day in a serious manner; I read each question and carefully consider each of the responses, selecting the most appropriate.
    6.   I respond to the IDEA form on the second day in a serious manner. I read each question and carefully consider each of the responses, selecting the most appropriate. (reworded)
    7.   If I like a professor, their personality influences my responses in a positive manner. (new)
    8.   If I **do not** like a professor, their personality influences my responses in a negative manner. (new)
    9.   I am more likely to complete the evaluation when I really like or really dislike the professor (as opposed to having neutral feelings). (new)
    10.   I am more likely to complete the evaluation when I feel the professor taught especially well or especially poorly. (new)
    11.   The nature of the course (subject matter) influences my scoring on the evaluation. (new)

12. The professors who receive the best evaluations are not necessarily the most effective teachers. (new)
13. I am Female _____   I am Male _____
14. I am in the department of Business Administration _____
    I am in the department of Political and Social Sciences _____
    I am in another Department _____ (reworded)

The responses for each perception question were arranged in a Likert format from strongly disagree (1) to strongly agree (5). The demographic questions were checked or left blank to provide a yes or no format. We used the MicroCase[*] statistical package to analyze the data. We compared students from the department of Business Administration to those from Political and Social Sciences (PaSS); we compared females to males; we compared stated seriousness from day one to day two. Since our data are nominal and ordinal level, we used contingency tables for our comparisons and rely on X^2, Somer's D and percentage differences for our analyses (Fox 2003).

DESCRIPTIVE ANALYSES

Due to the lack of literature on student perceptions of the IDEA instrument, we have approached our exploration with a series of questions. Table 1 shows the demographic characteristics of our research population. Our survey percentage of females and males falls between the percentages for Lander and for our college. Respondents from both departments represent about 55% of their majors.

TABLE 1. Demographic characteristics of the research population.						
	Females		Males		Total	
Department Affiliation	Valid N	Row %	Valid N	Row %		% of Sample
Business Administration	110	57.3	97	63.8	207	60.2
Political and Social Sciences	55	63.8	44	40.4	99	28.8
Neither/Both	27	14.1	11	12.5	38	11.0
Total	192		152		344	100.0

Table 2 includes the distribution of responses from our consenting respondents.

TABLE 2. Distribution of responses from the research population.					
Survey Questions	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Accurate way to provide feedback to administrators about professor's teaching objectives.	4.2	11.0	11.6	52	21.2
Accurate way for students to provide feedback to professors about their teaching objectives.	4.5	12.1	9.9	52.8	20.6
Believe administration takes evaluation results seriously for faculty retention, promotion, and salary increases.	5.6	15.5	27.1	35.9	15.8
Believe faculty take the results of the IDEA evaluations seriously.	5.7	11.4	25.3	42.9	14.8
Take first IDEA evaluation on the first day in a serious manner.	4.8	5.1	13.7	37.3	39.0
Take last IDEA evaluation on the second day in a serious manner.	4.0	9.7	15.4	37.0	33.9

---

[*] MicroCase Corporation, acquired in 1999 by Wadsworth, now a division of Thomson Learning, Inc.

TABLE 2. Distribution of responses from the research population, continued					
Survey Questions	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
If like professor, their personality influences responses in a positive manner.	1.4	3.4	7.1	41.9	46.2
If **do not** like a professor, their personality influences responses in a negative manner.	4.5	11.3	18.6	37.0	27.7
More likely to complete the evaluation when really like or really dislike professor.	11.1	8.9	26.0	27.4	26.6
More likely to complete the evaluation when feel professor taught especially well or especially poorly.	7.4	4.0	20.3	29.7	38.6
The nature of the course (subject matter) influences scoring on the evaluation.	8.9	10.0	30.3	38.3	12.6
The professors who receive the best evaluations are not necessarily the most effective teachers.	7.8	14.8	27.2	33.0	17.1

Replicated Questions:

Consistent with our research from last year, findings indicate that over two thirds of our consenting respondents believe that the IDEA instrument is an accurate means to provide feedback about a course's teaching objectives to both administrators and professors. In both years, however, only about half of students thought that the administration was serious in its use of the assessment when determining retention, promotion and salary increases. About 60% of the queried students believe that the instructors took the results of the IDEA evaluation seriously. Table 3 shows the specific results. None of the differences are significant.

TABLE 3. Comparison of replicated questions.		
Survey Questions	2008 - % Agree	2009 - % Agree
Accurate way to provide feedback to administrators about professor's teaching objectives.	70.8	73.2
Accurate way for students to provide feedback to professors about their teaching objectives.	71.6	73.4
Believe administration takes evaluation results seriously for faculty retention, promotion, and salary increases.	52.5	51.7
Believe faculty take the results of the IDEA evaluations seriously.	62.5	57.7

Exploration Questions:
For our comparative analyses, we collapsed the variable responses into three categories: disagree, neither disagree nor agree, and agree.

Question 1: Do students differ in how seriously they think about their completion of the IDEA instrument depending on whether it is the first day or the second day of the teaching evaluations process? Consistent with our results last year, it is obvious from figure 1 that over two thirds of all students say that they approach the evaluations in a serious manner. It is also obvious that fewer students take the evaluation seriously on the last day (70.9%) compared to the first day (76.3%). The relationship is significant based on Somer's D_{yx} of 0.75 (p<0.001), a proportional reduction in error (PRE) measure, that indicates knowing a student's seriousness on day one reduces the error in predicting their seriousness on day two by 75%. Six percent of students, who stated that they approached the evaluations seriously on

the first day, said that they did not approach them as seriously on the second day, the change we expected to find.
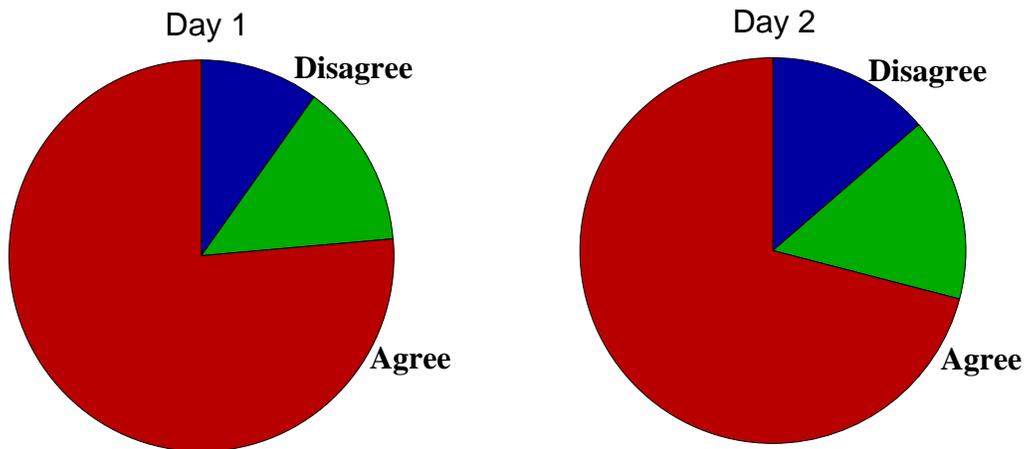
FIGURE 1. Distribution of students showing the seriousness with which they approach teaching evaluations for the first day and second day of the evaluation period.

Question 2: Do students differ in how seriously they think about their completion of the IDEA instrument based on whether they are majors in the department of business administration or political and social sciences (PaSS)? Kwan (1999) and Nerger et al. (2007) found academic discipline to be associated with differences in SETs. Do these differences reflect different perceptions about the teaching evaluation process or instrument as well? Figure 2 shows the comparison of students from business and PaSS. While a higher percentage of PaSS students (79%) than business students (77.7%) state that they approach the teaching evaluation process in a serious manner, the difference is not significant, a finding which is consistent with last year's research.
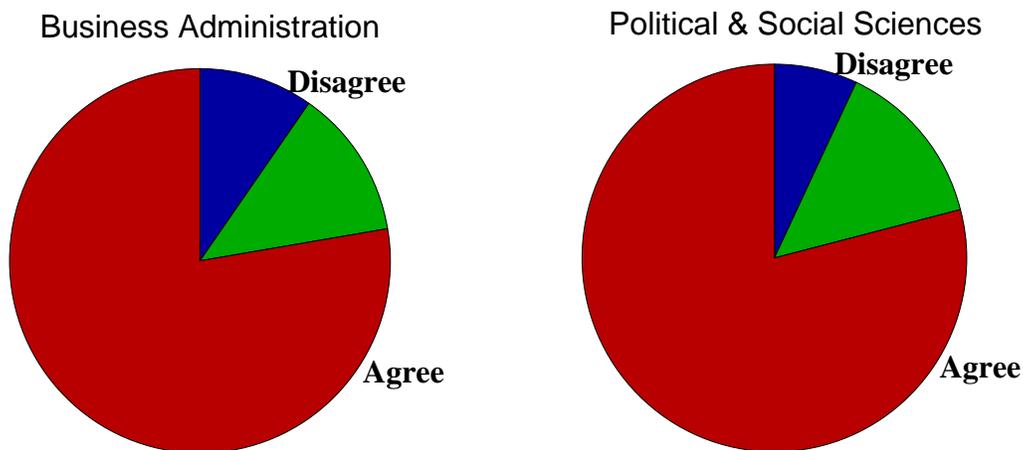
FIGURE 2. Comparison of students from business and PaSS showing the seriousness with which they approach teaching evaluations for the first day of the evaluation period.

Question 3: Do females differ from males in how seriously they approach their completion of the IDEA instrument? In general, females tend to evaluate teaching more positively (Millea and Grimes 2002; Davidovitch and Dan Soen 2006). In figure 3, it is easy to see that significantly (p=0.026) more females (82.3%) approach the evaluation process seriously than do males (70.1%) on the first day of evaluations. We found no other significant differences between female and male students.
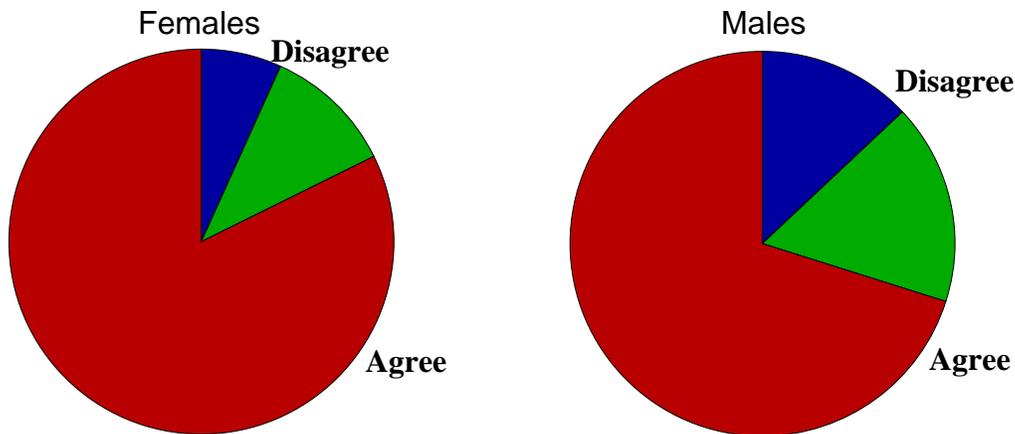
FIGURE 3. Comparison of females and males showing the seriousness with which they approach teaching evaluations for the first day of the evaluation period.

Question 4: *Are student evaluations influenced by whether they like or do not like a professor?* The inconsistent findings reported in the literature on the affects of personality on SETs, prompted us to ask two questions: one, does liking a professor positively influence a student rating; and two, does not liking a professor negatively influence a student rating. Nearly 9 out of every 10 students (88%) agreed that they are more likely to rate a professor positively if they like that professor. This result is far higher than the 65% of all students who agreed that not liking a professor influences them to give a lower rating. With respect to the influence of not liking a professor, however, students from the two departments differ significantly (chi-square = 12.056, p<0.001) as seen in figure 4. Among business students, 70%, compared to 53% of PaSS students agreed that they tended to give negative ratings to professors they did not like. Departmental differences between both females (p=0.042) and males (p=0.027) are also significant. In both departments, women are more likely than men to give negative ratings when they do not like a professor. In all of our explorations, we found no other significant differences between the females from the two departments or between the males of the two departments.
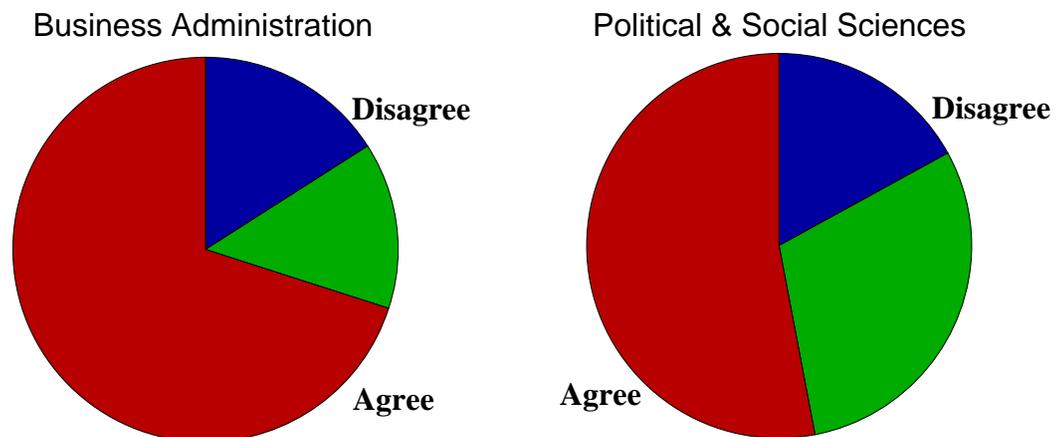
FIGURE 4. Comparison of students from business and PaSS showing the influence that not liking a professor has on the student ratings.

Question 5: *Are students more likely to complete an evaluation when they feel strongly (either liking or disliking) a professor?* This question was related to the last two questions. While 55.6% of Business students compared to 48% of PaSS students agreed that strong feelings for a professor made them more likely to complete an evaluation, the difference among students was not significant.

Question 6: *Are students more likely to complete an evaluation when they believe that a professor teaches especially well or especially poorly?* This question was related to the last three questions. Among all students, 68.3% agreed that they were more likely to complete an evaluation if they felt strongly about a professor's teaching ability. Department differences among students were not significant.

Question 7: *Are student evaluations influenced by the subject matter of the course?* Overall, 50.9% of students agreed that topic of a course influenced their evaluations. However, department differences were significant (p=0.01, based on chi-square = 6.188) with 44.9% of Business students compared to 59% of PaSS students agreeing that subject matter influenced their evaluations.
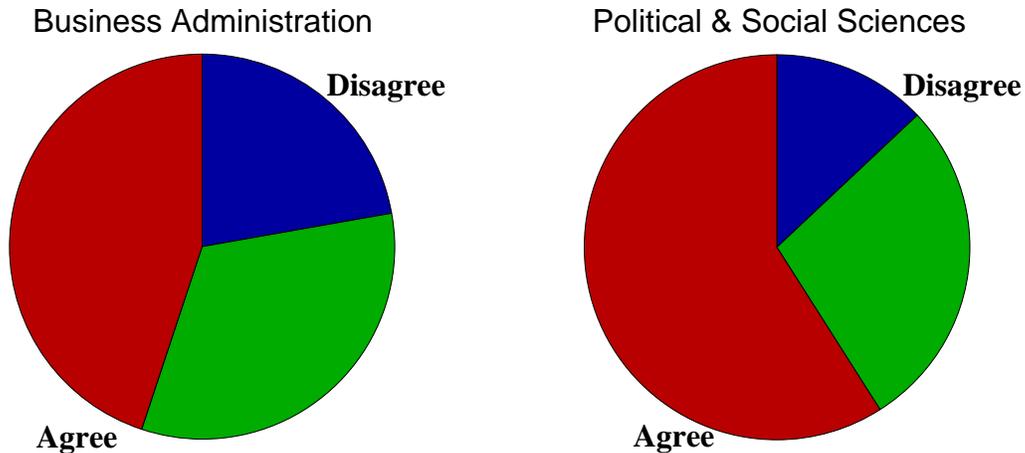
FIGURE 5. Comparison of students from business and PaSS showing the influence that subject matter has on the student ratings.

Question 8: *Do students think that the most effective instructors receive the best evaluations?* Overall, 50.9% of students believed that the most effective teachers do not necessarily receive the best evaluations. Department differences were not significant.

DISCUSSION

The goal of this study was to determine what impact, if any, student perceptions have on the evaluation process of the teaching quality. A short survey using Likert-scale questions was developed to assess students' seriousness and perceptions regarding the use of the student evaluation of teaching results. This survey was administered to students approximately one week after they completed the formal student evaluation of teaching.

We believe that we fixed the problems associated with our survey instrument from last year when we were surprised by the number of students that did not give us permission to use their survey responses in our research. We thought that the layout of the survey instrument had led students to miss this question. However, after redesigning the layout, 15% of students definitely denied us permission to use their data. Since students have no particular incentive to complete our surveys, we do not understand why students would take time to complete the questionnaire, but then deny us permission to use their data.

Last year, our second set of identifiers was also problematic. We asked students to indicate their academic affiliation. A few students checked that they were in either the department of business administration or political and social sciences and also checked that they were not in our college. We did not realize that students did not know the name of the college in which their department was housed. This year, we revised that question and asked students if they were in a department other than business administration or political and social sciences, rather than asking if they were in a different college.

About 11% of students stated that they were in either both departments or were in neither department. Students could be in both departments if they have a major in one and a minor in the other or if they are taking electives in the non-major department. Almost no students at Lander double major. Several specific classes in sociology are quite popular as electives among students throughout the university.

Last year while entering data, we noticed a contradiction in a sequence of answers. About 10% of students, who said that they did not take the evaluations seriously on the first day, stated that they approached the second-day evaluations with equal seriousness. This problem occurred because of the wording of our questions. This year we reworded both of these questions to simply ask how seriously students approached the evaluations on each day. The answers could have ranged from very seriously to not at all seriously in a Likert format. Even with this year's better-worded question about second day evaluations, 5.5% fewer students stated that they gave the same serious attention to the assessments completed on day two as to those completed on day one of the evaluation period. We believe this occurs from a fatigue factor given that students saw the same instrument five to six times during that two-day period. This tends to introduce a systematic bias, especially for those instructors who teach primarily on Tuesdays and Thursdays since the student evaluations have always been done on Mondays and Tuesdays. Our experiences as proctors for the student evaluations lead us to question the stated seriousness with which students say they approach the evaluations. We observe some students marking designs with their responses or marking all responses in a single column of the form. We hear statements from students such as, "I really like you as a teacher so I gave you all 1s", (1 is strongly disagree).

Last year, we did not include an open-ended question asking for comments, an oversight. We rectified that oversight this year. However, we received only a few comments, which were inconsequential. Nonetheless, future questionnaires will also include a place for students to add comments.

Our most recent findings again indicate that slightly better than 70% of our participating students believe that the IDEA instrument is an accurate means of providing feedback about class teaching objectives to the administration as well as to the professor. Conversely, only slightly more than 50% of the students perceive that the administration is serious in its use of the evaluation when determining retention, promotion and salary increases. This year, about 58%, of the queried students believe that the instructors took the results of the IDEA evaluation seriously compared to about 71.5% last year.

Several studies, Nerger et al. 2007; Onwuegbuzie et al. 2007; Clayson and Sheffet 2006; Okpapa and Ellis 2005; Clayson 1999; Clayson and Haley 1990, identified that characteristics of an instructor's personality are directly correlated to both instructor and course ratings. In the same area of reference, Surrey and Desselle (2007) found that students were more willing to complete the teaching evaluation if they really liked or disliked the professor. This year, our research focused on students' opinions of their instructors and how those opinions influenced their evaluations. Nearly 90% of students agreed that they are more likely to rate a professor positively if they like the professor. This result is far higher than the 65% of students who agreed that not liking a professor influences them to give a lower rating. Students from the two departments differ significantly in their responses about the influence of not liking their instructors. Only about half of PaSS students compared to over two thirds of business students agreed that they tended to give negative ratings to professors they did not like. Differences between females and males from the two departments are also significant. Among PaSS students, both females and males are less likely than females and males from business to be influenced negatively by not liking a professor. We expected the relationship between not liking a professor and writing a negative evaluation to be stronger than the relationship between writing a positive evaluation and liking a professor and were a bit surprised by this result. While students' feelings about a professor influenced whether their evaluations were positive or negative, they did not influence whether or not students completed evaluations. We think this is because these evaluations occur at the beginning of each class period, with a faculty proctor present. Certainly, a student could put the evaluation down on their desk and work on other class work, but it would be obvious to everyone in the room. We suspect that liking of not liking an instructor would

have a greater effect on completion of the evaluations at schools where students complete the evaluations online.

Related to our questions about liking or not liking a professor, are questions about student perceptions about professors who teach well or poorly. We asked if students were more likely to complete an evaluation when they believe that a professor teaches especially well or especially poorly. About two thirds agreed that they were more likely to complete an evaluation when they felt strongly about a professor's teaching ability. This is a result that we expected. We hope, however, that students use the evaluations to do more than affirm their beliefs about teaching competency. All student evaluations of teaching give students a chance to provide feedback about teaching: what worked well, what was confusing, what did not work, and suggestions to make the class better. We also asked if students think that the most effective instructors receive the best evaluations, a desirable goal if SETs are valid. Unfortunately, slightly under half of the students believed that this was the outcome, a disappointing result, and one that bears future exploration and makes relying on the SETS questionable.

Our last question, based on the literature, asked if student evaluations are influenced by the subject matter of the course. We were not surprised to see students influenced by the topic of a class when they complete their evaluations. The surprise was the significant (15%) difference between business students compared to Political and Social Science students.

Our research over the last several years continues to raise questions about student evaluations of teaching in general. The increasing pressure on universities to treat students as customers suggests that ethically, potential students and their parents should have access to these evaluations of teaching in the name of full disclosure, just as they get information on crimes on campus. However, given continuing questions about the validity of student evaluations, potential customers would also need information on factors that influence SETs. How would all that be presented and how would potential students and their parents make sense of it all? We believe that this research continues to challenge the received wisdom regarding the validity and reliability of the IDEA evaluation instrument. The need to implement the most valid and reliable instrument to gauge teaching quality is vital in the world of accountability.

REFERENCES

[1] Aultman, L. 2006. An unexpected benefit of formative student evaluations. (QUICK FIX). *College Teaching 54*.3:251.

[2] Addison, W.E., J. Best, and J.D. Warrington, 2006. Student's perceptions of course difficulty and their ratings of the instructor. *College Student Journal 40(*2):409-416.

[3] Anderson, K. J. and G. Smith . 2005 Students' preconceptions of professors: Benefits and barriers according to ethnicity and gender. *Hispanic Journal of Behavioral Science 27(*2):184-201.

[4] Babad E., D. Avni-Baad; and R. Rosenthal. 2004. Prediction of student's evaluations from brief instances of professors' nonverbal behavior in defined instructional situations. *Social Psychology of Education 7*:3-33.

[5] Basow, S.A. 1995. Student evaluations of college professors: When gender matters. *Journal of Educational Psychology 87(*4):656-665.

[6] Birnbaum, M.1999. A survey of faculty opinions concerning student evaluations of teaching. *The Senate Forum: A publication of the Academic Senate of California State University, Fullerton, 14*:19-22.

[7] Brown, M. J. 2008. Student perceptions of teaching evaluations. *Journal of Instructional Psychology 35*(2):177-181.

[8] Brown, M.J., M. Baillie and S. Fraser. 2009. Rating ratemyprofessors.com. A comparison of online and official student evaluations of teaching. *College Teaching 57(*2):89-92.

[9] Burden, P. 2009. A case study into teacher perceptions of the introduction of student evaluation of teaching surveys (SETs) in Japanese tertiary education. *Asian EFL Journal 11*(1):126-149.

[10] Burdsal, C. A. and J. W. Bardo. 1986. Measuring Student's Perceptions of Teaching: Dimensions of Evaluation. *Educational and Psychological Measurement. 46*(1):63-79.

[11] Carr, D., T. Davies; and A. Lavin. 2009. The effect of business faculty attire on student perceptions the quality of instruction and program quality. *College Student Journal 43*(1):45-55.

[12] Carson, L.A. and M. Uttley. 2008. Student Perceptions of Teaching Evaluations. Southeast InfORMS annual conference, 44, *Southeast InfORMS Proceedings*, 44:256-267.

[13] Cashin, W. E. 1989. Defining and Evaluating College Teaching. IDEA paper, No. 21, September. Center for Faculty Evaluation & Development. Kansas State University

[14] Cashin, W. E. 1995. Defining and Evaluating College Teaching. IDEA paper, No. 32, September. Center for Faculty Evaluation & Development. Kansas State University

[15] Cashin, W., and R. Downey. 1992. Using global student rating items for summative evaluation. *Journal of Educational Psychology 84*:563-572.

[16] Clayson, D.E. 2005. Within-class variability in student-teacher evaluations: Examples and problems. *Decision Sciences Journal of Innovative Education 3*(1):109-124.

[17] Clayson, D. E. and D. Haley 1990. Student evaluations in marketing: What is actually being measured? *Journal of Marketing Education 12*(9):9-17.

[18] Clayson, D. E. and M. J. Sheffet,. 2006. Personality and the Student Evaluation of Teaching. *Journal of Marketing Education 28*(2):149-160.

[19] Curran, J. M. and D. E. Rosen. 2006. Student attitudes toward college courses: An examination of influences and intentions. *Journal of Marketing Education 28*(2):135-148.

[20] Davidovitch, N. and D Soen. 2006. Class attendance and students' evaluation of their college instructors. *College Student Journal 40*.3:691(13).

[21] El Hassan, K. 2009. Investigating substantive and consequential validity of student ratings of instruction. *Higher Education Research & Development 28*(3):319-333.

[22] Felton, J., J. Mitchell; and M. Stinson. 2004. Web-based student evaluations of professors: the relations between perceived quality, easiness and sexiness. *Assessment & Evaluation in Higher Education 29*(1):91-108.

[23] Fernandez, J., M. Mateo &, J. Muniz 1998. Is there a Relationship between Class Size and Student Ratings of Teaching Quality? *Educational and Psychological Measurement 58*(4):596-604.

[24] Fernandez, J. and M. A. Mateo. 1992. Student evaluation of university teaching quality: Analysis of a questionnaire for a sample of university students in Spain. *Educational and Psychological Measurement 52*(3):675-686.

[25] Fox, William. 2003. *Social Statistics*, fourth edition. Belmont, California: Wadsworth Group.

[26] Germain, M. and T. Scandura. 2005. Grade inflation and student individual differences as systematic bias in faculty evaluations. *Journal of Instructional Psychology 32*.1:58(10).

[27] Grayson, J. P. 2004. The relationship between grades and academic program satisfaction over four years of study. *The Canadian Journal of Higher Education 34*(2):1-34.

[28] Gursoy, D. and W.T. Umbreit. 2005. Exploring Students' Evaluations of Teaching Effectiveness: What Factors are Important? *Journal of Hospitality & Tourism Research. 29*(1):91-109.

[29] Haskell, R. 1997. Academic Freedom, Promotion, Reappointment, Tenure and The Administrative Use of Student Evaluation of Faculty: (Part II) Views From the Court. *Education Policy Analysis Archives 5*(17).

[30] Helterbran, V. R. 2008. The ideal professor: Student perceptions of effective instructor practices, attitudes, and skills. *Education 129*(1):126-138.

[31] Hills, S. B.; N. Naegle and K. R. Bartkus. 2009. How important are items on a student evaluation? A study of item salience. *Journal of Education for Business 84*(5):297-303.

[32] Hinkin, T. R. 1991. The Effects of Time of Day on Student Teaching Evaluations: Perception versus Reality. *Journal of Management Education 15*(1):35-45.

[33] Horner, K. L., H. G. Murray and J. P. Rushton. 1989. Relation between aging and rated teaching effectiveness of academic psychologists. *Psychology and Aging 4*(2): 226-229.

[34] Hoyt, D. and S. Perera. 2000. Validity of the IDEA Student Ratings of Instruction System: An Update. *IDEA Research Report #2*. Manhattan, KS: Kansas State University, Center for Faculty Evaluation and Development.

[35] Jackson, D.; C. Teal; S. Raines; T. Nansel; R. Force, and C. Burdsal. 1999. The Dimensions of Students' Perceptions of Teaching Effectiveness. *Educational and Psychological Measurement 59*:580-596.

[36] Johnson, V. 2002. Teacher Course Evaluations and Student Grades: An Academic Tango. *Chance 15*:9-16.

[37] Kierstead, D., P. D'Agostino and H. Dill. 1988. Sex role stereotyping of college professors: Bias in students' rating of instructors. *Journal of Educational Psychology 80*(3):342-344.

[38] Krzystofiak, F., R. Cardy and J. Newman. 1988. Implicit personality and performance appraisal: The influence of trait inferences on evaluations of behavior. *Journal of Applied Psychology 73*(3):515-521.

[39] Kwan, K. 1999. How fair are student ratings in assessing the teaching performance of university teachers? *Assessment of Evaluation in Higher Education 24*:181-195.

[40] Leite, D., R. A. Santiago, C. S. Sarrico, C. L. Leite and M. Polidori. 2006. Students' perceptions on the influence of institutional evaluation on universities. *Assessment & Evaluation in Higher Education 31*(6):625-638.

[41] Marsh, H. W. 2001. Distinguishing Between Good (Useful) and Bad Workloads on Students' Evaluations of Teaching. *American Educational Research Journal 38*(1):183-212.

[42] Maurer, T., J. Beasley, J. Dilworth, A. Hall, J. Kropp, M. Rouse-Arnett, and J. Taulbee. 2006. Child and family development students polled: study examines student course evaluations. *Journal of Family and Consumer Sciences* 98.2:39-45.

[43] Millea, M., and E. Grimes. 2002. Grade expectations and student evaluation of teaching. *College Student Journal* 36:582-590.

[44] Nerger, J.; W. Viney, and R. Riedel II. 1997. Student ratings of teacher effectiveness: use and misuse. *The Midwest Quarterly 38*:218(16).

[45] Okpala, C. O. and R. Ellis. 2005. The perceptions of college students on teacher quality: A focus on teacher qualifications. *Education 126*(2)L 374-383.

[46] Onwuegbuzie, A. J.; A. E.Witcher; K. M. T.Collins; J. D.Filer; C. D. Wiedmaier, and C. W. Moor. 2007. Students' Perceptions of Characteristics of Effective College Teachers: A Validity Study of a Teaching Evaluation Form Using a Mixed-Methods Analysis. *American Educational Research Journal 44*(1):113-160.

[47] Pike, C. 1998. A validation study of an instrument designed to measure teaching effectiveness. *Journal of Social Work Education 34*:261-271.

[48] Read, W.J; D.V. Rama; K. Raghunandan. 2001. The relationship between student evaluations of teaching and faculty evaluations. Journal of Education for Business *76*(4):189-192.

[49] Rifkin, T. 1995. Eric Review: Faculty Evaluation in Community Colleges. *Community College Review* 01061995:63-72.

[50] Riniolo, T. C., K. C. Johnson, T. R. Sherman and J. A. Misso. 2006. Hot or not: Do professors perceived as physically attractive receive higher student evaluations? *The Journal of General Psychology 133*(1):19-35.

[51] Schneider, B., P. J. Hanges, H. W. Goldstein and E. P. Braverman. 1994. Do customer service perceptions generalize? The case of student and chair ratings of faculty effectiveness. *Journal of Applied Psychology 79*(5):685-690.

[52] Schulze, E. and A. Tomal. 2006. The chilly classroom. Beyond gender. *College Teaching 54*(3):263-269.

[53] Seldin, P. 1999. Current practices—good and bad—nationally. In P. Seldin (Ed.), *Changing Practices in Evaluating Teaching* (pp.1-24). Bolton, MA: Anker Publishing Company.

[54] Seldin, P. 1993. The Use and Abuse of Student Ratings of Professors. *The Chronicle of Higher Education* 39:40-42, July 21.

[55] Sheer, V. C. and T. K. Fung. 2007. Can email communication enhance professor-student relationship and student evaluation of professor?; Some empirical evidence. *J. Educational Computing Research 37*(3):289-306.

[56] Sprinkle, J. E. 2008. Student perceptions of effectiveness: An examination of the influence of student biases. *College Student Journal 42*(2):276-293.

[57] Surratt, C.K. and S.P. Desselle. 2007. Pharmacy student's perceptions of a teaching evaluation process. *American Journal of Pharmaceutical Education 71*(1):1-7.

[58] UCSB. 2004. Teaching large classes. Office of Academic Programs, Instructional Development University of California, Santa Barbara. *http://www.oic.id.ucsb.edu/Resources/Teaching/Large.ucsb.html*

[59] Uttley, M. and L.A. Carson. 2007. Student evaluations of teaching: Multiple class sections compared. Southeast InfORMS annual conference,43, *Southeast InfORMS Proceedings*, 43:264-277.

[60] Uttley M. and L.A Carson. 2006. Student Perceptions of Classes Taught by Videoconference: Local and remote sites compared. Southeast InfORMS annual conference, 42, *Southeast InfORMS Proceedings*, 42:194-205.

A CASE STUDY OF EDUCATING INFORMATION SYSTEMS STUDENTS ON BUSINESS PROCESS MANAGEMENT THROUGH DIGITAL GAMING

James Lawler, Pace University, Seidenberg School, New York City, New York, 212-246-1013

ABSTRACT

Digital gaming continues to be an approach for enhancing methods of pedagogy. The study evaluates the effectiveness of a gaming product of a leading technology firm in engaging graduate students in an information systems course at a major northeast institution. Preliminary findings from a detailed perception survey of the students indicate favorably high improvement in learning of business process management (BPM) methodology through the gaming software. However, improvement in learning through the system is indicated to be not as high in contrast to the case discussion reports and presentation project reports of the course involving research. These findings of the research-in-progress study may aid educators attempting to better integrate game-based learning with other methods of pedagogy.

Keywords: Business Process Management (BPM), Games, Gaming, Information Systems Education, Instructional Design, Learning Outcomes, Pedagogy, Second Life, Simulation, Virtual Reality

BACKGROUND

Digital gaming is an approximate $9 billion business, generating revenues of $6.6 billion in console software, $2 billion in mobile software, and $910 million in other software (DeMarle, 2008, p.92). Revenues increased to $9 billion in 2007 from $6 billion in 2001 and $2.6 billion in 1996 (Entertainment Software Association, 2007). Sales increased to 268 million units of software sold in 2007 from 74 million units in 1996 (DeMarle, 2008, p.92). Growth in the business is attributable to the attractiveness of electronic gaming to consumers of the current gaming generation of younger players and even the generation of increasingly older players (Vella, 2008). Because of the growth, educators continue evaluating the effectiveness of gaming in the learning of students.

Digital gaming is coming into the curricula of schools in an environment of simulation, video and virtual reality (Economist, 2007). Learning is considered to be enabled in the environment of simulation by an integration of elements of challenge, curiosity and fantasy (Akilli, 2007) that are familiar and immersing to gaming or Net Generation students. Learning is also considered to be enabled by real life simplification in virtual reality (Heinich, Molenda, Russell and Smaldino, 2002), as illustrated on Linden Labs' Second Life (www.secondlife.com). Funded by government and industry, educators are evaluating the entertainment of gaming and the learning that may be fostered by virtual reality, video and simulation of gaming (Long, 2007 and Nagel, 2008). Schools are increasingly evaluating the effectiveness of gaming as a method of pedagogy in contrast to the effectiveness of established methods.

Designing digital gaming for effectiveness in the intelligent learning of students is a challenge for educators in the context of the below:

- How do educators design digital gaming as an experience in learning?

- How do educators not experienced in the culture of gaming genres develop gaming of simulations and virtual reality in current environments of learning? (Dede, 1996) and
- How does digital gaming enhance existing methods of pedagogy, including books, case discussion reports, or presentation project proposal reports, and impact the learning of the students?

Digital game-based learning (Prensky, 2001) may be an engaging experience, but may not be educational in information (Gibson, Aldrich and Prensky, 2007) and may not be for educators in schools but for trainers in business firms. Entertainment may not meet goals of learning (Dickey, 2006, p.261) Literature is diverse in methods of integrating fantasy, curiosity and challenge into gaming models of pedagogy in order to motivate students (Bowman, 1982, Malone, 1981 and Provenzo, 1991). New technology evolving in the field of gaming is a further challenge for instructional designers in finding methods of pedagogy (Dickey, 2007) for engaging Net Generation students, as is the diversity of gaming played by the students. Digital gaming – great gaming and great learning - is a complex endeavor for educators considering simulation and virtual reality as a method of pedagogy (Becker, 2007).

Gaming can benefit educators faster however in schools of computer science and information systems. Given the decline of current students majoring in computer science (Pollacia and Russell, 2007 & Vegso, 2006), educators in the schools could entice further students by furnishing courses (Wallace, Russell and Markov, 2008) and degrees (Zyda, Lacour and Swain, 2008) in the design of gaming of simulation and virtual reality as a discipline. Gaming could be concurrently a method of pedagogy for courses and degrees of the schools. Net Generation students could be enticed into the programs of the schools, inasmuch as they might be later hired in business firms to be not gaming hobbyists or specialists but highly paid generalists or practitioners in information systems (Pham, 2008 and Young, 2007). The effectiveness of gaming as a discipline in enticing students into schools of computer science and information systems, and the effectiveness of the learning of the students as a method of pedagogy, are currently inconclusive from the literature.

Gaming is inherently interdisciplinary so that educators in schools of computer science and information systems could experiment further in gaming as a method of pedagogy. Firms in industry continue to demand students in the schools be knowledgeable if not experienced in not only information systems but also in business (Lee and Han, 2008). Gaming could be included in courses in the schools so that students might learn the interrelationships of a business in an environment of learning that is integrating practitioner scenarios through realistic simulation and virtual reality (Cordis, 2007, DiMeglio, 2007 and Lavelle, 2008) akin to firms having virtual venues (Hemp, 2008). Literature is inconclusive as to the effectiveness of gaming as a method in enhancing the learning of business in schools of computer science and information systems, or as a method in enhancing existing methods of pedagogy in the schools (Chapman and Sorge, 1999), such as lectures that might be considered numbing to students. Nevertheless the learning of Net Generation students on business principles of information systems might be enabled in an environment of simulation and virtual reality that is attuned to Net Generation learning styles (Leon, Przasnyski and Seal, 2008). This study evaluates the effectiveness of digital gaming in the engagement and the learning of business process management (BPM) in a course on information systems at a school of computer science and information systems.

INTRODUCTION TO STUDY

2

The effectiveness of digital gaming in engagement and learning is evaluated in *Global Information Systems Principles*, a core course in the curricula of the Seidenberg School of Computer Science and Information Systems of Pace University in New York City. The course consists of the below learning objectives:

- Comprehend criticality of business competitive strategy and technology;
- Describe role of business organizational strategy in management of technology;
- Identify current decision-making issues in management of business process strategy and technology;
- Improve creativity, critical-thinking and problem-solving in potential management of business process strategy and technology; and
- Initiate informed discussion of issues in management of leading edge technologies in a global industrial society.

Enhancement of a customer service process by business process management (BPM) is a focus of the course for students. The course includes a book, Management Information Systems: Managing the Digital Firm (Laudon and Laudon, 2008), case discussion reports on business strategy and management of technology (40% of final grade) and presentations of project proposal reports on business process strategy and technology in firms in industry (40%) requiring research, and a digital gaming product on BPM, customer service process and service-oriented architecture (SOA) technology (20%), as assignments for the students. *Global Information Systems Principles* is a course for graduate students of the university.

The digital gaming product is BPM Simulator: INNOV8, downloadable gaming software of IBM granted to the principal author who is also the instructor of *Global Information Systems Principles*. INNOV8 consists of a 3D environment of a game or meta-verse (Kumar, Chhugani, Kim, Kim, Nguyen and Dubey, 2008) setting (Rollings and Adams, 2003) in which students are challenged by choices as consultants in the improvement of a customer service process at a After, Inc. business firm, in a cinematic customized design of virtual reality. As consultants to After, Inc., they are empathic in emotional proximity (Dickey, 2006, p.251) to Logan, the consultant personality in After, Inc. From discovery of the process to construction of the model of the process, analysis, design and deployment of the process, and management and optimization of the performance of the process, students are engaged in experimental quests and scenes as they explore offices and interact with office personalities at After, Inc., in the improvement of the process. They progress in levels of old customer service process, new service process, and monitoring of the new process, as they respond to simple to complex scenes and stimuli which make the story (Thompson, Berbank-Green and Cusworth, 2007). They may not progress until they respond satisfactorily to the system. Striving is important in personal progression (Malone and Lepper, 1987). INNOV8 is a form of an experiential learning method – "if you do it, you learn it" and a form of a goal setting method – "you learn more if you are striving towards a goal". Students might learn BPM practices if not creativity, critical-thinking, and problem-solving skills (Reeves, Malone and O'Driscoll, 2008), as they improve the customer service process of After, Inc., the learning objective of INNOV8 and of the instructor, who desired not to do elaborate lecturing on BPM that might be numbing to information systems and computer science students exposed to BPM for the first time.

(BPM Simulator: INNOV8 will be demonstrated at the conference.)

BPM Simulator: INNOV8 is not inconsistent with the literature on digital gaming. Learners in *Global Information Systems Principles* may form a foundation for knowledge of BPM from INNOV8, in instruction properly sequenced in simple to complex scenes and quests of customer

3

service process solutions, leading to motivation and stable structures (Becker, 2007). Students may learn BPM in the obstacles included in the narrative of plausible scenes and quests at After, Inc. They may learn the problems of practitioners in problem-solving process solutions of business organizations as players in the virtual reality (Gee, 2005) of After, Inc., in a manner of increased self-efficacy (Bandura, 1997) similar to simulation without virtual reality (Faria and Nulsen, 1996). Learning problems and solutions may enable them to be more marketable to business organizations if not potentially productive as professionals (O'Sullivan, 2008). Literature on gaming (Bransford, Brown and Cocking, 1999) indicates that learning is facilitated if gaming is assessment-centered (engaging, interactive and responding), community-centered (engaging with players), knowledge-centered (engaging with principles) and learner-centered (relevant to reality), factors evident in INNOV8, excluding community-centered gaming.

The instructor included BPM Simulator: INNOV8 in *Global Information Systems Principles* in the periods of spring 2008, fall 2008 and spring 2009, and 39 students played INNOV8 in the semesters. Though INNOV8 may be played an average of 1 to1½ hours per student in computer labs at school sites if students respond satisfactorily to the scenes and tasks, the instructor required that INNOV8 be further played 1½ to 3 ½ hours per student on computers at personal sites of the students and later reviewed in 2 to 3 hours at the school. INNOV 8 was played one-on-one by the students, as Simulator is not a massively multiple on-line role player game (MMORPG) but a simple single player system. The students played INNOV8 without the help of the instructor, as they played it as though they were playing gaming on Second Life venues of virtual reality, and as there were system tutorials. In informal inquiry, the students indicated that INNOV8 helped in the learning of BPM, once they played INNOV8 and shared solutions with the instructor, though the effectiveness of INNOV8 as a learning method in *Global Information Systems Principles* might be considered further in a formal study.

Therefore, this study evaluates the effectiveness of BPM Simulator: INNOV8 in learning BPM in the course on *Global Information Systems Principles*.

- How does INNOV8 improve learning BPM as a method of pedagogy?
- How does INNOV8 improve BPM creativity, critical-thinking and problem-solving on process solutions? and
- How does INNOV8 improve or not improve learning BPM, and creativity, critical-thinking and problem-solving skills, in contrast to extant methods of pedagogy in the course: book, case discussion reports, and presentation project proposal reports?

Findings of improvement or non-improvement in outcomes have to be dependent on the perceptions of the students playing INNOV8 coupled with formal investigative study. Findings from an initial investigation of outcome perceptions might benefit educators considering digital gaming and virtual reality as a method of pedagogy, in a period of research that is focused frequently on the ineffectiveness not the effectiveness of gaming (Beedle and Wright, 2007).

FOCUS OF STUDY

The focus of the formal study is to evaluate the following:

- Effectiveness of BPM Simulator: INNOV8 in improvement in learning BPM
  in a course on *Global Information Systems Principles*;
- Effectiveness of INNOV8 in improvement in learning BPM creativity, critical-thinking
  and problem-solving skills on process strategy and technology in the course; and

4

- Extent of effectiveness of INNOV8 in improvement in learning BPM as a method of pedagogy in contrast to a book, case discussion reports, and presentation project proposal reports as established methods of pedagogy in the course.

This study evaluates further the extent of the helpfulness of the metaphors of personalities, scenes and quests of INNOV8 in the learning of students at the Seidenberg School and investigates the navigation and usability of the system. INNOV8 is a product of a leading technology firm granted to a sample of institutions, such as Pace University (Daniel, 2008). Though technology firms are hyping digital gaming software, such as INNOV8, as the future of learning, findings on gaming and virtual reality as a method of pedagogy in schools of information systems is limited in the literature, necessitating initiative of institutions in researching the method (Zyda, 2007). This study is focused on furnishing guidance on digital gaming methodology that might be beneficial to educators, if not game designers and instructional designers, integrating gaming in curricula for information systems students (Kao, 2007).

METHODOLOGY OF STUDY

The methodology of the study consisted of a perception survey of 39 graduate students in the *Global Information Systems Principles* course and independent study of the principal author, in the spring and fall 2008 and spring 2009 semesters, in the Seidenberg School of Computer Science and Information Systems of Pace University, in downtown New York City. The population consisted of an average age of 24.5 years of female (45.0%) and male (55.0%) students. These students were experienced gamers on computers (85.0%), Internet (80.0%), and Second Like-like virtual reality (75.0%), or on gaming systems in other courses in the extant or other institutions (45.0%). They averaged 16.0 hours monthly on gaming systems. The bulk of the population was international (80.0%), furnishing diverse and interesting perspectives on BPM Simulator: INNOV8.

The survey focused on 92 items primarily relating to the following:

- Effectiveness in improvement of learning BPM strategy and technology from book of course, case discussion reports, presentation project proposal reports, and INNOV8;
- Effectiveness in improvement in learning BPM creativity, critical-thinking and problem-solving skills from book, case discussion reports, project proposal reports, and INNOV8 system of course; and
- Effectiveness of metaphors of personalities, quests and scenes of INNOV8 system and helpfulness of navigation and usability of system.

The students furnished their answers anonymously to item statements on a Likert-like 9-point scale from possible responses of very strongly agree (8) to very strongly disagree (1) and neither agree nor disagree (0), and several statements were in negative undertones in order to screen acquiescence response sets (Gall, Gall and Borg, 2003). All of the students completed the perception survey, the instrument of which is available upon request of the author, and were compensated with extra credit in the final grades of the course. The instrument of survey was reviewed for insurability of interpretability in a pilot review by a sample of students in spring 2008.

The methodology of the study included moreover a review of the personal reflections on the INNOV8 system by the students.

5

The answers from the survey were interpreted statistically by the second author of the study, for implications to instructors in information systems.

PRELIMINARY ANALYSIS

The preliminary findings disclose that the students are indicating generally high improvement in learning BPM methodology through the IBM BPM Simulator: INNOV8 gaming system (mean=6.00+). The students are demonstratively indicating higher learning of BPM through INNOV8 than through the book of the course (3.00-). However, they are indicating lower learning of BPM through INNOV8 than through the presentation project proposal reports (7.00+) that require interaction with the instructor and other students. They are also indicating lower learning of BPM through INNOV8 than through the case discussion reports (7.00-) that require contemporary research. The findings are indicating that INNOV8 is a helpful but limited method of pedagogy in the perceptions of the students.

The findings are concurrently disclosing that the learning of creativity, critical thinking and problem-solving skills is perceived to be higher through the project proposal reports (7.00, 7.00- and 6.00) than through INNOV8. The learning of the skills is perceived to be higher through the discussion reports (6.00, 7.00 and 6.00-) than through INNOV8. The learning of the skills is perceived to be lower through the book of the course (4.00, 5.00+ and 2.00) than through INNOV8, so that the findings on the learning of the soft skills are generally parallel to the findings on BPM.

The preliminary findings are disclosing that the learning of BPM is improved through the cues (7.00-), personalities (6.00+), quests (7.00), scenes (7.00+) and sound and visual technology (5.00) of INNOV8. Navigation (5.00) and re-playability (6.00-) are however indicated by the students to be limited in facilitating the learning. The students are further indicating the likelihood of improved learning if INNOV8 included a multi-player socializing system (7.00+) instead of the independent single-playing system. They are nevertheless indicating that they learned the fundamentals of BPM through the single-playing system (6.00+), that the playing of INNOV8 is fun (7.00-), and enjoyable (8.00-). In short, the findings are indicating that the students are learning BPM, business strategy and technology through INNOV8, though the system appears to be ideal in learning when integrated with the presentation project proposal and case discussion reports of the course, otherwise it is not a panacea.

From a preliminary reading, these findings are generally indistinguishable for experienced and non-experienced gamer students, female and male students, and US and non-US students.

Finally, the reflections of a composite diversity of a sample of the students are below:

- "INNOV8 gave appearance of an actual business environment, not a game, giving creditability to the goal of learning … gives a good idea of what BPM is about … gives importance of different departments in completing a process … inter-dependencies … interacting with problems requiring solutions … great application in introducing BPM";
- "easy to follow … encourages player to progress by trail and error … focused on learning … may repeat several times … multiple 'what if' scenarios …real life simulations … requires you to really think … structural and systematic … like a treasure hunt";
- "educating along with having fun … 'hands on' learning instead of listening to a lecture or reading a book … having fun and thinking is revolutionary in itself … more motivation to learn by playing INNOV8 … not passive or sitting in a room";

6

- "[furnishes] helpful hints and tips … helpful tutorials … keeps players interested and involved [in the playing] … not frustrated on the mechanics";
- "Innov8 is like games [such as] Counter Strike and The Mummy that are played everywhere";
- "more fun than learning … more playing than learning … needs to be combined with lecturing [in order to] learn BPM in depth … data in detail … not an extensive study of BPM … should have more terminology";
- "mouse is not controlling direction … navigation problems … not Microsoft standards";
- "[should be] option to customize processes … one process … opportunities to customize projects [in the system] … should be tougher";
- "should be multiple-player [system] so that students might [play] with other students in teams;" and
- "INNOV8 is in adolescence … I believe IBM might [develop] a more … comprehensive and dynamic version of INNOV8 … INNOV8 might help in [initiating] an instructional methodology which might be eventually more prevalent ..."

These reflections are consistent with the findings of the perception survey.

PRELIMINARY IMPLICATIONS OF STUDY

"I have been introduced to a different world of computing… and a different environment … I feel like an anthropologist who has discovered a new civilization. [I am] still learning about the culture and practice of games, and it is a different world." (Waldo, 2008)

The findings from perceptions of the students in this research-in-progress study are indicating engagement and favorably high improvement in learning BPM in the independent playing of the BPM Simulator: INNOV8 gaming system. The students in the Seidenberg School finished the course and learned a flavor of multi-disciplined practices of business process strategy and information technology through the INNOV8 system. Helped by INNOV8, the instructor increased the integration of the system in *Global Information Systems Principles* and lectured in a limited manner on BPM. Literature indicates issues in insuring the focus of students in on-line learning if not in on-line game playing (Bos and Shami, 2006). The BPM Simulator: INNOV8 system focused the students and fundamentally met the learning objectives of the instructor.

Though the findings from the perceptions of the students are indicating higher improvement in learning BPM through the gaming system relative to the book in the course, they were not as high relative to the presentation project proposal reports and case discussion reports required by the instructor. The students learned more of the organizational practices of process strategy and technology in project and discussion report researching than in INNOV8 playing. They learned more problems and recent solutions of strategy and technology in multiple organizations in the project report researching than in playing INNOV8, inasmuch as INNOV8 focused on solutions in a single organization in a programmed static system (Brown and Thomas, 2008). INNOV8 is a limited method of pedagogy in a semester than the perpetual researching and seeking of information inherent in discussion and project reports throughout a semester. The mix of the reports and the Simulator ideally met the objectives of the instructor.

The learning of creativity, critical-thinking and problem-solving skills through the gaming system is found to be not as high in perception relative to the case discussion reports and the presentation project proposal reports of the students. Though INNOV8 included personalities and scenarios realistic of industry reality, they learned the mix of professional skills more through the interactivity of presenting the discussion reports and the project reports to the instructor and

7

the other students and refining the reports in response to inquiry. The interactivity of personalities of students led to learning of inter-dependencies of organizational scenarios that required creativity, critical-thinking and problem-solving soft skills of the students. The discussion and project reports were perceived to be more realistic requiring soft skills than the simulation of the system. These reports, as methods of pedagogy more than the Simulator, met the objectives of the instructor in preparing the information systems students to be modestly proficient in soft skills required by industry.

The findings further *indicate that BPM Simulator: INNOV8 might incorporate increased instructional design functionality*. The gaming in Simulator might be integrated more as an intervention into the book, discussion reports, and project reports of *Global Information Systems Principles*. The learning metrics of outcomes and playing standards might be matured more in Simulator, though pedagogical and playing standards on such systems might be elusive (Vernadakis, Zetou, Tsitskari, Giannousi and Kioumourtzoglou, 2008) if not non-existent (Mayo, 2007) in the extant field of virtual reality (Lamont, 2007). The findings of the survey indicate learning might be improved more in involvement (Chapman and Sorge, 1999) in Simulator if it matured into a multiple-player system, integrating the navigation and usability of the single player system that was perceived positively by the students. These findings indicate the criticality of firms in the gaming industry collaborating with educators, in order to improve the instructional design functionality of gaming systems (DeMarle, 2008, p.93).

Finally, *the findings of this study furnish an encouraging foundation for educators evaluating the effectiveness of the integration of gaming systems into curricula with other methods of pedagogy*. The integration of gaming systems requires the experience of instructors in interventions of learning (Leon, Przasnyski and Seal, 2008) and the flexibility of the instructors in learning the genres of gaming systems and the potential of the technologies as a method of pedagogy. The effectiveness of gaming systems and of the integration of the systems with other methods of pedagogy require further pedagogical research by instructors interested in the systems and in virtual reality. Those instructors interested in the systems might interface with firms in the gaming industry granting the technologies to universities, such as with Pace University, and initiate research of the technologies as an instructional tool. The effectiveness or non-effectiveness of gaming and virtual reality systems in the instruction of Net Generation and other students in schools of computer science and information systems might be learned by instructors only when they initiate the research on the learning styles of the students and on the technologies.

LIMITATIONS AND OPPORTUNITIES IN RESEARCH

Though exploratory the findings of a study from an essentially small sample size of posttest students in one course of one instructor of defined instructional methods of pedagogy, and on one gaming system of one topic of one university, cannot be generalized optimistically to other universities without reservation. BPM Simulator: INNOV8 is furnished by merely one of the technology firms marketing gaming systems, limiting projection of findings on INNOV8. The system is not a multiple-player but a single player system, precluding projection of findings to multiple-player systems.

Following presentation of the final research study with final statistical interpretation, the instructor of the course will continue to evaluate INNOV8 in courses of *Global Information Systems Principles*, and if feasible in other courses of other instructors, in fall 2009 and spring 2010 semesters, increasing the number of graduate if not undergraduate students to study. He will continue to evaluate forthcoming versions of INNOV8 in 2009 and 2010 and furnish input to

IBM. However, the instructor will consider evolving gaming systems of other technology firms, focusing on multiple-player systems on virtual reality with student teaming. He will continue to pursue grant opportunities simultaneously. Lastly, the instructor will be surveying gamer students in the computer clubs of the Seidenberg School, and in the population of students of Pace University, in order to continue research of the learning styles of the new generation of students that might be integrated into the curricula of the school.

CONCLUSION

The study is beneficial for educators in findings of effectiveness in favorably high improvement in the fundamental learning of business process management (BPM) through BPM Simulator: INNOV8 gaming as an individual method of pedagogy. Though improvement in learning through INNOV8 is found to be not as high in perception relative to presentation project proposal reports and case discussion reports requiring research, improvement is higher in perception relative to the book of the course and instructor lecturing. Improvement in learning of creativity, critical-thinking and problem-solving soft skills of the information systems students through INNOV8 is also found to be not as high in perceptions relative to the proposal and discussion reports, but higher in perception relative to book and lecturing. The study concurrently found that the features of the INNOV8 playing system might incorporate increased instructional design functionality and multiple-player system technology. The findings of this initial study are cautionary but encouraging for educators and instructional designers evaluating further integration of gaming-based interactive learning systems with other methods of pedagogy for all students.

REFERENCES

Akilli, G.K. "Games and Simulations: A New Approach in Education?" In Gibson, D., Aldrich, C. and Prensky, M. (Eds.), *Games and Simulations in On-Line Learning: Research and Development Frameworks*. Hershey, Pennsylvania: Information Science Publishing, 5, 2007.

Bandura, A. *Self-Efficacy: The Exercise of Control*. New York, New York: W.H. Freeman, 1997.

Becker, K. "Pedagogy in Commercial Video Games." In Gibson, D., Aldrich, C. and Prensky, M (Eds.), *Games and Simulations in On-Line Learning: Research and Development Frameworks*. Hershey, Pennsylvania: Information Science Publishing, 43, 2007.

Beedle, J.B. and Wright, V.H. "Perspectives from Multi-Player Video Games." In Gibson, D., Aldrich, C. and Prensky, M. (Eds.), *Games and Simulations in On-Line Learning: Research and Development Frameworks*. Hershey, Pennsylvania: Information Science Publishing, 151, 2007.

Bos, N. and Shami, N.S. "Adapting a Face-to-Face Role-Playing Simulation for On-Line Play." *Educational Technology Research and Development*, 2006, 54(5), 495.

Bowman, R.F. "A 'Pac-Man' Theory of Motivation: Tactile Implications for Classroom Instruction." *Educational Technology*, 1982, 22(9), 14-17.

Bransford, J.D., Brown, A.L. and Cocking, R.R. *How People Learn: Brain, Mind, Experience and School*. Washington, D.C.: National Academy Press, 1999.

9

Brown, J.S. and T.D. "The Gamer Disposition." Harvard Business Review, February. In Reply to Letters to the Editor, *Harvard Business Review*, 2008, May, 125.

Chapman, K.J. and Sorge, C.L. "Can a Simulation Help Achieve Course Objectives? An Exploratory Study Investigating Differences Among Instructional Tools." *Journal of Education for Business*, 1999, March / April, 226.

Daniel, D. "A BPM Simulator: INNOV8." *SOA / Web Sphere – INNOV8 Design and Marketing*, IBM, 2008, October 1, 1.

Dede, C. "The Evolution of Constructivist Learning Environments: Immersion in Distributed, Virtual Worlds." In Wilson, B.G. (Ed.), *Constructivist Learning Environments: Case Studies in Instructional Design*. Englewood Cliffs, New Jersey: Educational Technology Publications, 165-175, 1996.

DeMarle, A. "Innovation and Value: A Proper Mix of Innovations and Standards Could Ensure That Electronic Games Reach Their Full Potential." *IEEE Computer*, 2008, September, 92-93.

Dickey, M.D. "Game Design and Learning: A Conjectural Analysis of How Massively Multiple On-Line Role-Playing Games (MMORPGs) Foster Intrinsic Motivation." *Educational Technology Research and Development*, 2007, 55(3), 254.

Dickey, M.D. "Game Design Narrative for Learning: Appropriating Adventure Game Design Narrative Devices and Techniques for the Design of Interactive Learning Environments." *Educational Technology Research and Development*, 2006, 54(3), 251,261.

Di Meglio, F. "I Was a Second Life B-School Student: Undergraduate Programs Already Have a Presence in This Virtual World, but INSEAD Is One of the First Management Programs to Break Ground." *Business Week*, 2007, April 16, 1-2.

Faria, A.J. and Nulsen, R. "Business Simulation Games: Current Usage Levels." In Patz, A.L. and Butler, J.K. Jr. (Eds.), *Developments in Business*. Madison, Wisconsin: Omni Press, 1996.

Gall, M.D., Gall, J.P. and Borg, W.R. *Educational Research: An Introduction*, 7th Edition. Boston, Massachusetts: Allyn and Bacon, 2003.

Gee, J.P. "Learning, Literacy, and Good Video Games." *Annual Meeting of the American Educational Research Association*, 2005, Montreal, Canada.

Gibson, D., Aldrich, C. and Prensky, M. *Games and Simulations in On-Line Learning: Research and Development Frameworks*. Hershey, Pennsylvania: Information Science Publishing, vii, 2007.

Hemp, P. "Getting Real About Virtual Worlds." *Harvard Business Review*, 2008, October, 27.

Heinich, R., Molenda, M., Russell, J.D. and Smaldino, S.E. *Instructional Media and Technologies for Learning*, 7th Edition. Upper Saddle River, New Jersey: Prentice Hall, 4, 2002.

Kao, J. *Innovation Nation: How America Is Losing Its Innovation Edge, Why It Matters, and What We Can Do to Get It Back*. New York, New York: Simon and Schuster, Inc.: Free Press, 2007.

10

Kumar, S., Chhugani, J., Kim, C., Kim, D., Nguyen, A. and Dubey, P. "Second Life and the New Generation of Virtual Worlds: Unlike On-Line Games, Metaverses Present a Single Seamless, Persistent World Where Users Can Transparently Roam Around Without Predefined Objectives." *IEEE Computer*, 2008, August, 46-48.

Lamont, I. "What Is There Is Potential." *Computerworld*, 2007, December 3, 38.

Laudon, K.C. and Laudon, J.P. *Management Information Systems: Managing the Digital Firm.* Upper Saddle River, New Jersey: Pearson Prentice Hall, 2008.

Lavelle, L. "The Sims: Executive Edition." *Business Week*, 2008, April 7, 092.

Lee, C.K. and Han, H-J. "Analysis of Skills Requirements for Entry-Level Programmer / Analysts in Fortune 500 Corporations." *Journal of Information Systems Education*, 2008, 19(1), 17-27.

Leon, L.A., Przasnyski, Z.H. and Seal, K.C. "Teaching Operations Research / Management Science to Net-Generation: A Paradigm Gap?" *OR / MS Today*, 2008, October, p. 10.

Long, C. "New York School Opens Lab for Serious Games." *Yahoo! News*, 2007, December 12, 1-3.

Malone, T.W. "Toward a Theory of Intrinsically Motivating Instruction." *Cognitive Science*, 1981, 4, 333-369.

Malone, T.W. and Lepper, M.R. "Making Learning Fun: A Taxonomy of Intrinsic Motivations for Learning." In Snow, R.E. and Farr, M.J. (Eds.), *Aptitude, Learning and Instruction*, Volume 3: *Conative and Affective Process Analyses*. Hillsdale, New Jersey: Erlbaum, 223-253, 1987.

Mayo, M.J. "Games for Science and Engineering Education: Video Games Can Teach Science and Engineering Better Than Lectures. Are They a Cure for a Numbing 200-Person Class?" *Communications of the ACM*, 2007, 50(7), 35.

McClave, J. and Sincich, T. *A First Course in Statistics*, 9th Edition. Upper Saddle River, New Jersey: Pearson Prentice Hall, 2006.

Nagel, D. "Alliance to Study Video Games for Math and Science Education." *Redmond Developer News*, 2008, October 7, 1-2.

O'Sullivan, J. "Preparing Today's Students for Tomorrow's Cyber World: Merging Technology, Business, and the Classroom." *Proceedings of the Faculty Access to Computing Technology (FACT) Conference*, Farmingdale, New York, 2008, April 4, 6.

Pham, A. "Colleges Learn to Make Games Work." *Los Angeles Times*, 2008, October 31, 1-5.

Pollacia, L. and Russell, J. "Addressing the Decline in Computer Information Systems Enrollment." *Issues in Information Systems*, 2007, 8(1), 97-102.

Prensky, M. *Digital Game-Based Learning*. New York, New York: McGraw-Hill, Inc., 2001.

11

Provenzo, E.F. *Video Kids: Making Sense of Nintendo*. Cambridge, Massachusetts: Harvard University Press, 1991.

Reeves, B., Malone, T.W. and O' Driscoll, T. "Leadership's On-Line Labs: Tens of Millions of People Are Honing Their Leadership Skills in Multi-Player On-Line Games." *Harvard Business Review*, 2008, May, 1-2.

Rollings, A. and Adams, E. *Game Design*. Indianapolis, Indiana: New Riders, 2003.

Ross, S. *Introduction to Probability and Statistics for Engineers and Scientists*, 3rd Edition. Burlington, Maine: Elsevier Academic Press, 2004.

Thompson, J., Berbank-Green, B. and Cusworth, N. *Game Design: Principles, Practice, and Techniques – the Ultimate Guide for the Aspiring Game Designer*. Hoboken, New Jersey: John Wiley & Sons, Inc., 108-109, 2007.

Vegso, J. "Drop in Computer Science Bachelor's Degree Production." *Computing Research News*, 2006, 18(2), 5.

Vella, M. "Video Games: Not Just Child's Play." *Business Week*, 2008, April 28, 015.

Vernadakis, N., Zetou, E., Tsitskari, E., Giannousi, M. and Kioumourtzoglou, E. "Student Attitude and Learning Outcomes of Multimedia Computer-Assisted Versus Traditional Instruction in Basketball." *Educational Information Technology*, 2008, 13, 177.

Waldo, J. "Scaling in Games and Virtual Worlds: On-Line Games and Virtual Worlds Have Familiar Scaling Requirements, but Do Not Be Fooled – Everything You Know Is Wrong." *Communications of the ACM*, 2008, 51(8), 38.

Wallace, S.A., Russell, I. and Markov, Z "Integrating Games and Machine Learning in the Undergraduate Computer Science Classroom." *Proceedings of the Third International Conference on Game Development in Computer Science Education*, 2008, February 27 – March 3, Miami, Florida, 56.

Young, J.R. "Community College Uses a Video-Game Lab to Lure Students into Computer Courses." *The Chronicle of Higher Education: Information Technology*, 2007, December 13, 1-3.

Zyda, M., Lacour, V. and Swain, C. "Operating a Computer Science Game Degree Program." *Proceedings of the Third International Conference on Game Development in Computer Science Education*, 2008, February 27 – March 3, Miami, Florida, 71.

Zyda, M. "Creating a Science of Games: The Same Technology That Makes Interactive 3D Games So Entertaining in the Physical Action Domain Is Just as Effective in Education, Training, and the Other More Serious Applications." *Communications of the ACM*, 2007, 50(7), 28.

_____ "Essential Facts about the Computer and Video Game Industry: 2007 Sales, Demographics, and Usage Data." *Entertainment Software Association (ESA)*, 2007.

_____ "Getting Serious: Virtual Worlds Are Being Put to Serious Real-World Uses – and Are Starting to Encounter Some Real-World Problems." *Economist*, 2007, December 8, 3-4.

12

_____ "Software: Serious Games in Virtual Worlds." *Cordis Newsletter*, 2007, December 11, 1-3.

ACKNOWLEDGEMENTS

SOFTWARE SKILL PORTABILITY: A CASE STUDY

A. K. Aggarwal, University of Baltimore, Baltimore, MD, USA; 410 837-5275

ABSTRACT

As internet expands more and more students are opting for on line courses. On-line classes create challenges for professors who teach analytical, programming and/or software courses. On-line courses are not meant for students that require additional or extra attention. This problem magnifies in courses that are either software based or use software extensively. Many students have working knowledge of some of the popular software like EXCEL, WORD etc. The problem arises when a different software is used in the class. This raises a basic question: Can students familiar with one software learn a similar software on their own or in short time? Learning here implies learning the software syntax and its application. This paper discusses software skill portability in an online database course. Based on our experience we found that some students proficient in a software do adapt to similar software easily.

INTRODUCTION

As economy falters, resources are becoming fewer and classes are becoming larger. This is putting additional burden on instructors who must maintain education quality with limited resources. This problem magnifies when courses involve analytical and/or programming skills. These problems are further magnified if classes are online. Students are taking many courses online without realizing the extra burden that places on them. Many students do not understand the rigor of online courses and take them as "add-on" courses. This makes teaching software oriented courses challenging for instructors. Not only students have to learn the syntax of software, they have to apply them in business setting. On the bright side, many students already have software skills which may save time if students are able to transfer their skills in similar software. This would free instructor to concentrate on the concepts as opposed to the syntax of the software. This paper studies software portability issue in a data base course.

The next section briefly reviews portability and the following section describes the experiment and the final section discusses the results.

SOFTWARE SKILL PORTABILITY

Portability has been defined extensively in terms of software portability, i.e., a software is portable if can run on different platforms with little or no modifications. According to Garen (2007), "..Portability does not imply that the application will transfer simply to the new platform, but nor does it mean a major effort is required. Portability is simply the ability to use the program on another system with reasonable cost and effort..". Portability has also been defined in terms of employees transferring skills to other employees. Portability has also been defined in terms of hardware and software. Universal remote control (same control can be used with many different devices), laptops (portable with respect to time and space) are some example of portable devices. However, there is very little literature on software skill portability, the topic of this paper. Only recently, literature has started to emerge in this area. Tom Stern (2008), emphasizes the need for skill portability, According to him "..In today's culture of reduced job security with a greater emphasis on skill-set development and portability, people aren't just *taking* jobs; they feel the necessity to use them. ..".

Portability is becoming important at many levels. In general portability could imply transferring software skills from one course to another course or from one software to another software or from one version to an updated version of the same software. (See table 1)

Table 1: Software Skill Portability

Portability level	Example
Software Skills	
• One software to another (similar) software	ACCESS to ORACLE
• One version to another	MS-office version 2003 to 2007
Pedagogical Skill	
• Applying to different area	Spreadsheet skill learned in a course can be applied to MIS, FINANCE etc
• Apply same skills to different versions	Programming skills applied to different programming languages, VBASIC, C++ etc

Software skill portability is defined as skill that learned once can be used repeatedly in other software. Skill portability can be defined in many different ways. We have defined it at two levels:
- Software—these refers to software skills that are transferred from software to software
- Pedagogical skill—these refer to pedagogical skills transferred from one situation (course) to another

In this paper we will study software skill transferability at the software. The next section discusses the experiment.

THE EXPERIMENT

The present study was conducted at an urban public university in the Mid-Atlantic area. The university is an upper-division university and has a non-traditional, commuter student population. University offers BS in MIS, BBAs with MIS specialization and MBA with MIS specialization. The database course was selected to study software skill portability. Database course has first introductory MIS course as a pre requisite but in reality many students also finish at least one programming language course before they take this course. The purpose, here, is to learn if one software related competency can be used in other software. Many students come with ACCESS experience from community college or from work, however, the course uses ORACLE software. This poses many challenges. Can student learn ORACLE software skills on their own since they already know ACCESS? Can student apply ACCESS pedagogical skills in ORACLE? If students can learn software on their own then instructor can concentrate on other important topics. The following hypotheses were developed:

H1: Students who had prior knowledge of ACCESS software package will do better in the course.

Selection of learning objectives

Though there are many learning objectives (LO) for the database course, we will concentrate on the following:

Upon completing this course students will be able to:

1. Implement database systems into database software.

In this LO, students should be aware of syntax and programming of the software used. This relates to "Knowledge" and "Application" category of Bloom's taxonomy (Bloom, 1956). Our assessment of student learning will focus on database syntax knowledge and application portability.

Selection of assessment approaches

Typically, there are several aspects of software competency – a) software accessibility b)

understanding the syntax, c) correcting "bugs" and d) developing applications

Software Accessibility
Implies ease with which students can access the software remotely. Ftp related instructions are provided.

Understanding the syntax
Software have their own syntax and ORACLE is no exception. ORACLE has its own syntax that is used in creating tables, writing queries in SQL etc. It relates to student's understanding of syntax.

Correcting "bugs"
Removing errors. Making sure that SQL statements are correct. This relates to understanding of "logic" of SQL

Developing complete programs
Developing complete solution to problems.

We will use the following measures for software portability:

- Questionnaires: at the beginning and end of the course to measure student's perception of their database software competency. A scale of 1-10 was used for this purpose.
- ORACLE assignments to measure software skill portability.

Assessment Phase

Thirty seven students in database class were surveyed at the beginning of the semester. The questionnaire was divided in several sections:

1. Demographic information
2. Familiarity with e-learning environment
3. Self-efficacy skills in the following areas
   i. Internet browsing
   ii. Spreadsheet analysis
   iii. File transfer protocols (FTP)
   iv. On-line accounting research databases
   v. Locating company financial statements on-line
   vi. Database competency and

For this experiment, we will only look at database competency to study skill portability.

Collect data

Students' Backgrounds

Students were given 2% of their grade for completing the questionnaire at the beginning and ending of the semester. Table 2 summarizes student's perception of database proficiency.

Table 2 (a) Database Competency

A_db_create

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	5.4	5.7	5.7
	2	3	8.1	8.6	14.3
	3	5	13.5	14.3	28.6
	4	3	8.1	8.6	37.1
	4.5	1	2.7	2.9	40.0
	5	5	13.5	14.3	54.3
	6	6	16.2	17.1	71.4
	7	2	5.4	5.7	77.1
	8	5	13.5	14.3	91.4
	9	3	8.1	8.6	100.0
	Total	35	94.6	100.0	
Missing	System	2	5.4		
Total		37	100.0		

Table 2 (b) Database competency summary

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
A_db_create	35	1	9	5.19	2.352
Valid N (listwise)	35				

Table 2(a) and 2(b) reveal interesting statistics, almost 50% students perceived themselves having "good" knowledge of ACCESS database. This would imply that almost half the class should have some table, querying and report building capabilities.

Test of Hypothesis

Three home works that have following requirements were used for this experiment:

- Access ORACLE software remotely
- Create table(s)
- Load data
- Answer queries

Students were provided handouts that described how to access ORACLE remotely and a sample database example was provided. SPSS software package was used to test the hypothesis. Table 3 summarizes the results.

Table 3: Software portability

Group Statistics

	A_db_create	N	Mean	Std. Deviation	Std. Error Mean
final	>= 5	20	82.2296	7.49611	1.67618
	< 5	12	63.8451	31.31699	9.04044

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
final	21.178	.000	2.533	30	.017

Table 3 clearly shows that students that have average skills(>=5) in ACCESS do perform better in the database class than students that have less ACCESS skills. This would imply students can translate some skills from one software to another without instructor's intervention.

DISCUSSION AND CONCLUSIONS

The results presented above are encouraging for instructors and has implication for counselors. For student counselors it would imply encouraging students to have some database software competency

before enrolling in the database course. One of the student's complaint is the rigor of the course, and many students can not keep pace with it. It may also mean officially revising pre requisites for the database course by *requiring* some database competency before allowing students to enroll in the course. For instructors this would imply, they can concentrate on pedagogical issues of the course instead of spending too much time teaching the syntax of the software.

Results of this experiment must be interpreted with caution since they are based on one semester study. Our experiment needs validation. We intend to repeat this experiment in future semesters to validate our results.

REFERENCE

Bloom B. S. (1956). Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain. New York: David McKay Co Inc

Garen, Ken (2007), Software Portability Weighting Options, making choices, The CPA Journal, available at: http://www.nysscpa.org/cpajournal/2007/1107/perspectives/p10.htm

Stern, Tom (2008), The Skills Portability Factor, available at:
http://www.fastcompany.com/articles/2008/08/tom-stern-skill-portability.html

INCORPORATING INTANGIBLE BENEFITS INTO A MORE HOLISTIC DSS APPLICATION DEVELOPMENT PROCESS

Robert D. Spillman, Radford University, rspillma@radford.edu
Nozar Hashemzadeh, Radford University, nhashemz@radford.edu

ABSTRACT

The focus of this paper is to provide supporting evidence that a Personalized Decision Support System (PDSS) can serve as an outlet for creativity and professional advancement by student software writers and developers. We envision that such a system promotes students' self-esteem and enhances the quality of outreach programs encouraged by many universities. Our findings demonstrate that students who have a passion to incorporate real world applications to address real problems tend to have greater appreciation of self worth and self image. This is because they feel that they are sharing their knowledge, skills, and time with their immediate community and giving something back. The presenters will demonstrate two examples of such projects.

INTRODUCTION

The focus of this paper is to provide supporting evidence that a Personalized Decision Support System (PDSS) can serve as an outlet for creativity and professional advancement by student software writers and developers. We envision that such a system promotes students' self-esteem and enhances the quality of outreach programs encouraged by many universities. By providing intangible benefits and values, a PDSS can be an important motivating factor for job success and satisfaction and does serve as a catalyst for broadening social skills that students need to have a happy and fulfilling life.

BACKGROUND

After several decades of teaching decision support systems and expert systems (DSS/ES) and a variety of economics classes, we have observed that many students who take these courses are unlikely to discover their full academic and personal potentials through working on *just* "impersonal" projects which are detached from their family background, social mores and personal convictions. In addressing some of the shortcomings of conventional pedagogy, we strive to assign projects that would enable student opportunity and the autonomy to accomplish their goals and provide tangible support to their clientele so that they may be able to draw some satisfaction and a sense of accomplishment from the end results.

In preparing the groundwork for the term projects, we interview students to explore their desire to engage in projects that are self-enhancing and compatible with their backgrounds, career goals and personal aspirations. Students may work individually or in groups of no more than two. The instructor meets with each individual or group several times a semester to further conduct a "discovery" or "interest session" dialog. The purpose of such meetings is to explore and clarify new ideas or reveal new areas of research

in an effort to identify more relevant application projects and implications for self-enhancement. Generally speaking, these meeting are referred to as "counseling/getting to know/exploration of ideas/exploration of interest" discourses. As we go through this discovery phase many students express ideas, interests or concerns that have not been examined in other classes. Ordinarily, most students' projects tend to focus around typical applications which are geared to business needs and applications. What is germane to our approach is to show how students can incorporate their personal traits and social values into a project and how the application of such a project contributes to the fulfillment of the developer's notion of self worth and self actualization. In addition, we seek to clarify how such projects may augment their interest in the IT or economics field.

Balancing Competing Goals

Like others, we have discovered that many of our students have had difficulty in striking a sound balance among their competing goals and needs. Such imbalances, according to widely known research, are a major source of personal stress, poor health and possibly job failure. One of our paramount objectives in assigning custom-made projects is to empower students to identify and prioritize their goals in life, school, and work environment by formally integrating these goals in their projects. Specifically, we work with the student to explore the following intangibles:

> Why have you chosen this field?
> What do you hope to accomplish?
> Where do you see yourself after graduation?
> Where do you see yourself in 5 or ten years?
> What is the perfect fit for you in the IT world?
> What knowledge and skills would you like to exploit that would allow you to become more of the individual you would like to be?
> Do you achieve personal satisfaction from sharing your knowledge and skills with others or groups?

The Relevance of Rational Choice Theory

Most importantly, we explore the extent to which the theory of Rational Choice (i.e. comparing costs and benefits of one's action) are applicable to a college course setting. Since this theory rests on unambiguous calculations of the monetary rewards and costs of an activity and is casted predominately in the context of a quantifiable model, it does not address the intangible benefits that could emanate from the development and implementation of a PDSS project. In the discipline of economics, where the theory of rational choice has been developed and refined, intangible benefits have been described and analyzed in many ways. Generally, economists refer to intangible benefits as positive externalities which are present in many phases of human activity. To illustrate, when the consumption or production activities of an economic agent generates benefits over and above its private costs, it is referred to as "positive externality". In these circumstances, the activity in question is "under-supplied" and ought to be subsidized so that it reaches a greater number of consumers and or producers. The classical example given to illustrate positive externality is the pollination of plants and fruit trees that occur in spring time by honey-bees who are just doing their assigned chores—i.e. collect pollen for the hive. Yet, many farmers, growers and consumers benefit from the activity of this ordinary creature.

Below we describe the development process for two nontraditional PDSS applications carried out by students from a DSS/ES class. In both instances, meetings were conducted with the developers/students to discuss and discover areas of interest. We sought to identify areas about which they had passion but may not have had the opportunity to address in earlier studies.

The first example describes the application of a PDSS project designed to assist members of a local church to discover how they could raise their sense of self worth and belonging in their church community. The application provided members a way to engage in "soul searching" by identifying tasks within areas that would give them new channels to give back to the church and community beyond their customary monetary or material contributions. The second project describes an application tailored to assist elderly individuals in determining their eligibility for residency in a subsidized low income assisted living facility.

Project 1: Ministry Giving

After meeting with the developer/student to determine the direction of his project we realized that he had more of a desire to address issues that went beyond the requirements described in a typical DSS project. The developer expressly wanted to give back to the community and more specifically to his community based church. He was actively involved in church and wanted to create a DSS project that would allow church members some mechanism for identifying areas and tasks they could pursue to help their church community and be able to identify those areas and tasks without the influence of peer pressure.

With an active membership of 300 who regularly attended the Sunday services, the challenge was to create a user friendly "online instrument" that would be convenient to administer and evaluate in a timely fashion. The project also enabled the church staff to incorporate questions that would give them sufficient information to better align members' skills with ministry areas already in existence in the church. The application enabled members to complete it on their own time with results trickling down over the course of the week. Once all the tests were completed, the results were compiled into an administration module that showed who scored best in each of the areas which helped to discover "hidden" gifts of the membership.

The church he attended had just completed a series of study of self reflection based on materials and the book by Rick Warren, *The Purpose Driven Life*. The student drew some inspiration from the book and applied some of the suggestions and materials suggested by Mr. Warren. The developer believed that many parishioners possessed valuable personal qualities that could be identified and utilized to further the ideals of the church. Among others, this project provided many benefits such as:

- Provide nonintrusive means for members to identify tasks by conducting a self assessment with less emphasis on ones financial abilities.
- Provide a way for members to identify tasks within areas of outreach and ministry in which they could participate and feel comfortable in doing so.
- Identify areas of participation where people with similar interests could work together for common goals.
- Identify tasks in which members could participate that would enable them to feel more a part of the church community when giving back in ways they perceive to have value.
- Provide a channel for members to increase their perceived self worth by participating in communal activities.
- Present an even better image of the church in the community through member involvement.
- Increase total membership participation thereby allowing the parishioners to better identify with the church community.
- Provide new members an avenue through which they could identify ministry areas in which they could participate with members of similar interests.
- Provide a positive image for the university through community involvement.

The online instrument assessed 10 areas where one could discover their areas of interests based on responses to 40 questions. Respondents were asked to indicate their level of agreement with each of the questions using a five point scale ranging from 0 to 4 with 0 indicating "no interest at all" to a 4 denoting a "strong" level of interest. The instrument included such areas as: *teaching, mercy, giving, craftsmanship, music, administration, service, hospitality, leadership, and assisting others*. Upon the completion of the assessment, an overall score was assigned to each area with an operational definition of each specific area. The premise was that the higher the score the greater the likelihood of success by the respondent if he/she participated in that area. In addition, the instrument sought to identify existing tasks in which respondents could participate. For example, if one scored highest in the "teaching area", the DSS provided an operational definition of "teaching" as: the ability to apply a logical and systematic approach to Biblical study such that relevant information regarding the message of the ministry could be easily communicated to parishioners. Moreover, within the area of "teaching", the end user was provided the opportunity to choose from existing activities to participate. Such tasks included: "purpose driven life ministry" or the "children's church ministry". If the end user had an equally high score in another area, or another area ranked second such as "mercy", then the respondent could choose to be associated with the task of "celebrate recovery ministry". Obviously, there was substantial subjectivity in analyzing the results.

The application of the assessment was met with much success. There has been more involvement and participation by members and a greater willingness to become involved in church directed activities. In addition, the assessment allowed new members an outlet through which they could identify areas they could participate in with other members of similar interests.

Project 2: Qualifying Applicants for Residency in a Low Income Subsidized Assisted Living Facility

The second project was also completed as a senior level DSS semester project. The focus of the project was to provide a web based DSS to assist low income elderly persons or their care givers with a web site to determine whether or not they financially qualified for residency in a subsidized low income assisted living center.

There were other objectives to be realized as well. The assisted living center is a "for profit" institution and seeks to maintain the number of residents as close to capacity as possible. As one would expect, the developers included some marketing aspects in the application as a sales tool as per the request of the facility. As part of the development process, the developers visited the residency, took pictures, and interviewed staff and residents.

With those objectives in mind, the web site allowed prospective residents or their care givers to view the facility and complete a requirements eligibility test. Visual images of the facility provided prospective clients with a good overall view of the institution including amenities and sample room layouts as well as other features. The project provided other benefits such as:

- Provide a real world application through which the developers could provide assistance in meeting the needs of a particular population.
- Allow potential residents to get a first hand view of residency eligibility from the privacy of their current residence.
- Help elderly persons to feel comfortable in disclosing their current financial status to strangers in a confidential manner.
- Enable potential clients to disclose additional personal information from what they perceive to be their own private comfortable environment.
- Allow for follow up by staff to discuss concerns with potential clients.

- Give the institution a marketing tool.
- Provide information to care givers who are planning for extended care of loved ones.

This project was met with much success and is currently being used by the facility. The residency has reported a noted increase in inquiries about the facility and has had an increase in applications from qualified applicants. In addition, the developers are in the process of developing other such sites for similar institutions.

SUMMARY AND IMPLICATIONS

The purpose of this paper was to provide two examples of how intangible benefits can be incorporated into DSS projects. Students want to achieve results and be productive in their chosen areas of study. We believe incorporation of personal values and mores by the project developer provides a sense of ownership and greater involvement throughout the project development process. Students who create real world applications targeting real problems are more passionate about their projects and tend to have greater feelings of self worth and job satisfaction.

SELECTED REFERENCES

Balakrishnan, N., Render, B., & Stair, Jr., R. M. (2007) *Managerial Decision Modeling with Spreadsheets*. Upper Saddle River, NJ: Pearson Education, Inc.

Duggan, E. W., & Reichgelt, H. (2006). *Measuring Information Systems Delivery Quality*. Hershey, PA: Idea Group Pub.

Kavanagh, M. J., & Thite M. (2009). *Human Resource Information Systems: Basics, Applications, and Future Directions*. Los Angeles: Sage

Kros, J. R. (2008) *Spreadsheet Modeling for Business Decisions*. New York: McGraw-Hill.

Post, G. V., & Anderson, D. L. (2006). *Management Information Systems: Solving Business Problems with Information Technology (Fourth Ed.)*. New York: McGraw-Hill.

Rainer, Jr., R. K., Turban, E., & Potter, R. E. (2007). *Introduction to Information Systems: Supporting and Transforming Business*. Hoboken, NJ: John Wiley & Sons, Inc.

Turban, E., Aronson, J. E., Liang, T-P., & Sharda, R. (2007) *Decision Support and Business Intelligence Systems (Eighth Ed.)*. Upper Saddle-River, NJ. Pearson Education, Inc.

Turban, E., Leidner, D., McLean, E., & Wetherbe. J. (2008). *Information Technology for Management: Transforming Organizations in the Digital Economy (Sixth Ed.)*. Hoboken, NJ: John Wiley & Sons, Inc.

PRINCIPLES OF FINANCE: NO TEXT REQUIRED?

Michael D. Evans, Winthrop University, evansm@winthrop.edu

ABSTRACT

Corporate Finance is regarded by students as the most challenging course in the business core at Winthrop University. In earlier years, students demonstrated a willingness to accept this challenge. They typically came to class prepared, having read assigned materials and having made a concerted effort to solve assigned problems. More recently, the author has witnessed a decline in the amount of advance preparation. This trend, coupled with the escalating cost of textbooks, has led the author to consider teaching this class without a text. This paper examines the advantages and disadvantages of doing so and summarizes student feedback regarding the current text.

INTRODUCTION

The author has taught accounting and finance at Winthrop University for the previous nineteen years. During this tenure, FINC 311, Corporate Finance, has been the class students in the College of Business have viewed as the most difficult course in the business core. It is not uncommon for students to delay taking the course until their senior year even though tools and techniques learned in this class are utilized in other upper level business courses. Often, students take the course with the goal of getting by with a grade of C. It is not uncommon for students to take this course on a Satisfactory/Unsatisfactory basis. Unfortunately, a number of students believe that they won't need to know finance because their major is marketing or management. Clearly, we have some work to do to change this mindset.

We typically offer 4 or 5 sections of FINC 311 each semester. These sections are taught by 3 or more professors. It is our practice to reach a consensus regarding the text to be used. Each professor then structures his class as desired. There is a variety of styles among the finance faculty. Some utilize PowerPoint heavily. Others are "old school" and use chalk and the blackboard. Some faculty members give all multiple choice exams while others believe a mix of multiple choice and problems is a more appropriate assessment tool. Given these differences, students have the ability to do their homework in order to decide which section to sign up for. Clear patterns have emerged over the years. One can predict the order in which sections will fill up based on the assigned professor.

Over the years, it has been my goal to engage students in the classroom. Rather than lecture, I tend to ask questions and engage in a discussion. This approach worked well in the early years of my tenure. Students came to class having read assigned materials and having attempted assigned homework problems. Students were comfortable participating in class discussions and understood that responding to questions in class provided an opportunity to test themselves before taking the actual exam.

In more recent years, it appears that students have become more note takers. The prevailing attitude is, "Tell me what you want me to know and ask me exactly that on the exam". It is not uncommon for students to question the fairness of exam questions if modest changes are made on the exam to the wording of questions or problems previously covered.

OUR CURRENT TEXT

Our current text is <u>Foundations of Finance</u> by Keown [2]. This text was selected because it was viewed by the finance professors as being extremely student friendly. The text is well-organized and concepts are presented clearly. The objectives for each chapter are clearly stated. Key terms are highlighted in the margins. Examples are easy to follow. Check figures are provided for selected end-of-chapter problems. Detailed instructions for using the BA II Plus and HP 10b calculators to solve time value of money problems are provided. It should be noted that I strongly encourage all students to purchase the BA II Plus calculator. All problems are solved in class using this calculator. Accordingly, students learn the specific keystrokes for this calculator.

Over the years, I have relied less on the textbook during class. Discussions are often conducted without reference to the text. A robust set of lecture notes have been prepared and made available on my webpage. I also try to emphasize the practical aspects of finance by incorporating my experiences as a practicing CPA and Financial Planner over the past 26 years. The assigned text has largely been used as a source of homework and review problems.

I have questioned the effectiveness of assigning a text given the cost, limited reading on the part of students and limited use during class discussions. The Winthrop University Bookstore currently charges $158 for a new text and $118 for a used text. I found prices online ranging from $54 to $146.67. I also identified a website from which the text can be rented for the semester ($59.62). Clearly, students should consider alternatives to buying the text from our bookstore. Students must be careful when buying texts online, however. There have been a number of instances where the text is not delivered in a timely manner. In a few cases, I have loaned the text to a student to prepare for the first exam because the ordered textbook had not arrived. Some students have received an international version of the text. Typically, the content is similar, but there can be differences in homework problems.

Our current text contains 17 chapters. I typically cover 10 – 11 chapters in a semester. I was disappointed to learn that creating a custom text in which those chapters not covered are eliminated would not result in any significant cost savings.

ELIMINATE THE TEXT?

Clearly, textbooks are expensive and often contain far more material than we can cover in a semester. It is not uncommon for students to complain that the text wasn't used for a given class (i.e. they wasted their money). Some professors argue that we might be better off by eschewing a textbook [4]. It is noted that students often merely have the goal of earning a degree. Love of the subject matter may be lacking. Further, the textbook is viewed as a reference rather than a learning tool [3].

Corporate Finance is largely a problem solving course. If a text were not assigned, the professor would have to ensure that lecture notes were complete and clear. This should not pose a major challenge. Developing a problem set may be more problematic. Students should be given the opportunity to work a variety of problems for homework. Further, additional problems should be provided for test preparation. Solutions and/or check figures should be made available. Accordingly, there could be a significant upfront cost in time for the professor to move away from a text. This cost may be lessened by online tools made available by publishers. Pearson, the publisher of our text, offers a package called MyFinanceLab that may minimize or eliminate the need to create practice problem sets. Eliminating a text will likely require increased webpage content and/or more class handouts.

It is suggested that professors who decide to give up the textbook do so slowly by developing their own curriculum unit by unit or lesson by lesson. Specific tips are provided on how to wean from the text [1]. These include:

- Read widely
- Plan and prioritize
- Borrow and adapt others' curriculum
- Customize homework

My initial thought was to make the textbook optional for the Spring 2010 semester. This would provide time for the preparation of additional web content. Potential benefits include:

- Cost savings for students
- Freeing up money for students to purchase the required calculator in a timely manner
- Placing a higher premium on attending class and being an active participant

Ultimately, my decision will be based on written feedback received from students on the class evaluation form.

STUDENT FEEDBACK

Typically, I have 25 – 40 students in my FINC 311 class each semester. Each student has the opportunity to complete a course evaluation at the end of each semester. The evaluation instrument contains questions that students provide an answer ranging from strongly agree to strongly disagree. There are also open ended questions where students can write whatever they choose. One of the open ended questions is "What is your opinion of the textbook(s) used in this course?"

I reviewed student responses to this question for each semester for the prior three years. Unfortunately, responses tended to be very short. It was not uncommon for students to simply respond that the textbook was "good" or "helpful". There were a number of comments that the textbook was needed in order to be successful in the class. Some students commented that the book was easy to read and understand. Similar comments were reported by my colleagues. It was noted that students in my class must work a variety of problems to ensure they understand the concepts in order to be successful on exams. Memorization of assigned homework problems does not work.

I only saw one negative comment in which the student said that the textbook was awful. No specifics were provided for this assessment. However, it was clear that the student did not expect to receive the desired grade for the course.

Quite candidly, the comments regarding the text were more favorable than I anticipated. There was no mention of cost.

CONCLUSION

There is no question that the escalating cost of textbooks coupled with current student behavior begs the question whether a textbook should be assigned in a given class. Clearly, there are benefits to assigning a text in a problem solving class.

- Clear discussion of the concepts
- Step-by-step solutions to examples in the chapter
- Homework and review problems with check figures
- Detailed instructions on the use of a financial function calculator

Nonetheless, one must consider the cost/benefit ratio for the students and the professor. Fortunately, students have become savvy and are able to find textbooks at substantially lower prices than those charged by the bookstore. The practice of renting a text will likely gather steam. Feedback to our current text was universally positive. It was expected that feedback would be more mixed.

I expect that I will continue to assign the textbook. I do plan to refer to it more in class discussions and to work problems in class that have not been assigned for homework.

REFERENCES

[1] butterfi. "How To: Toss the Text." www.edutopia.org, 2005.
[2] Keown, A.J., Martin, J. D. and Scott, Jr. D. S. *Foundations of Finance*, 6th Edition, Pearson, 2007.
[3] Klymkowsky, M. W. "Teaching without a Textbook: Strategies to Focus Learning on Fundamental Concepts and Scientific Process, " www.lifescied.org/cgi/content/full/6/3/190.
[4] Weir, R. "Teaching Without Textbooks,"
www.insidehighered.com/layout/set/print/views/2007/03/06/weir.

Jerry Neal
University of Central Missouri

Dennis Ehlert
University of Central Missouri

ABSTRACT

The purpose of the present study was to examine the challenges that charter school administrators in one state experienced in their workings with special needs students, and provide some insight into similar challenges that might occur when establishing special education programs in these innovative settings. Recommendations are offered to provide guidance to administrators who may find themselves in charge of start-up charter schools and who may not have expertise with special education program issues.

Since the first charter school opened in Minnesota in 1991, there has been an explosion in the number of these types of "alternative" educational facilities in the United States. According to the Center for Education Reform, as of fall 2005, there were approximately 3,600 charter schools educating upwards of 1 million students (Center for Education Reform, 2005). Charter schools are public schools that are operated under a contract or "charter" between the school and a "sponsor" which is typically a university, or in some cases, individual citizens or other institutions such as a public school district or civic group. The reasons that charter schools are initially organized are as varied as the types of schools that are now in existence. In many instances, groups of parents have felt disenfranchised by school administrators or feel that the local schools and their state-mandated curricula are doing an inadequate job in providing meaningful educational experiences to children. Other reasons often cited for the establishment of a charter school include that the parents or interested parties want to realize a vision for the school, to gain autonomy over the control of myriad educational issues, to serve a "special" population of students, financial reasons, and, in some cases, to simply increase the likelihood of parental involvement in school matters (U.S. Department of Education, 2001).

Charter schools are in essence experiments that have grown out of what has come to be known as the Educational Reform Movement. Over a decade ago, Hassel (1999) observed that the proliferation of charter school has resulted from, and is the apex of, several noted trends in the school reform literature. These include the push for school choice, sometimes referred to as the "voucher movement"; the idea of competition between schools, thus breaking a school district's monopoly over who can provide the better education; school-based management or decentralizing control of schools and thereby giving more decision-making power to those closest to the classroom; deregulation, which would free schools from adhering to many of the rules and regulations that often constrain educators in how they conduct day-to-day business; and finally, accountability for results by setting high academic standards and imposing consequences for failing to meet these expectations (pp 4-5). But while charter schools have held promise for establishing autonomy and providing students with an education that might be seen as innovative, state and federal laws have not allowed them to circumvent existing mandates to provide students with disabilities a free appropriate public education (FAPE) in the least restrictive environment. Under federal laws, including Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act, and the Individuals with Disabilities Education Act (IDEA), charter schools may not exclude children with disabilities from attending a charter school and are required to provide these children with an education in the same manner as would be expected of a traditional public school.

Relatively little research exists on the extent to which charter schools are fulfilling their mandate to provide FAPE to students with disabilities attending charter schools. The literature that does exist in this area has not provided clear trends, and perhaps has provided ambiguous results, as to how charter schools provide for the educational needs of students with disabilities. For example, several studies have noted that special education students are often not admitted to some charter schools because they do not meet certain vague and perhaps seemingly arbitrary admission standards. Those students that are admitted may be "counseled out" or simply do not re-enroll because they "do not fit" the mission of the school (McKinney, 1996; Ramanathan, & Zollers, 1999; Watkins, 1999). Walsh (2001) noted that in one instance the San Francisco, California, Board of Education sought to terminate its contract with a for-profit management group that operated charter schools because of, among other things, allegations that the management company tried to limit the number of special needs students because they are costly to educate and would cut into the profits made by the company.

Failure to admit students with disabilities to charter schools is but one of many discouraging trends in the available literature. Many charter schools do not occupy what might be considered "traditional" school building facilities. Often purchasing or leasing whatever facilities and equipment that are available in order to get started, charter school boards have used buildings such as community centers, vacant warehouses, and even old service station garages to conduct classes. Many of these facilities are not designed to be "school buildings." Some charter schools have been found to be in direct violation of city occupancy codes and many often do not meet even the most basic requirements for accessibility under the Americans with Disabilities Act (Creno, 1998; Fiore & Cashman, 1999). Other problems noted include lack of psychologists and certificated special education staff; failure to implement existing IEPs or develop new ones; failure to design programs or services to meet individual needs thus taking a "one size fits all" approach; failure to provide parents with due process procedures or procedural safeguards; failure to follow laws when imposing discipline such as suspensions to students with disabilities, and; general building code violations (Fiore & Cashman, 1999; McLaughlin, 1996; National Education Association, 1998; Zollers & Ramanathan, 1998).

While there are numerous examples of charter schools not adequately meeting the needs of students with disabilities, there is also evidence that some charter schools are doing at least an acceptable job of educating children and youth with disabilities. Fiore and Cashman (1999) as well as others (Lange & Lehr, 2000; McLaughlin & Henderson, 1998; Rhim & McLaughlin, 2000; Zigmond, 1999) have found that students with disabilities fare as well in charter schools, academically and socially, as they would in traditional public schools.

Zigmond (1999) has been particularly vocal in her criticism of attacks on charter schools in the literature and has observed that charter schools may in fact be ahead of traditional public schools in implementing full inclusion for all students with disabilities. Lange and Lehr (2000) interviewed 600 parents of students with disabilities enrolled in charter schools in Minnesota. These parents reported that they were satisfied with the education that their special needs children had received and that they had sought out charter schools to serve their children because of the schools' smaller class sizes, close proximity to home, and a caring attitude on the part of the faculty and staff.

The most notable investigation to date of charter schools and their ability to serve the needs of exceptional children and youth was a national study spearheaded by Fiore (Fiore, Harwell, Blackorby, & Finnigan, 2000) and has provided a cross-section of what has transpired nationally in charter schools with respect to students with disabilities. While the study sample was somewhat limited in size (N=32 schools), the results present a concise depiction of charter schools in terms of their facilities, curriculum and instruction, staffing and leadership, students, and parental involvement. As in other studies focusing on charter schools and students with disabilities, mixed results are juxtaposed and few definitive

conclusions about the general success of charter schools in educating students with disabilities are apparent.

The purpose of the present study was to examine the challenges that charter school administrators in one state have experienced in meeting the needs of students with exceptionalities, and to provide some insight as to the challenges which might be expected when establishing special education programs in similar settings. As researchers continue to contribute to the professional dialogue in this area, patterns should emerge that will reveal to administrators and teachers in charter schools what truly is "best practice" in providing services to students with disabilities in alternative educational venues.

METHOD

Data Collection Instrument

      An interview protocol was developed for the study that was divided into four sections. The first section included items related to demographic features of the school and the population of special needs students in attendance. The second section sought to obtain information as to how services are provided to the schools' population of students with disabilities (ie., self-contained classrooms, regular classrooms, resource rooms, itinerant services). The third section required the participants to respond to open-ended questions and describe problems that they had experienced in providing Free Appropriate Public Education (FAPE) as required under federal law, particularly Public Law 107-15, the Individuals with Disabilities Education Act of 2004 (IDEIA). The last section asked the respondents to identify challenges they might expect to encounter in the next five years based upon what they had previously experienced, and learned, over the preceding two years. These final two sections were of the greatest interest for the present study as the authors were attempting to discover what proved to be the most significant challenges for the administrators as they provided FAPE to the students with special needs in an alternative setting.

Subjects and Setting

      The subjects for the study included the building administrators for 16 of the 21 charter schools in the state of Missouri. Three of the charter schools in the Kansas City area that are operated by for-profit corporations declined to participate. Two other schools did not return requests for their participation in the study. Missouri's Charter School legislation allows for charter schools to exist only in the metropolitan areas of Kansas City and St. Louis. Kansas City has a total of 17 schools, while St. Louis has only 4. Three of the charter schools in the St. Louis area are operated by a for-profit corporation. Two of these schools are located in large buildings that had once been owned by the federal government as part of the General Accounting Office. The third is located on the grounds of a former state-run facility for people with developmental disabilities. The fourth charter school in St. Louis is located in a renovated former business near the central part of the city and is operated by a board that has no ties to for-profit educational companies. Most of the charter schools in the Kansas City area are located in buildings that were at one time owned by the Kansas City, Missouri, Public School District or by parochial schools and churches. Five of the Kansas City charter schools are operated by two separate for-profit corporations. The children who attend the charter schools in both Kansas City and St. Louis are predominantly minority students (85.8%) and based upon free and reduced lunch figures, most (75%) are from economically disadvantaged neighborhoods and families.

Design and Procedure

Semi-structured interviews were used to gather information pertaining to how the charter schools served the population of special needs children that attended their schools, what obstacles had been encountered in establishing special education programs, and what the administrators perceived as challenges to providing continued services in the near future. Data were collected for the study via face-to-face interviews with the principals of the charter schools. All meetings were tape recorded in order to clarify any responses and to facilitate the flow of discussion during the interview encounters. Interviews took place during the spring of 2001 and were conducted in the administrators' offices located in the charter schools. All interview questions were read to the subjects and answers were recorded verbatim by one or more of the investigators. In some instances, other school personnel such as special educators or clerical staff were present during the interviews. The investigators were aware of the need to be accurate in their interpretations of the responses and continually checked for accuracy by engaging the participants in active feedback and corroborated any interpretations of the information during the interview process.

Data Analysis

The data obtained from the interviews were analyzed over a three-month period following the last interview in early June 2001. The researchers jointly reviewed the tapes of the interviews while examining their hand-written notes in order to arrive at consensus as to what the participant meant and to construct distinct categories as patterns of responses became readily apparent. Due to the small number of participants in this investigation and the types of questions asked, the authors realized pre-hoc that formal quantitative statistics could not be used to convey the obtained results in a meaningful manner. As such, it was decided that only qualitative data analysis should be used to discuss results. This approach is warranted when the data generated requires sensitivity to detail and context, accurate access to information, and ways of rigorously exploring themes and discovering patterns that may not be readily testable with quantitative statistical methods.

RESULTS

Student enrollment in the charter schools studied ranged from 83 students in the smallest school to 575 students in the largest. All of the charter schools studied accepted students with disabilities that were eligible for special education and related services under the Individuals with Disabilities Education Act (IDEA). The number of students with disabilities served in the charter schools ranged from one student to fifty-six students. There was an overall prevalence rate of 7.2% of the schools' total student populations that received special education and related services. This is well below the national prevalence rate of between 12-14% for all students with disabilities in all educational placements (U.S. Department of Education, 2000). Table 1 compares the prevalence rates of the special education population in the charter schools that were investigated to the national prevalence rates.

Table 1.

Comparison of Prevalence Rates of Students in Charter School
Special Education Categories to National Prevalence Rates

Category	Charter School (# of Students)	Percent of Charter School Popula-tion*		**National Average (Percent of total public school population)
LD	161	3.7		5.5
Speech or Language	71	1.6		5.0
MR	40	1.0		1.4
BD / ED	23	.5		0.8
Others	19	.4		1.8
Total SPED	314	7.2%		14.5

*Total student population in charter schools = 4,389
** SOURCE: Elementary and Secondary School Compliance Reports. U.S. Department of Education, Office of Civil Rights (1999). Washington, DC: Author.

When the total number of students with disabilities in the charter schools included in this study is disaggregated by categories of exceptionality, the figures closely approximate the numbers that are found for all public schools nationally. Table 2 presents this information.

TABLE 2

Comparison of
Categories of IDEA Students Served in Charter Schools
With National Average

Category	Charter School (# of IDEA Students)	Charter School (% of IDEA) n = 314		National Average* (% of total IDEA Students in all Categories)
LD	161	51%		51.0%
Speech /lang.	71	23%		19.4%
MR	40	13%		11.0%
BD / ED	23	7%		8.4%
Others	19	6%		10.2%
Total SPED	314	100%		100%

*SOURCE: To Assure the Free Appropriate Public Education of All Children with Disabilities: The Twenty-Second Annual Report to Congress on the Implementation of the Individuals with Disabilities Act. U.S. Department of Education (2000). Washington, DC: Author.

Service Delivery

The service delivery option employed most frequently by the charter schools in the study was "regular classroom with supplemental aides and services." Forty-three percent of the administrators indicated that the regular classroom was the most appropriate for the "types of children that are present" in the charter schools. Other options included Resource Room (28%), Self-Contained (7%), and Itinerant (3%). According to the respondents, 5% of students were served in classrooms in which no supplemental aides or services were being offered to meet the students' needs. Common statements noted several times by the investigators involved the justification for the extensive use of the regular classroom as the chief service delivery option. Comments such as "Inclusion was the option that we selected to use simply because it is the correct thing to do" and "All children should be given the opportunity to be with their peers without singling them out for additional instruction outside of the classroom" were heard repeatedly in the schools that were visited. In some instances, it became almost a mantra or rationalization for choosing inclusive education as the delivery option of choice. One respondent replied:

> We have selected to serve our special students in the regular classroom for a number of reasons, the first of which being it is the law. The second reason is that we are providing quality education to *all* [italics added] of our students and our teachers are able to meet the needs of these children without subjecting them to removal from the classroom. And finally, these students will be tested on the state test and they need to be in the classroom that teaches them the material that will be on the tests.

The fact that many of the schools investigated had only a very small number of special educators on staff to meet the needs of rather large numbers of children in some instances was seldom mentioned by the administrators. Special educators were rationed out among the regular classes to see to the needs of a very diverse, and sometimes large, caseload of students. Additionally, it seemed as if some of these administrators had been led to believe that the only service delivery option available to them was full inclusion, when in fact, a full continuum of options was available if the human and fiscal resources were there to allow those options to exist. It perhaps was viewed by some of the administrators as more monetarily and administratively expedient to serve students with exceptional needs in the one placement option that appeared to be both socially palatable and economically more efficient.

Start-Up Challenges

The interviewers posed the following statement to the administrators in the study: "Describe the three greatest challenges that your school has encountered in providing services to children with special needs." The responses to this statement, with only slight variation, fell into four distinct categories. These categories, those for which more than half of the respondents identified as presenting difficulties in establishing their programs, included Time/Paperwork, Employing Certificated Faculty, Resources (money, space, materials), and Provision of a Full Continuum of Services. These issues are discussed further.

Time and Paperwork.

Of all of the hurdles that the charter school administrators encountered when providing services to special needs students, none was cited more often than the burden of state/federal paperwork and the time needed to see that all programs were in place and in compliance. Two examples from opposite sides of the state express the general sentiment of the entire group of respondents interviewed:

> The greatest challenge was just getting started. Having to find out everything, having to create the *whole* [italics added] program. Finding out who I needed, what I needed. The sheer number of

hours involved. It was just overwhelming. I have a background in special education, but to try to do it all, everything; I just felt so inadequate. It all got done, but I had to relearn everything I knew about special education.

Another administrator noted:

Paperwork! Like everyone else. We try to do as little of it as we can. I think that, in a lot of cases, it is simply an understanding of children with special needs. My teachers are not having a problem with special needs children. They understand that the very *mission* [italics added] of this school is to take children who, for whatever reason, are at risk of failing in regular "public" education, and get them ready to succeed in high school. We have children here who basically did not even go to school in the last year and now they *want* [italics added] to come to school. But spending time on paperwork instead of time teaching these kids is just plain ridiculous! We do as little as possible and enough to get by.

Employing Certificated Faculty.

There is a shortage of certificated special education teachers nation-wide. This has been a recognized problem for a number of years, and it was being keenly felt by the administrators of the charter schools in this study. Teacher burnout, attrition, the heavy caseloads associated with teaching in the special education field, paperwork, and long hours contribute to the problem of finding certificated special education teachers. Those that are available are often drawn to schools that offer greater monetary inducements and job security, both of which are sometimes absent in charter schools. Charter schools must often operate on a limited budget, and because all charter schools in this state are subject to the scrutiny of sponsors who demand accountability for achievement and fiduciary integrity, there may be a general reluctance on the part of the some qualified special educators to abandon established public school positions and venture into the uncharted waters of educational experiments embodied by charter schools. Thirteen of the sixteen school administrators involved in the study indicated that they had experienced difficulties in locating and hiring qualified professionals to fill the positions in their special education programs. This was particularly acute in those specialized related service areas such as speech and language therapists, and educational diagnosticians. In most instances, these services were provided by contractual arrangements with public school personnel or through private centers that offer these services. According to one administrator:

Speech therapists? Where can I find one? I have several students now that need therapy and we can't provide it because we can't find one to provide the service. If we contact the (public) schools to help, they just say that they are looking for speech therapists too! I have three or four kids right now that you cannot understand because their speech is poor, and I am at a loss as to what to do. It's sad.

Several administrators, who had similar problems in finding special educators, often resorted to extraordinary measures to address their needs. Typical responses included:

We had to have some of our "regular" educators go back to school to get certificated provisionally so that they could teach these students in their regular classes.

Another responded:

The (local) university had a program (in collaboration with the state department of education) where we could have student teachers in special education teach our special students with

supervision from a master teacher. It worked out well. They gained experience and we got a good, enthusiastic teacher at a really low cost.

Another administrator summed up the situation for many charter schools in need of special education professionals:

We canvassed the area teacher education programs, looking for those students that would graduate soon and would be willing to come to our school. We networked. We were competing for a limited commodity. We made do. We are still looking for people who know what they are doing and will be with us in the future. It is just hard attracting good quality people when they are in such demand all over.

Resources.

A third recurring theme that was heard from the respondents was that of a lack of resources, including physical space for classrooms, monies for programs and activities, and a general lack of available materials designed for special needs populations. These challenges are, by no means, unique to charter schools. However, when considering the relatively small numbers of students requiring special services in the schools under investigation, and hence, the reduced amount of federal and state funding that follows these students, it was no surprise that there would be shortages of available dollars for materials, equipment, and other necessities that are typically found in larger public special education programs. This is perhaps another reason why many of the charter schools studied have opted for a more "inclusionary" service delivery model. This arrangement allows for students with disabilities to be educated in the least restrictive of all environments (the regular classroom) and yet still have access to the requisite materials, activities, and curricula specified by their particular Individualized Education Programs (IEPs).

Charter school facilities, in many instances, are not what some may consider typical "school buildings." Many schools in this study were, indeed, spacious, well-appointed facilities that one would associate with a "school." In other instances, the school was essentially a "store front" that had been acquired and utilized until a larger, more traditional, facility could be obtained. In one instance, two charter schools, operated by the same for-profit charter school management company, occupied the same building. That facility was exceptionally well-appointed and would be considered palatial by school administrators in many sectors of the state.

A major concern for any charter school in its inception stages is that of selecting a site that is physically accessible to students and staff. When questioned about the availability of "pull-out programs" in her school, one administrator replied:

If I pull out this student (one who had physical disabilities) for services from a regular classroom, where do I pull her out to? There are no other classrooms on the ground floor, and that means we would have to go up (stairs). But there are no elevators. Pull-out is out of the question. We bring the services to the student in the regular classroom.

Providing a Full Continuum of Services.

Shortages of qualified staff and limited resources combine to make the provision of a full continuum of services a challenge to many of the charter schools in this study. Of particular concern was the provision of services for students who had been identified as "behaviorally disordered." Many of the participants stated that they could not find teachers certificated in this categorical area, and when they did locate them, those teachers were also responsible for children who had a variety of other disorders such as learning disabilities and mild mental retardation. Consequently, the participants were greatly concerned that they

were not adequately providing the kinds of services (ie. counseling, behavior supports) that many of these children needed. As one administrator described:

> The kids that came to us from some of the public schools had behavior problems that were tremendous challenges. The parents had enrolled them, hoping that our school would be a more therapeutic environment than what they had been in, and we tried our best to meet their needs. In many cases we were successful, but in some...they need a self contained class to work on their social skills along with the academics. But we have to spread what we have around pretty thin, and that means that some of the (children's) needs may go unmet. That was the thing that was really unfortunate as we got this school going. We simply *have* [italics added] to do better in the future along these lines.

Another participant noted:

> We have to contract for so many of the services that we are required to offer these students. It would be wonderful to have them (the service providers) here on the school grounds all of the time, but just go and try to find a speech therapist that you can afford. We have one or two students that need PT (physical therapy) as well, but we can't justify that expense of hiring a PT person for so few kids with our board, and so we do the next best thing; we contract out for that service.

Future Challenges

The final section of the study dealt with issues that the charter school administrators viewed as being particularly challenging in the near future. The participants were asked to respond to the statement, "Please describe any major concerns that you anticipate for your special education program over the next 5 years." It was not surprising that the respondents in the study identified challenges for the future that were very similar to the challenges that they encountered in establishing their programs initially. The three greatest challenges identified by the participants included: (a) finding adequate numbers of teachers, paraprofessionals, and related service providers for their programs; (b) having the ability to offer a broader continuum of service delivery options to their students; and (c) finding all of the requisite resources (funding, space, securing records, time for paperwork) to allow the schools to provide services to children with exceptional learning needs. Nearly 80% of the school administrators interviewed remarked that hiring qualified special education personnel was a continuing problem and they saw no reason to believe that this situation was going to ease in the foreseeable future. This is not a difficulty that is unique to the charter schools; many public schools across the nation cannot hire qualified people to fill these positions. And as the population of special needs children steadily increases, there will be an increasing need to supply schools, all schools, with teachers who are properly trained and have a willingness to work with children that pose considerable learning and behavior challenges.

A number of study participants noted that having the ability to provide a broader continuum of service delivery options would be a considerable challenge in the years ahead. Much of this difficulty arises because the charter schools often find themselves in a position where they must contract off campus for specialized services such as counseling, speech-language services, and physical/occupational therapies. That difficulty is actually two-fold. First, with small numbers of children in the charter schools who require these specialized services, hiring personnel to work exclusively with so few children becomes cost prohibitive. Second, there are simply not enough of these highly-trained professionals to fill the existing needs of all schools. Along these same lines is the awareness on the part of many charter school administrators that some children with greater learning needs will require more intense, individualized instruction that may not be obtainable by using only one service delivery option such as the inclusion

model. In order to provide a greater array of services to children, the charter schools will have to access the resources, which are becoming increasingly scarce, to address these concerns.

A need for greater resources was the third most often mentioned as being a concern over the next five years. Space is at a premium in many of the schools visited, and as the schools' enrollments increase, the need for teaching space will continue to be a problem. Many of the charter schools in this investigation rented space, and in some instances, they had to share space with other "schools" or building tenets. Space costs money, and that is another resource that many charter schools lack. For educating students with exceptional learning needs, they must rely on the traditional funding mechanisms (exceptional pupil aid and entitlements) that follow the students from the public school (domicile district) to the charter school. The administrators were keenly aware that the monies they receive from the public schools are inadequate now and the prospects for additional funding in the years to come are rather bleak.

DISCUSSION

Since their inception, charter schools have become an increasingly prominent feature of America's educational landscape. Because they are so new, and because each is unique in its mission, they remain largely experimental. However, the challenges that have been experienced by charter schools as they attempt to educate children with exceptional learning needs are essentially the same as those faced by the public schools nationally. Teacher shortages, lack of time and resources, paperwork burdens, and other familiar themes were heard over and over again by the investigators during the course of the study. These are the same issues that have resounded in the special education literature for the past decade, and there appears to be neither abatement in the near future nor any immediate answers to these concerns. Many of the administrators involved in this study were clearly frustrated by federal and state requirements for the education of students with disabilities. In some instances, a clear lack of knowledge of the special education laws and operating procedures was readily apparent. These administrators were, in most instances, struggling with just getting the schools in an operational mode, and were largely concerned with providing a good education for the whole student population. In some instances it was as if providing for the needs of students with disabilities was an afterthought. However, the administrators, in every instance, were zealously committed to the success of their respective schools, their students, and to adhering to the missions of those schools.

Based upon the results of this investigation, a number of recommendations are suggested for charter school administrators who must comply with federal and state laws pertaining to the provision of education for students with disabilities. First, and foremost, it is recommended that charter school administrators, or those responsible for the provision of a Free Appropriate Public Education (FAPE) to children and youth with special needs, seek assistance from their sponsoring agencies, nearby colleges and universities with teacher education programs, state departments of education, and other resources that can offer expertise and guidance in the initial phases of special education service delivery. These sources can provide valuable information related to the provision of FAPE, legal compliance issues, handling paperwork and data collection, obtaining funding, working effectively with parents and advocacy groups, and securing qualified teachers and paraprofessionals.

Second, in order to avoid many of the "start-up" difficulties experienced by those in the present study, the authors echo the admonitions of previous investigators (Blakemore, 1998; Lange, 1997) to: (a) consider as early as possible in the charter school's planning stages the current or potential needs of special education students (ie. physical access, related services personnel, behavioral intervention plans); (b) have in place an efficient method of student referral for unidentified, yet potentially eligible, students at risk for disabilities; and (c) work closely with special education professionals from "feeder schools" to obtain current Individualized Education Programs (IEPs) and other pertinent records of incoming students in order to be prepared to initiate appropriate services to students without delay.

Finally, charter schools, just as their traditional public school counterparts, should have in each building sufficient numbers of "qualified" special education professionals who have been trained in meeting the needs of children and youth with exceptional learning and behavior challenges. There has been a recent effort in Missouri, and in other areas of the nation, to address the significant shortage of teachers in several "critical areas" of public education. Among these efforts include programs that allow persons with any undergraduate degree (ie. mortuary science, electrical engineering, aviation) to be placed on a fast track to become teachers in public schools. Under these fast track plans, school districts can employ persons who desire to be teachers if they agree to certain conditions. Common among these conditions for temporary certification include earning a number of college hours for state certification in a selected area of training (including special education), being supervised by a college clinical supervision professional, and completing additional requirements (ie. portfolios, assessments such as PRAXIS) as specified by the particular state teacher certification authority. Some states' charter schools legislation allows for certain percentages of "non-certificated personnel" to be employed as teachers in those charter schools. It has been our experience that children with extraordinary learning and behavior problems are the ones that are the *most* in need of capable, qualified, certificated professionals who are well grounded in the legal and pedagogical nuances of meeting these children's unique learning needs. While we recognize the acute shortage of special education professionals in all public, private and alternative settings where special needs children are educated, it is imperative that these children's unique educational needs are placed above all other considerations. Providing unqualified, untrained, and ill-prepared instructors for special needs children is ill-conceived, imprudent, and perhaps illegal.

Charter schools remain largely experiments in American education. They will in all likelihood remain so until they can show that they are both accountable to state and federal mandates to serve the needs of all children in environments that are conducive to learning and abide by their missions of innovation and true alternatives to traditional public schools. Continued investigation into the operation of these schools appears warranted, particularly in light of new federal legislation such as the No Child Left Behind Act, and the reauthorization of the Individuals with Disabilities Education Act.

REFERENCES

Blakemore, C. (1998). *A public school of your own: Your guide to creating and running a charter school.* Golden, CO: Adams-Pomeroy.

Center for Education Reform. (2005). Charter school highlights and statistics. Retrieved April 1, 2007, from http://edreform.com/pubs/chglance.htm .

Cosmos, C. (2000). Promise and peril: A look at charter schools. *CEC Today, 7(3).*

Creno, C. (1998, June 25). Suit: Charter closed to boy with AIDS. *Arizona Republic.*

Fiori, T.A., & Cashman, E.R. (1999). *Review of charter school legislation provisions related to students with disabilities.* Research Triangle Institute, NC. ERIC Document Reproduction Service ED426511.

Fiore, T. A., Harwell, L.M., Blackorby, J., & Finnagan, K.S. (2000). *Charter schools and students with disabilities: A national study (Final Report).* Washington, DC: Office of Educational Research and Improvement, U.S. Department of Education.

Hassel, B.C.(1999). *The charter school challenge: Avoiding the pitfalls, fulfilling the promise.* Washington, DC: Brookings Institution Press.

Lange, C.M., & Lehr, C.A. (2000). Charter schools and students with disabilities: Parent perceptions of reasons for transfer and satisfaction with services. *Remedial and Special Education, 21*(3), 141-151.

Lange, C.M.(1997). *Charter schools and special education: A handbook.* Alexandria, VA: National
      Association of State Directors of Special Education.

McKinney, J.R. (1996). Charter schools: A new barrier for children with disabilities. *Educational
      Leadership, 54*(2), 22-25.

McLaughlin, M. (1996). *Charter schools and students with disabilities: Issue brief.* ERIC Document
      Reproduction Service ED401696.

McLaughlin, M.J.,& Henderson, K.(1998). Charter schools in Colorado and their responses to the
      education of students with disabilities. *Journal of Special Education, 32*(2), 99-107.

National Education Association (1998, April). *Charter schools: A look at accountability.* Author.
      Available On-Line http://www.nea.org/issues/charter/accnt98.html]

National Education Association (2003). *Charter schools.* Author. Available On-Line
      http:www.nea.org/issues/charter.

Ramanathan, A.K., & Zollers, N.J. (1999). For-profit schools continue to skimp on special education: A
      response to Naomi Zigmond. *Phi Delta Kappan, 81*(4)*,* 284-289.

Rhim, L. M., & McLaughlin, M.J. (2000). *Charter schools and special education: Balancing disparate
      visions. An investigation of charter schools and special education in fifteen states.* ERIC
      Document reproduction Service ED444297.

U.S. Department of Education, (2001). *The state of charter schools 2000.* Author: Available On-Line
      [http://www.ed.gov/pubs/charter4thyear/].

U.S. Department of Education (2000). *Twenty-second annual report to Congress. To assure the free
      appropriate public education for all children with disabilities. The twenty-second annual report
      to Congress on the implementation of the Individuals with Disabilities Education Act.*
      Washington, DC: Author.

Walsh, M. (2001, April 4). San Francisco moves to revoke Edison's contract. *Education Week on the
      Web.* Available On Line: [http://www.edweek.org/ew/ewstory.cfm/slug=29sf.h20].

Watkins, T. (1999). The charter challenge. *American School Board Journal, 186*(12), 34-36.

Zigmond, N. (1999). Special education revisited: A response to Zollers and Rananathan. *Phi Delta
      Kappan, 81*(3), 228-234.

Zollers, N.J., & Rananathan, A.K. (1998). For profit charter schools and students with disabilities: The
      sordid side of the business of schooling. *Phi delta Kappan, 8*(4),298.

A CASE STUDY OF STUDENT VIEWS OF AN ADULT-CENTERED PROGRAM BY SITE FOR A MULTI-SITE BUSINESS PROGRAM

Daryl Couch, Southern Wesleyan University, 907 Wesleyan Drive, Central, SC 29630
Jeffrey Moore, North Greenville University, 113 McBee Drive, Easley, SC 29640
Royce Caines, Southern Wesleyan University, 907 Wesleyan Drive, Central, SC 29630

ABSTRACT

Operating a college degree program at multiple sites offers many challenges. It is imperative that administrators continually review data to insure that programs offered are consistent in meeting student needs and providing quality consistency across all elements of the program(s) offered. This case study is an examination of one effort to collect data and implement statistical analysis to determine whether problem issues can be identified.

The results are useful in providing a framework by which an institution of higher learning can approach the issues of identifying concerns of students. The results can be useful to the individual institution but also provide a basis that others may wish to utilize for similar circumstances.

INTRODUCTION

The institution that is the subject of this case study operates with a main campus augmented by four regional learning centers that attract a significant number of students. At all five sites, the focus of educational services is directed towards adult students who are entering degree programs that range from the Associates degree to the Master's level graduate degrees. Other programs are offered; however, the focus of this case study is limited to the business programs.

This institution has been offering adult degree programs for over two decades. Programs have been revised over time as market conditions and internal resources have changed. Currently the programs operate with a mix of full-time and adjunct faculty members who are utilized to fulfill the mission of the institution.

In spring 2008, administrators of the business program decided to undertake a significant survey as one source of data to supplement course surveys and anecdotal information that is commonly collected in the program. Twelve hundred surveys were distributed with eight hundred twenty four completed and returned which provide the data for this analysis.

The collection of data and preparation of cross tabulation tables provided the raw data and allowed a general overview of responses. However, the authors of this study desired to use the data to make inferences that would identify issues that need to be addressed so the concept was to complete Chi-Square Tests of Independence to determine if statistically significant differences were being observed by site location and by program.

REVIEW OF RELATED LITERATURE

The authors of this paper found relatively limited literature on the subject of multi-campus delivery of educational services. Briscoe and de Oliver [1] provided a case study related to how a multiple campus

university affected the access to educational services for underprivileged. Their conclusions indicate that the underprivileged group is likely to receive different services at a branch campus. Dengerink [2] explored the structure of universities with multiple campuses. This non-empirical paper examines the organizational structure that affects both the overall university and local constitutencies.

METHODOLOGY

The surveys were distributed to classes in the program at all the sites. All responses were confidential and students were assured that individual forms would remain anonymous. Basic demographic information was collected that identified the degree program, the learning site attended, percent of the program completed, field of employment, and a few other items that were useful but would not identify the specific student. Participants were also afforded the opportunity to provide comments on any aspect of the program they desired and over 500 comments were received. All surveys were returned to the main campus site for tabulation and analysis.

 The survey itself focused on five main issues:

    (1) Faculty Effectiveness (16 questions)
    (2) Curriculum Effectiveness (16 questions)
    (3) Study Group Effectiveness (16 questions)
    (4) Satisfaction of students (7 questions)
    (5) Recommendations for Change (10 questions)

While the paper will be too long if all the responses to the survey are included, samples of the responses by location are shown below. The methodology for analysis will be used on all the data; however this paper will be limited to analyzing the results from a select number of questions.

RESULTS

An example of the responses received for one of the questions related to faculty effectiveness is shown below in Table 1.

Table 1. Faculty Effectiveness in Communicating Biblical Attitudes and Values, Response by Percent.

	Site 1	Site 2	Site 3	Site 4	Site 5	Overall
Not Effective	.9	1.4	.6	1.0	.5	.9
Not Very Effective	2.8	6.4	.6	.5	2.5	2.3
Somewhat Effective	10.2	21.3	18.8	19.7	10.5	16.3
Effective	43.5	39.0	44.2	40.4	41.5	41.6
Very Effective	42.6	31.9	35.7	38.5	45.0	39.0

    • Note column totals may not equal 100 due to rounding

Chi-Square statistic = .31.772
p-value = .011

As shown above, the Chi-Square statistic is significant at the .05 level of significance. This indicates that students at different locations perceive a significant difference in faculty effectiveness in communicating a significant core mission of the university. This analysis does not give enough detail to show why this difference is perceived; however, it is an indication that further analysis is needed.
An example of the responses received for one of the questions relating to curriculum effectiveness is shown below in Table 2. p-Value = .181

Given the lack of significance of the Chi-Square statistic, it appears that students do not perceive a difference in the inclusion of core mission attitudes and values in the curriculum therefore there is little basis to be concerned that curriculum (in this dimension) is perceived differently at the different locations. This is the expected outcome as the same written module is provided for each course no matter at which the course is offered,

Table 2. Effectiveness in Emphasis on Biblical Attitudes and Values in Curriculum by Location, Response by Percent.

	Site 1	Site 2	Site 3	Site 4	Site 5	Overall
Not Effective	4.6	7.1	4.7	2.4	5.1	4.6
Not Very Effective	5.6	14.3	5.4	8.7	8.6	8.6
Somewhat Effective	22.2	28.6	27.5	31.4	24.4	27.2
Effective	44.4	28.6	38.9	34.8	36.0	36.1
Very Effective	23.1	21.4	23.5	22.7	25.9	23.5

- Note column totals may not equal 100 due to rounding

Chi-Square Statistic = 20.940

A central feature of the academic services offered in this program is the role of the Study Group. Adult students are assigned to groups of three to five who work on group projects and provide support and encouragement to the members of the group. Each site has Academic support personnel who provide services to students in general and Study Groups in particular. An example of the responses received for one of the questions relating to Study Group Effectiveness is shown below in Table 3. The responses to this question are significant at the .10 level of significance. At this level of significance, there appears to be differences across locations for this important component of the programs.

Table 3. Effectiveness in Study Group Communication by Location, Response by Percent.

	Site 1	Site 2	Site 3	Site 4	Site 5	Overall
Not Effective	2.9	1.4	0.0	1.0	.5	1.0
Not Very Effective	2.9	4.2	5.4	1.0	3.2	3.2
Somewhat Effective	13.5	12.5	12.8	18.2	13.4	14.4
Effective	30.8	34.0	39.6	45.3	37.6	38.4
Very Effective	50.0	47.9	42.3	34.5	45.2	43.0

- Note column totals may not equal 100 due to rounding

Chi-Square statistic = 24.924
p-value = .071

An example of the responses received for one of the questions relating to overall student satisfaction is shown below in Table 4. The results from Table 4 below confirm anecdotal evidence that had been obtained by the university. As a result , plans were made to change one of the facilities that house the offerings at Site 3 and efforts have been made to improve Site 5.

Table 4.Satisfaction With The Condition of the Facility Location, Response by Percent.

	Site 1	Site 2	Site 3	Site 4	Site 5	Overall
Very Satisfied	44.0	27.2	14.3	26.1	19.9	24.9
Satisfied	47.7	46.3	26.6	53.6	42.2	43.7
Somewhat Satisfied	6.4	13.6	26.6	12.8	24.3	17.5
Somewhat Dissatisfied	.9	10.9	18.8	6.6	7.8	9.2
Dissatisfied	.9	2.0	13.6	.9	5.8	4.7

- Note column totals may not equal 100 due to rounding

Chi-Square Test statistic = 58.32
p-value = .000

An example of the responses received for one of the questions concerning program change is shown below in Table 5. Based on these responses, it appears there are no differences in student perceptions of being offered business elective courses online which the university has not done in the past.

Overall this is a very simplistic approach to identifying significant perception differences across locations where degree programs are offered. As an initial step, this survey and statistical analysis of the data allows the university to identify the most pressing needs that should be addressed. Further analysis of the data will allow a more complete view of what is happening at each site and will provide the basis for administrators to make strategic decisions based on data rather than relying on anecdotal information.

Table 5. Attitudes Towards Offering Business Elective Courses On-Line by Location, Response by Percent.

	Site 1	Site 2	Site 3	Site 4	Site 5	Overall
A Significant Improvement	49.1	62.2	60.0	57.1	60.4	58.3
Somewhat of An Improvement	23.6	21.0	24.7	20.0	19.3	21.3
No Real Change	10.4	7.0	7.3	9.5	7.9	8.4
A Negative Effect	.9	2.1	.7	2.4	1.5	1.6
No Opinion	16.0	7.7	7.3	11.0	10.9	10.4

Chi-Square Test Statistic = 9.9
p-value =.87

REFERENCES

[1] Briscoe, Feliccia M. and Miguel de Oliver (2006) "Access to Higher Education: A Conflict Between Landed Interests and Democratic Ideals", Education and Urban Society, Vol. 38:2, pp. 204-227.

[2] Dengerink, Harold A.(2001), Institutional Identity and Organizational Structure in Multi-Campus Universities", Metropolitan Universities: An International Forum, Vol. 12:2, pp. 20-29.

[3] Lebowitz, Gloria (1997), "Library Service to Distant Students: An Equity Issue," The Journal of Academic Librarianship, July 1997, pp. 303-308.

LINKING ACADEMIC EXCELLENCE, ASSESSMENT, AND ADMINISTRATION

Richard T. Symons, Ashland University, Dauch College of Business and Economics, 401 College Avenue, Ashland, OH 44805, (419)-289-5187, rsymons@ashland.edu

Raymond A. Jacobs, Ashland University, Dauch College of Business and Economics, 401 College Avenue, Ashland, OH 44805, (419)-289-5931, rjacobs@ashland.edu

ABSTRACT

This paper describes a practical application of a process that employs rubrics developed by the ACBSP as part of their Global Benchmarking Assessment Initiative as a tool to develop and assess the competencies of an existing business program, including the administrative protocol required to continuously improve the program.

IMPROVING A COMPETENCY-BASED MODEL FOR ASSESSMENT

Assessment his long been viewed as "another thing to do". This critical requirement for accreditation has not been well linked to the desire for teaching excellence. This presentation will describe a process that provides this link. In addition, this process enables higher learning order benchmarking and the ability to incorporate the process into the normal administrative activities.

Several years ago, the College of Business and Economics at Ashland University adopted a competency-based framework for its curriculum. The competencies were selected based on input and feedback collected from various stakeholders, including current and potential employers of our graduates. The four core competencies that all undergraduate Business and Economics majors should develop were identified as *professional competence, communication skills, integrity and accountability*, and *interpersonal competence*. Typically, each course supported the first of these competencies, *professional competence*, by helping students develop an understanding of the *specialized knowledge* area associated with the functional area of a business related to the course. Professional competence also is developed through the *diagnostic use of concepts*, which involves the application of theories and concepts to managerial problems and solutions. For example, this competency is developed in the Operations Management course when students learn to identify operations decision situations and apply the appropriate qualitative and quantitative methodologies to analyze the situation and then recommend a decision or solve the problem.

The second core competency, *communication skills*, also is present in every course offered in the College. For example, in many courses, verbal communication skills are reinforced as students ask questions and participate in class discussions. Skills in listening, an important component of effective communication, are developed as students listen to class discussion and lectures. Writing skills are developed as students complete a variety of written assignments, including essay questions on exams and research papers.   Students can receive feedback and assistance from student peer tutors in the College's Writing Fellows Center.

Although the first two competencies were relatively straightforward to assess, the others proved to be more problematic. In addition, a review of the literature indicated that other competencies, measured by

student learning outcomes, were identified as critical. These additional content areas were identified by ACBSP based on the applications for accreditation self studies for the period 2000 thru 2007, and a set of rubrics were designed for the assessment of each of these key content areas.

APPLYING RUBRICS FOR COMPETENCY ASSESSMENT

Although there is general agreement that the College of Business and Economics curriculum provides a set of courses that collectively supports and enhances each student's competencies in the selected areas, there remains a need to verify the level to which the students have improved their skills in these key areas. To this end, the College decided to adopt the set of student learning outcome rubrics associated with the critical competencies identified by ACBSP. As part of the Global Benchmarking Initiative, rubrics were developed and tested in the following seven areas:

1. Communications

2. Critical Thinking

3. Business Knowledge and Technical Skills

4. Leadership/Teamwork

5. Ethics

6. Analytical/Quantitative Skills

7. International and Global Perspective

These rubrics can be used for formative and summative periodic assessment of student learning outcomes within a college or program. In addition, they can be used to collect representative data across multiple institutions for benchmarking purposes, using the Global Benchmarking Initiative (GBI) database system developed by ACBSP and hosted by LiveText, Inc.

These assessment rubrics form a key part of an integrated, continuous improvement process that addresses stakeholder requirements, assesses competencies, assists in program refinement, and provides information for normal administrative activities. Implementation begins with a yearly satisfaction survey administered to undergraduate students immediately upon graduation and at three-year increments for nine years after graduation. An employer survey will be administered every other year. In addition, student learning outcomes are assessed yearly by a series of cascading matrices. These matrices relate institutional competencies to college competencies, college competencies to program competencies, and program competencies to student learning outcomes in individual courses.

PROGRAM ASSESSMENT PROCESS SUMMARY

The first step in this assessment process is to develop a matrix that maps the relationship between the institutional competencies and college competencies. For example

<table>
<tr><td rowspan="2" colspan="2"></td><td colspan="4">Institutional Competencies (Student Learning Outcomes)</td></tr>
<tr><td>Intellectual Growth</td><td>Preparation for Work</td><td>Global Responsibilities</td><td>…</td></tr>
<tr><td rowspan="4">Program Competencies</td><td>Communication</td><td></td><td>X</td><td></td><td></td></tr>
<tr><td>Critical Thinking</td><td>X</td><td>X</td><td>X</td><td></td></tr>
<tr><td>Business Knowledge and Technical Skills</td><td></td><td>X</td><td>X</td><td></td></tr>
<tr><td>…</td><td></td><td></td><td></td><td></td></tr>
</table>

Once this has been done, the college competencies can be assessed for formative purposes in required core courses. A major problem in the implementation of many assessment processes is that assessment is viewed as an additional activity, separate from the regular teaching activities. Embedding these assessments within existing courses overcomes this problem. An example of placement of assessments of the seven content areas into a set of core courses is given below. Note that the formative assessments for content area three are embedded into one or more required courses in each major or program, as determined by the appropriate department. In all seven content areas, the GBI rubrics should be used if participation in benchmarking is desired, however other rubrics and assessment instruments can be selected as desired.

<table>
<tr><td>Content Area</td><td>Core Course</td><td>Class Level</td><td>Assessment Evidence</td></tr>
<tr><td>1. Communications</td><td>MIS 221 Information Technology</td><td>FR/SO</td><td>MS Word Project</td></tr>
<tr><td>2. Critical Thinking</td><td>ECON 232 Microeconomics</td><td>FR/SO</td><td>essay on exam</td></tr>
<tr><td>3. Business Knowledge</td><td>various in each major (see below)</td><td>various</td><td>various methods (see below)</td></tr>
<tr><td>4. Leadership/Teamwork</td><td>MGT 240 Intro. to Management</td><td>FR/SO</td><td>paper/essay</td></tr>
<tr><td>5. Ethics</td><td>MGT 401 Business Law I</td><td>JR/SR</td><td>case analysis</td></tr>
<tr><td>6. Analytical/Quantitative</td><td>MGT 319 Operations Management</td><td>SO/JR</td><td>case analysis</td></tr>
<tr><td>7. International/Global</td><td>MKT 233 Principles of Marketing</td><td>FR/SO</td><td>case analysis</td></tr>
</table>

The next step in this process is to link college competencies to program competencies using the same process. Once this is completed, the final step is linking student learning outcomes in each course and/or activity to the program competencies. For example,

<table>
<tr><td rowspan="2" colspan="2"></td><td colspan="3">Program Competencies</td></tr>
<tr><td>Perform appropriate market research, define market segments, and describe critical market characteristics and trends.</td><td>Develop operational product plans.</td><td>Develop product placement criteria and distribution channel alternatives.</td></tr>
<tr><td rowspan="3">Course-Level Student Learning Outcomes</td><td>Demonstrate the understanding of the role of research in marketing.</td><td>X</td><td></td><td>X</td></tr>
<tr><td>Demonstrate the understanding of the marketing research process including research design, data collection, and data analysis.</td><td></td><td>X</td><td>X</td></tr>
<tr><td>Demonstrate understanding of qualitative & quantitative methods and outcomes.</td><td>X</td><td></td><td>X</td></tr>
</table>

During this final step, faculty will find this to be an important tool for program development and curriculum review and aids in the implementation of a curriculum mapping process.

The summative assessment is applied in the capstone course in the form of a case analysis that will be evaluated using rubrics designed by ACSBP and are part of a Global Benchmarking program that will enable comparison of business programs worldwide. Total summative assessment will include this information, review of the student's internship experience, and results from the ETS Major Field exam. The progress of each student is monitored using these marker assessments and the cumulative outcome of the process combined with the final summative assessment form the final program assessment. This process is most effective when administered via an assessment management assistance program. Without this type of electronic organizer the paperwork would be overwhelming and prohibitive.

INVESTIGATION OF THE OUTCOME FROM OFFERING TUTORING SERVICES AND WORKSHOPS TO THE STUDENTS ENROLLED IN INTRODUCTORY ACCOUNTING COURSE

Adel M. Novin, Clayton State University, Morrow, GA 30260, AdelNovin@Clayton.edu

ABSTRACT

This study has investigated the outcome from offering tutoring and workshops to the students enrolled in introductory accounting course.

INTRODUCTION

The introductory accounting course is an important course which can significantly benefit those who enter careers that utilize accounting information for decision-making. The course familiarizes students with the process by which accounting information is prepared and used in making business decisions. Due to the importance of the introductory accounting course, considerable effort has been devoted to the enrichment of the content of the course (See, for example, Baldwin and Ingram 1991; Rankine and Stice 1994; Saudagaran 1996; and Dreike et al. 1998).

Normally a considerable number of students find the content of introductory accounting course challenging and somewhat difficult. Because of that students enrolled in the course demand tutoring services. In the author's school tutoring services are provided by peer students who are perceived to be outstanding students. The past experience in author's school had shown that the tutoring services overall were not effective – that is, it did not have a significant impact on the success and grade of students who utilized the tutoring services.

In the fall of 2008, a new plan was adopted for providing the outside class help to the introductory accounting students. The new plan included individual tutoring and offering of weekly workshops. A graduate student was hired to conduct both the tutoring and the workshops. At the end of semester a study was undertaken to investigate the outcome. Surprisingly very positive results were achieved. This paper reports the findings.

NEW PLAN

During the fall 2008, two hundred eight (208) students were enrolled in the five sections of ACCT 2101 taught by two professors. On August 24, 2008, the graduate student began conducted a series of workshops and tutoring sessions for the students. The last session was conducted on December 9, 2008. Students were informed about the content of each week's workshop through weekly announcements. The weekly schedule was as follows:

1) Workshops

Sundays	2:00 - 4:00 pm
Monday	11:00 - 1:00 pm
Tuesday	8:30 - 9:45 pm

2) Tutoring

       Mondays   1:30 - 2:30 pm
       Tuesdays 7:00 - 8:00 pm

RESULTS

Overall, 48 students attended these workshops and tutoring sessions. This constituted 23% of the total 208 students who were enrolled in the five sections. The number of sessions attended by each of these 48 students ranged from 1 to 16 sessions. For example, one student attended 16 sessions. On the other hand, twenty four of these 48 students (50%) each attended only one session.

The breakdown of attendance record by day of week was as follows;

Sundays	41%
Mondays	26%
Tuesdays	33%
	100%

The final grades received by these 48 students in ACCT 2101 in the fall 2008 are displayed in the following table. Per table, 75% of the students who attended the workshops and tutoring sessions received a passing grade of "C" or better in the course.

Grade	No. Students	Percentage
A	3	6%
B	5	11%
C	28	58%
D	6	13%
F	2	4%
W	4	8%
	48	100%

The following table compares the results for those who "attended" the workshops and tutoring sessions and those who "did not attend" any of the workshops and tutoring sessions. It is clear that those who attended have a lower repeat rate (F, D, or W).

Grades Received by Students	Professor A's Classes		Professor B's Classes	
	Students Who Attended	Students Who Did Not Attend	Students Who Attended	Students Who Did Not Attend
A	9%	16%	0%	3%
B	12%	16%	7%	18%
C	59%	33%	57%	30%
F, D, W – Have to Repeat	20%	32%	36%	49%
	100%	100%	100%	100%

The number of sessions attended, and the final grade received by each of these 48 students were as follows:

Student #	No. of Sessions Attended	Course Grade	Student #	No. of Sessions Attended	Course Grade
1	16	C	25	1	C
2	15	C	26	1	C
3	11	B	27	1	C
4	10	C	28	1	C
5	9	A	29	1	D
6	7	B	30	1	C
7	7	C	31	1	C
8	7	C	32	1	W
9	7	C	33	1	C
10	6	C	34	1	W
11	6	C	35	1	C
12	5	A	36	1	C
13	4	B	37	1	W
14	4	D	38	1	D
15	4	B	39	1	A
16	3	C	40	1	D
17	3	C	41	1	D
18	2	C	42	1	F
19	2	C	43	1	C
20	2	C	44	1	D
21	2	F	45	1	W
22	2	C	46	1	C
23	2	C	47	1	B
24	2	C	48	1	C

Based upon the correlation analysis results, the correlation between the final grade and the number of sessions attended is 33%. According to the regression analysis, the number of sessions attended explains 11% of changes in grades at 0.02 significance level.

CONCLUSION

Although it is difficult to measure the precise impact of attendance in workshops and tutoring sessions on students' learning, it is clear that these workshops and tutoring sessions were helpful and had somewhat a positive impact on students' learning – i.e., those attended the workshops and tutoring sessions had a lower repeat rate than those who did not attend. This result is in contrast to our past experience. There are two possible reasons for getting a better result this time. First, in the past we did not have workshops; we had just tutoring. Perhaps providing help in a "workshop" format provides students with more

learning – example; learning from each others' questions in the workshops. The other reason could be the tutor. More investigation is needed to find out why those 24 students (50%) who attended only one session did not return for more sessions. If school has limited funds for offering the workshops and tutoring services; based upon our attendance record, it appears that Sundays are a good day for offering workshops.

REFERENCES

[1] Association to Advance Collegiate Schools of Business (AACSB). 2002. Proposed Eligibility Standards for Business Accreditation. St. Louis, MO: AACSB.

[2] Baldwin, Bruce and Robert Ingram. 1991. "Rethinking the Objectives and Content of Elementary Accounting," *Journal of Accounting Education*, Volume 9, pp. 1-14.

[3] Dreike Almer, Elizabeth, Kumen Jones, and Cindy Moeckel 1998. "The Impact of One-Minute Papers on Learning in an Introductory Accounting Course," *Issues in Accounting Education*, August, pp. 485-497.

[4] Rankine, Graeme and Earl K. Stice. 1994. "Using Articles From Popular Press in the Introductory Accounting Course," *Issues in Accounting Education*, Spring, Volume 9, No. 1, pp. 142-150.

[5] Saudagaran, Shahrokh. 1996. "The First Course in Accounting: An Innovative Approach," *Issues in Accounting Education*, Volume 11, No. 1, pp.83-94.

Effectively Managing Responses to Constructive Feedback in a Classroom Setting:

A Proposed Model

by

Khushwant K. S. Pittenger, Ph.D.
Professor, Management
Jepson Endowed Chair
Dauch College of Business and Economics
Ashland University
kpitten@ashland.edu

Constance M. Savage, Ph.D.
Associate Professor, Management
Burton D. Morgan Chair of Free Enterprise
Dauch College of Business and Economics
Ashland University
csavage@ashland.edu

Dilhara Fernando
Dauch College of Business and Economics
Ashland University
dfernand@ashland.edu

Feedback is a mature field of inquiry (Audia and Locke, 2003). A great deal has been written about the meaning and significance of feedback, types of feedback, guidelines for delivering effective feedback, theoretical models of feedback and various variable affecting the process of feedback. Most introductory management and organizational behavior textbooks incorporate the topic. The Journal of Human Resource Management Review devoted an entire issue (2003, issue 13) to the subject. Despite such extensive coverage of the subject in its multiplicity, it seems the aspect of managing recipient response to feedback especially to negative or constructive feedback is under-examined. Audia and Locke (2003) state, "…theoretical models give little attention to specific issues raised by positive versus negative feedback. … Acknowledging the importance of feedback sign in the feedback process, this paper

focuses on factors that prevent people from benefiting from negative feedback." (Audia and Locke, 2003, pp. 631-632). Their paper outlines a three step model revolving around: (1) the search for negative feedback, (2) the appraisal of feedback; and (3) the action taken in response to negative feedback. In the proposed model, they analyze the issues from the recipient perspective. Same is the case with psychoanalyst, Kerry J. Sulkowicz's piece in the Business Week He advocates that while neither giving nor receiving negative feedback is pleasant for understandable reasons, but "for most of us it's still easier to give this kind of feedback than to get it." (Sulkowicz, 2009, p. 6). His advice is aimed at the recipient too.

No doubt recipient is one of the three key elements in a basic performance feedback process model along with feedback message and its source (Ilgen et al., 1979; Fedor, 1991; O'Leary-Kelly, 1998 and Herold & Fedor, 2003). Comprehensive performance feedback models elaborate on the multiple characteristics of these three basic components. London (1995), in his model does explore the process of feedback giving from the source's perspective. He also advocates that, "the relationship between feedback source and recipient is a dynamic interactive process." (London, 1995, p.163). Depending on its nature, feedback affects the recipient (e.g., causing the recipient to ignore the feedback, take it with a grain of salt, or take it to heart) which, in turn, influences the source and thus completing a cycle. London proposes that this cycle between the source and recipient can be a cycle of destructive behavior resulting in negative or poor performance on the part of recipient or alternatively a cycle of mutual support and encouragement resulting in excellent performance.

Creating an opportunity for excellent performance for each student is generally the goal of teaching. Integral part of the teaching/learning process is providing accurate performance feedback including constructive feedback (Ovando, 1994). Giving reinforcing or positive

feedback is easier as recipients are generally accepting of the information (Audia and Locke, 2003). It is constructive feedback that creates more challenges for instructors. If the cycle of behavior concerning constructive feedback between a source (i.e., teacher) and recipient (i.e., student) is managed ineffectively, it can result in poor performance (London, 1995) and/or anti-social behavior (O'Leary-Kelly and Newman, 2003). Alternatively, the dynamics of constructive feedback between teachers and students when well managed are likely to result in successful teaching, learning and personal satisfaction (Ovando, 1994).

In summary, while performance feedback models acknowledge an interactive play between source and recipient, they do not go beyond giving possible reasons for recipient's reactions. Feedback literature specifically offering practical advice to the source about ways to manage the predictable recipient response in the case of negative feedback is sparse. Most advice concerning effective use of constructive feedback, as noted in the first paragraph, is aimed at recipient. This gap of knowledge in the feedback literature is regrettable. As reasoned in the preceding paragraph, effective management of source-recipient dynamics when offering constructive feedback is important to elicit excellent performance and to avoid anti-social behavior. In a traditional teaching situation, the greater responsibility of managing the process effectively lies with the instructor. The absence of notable feedback literature concerning what a teacher (often a source) can do in a situation that happens commonly as a regular part of the teaching/learning process establishes the significance of this proposed paper.

The purpose of our paper is to address the gap in the performance feedback literature concerning management of recipient response by a source in the case of constructive feedback especially in a classroom setting. Specifically, we will:

Conduct a literature review distilling wisdom for instructors about ways to offer constructive feedback. The focus will be on offering practical tips for classroom use. We will address the question: How do you offer constructive feedback to minimize negative student response?

Offer insights into student response to constructive feedback based on existing performance feedback models. This will address the question: What kind of a response can you expect from students when offering constructive feedback?

Build and present a systematic model focusing on managing student response to constructive feedback. The model will address the question: How can you effectively manage student response to constructive feedback to elicit better performance and higher student/teacher satisfaction?

Such paper will be of interest to many in the conference because regardless of the discipline they teach, all instructors participate in the process of offering feedback. They will benefit from the presentation because of its applied nature and it universal appeal.

References

Audia, P. G. & Locke, E. A. (2003). Benefitting from negative feedback. *Human Resource Management Review, 13,* 631-646.

Fedor, D. B. (1991). Recipient responses to performance feedback: A proposed model and its implication. In. G. R. Ferris & K. M. Rowland (Eds.), *Research in personnel and human resources management, vol. 9* (pp.73-120). Stamford, CT: JAI press.

Herold, D. M. & Fedor, D. B. (2003). Individual differences in feedback propensities and training performance. *Human Resource Management Review, 13,* 675-689.

Ilgen, D. R., Fischer, C. D., & Taylor, M. S. (1979). Consequences of individual feedback on

behavior in organization. *Journal of Applied Psychology, 64,* 349-371

London, M. (1995). Giving feedback: Source-centered antecedents and consequences of

constructive and destructive feedback. *Human Resource Management Review, Vol. 5* (3),

159-188.

O'Leary-Kelly, A. (1998). The influence of group feedback on individual group member

response. In. G. R. Ferris & K. M. Rowland (Eds.), *Research in personnel and human*

*resources management, vol. 16 (*pp.255-294). Stamford, CT: JAI press.

O'Leary-Kelly, A. M. and Newman, J. L. (2003). The implications of performance feedback

research for understanding antisocial work behavior. *Human Resource Management*

Review, 13, 605-629.

Ovando, M. N. (1994). Constructive feedback: A key to successful teaching. *International*

Journal of Educational Management Vol. 8 (6), 19-22.

Sulkowicz, K. J. (2009, May 4). Analyze this. *Business Week*, 16.

EXPERIENTIAL LEARNING THROUGH STUDY ABROAD: A MODEL FOR LINKING THEORY AND PRACTICE

ABSTRACT

Globalization and its implications for future international relationships make study abroad a desirable option for faculty and students who wish to extend learning beyond its traditional boundaries. Study abroad experiences have the potential to influence students' view of themselves as global citizens while improving their skills as thoughtful scholars. This paper is an examination of the construction and execution of a study abroad experience as well a retrospective examination of the potential linkages between theory and practical application. In this respect the study abroad represents a dimension of experiential learning (Kolb 1984). The project is informed by literature that discusses theories related to pedagogy (Fobes & Kaufman 2008; Fobes 2005; Kaufman 2002) and activism (Feagin & Vera 2001).

INTRODUCTION

In the context of teaching sociology in the undergraduate environment this paper builds on the previous works of those who likewise consider the merits of critical pedagogy (Fobes & Kaufman 2008; Fobes 2005; Kaufman 2002) and experiential learning (Kolb 1984). Both approaches add leverage to the case for social action as illustrated by Friere 1993; Feagin & Vera 2001 and to some extent the canon of Patricia Hill Collins who in her examination of critical social theory similarly regards the production of knowledge contested ground that forms the basis of power relationships (Collins, 1998).

Pedagogy, the art and or science of teaching continues to change and evolve as the academic community and its students move through historical points. While it is sometimes difficult to always anticipate which approach best addresses the needs of particular students at any given point in history, critical or radical pedagogy continues to be a topic of discussion and occasional debate. This particular pedagogy "requires adopting alternative grading practices, cultivating classroom dialogue, relegating considerable power to students, and promoting social activism" (Sweet, 1998). For the past decade some few articles published in *Teaching Sociology* have addressed and oft debated the merits of critical or radical pedagogy in the study of sociology (Fobes & Kaufman 2008; Fobes 2005; Kaufman 2002; Sweet, 1998; Gaianguest, 1998). Only one such article has addressed this pedagogy in the context of study abroad (Fobes, 2005). While another article published over a decade ago outlines processes for teaching sociology in an international setting, critical pedagogy is not a part of that dialogue (Kain & D'Andrea, 1992).

Catherine Fobes' summation of critical pedagogical canons includes a distinction between pedagogy and teaching. As Fobes notes from her own research of the subject "basic tenets [of critical pedagogical theorists] include education stimulating social change rather than mastering facts and skills, encouraging creativity through dialogic learning, working with indigenous people to co-create knowledge, maintaining teacher/learner flexibility, and emphasizing teaching as a human act." (p.182). For the purposes of this examination social change, creativity through dialogic learning and teacher/learner flexibility appeared to be the common threads that link to critical pedagogy in this project.

In general study abroad advantages those students who otherwise may not have an opportunity to visit foreign countries. In this example both student and parents seem comfortable to have representatives of the university and a university sponsored activity as a safety net. More generally, studying the intricacies of other cultures exposes students to a wider selection of lifestyle alternatives some of which may be more appealing than what they currently experience. In this case the student population is drawn from small rural communities within a 100 mile radius of the university. Their daily exposure to diverse customs and alternative ways of thinking typically does not extend beyond that circle. Many of these students are first generation university attendees with little exposure to or experience with alternative modes of learning. In the case of teaching sociology and certainly in attempts to discuss relevant social problems, those students with little or no exposure to opposing viewpoints present narrow and fragmented experiential frameworks of knowledge.

The study abroad program at Lander University, South Carolina is open to all students and continues to broaden its scope. At present the program offers full semester study abroad experiences as well as opportunities for excursions during summer and spring during the scheduled academic breaks. In this particular case the appeal of spring study abroad events lies in the possibility for students to receive financial aid as a consequence of being enrolled in course work connected to academic credit. This defrays some of the costs associated with this type of international classroom experience. Additionally, the program at Lander awards some scholarship monies to students based on documented financial need. Study abroad proposals are reviewed by committee and rated on a competitive basis. In this particular case the course design for the proposal was developed and presented to the director of the study abroad program nearly one year before it entered the approval process.

There were several reasons that the Netherlands was selected as the site for this study abroad experience. First, the country offered a marked contrast in social structure. Although a relatively small country the Netherlands presents not only an exemplar of well-integrated social policy it also presents frameworks for egalitarianism. Moreover, because the Netherlands is universally known for its sexual and drug related liberalism, the social institutions of the country were expected to reflect this particular position in contrast to those attitudes and practices in the United States. Second, English is spoken by the Dutch with relative ease and frequency. Thus, their willingness to interact with Americans was predictable. Finally, a resource network existed that allowed access to several "closed" organizations.

COURSE DESIGN AND OBJECTIVES

Two courses introduced students to social problems as observed and researched concerning the Netherlands. The two were interrelated though not dependent and were offered in spring semester under the rubric of special topics. Students were expected to complete course work within the frameworks of field research methodology and course work in comparative social institutions. Initially the program of study proposed to provide close, comparative examinations of the source, nature, extent and consequences of selected social and cultural problems. The course also sought to address individual and structural social change in both the Netherlands and the United States. The idea of linking course work requirements to the study abroad experience was new to the university's study abroad program. Previous trips, especially those conducted during spring break had not been linked to graded, academic outcomes nor had they been arranged without the use of commercial tour packages.

 There were four broad-based objectives presented as a part of the proposal submitted to the university study aboard committee. As the project developed more specific product driven objectives were added to replicate customary academic expectations. These objectives mirrored those of the 300 level research methods course required for all sociology majors. It was therefore possible for students to substitute

the field research course in order to meet this requirement. The expectation for the field research course was that students would be able to 1) discuss the major components of societies and the relationship of individuals to the social environment; 2) critically and sociologically analyze the circumstances and consequences of specified social environments; 3) Identify and compare individual and structural change in the Netherlands and the United States as it relates to specified social environments and finally, apply the tools of a selected research method through the transcription and analysis of field notes.

LEARNING OUTCOMES

Among several *manifest outcomes* for the courses were the usual paper, objective tests, and presentations. In addition the students were required to keep journals for both courses. The final paper was designed to develop a rudimentary research proposal and as such included the requirement to address shortcomings of the process as well as a description of the next steps to advance the research agenda. Journal entries were expected to develop observational and analytical skills as well as address the techniques for writing field notes. Several *latent outcomes* were identified based on the students' stated reason for participating is this particular study abroad experience. Those reasons are discussed in the conclusion portion of this paper. From the perspective of one instructor the latent outcomes are also included and linked to critical pedagogy.

PEDAGOGICAL FRAMEWORKS OF THE PROJECT

This section of the paper presents a summary of the educational and social components of the experience. Here also begins discussion of the pedagogical and thus structural concerns related to replication of a plausible learning environment. Early in the process it became apparent that once removed from the traditional classroom setting rules and to some degree roles changed. Therefore in this section some attention is also given to group dynamics and student-centered learning as they impact this particular learning environment. Here too is the development of the link between experiential learning as pedagogy (Kolb, 1984) and the sociological tradition of social action (Feagin & Vera, 2001).

During the eight day period spent in Amsterdam and environs the attempt was to provide a balance between cultural exposure and data collection for academic output. Planned events included group meals, bus and museum tours as well as walking tours. Students also had the opportunity to experience several modes of public transportation such as the underground, the city bus and trolley and the intercity train systems. These experiences were orchestrated in accordance with the more formal academic appointments at the ambassador's office, two prison system facilities, and finally, the Netherlands Institute for Health Services Research (NIVEL). We were unable to effectively coordinate a visit to the University of Amsterdam or local hospital. However, spontaneous outings to a park and local fire station yielded valuable data. A number of students more vividly recalled these experiences more so than those events that were formalized by appointments.

Traditional student-teacher roles which typically include some form of hierarchical relationship became less visible and even less comfortable. The dynamics of selecting and sharing meals, plotting routes of travel, deciphering transportation systems and routes and shopping for souvenirs generated a synergy of its own. This temporarily presented a dilemma as this instructor felt compelled to challenge students to remain focused on academic outcomes. However, the shift from a traditional classroom hierarchical structure reflects the suggested pedagogy of Paulo Freire (1993) and in many respects laid the

groundwork for experiential learning as theorized in Kolb's model for creating knowledge through experience.

The educational doctrine of Freire arises from dilution of the power relations that are sometimes reflected in teaching environments especially at the secondary level of education. What was desirable early on in the study abroad environment was that students would develop not only a sense of adventure but be anxious to begin developing intellectual independence as they experienced the cultural aspects of Netherlands environment. Inherent in that independence is the belief that knowledge and its development is equally the territory of student and teacher.

Juxtaposed against Freire, David Kolb conceptualizes a model of learning that further amplifies the position that learning and thus knowledge are the creation and primary territory as well as responsibility of the learner. Kolb further theorizes that this model "is consistent with the strategies of human cognition" (Kolb, 1981, 1984).   His model appears below (Figure 1).
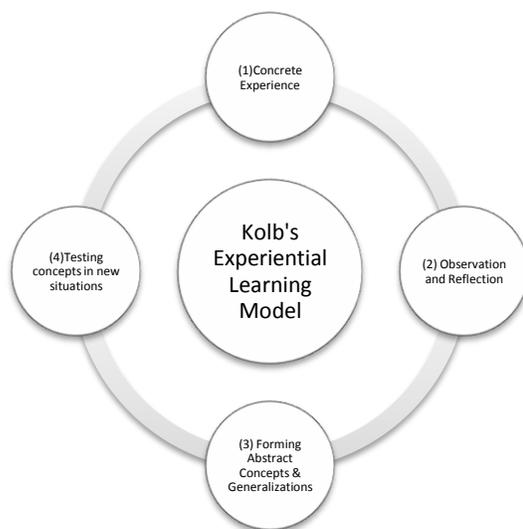
Figure 1. **Kolb's Experiential Learning Cycle (1981)**   *Figure 2*. Adaptation of Kolb's model (2009)
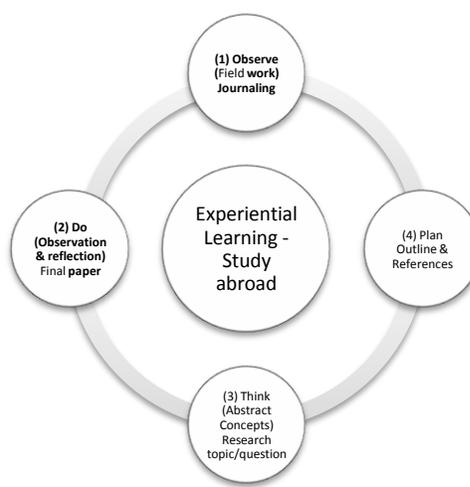
Kolb's model is seemingly the gold standard in the canons of learning and likewise adapts easily to the study abroad experience under review. It not only serves as the blueprint for the learning components and outcomes associated with the course construction it also attends to the learning style of the students.   Each stage corresponds to a specific learning style in the following manner. Stage 1: "accommodators" [whose] "greatest strength lies in doing things…in carrying out plans"; Stage 2: "divergers, [whose] greatest strength lies in imaginative ability…the ability to view concrete situations from many perspectives"; Stage 3: The "assimilators." In this case the learners "create[s] and use theoretical models [and] excel in inductive reasoning." Lastly, Stage 4 addresses the learning style of the converger, who has as "their greatest strength the application of ideas." In the use of this model each stage must be experienced by each learner. However, there is no necessity to complete the stages in sequence (Kolb, 1981, 1984).

Thus, and for example the products or assignments for the final paper began with students selecting a research topic then developing their research question (Figure 2). This can be conceptualized as Stage 3: Forming abstract concepts or thinking and corresponds to the learning style of the assimilators who

learn better when presented with theoretical models. Note that all students were concurrently enrolled in a related course entitled Comparative Social Institutions. In part that course provided useful information about the institutions that they anticipated examining while in the Netherlands. Thus the formation of abstract concepts was given a general framework for consideration of comparison and ultimately social change. Beginning with Stage 3 and moving clockwise around the model places the learner at Stage 2. Here what they "do" results in a paper referred to as a research proposal.

 In retrospect students may initially benefit from examination of this model as part of their preparation for the study abroad experience. Such an overview provides the broader context of the learning experience. It likewise presents students with the opportunity to make choices about the quality and depth of their experience at each stage of the experiential learning process. This model further supports the findings from one study that queries sociology majors about the mechanics of learning sociology (McKinney, 2007). The study determined that "student's beliefs about what helps them learn fit well with existing research and theory on learning in higher education including the importance of experiential and active learning…" (p.117)

 One major concern of this model however, is that of assessment. What are the most effective and valid measures for determining whether or not students' experiences are accurately assessed especially in learning environments where such assessment is driven by traditional quantitative measures?   In part it seems inconsistent with a goal of a critical pedagogy. The goal to co-create knowledge or facilitate student empowerment in the learning environment may necessarily demand the involvement of students in evaluation not only of the project but also of themselves. To then apply such measurement methodologies that are strictly instructor driven may once again suggest a higher order of knowledge accessible only to instructors. In this respect such measurement disregards the intent of the pedagogy. This particular conundrum was addressed in part using an end of the course survey and students' self-assessment. Those evaluation tools are further examined in the methods and data analysis portion of this paper. To this point the discussion of pedagogical concerns has examined the dissolution of power relations and thus, the co-creation of knowledge as well as the application of an experiential learning model that maps to product driven out comes. What follows is yet a third concern of this learning experiment.

Again in retrospect, the unforeseen realties of group dynamics played a pivotal role in this learning experience. Group dynamics is a term used to define and explain the mechanisms of group interaction. The subject and related research provides ample information for a separate study. In short, group dynamics typically is the territory of educational psychology, organizational development and in the discipline of sociology is sometimes used to conduct focus groups, a data collection method in qualitative research (Stewart, Shamdasani and Rook, 2007; Morgan 1997). Pertinent to this discussion however, is the role that intergroup dynamics played in executing this study abroad experience. Once outside the traditional classroom environment this particular group of learners was now faced with developing interdependent relationships to accomplish several tasks. In every respect they had to reconstitute the group because of the change in environment and to some degree a shift in leadership roles. A number of the tasks they set to accomplish had to be negotiated across racial and gender divides. Three things were evident. Group members had not experienced the five stages of group development (Tuckman, 1977) in this environment; therefore they had not previously negotiated ways to handle conflict and finally, the shift to student-centered learning, a necessary consequence of field research had yet to be fully executed. At the onset the dynamics of groups was of little to no concern. However, as decisions regarding meeting times, location for meals and other logistical arrangements were made and sometimes adjusted, it became apparent that the expected synergy was missing. Future

planning must necessarily give this dimension of the experience thought and attempt to infuse as a minimum, some group process work into the curriculum both before and during the trip.

The final point made here regarding pedagogical frameworks relates to the sociological tradition of activism and social change. The pages of *Liberation Sociology* remind every sociologist of the discipline's traditional roots (Feagin & Vera, 2001). The authors note in their historical examination of the discipline that beyond the canons of the three major theoretical paradigms there is need and indeed obligation to seek social change. Field work as was experienced in the Netherlands provided learners the opportunity to examine social problems, compare solutions to the problem and formulate policy recommendations for change. Readers will note in the selected journal entries that follow a demonstration of comparative ability. The students readily identified the ways that the Netherlands differed in approaches to the social systems and situations. The next step in the process of developing learners who are also agents of change presents a challenge to the process of experiential learning and critical pedagogy.

METHODS AND DATA ANALYSIS

In this portion of the paper the discussion turns to the comments of the students at the conclusion of the research methods course, as well as brief discussion of the grading rubric used for the research proposal and subsequent grades on that paper, and samples of journal entries.

As part of an on-going effort throughout the university to standardize and stabilize assessment, grading rubrics are in use across a variety of disciplines. In this situation the instructor gave the grading rubrics for the final paper and oral presentation to students prior to their departure for the study abroad trip conducted during spring break. Both rubrics were previously and currently used in other sociology research methods courses. This was believed to maintain consistency across the methods courses requiring the same standard of performance for all students whether or not they elected to have a study abroad experience. One obvious shortcoming of the rubrics is that at best they are only able to assess the manifest outcomes of the project. Nonetheless, these products, namely, journal entries, a paper and oral presentation represent intellectual efforts on the part of the learners and are therefore an integral part of the study abroad experience. Final grades were equally distributed with four letter grades of "A", four of "B" and four of "C". At least two students had marginal final papers primarily because of their inability to separate themselves from the very real events of their everyday experiences and biases as well as an overriding desire to travel abroad without the responsibility and daily rigors of academic output. All journaling efforts were largely unstructured. To some extent this may have been an oversight on the part of this teacher whose pedagogy hoped for more reflective and analytical notations. Journaling is within itself a refined skill as is the creation of useful field notes. Both require some introspection. However, following are a selection of journal notes that represent some of the more thoughtful entries.

The first entry comes from the journal of a young woman who has travelled some and is being raised in a multi-racial, multicultural household. On this particular day one of the instructors has acted spontaneously and encouraged the group to venture to a local park. It is day two of the trip. The purpose of the outing is to collect data from willing passers-by. The information two of the students seek relates to single parenting and juvenile behavior. Here is what the young woman, one of the more serious as well as successful student records in her journal:

> We are a group of fourteen Americans and we stand out like sore thumbs. It's great…On the way [to the park] we saw so many things. Dogs strapped onto the bikes. Dog without leashes who

never stray from their owners…We went to parks so that C & T could get their research… It was so great here today was simply incredible, simply magical. The parents never yelled; the kids were free to roam the park and jump in puddles. Very different from America. From what C & T said they are so respectful of their children and when T asked about the amount of TV. they allow their four-year olds, it was ½ hour or less a day. They read to their children. I was floored by this. How incredible!

This student is beginning to formulate a contrast between the Netherlands and the United States. She uses the structure of family to define differences in childhood experiences of Dutch children. Having defined these differences she will now need to relate them to larger social forces that shape family dynamics. If successful she can then begin to suggest ways to replicate conditions for family life in the United States where appropriate. Thus develops an opportunity for activism and social change. The relationship between identification of structural differences and initiation of social change is a subtle point and one that not every student is prepared to capture. This point was discussed earlier as a part of the pedagogical framework.

The next entry follows a pattern similar to the previous student. This student, also academically focused, develops comparisons about the nature of prison environments. Her career goals include law school. Unlike the previous entry the reader has a glimpse of her personal life, dimensions not frequently displayed in these journals.

Today was an extra special day because today is my 22nd birthday…In order to get to the prison we had to ride the subway. The subway was crowded! Besides the confusion of the subway, the tour of the prison was very interesting. Their [Dutch] prisons look nothing like ours. They are much cleaner. The Dutch truly believe in rehabilitation. The Dutch prison system offers many more opportunities than South Carolina's system. I was embarrassed in a way to know that we treat our inmates so cruel and yet the Dutch treat their inmates like true human beings. Later that evening my classmates took me out to eat for my birthday. They surprised me which was very sweet.

The following comment comes from a young man, a senior at the university who aspires to be a Wal Mart manager when he graduates in May. He has been adventurous, almost fearless in his independent late night exploration of Amsterdam which he equates with the lifestyles of all Europeans. He says:

Overall I love Europe. On our trip we had our ups and downs but that all got resolved. We did a lot of walking, that was the worst part and some days it was raining…But it['s] all good…Before I started working on this paper I thought it was going to be hard to complete But as I do interviews and take surveys it makes my research much easier. My abstract has come together good and my introduction sounds amazing and now I need to start on the other sections and just put this paper together.

Clearly he is goal oriented in his intensity to complete the research proposal, the final required product. In some ways he has surprisingly emerged as an informal leader among a portion of the group.   The next student makes some reflective comments about the usefulness of group interaction in the learning process.   In her comments the reader can begin to see the beginnings of a developing collegial relationship. Here is what she had to say about that relationship:

The group helped us open our eyes to the different cultures in the way we do things. If we miss something then someone else in the group can help point it out. I think that doing it with a

group made it better. It (?) sometimes hindered us because it felt that we were rushed and could not complete the research in a timely fashion.

A second entry from the same student makes observations about what she views as Dutch family dynamics.

...people have their children a lot older. ...just walking you notice that families are more important and just the quality time that they spend with their children. Not only that the fathers play a more positive and active role in the children ['s] lives. ... when I was interviewing the parents for my research questions that dads actually take time out on a Saturday to go to the park. One male was out with his friend on a Saturday while pushing his...son. It really helped with my project because the parenting responsibilities are taken very seriously so their values are to teach their children one-on-one and not let the TV. teach them.

The young woman's exchanges with this instructor were most frequently formulated as questions. As evident from her journal entries she made reasonable observations. However, she seemed reluctant to trust her often insightful moments. In addition, she struggled with a tendency to over generalize. Statements such as "the fathers play a more active and positive role...," reflects this tendency. In this environment it was possible to frequently discuss what constitutes bias. Her final paper however, reflected neither ambivalence nor bias. In the last analysis it was among the best of the group.

The final journal entry is the contribution on a young man, a rising senior involved in number of on-campus activities. He has most recently been selected to oversee and coordinate the efforts of all on-campus resident aides. Given his level of social interaction the following comments concerning community involvement seem in character.

Back home! Now that I am back in S.C. I have noticed the changes in my views of many issues. Before going to Amsterdam I feel that I was sheltered to American values and beliefs. I was not as open to issues as I am now. I have definitely learned to be open to try new things and meet new, different people. I encountered different cultures and people while in Amsterdam. One aspect of their culture that I admire is their communitarian views. They believe in helping the community as a whole instead of just looking out for individuals. Another aspect that I am more appreciative of now is their openness. For example, before going to Amsterdam I thought the Red Light District and the coffee shops were taboo topics. But after I experienced both I know now that is the way their society is structured. Now that I am back in American society I have learned not to cut my experiences short. I want to do new things and live life to the fullest. Now that I have studied abroad I want to do it again. In the future my next destination will be either Africa or Paris.

This final entry once again illustrates how some students formulated their Netherlands experience to contrast their experiences in the United States. These consistent comparisons certainly indicate an understanding of both the manifest and latent intent of this study abroad trip and its associated academic requirements.

A final observation about the journal entries relates to the challenge such a requirement presents to both student and teacher especially in the mobile learning environment of studying abroad. The density of our schedule and low energy levels made timely feedback about journal entries an insurmountable hurdle. In the future it may be useful and desirable to: 1) carve out specific times to discuss journal input; 2.) Discuss journal entries in a group forum. As previously noted in one journal

entry groups interaction was a useful learning tool. Such a process though formalized may model and create additional opportunities for student-centered learning.

At the conclusion of the course and following completion of all written and oral requirements the twelve participating students completed a questionnaire. Admittedly the questionnaire was an afterthought. However, immediately after returning to the traditional classroom environment, group dynamics made it evident that openly and collectively processing the experience was not going to occur. It then became a matter of some urgency at least for this teacher that some closure was necessary. Below is the questionnaire that all students completed on the last day of class and following the submission of their final research proposal and oral presentation. The questionnaire is followed by a chart that provides an analysis of their input. The purpose of soliciting their input was twofold. First and foremost the request for their input follows an adopted pedagogy. Specifically, such input from learners once again shifts the learning focus from teacher-centered to student-centered which has already been noted as a way of developing empowered learners who are not restrained by hierarchical classroom structures. In the future a revised questionnaire might be useful in establishing correlations between questionnaire responses and earned grades. The original survey instrument is included below.

Please answer the following questions regarding your study abroad experience. Your responses are held in confidence and without personal identification. They will be used to evaluate the experience. Thanks for your time.

1. What was your **primary reason** for going to the Netherlands?
    a. Pleasure
    b. Cultural enrichment
    c. Academic interest
2. Would you go again if you knew that there were academic requirements?
    a. Yes
    b. No
3. Was the cost of the trip a major concern for you or your family?
    a. Yes
    b. No
4. What were your major concerns before you went on the trip?
5. Were you adequately prepared for the trip? (Please circle all that apply)
    a. I understood the academic requirements
    b. I did some research about the country
    c. I packed appropriate clothing
    d. I had enough money to meet my needs
    e. I was able to talk to my family from the Netherlands if I wanted
    f. Any additional comments about preparation:
6. I used my journal entries to: (Select all that apply)
    a. Record observations for use as data
    b. Express my feelings about personal matters
    c. Meet the requirements of the class
    d. Other_____   Please be specific.
7. Would you recommend this or similar trips to other students?
    a. Yes, why?
    b. No, why not?

8. How did you spend your time in the Netherlands? Please estimate this by using percentages (e.g. studying, 50%)
   a. Tours
   b. Free time
   c. Academic (this includes trips to the prison, hospital and the Hague)
   d. Sleeping/Resting
   e. Other activities (Please name those activities)
9. Indicate one thing you liked most about this trip.
10. Indicate one thing liked least about this trip.
11. Please make recommendations for future study abroad trips sponsored by the department of Political and Social Science.

The table below summarizes the student input from the questionnaire. Following this table is a summation of recommendations that the student make for future study abroad experiences.

Question	Positive Response	Negative Response
#1 -Primary reason for going	Academic(2)	Pleasure, enrichment (10)
#2- Go again with academic requirements	Yes (12)	
#3 – Concern about cost?	No concern (7)	Concerned (5)
#4 – Concerns before leaving		Flying, organization, money, workload, adaptation
#5 – Adequate preparation	4 or more responses (11)	Fewer than 4 responses (1)
#6 – Use of journal	3 or more responses (12)	
#7 – Recommend to others	Yes (12)	
#8 – Use of time (Academic)	30-50% (7)	Less than 30% (5)
#9 – Liked most	Free time(1);tours (4);culture (5); doing actual research (2)	
#10 – Liked least		Walking (5);behavior of classmates(4); tours (2); organization (1)

n=12; ( ) =number of student responses

For the most part students indicated they were satisfied with the experience. They indicated that not only would they do it again they would also recommend such an experience to others. From the data it is clear that their stated reasons for going on the trip were less focused on the academic dimensions of the experience. Yet the numbers suggest that better than 50% of them used their time in academic pursuits. At least two students noted that "doing the actual research" was their favorite part of the trip. Question #11 asked the students to make recommendations for future study abroad experiences. They made two recurring points that bear closer examination in preparation for the next trip. First, five of the twelve students stated there was a need for more organization (4) and communication (1). They did not expound on this position. The best that can be deciphered from those comments is purely speculative. However, one of the five students did suggest that communication was not would it should have been. In this respect in future efforts to improve perceptions of organization it may be useful to devote several hours of class time to building group cohesiveness that in turn will develop communication. This would provide the opportunity to discuss the details of itinerary, transportation and appropriative behavior.

Some scattered comments related to these as items of concern. Interestingly, three students viewed serious commitment to academics and behavior as matters for concern. In short, communication of logistical details may enhance the experience for all concerned.

In addition to the questionnaire students were also asked to provide an assessment of their overall performance in the course and suggest the letter grade they believed they had legitimately earned. The statement of self-assessment was: "What letter grade do you believe you have EARNED in this class and why? Consider such things as attendance, participation, cooperation, involvement and effort as well as the quality of our work." Based on these criteria 75% of the learners accurately predicted their final cumulative grade. This correlation may merit future study. Collaboration between learners and teachers regarding grading as well as learning may prove to be a useful during all phases of the learning process.

<div align="center">CONSCLUSION</div>

The study aboard experience presents an opportunity to explore if not push the boundaries of pedagogy. It challenges both learner and teacher in ways not typically experienced in the tradition classroom setting. This is particularly true when considering the constant close proximity of both student and teacher where traditional boundaries may no longer be effective or even appropriate. In a retrospective analysis of the study abroad experience this examination of pedagogy has included application of an experiential learning model to contextualize the manifest outcomes or products of the students' academic work. The concern for assessment that in part includes student input regarding the logistical dimensions of the experience as well as grading has also been a portion of the pedagogical dialogue. It remains a challenge to remain true to student-centered learning without also inclusion of the student in the evaluative process. And finally, the linkage of the research project to social action has been given some attention. The challenge here remains to develop strategies that assist the sociology student in the transfer of their field experience to one of social action. In future study abroad experiences it may be valuable to include students in pre-planning, assessment and group development.

REFERENCES

[1] Collins, Patricia Hill (1998). *Fighting Words: Black Women and the Search for Justice*. Minneapolis: University of Minnesota

[2] Feagin, Joe R. and Hernán Vera (2001). *Liberation Sociology*. Boulder, CO: Westview Press.

[3] Fobes, Catherine (2005). Taking a Critical Pedagogical Look at Travel-Study Abroad:"A Classroom with A View" in Cusco, Peru. *Teaching Sociology 3:*181-194*.*

[4] Fobes, Catherine and Peter Kaufman (2008). Critical Pedagogy in the Sociology Classroom: Challenges and Concerns. *Teaching Sociology 36:26*-33.

[5] Freire, Paulo (1993). *Pedagogy of the Oppressed*. NY: Continuum.

[6] Gaianguest, Kathyrn (1998). Radical Pedagogy is Social Change in Action. Response to "Practicing Radical Pedagogy: Balancing Ideals with Institutional Constraints. *Teaching Sociology.* 26:123-126.

[7] Kain, Edward L. and Vanetta-Marie D'Andrea (1992). Teaching Sociology in an International Setting: Using London as a Laboratory. *Teaching Sociology 20:*1-11

[8] Kolb, David A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Prentice-Hall, Inc., Englewood Cliffs, N.J.

[9] Kolb, David A. (1981). *Learning Styles and Disciplinary Differences in the Modern American College responding to the New Realities of Diverse Students and a Changing Society,* Arthur C. Chickering and Associates, Jossey-Bass Inc., San Francisco, CA

[10] Learning Theories Knowledgebase (2009, August). Humanist Theories at Learning-Theories.com. Retrieved August 14th, 2009 from http://www.learning-theories.com/humanism.html

[11] McKinney, Kathleen (2007). The Student Voice: Sociology Majors Tell Us About Learning Sociology. *Teaching Sociology 35*:112-134.

[12] Morgan, D.L. (1997). *Focus Groups as Qualitative Research* 2nd ed., Sage Publications, Thousand Oaks, CA.

[13] Shor, Ira and Paulo Freire (1987). *A Pedagogy for Liberation: Dialogues on Transforming Education*. Gergin & Garvey Inc., Granby, MA.

[14] Stewart, David W., Prem N. Shamdasani and Dennis W. Rook (2007). *Focus Groups, Theory and Practice*, 2nd ed., Sage Publications, Thousand Oaks, CA.

[15] Sweet, Stephen (1998). Practicing Radical Pedagogy: Balancing Ideals with Institutional Constraints. *Teaching Sociology 26*:100-111.

[16] Tuckman, Bruce W., & Jensen, Mary Ann C. (1977). "Stages of small group development revisited', *Group and Organizational Studies 2:*419- 427.

Achieving Collaborative Gain in Computing-Focused Higher Education

Dr. Ron Sones
Liberty University
School of Engineering and Computational Sciences
1971 University Blvd.
Lynchburg, VA 24502
434-592-7150
rsones@liberty.edu

Dr. Jerry Westfall
Liberty University
School of Engineering and Computational Sciences
1971 University Blvd.
Lynchburg, VA 24502
434-592-4681
jwestfall@liberty.edu

Educational Innovation

Paper Proposal

May 15, 2009

Abstract

A simple majority of undergraduates in Computer Science, Information Systems, Software Engineering or similar programs will include somewhere in a research paper assignment a statement explaining how rapidly the information technology industry continues to evolve. While these fledgling scholars might easily document the pace of new hardware or software products coming to market, related programs of study at colleges and universities do not mirror this brisk evolution in the industry for which they train their students to at least contribute, if not compete. While at the core some might argue that principles of digital computing have not changed significantly since the IBM 360, most will admit that the industry's evolving nature requires dynamic curricular adjustment. This paper investigates whether traditional curricular and school structures prevalent in higher education foster an atmosphere of imaginative exploration of the industry to help undergraduate programs provide their students the maximum opportunity for success in the Information Technology industry.

Background

The past six decades have witnessed digital computers transition from a few installations dedicated to government needs or research, to an infusion so deep in the culture that one can hardly avoid them. From electronic mail to cell phones, cars to debit cards, Google to television on demand, most every household in the civilized world feels the imprint of the spread of technology. Prognosticators suggest the saturation will continue in ways that we cannot yet imagine. A similar trend shows in the development of computer related curriculum in higher education.

Early studies of computers typically occurred in the more traditional departments of math or physics. Computing fits wonderfully in either of these areas given the digital nature of computing theory and the physics required to translate that theory into a computational device. Eventually, though, computer sciences came into its own and became a distinct discipline, gaining full recognition and academic honor in the early 1970's. This coincided with the birth of the Apple microcomputer (followed closely by the IBM PC) in the same decades. The personal computer introduced a new element of the information technology industry producing hardware and software targeted to the consumer, rather than to the computer scientist. This catalyst helped push the computing curriculum on campuses beyond the department of computer science.

Soon, schools of businesses introduced courses to help students understand how to integrate computing into accounting, or economics, or finance, or marketing. Schools of education offered classes on the use of personal computers in education. The sciences and fine arts began a similar integration. In a short period, business schools evolved to offer entire majors in computing focusing not on the design and understanding of how a computer works or the syntax of a language, but rather on the application of existing hardware and software to a business problem. The information systems major (or similarly named programs) became as popular in schools of business as the computer science major had become in other schools. The saturation continues as courses such as "Computers in Accounting" disappear in favor of incorporating program-specific software packages and tools in all accounting courses. Thus, while the relatively new phenomenon of computing permeates centuries-old disciplines of study like the sciences, fine arts, education and others, it has also in a relatively short span spawned discipline-specific programs of study in computing in many of these context areas. This paper addresses whether the proliferation of computer-specific programs of study in separate colleges and schools of a university best serves the faculty and students.

Problem

The two most prolific computer related programs of study in universities are computer science and information systems (or some variation on the information systems title). A quick survey of college catalogues would find the overwhelming majority of computer science programs in either the school of engineering, science, or arts and sciences. The typical information systems degree is usually housed in a school of business or commerce. Thus, the faculty and student populations study and operate independent of each other. This myopic approach, we believe, incurs a hidden cost.

According to the Oxford English Dictionary (OED), a faculty is the "whole body of Masters and Doctors, sometimes including the students, in any one of the studies, Theology, Law, Medicine, Arts." This definition dates to the 13th century and speaks to a spirit of collaboration and cooperation among peers as they seek to understand and develop a given discipline. An increase in divisions among such groups results in an inverse potential for insight into the whole body of education experience. Unfortunately, colleagues that might have benefited from the collegial spirit of faculty not only lose this opportunity when placed in different schools, they often end by developing a spirit of enmity.

Surendran, Ehie and Somarajan (2005) speak of "turf battles" and academic "functional silos" when comparing these two faculty groups.

Not all campuses experience an antagonism between their computer science and information systems faculty. Yet, housed in different schools, they lose the opportunity for incidental collaboration which should characterize a healthy faculty. Similarly, the separation extends to the students in each major who are ultimately studying closely related disciplines. The thrust of this organization scheme fosters an unhealthy spirit of competition between groups. Whether competing for students, competing for resources, competing for attention, or any other motivation, the competition itself minimizes the positive impact that students might otherwise enjoy at such a critical stage in their transition to adulthood. Collaboration should particularly distinguish a university faculty from other groups of professionals, whether pursuing a formal research agenda or through a spontaneous tete-a-tete. Competition resulting from the (posited unnecessary) division of faculty minimizes collaboration and provides no healthy benefit in its place. The popular lines of defense for competition rest mostly on culture and misinformation. Alfie Kohn chronicles four of the most common myths regarding the benefits of competition in our culture:

> The first myth is that competition is an unavoidable fact of life, part of "human nature." Although this assumption is made casually (and without evidence), it demands a considered response; if it were true, arguments about competition's desirability would be beside the point since there is nothing we can do about our nature. The second myth is that competition motivates us to do our best—or, in stronger form, that we would cease being productive if we did not compete. This assumption is invoked to explain everything from grades to capitalism. Third, it is sometimes asserted that contests provide the best, if not the only, way to have a good time. All the joys of play are said to hinge on competitive games. The last myth is that competition builds character, that it is good for self-confidence. (Kohn, 1992, p. 8)

Without reviewing the empirical evidence presented by Kohn to support the assertions of the detrimental impacts of competition, it should still follow that other evidence exists to indicate we have much room for improvement in educating our students beyond the high school level.

A brief scan of the literature indicates an increased sense of urgency for improving the efficacy of higher education, especially in technology and the sciences. The economy of our nation has long since crossed the threshold from manufacturing to information. Pressures from emerging economies now challenge our dominance in this critical area. We can no longer afford to spend the capital of

previous generations of inventors and thought leaders. Noted scholars from the National Research Council (Bransford, Brown, and Cocking, 2000), the American Psychological Association (1997), and other empirical studies (Baxter Magolda 1999; Boyatzis, Cowen and Kolb 1995; Keeton, Scheckely and Griggs 2002; King 2003; Light 2001; Mentkowski and Associates 2000; Zull 2002) urge administrators, scholars, and others in higher education to explore methods of boosting the learning of college students. While most educational researchers propose a method for enhancing a student's ability to achieve learning objectives, none propose continued subdivision of faculty in related fields of study. The evidence underscores that the status quo will not suffice. To achieve meaningful gain requires an approach grounded in the fundamentals of curricular design.

Basics of Curriculum Design

The basic definition of curriculum has changed little since the early 17th century. The OED defines curriculum as "a regular course of study or training, as at a school or university." Some other relevant definitions from more recent literature include:

> An interrelated set of plans and experiences which a student completes under the guidance of the school. (Marsh and Stafford, 1984, p. 3)

> All the planned experiences provided by the school to assist the pupils in attaining the designated learning outcomes to the best of their abilities. (Neagley and Evan, 1967)

> A programme of activities (by teachers and pupils) designed so that pupils will attain so far as possible certain educational and other schooling ends or objectives. (Barrow, 1984, p. 11)

While the OED refers to a "regular course," the other three definitions similarly address plans, planned experiences or programs of specific design. Grundy (1987, p.24) traces this approach of curriculum back to Aristotle and his consideration of different kinds of human action in *Nicomachean Ethics*. In Aristotelian terms, "the disposition which informs one kind of human action is the disposition *techne* or skill….The action in which the artisan engages is called *poietike*, in English 'making' action….(In the Greek all these words are represented by the term *eidos. Eidos* is like the English term 'idea' but encompasses this wider range of meanings.)" The following diagram illustrates how these terms relate to developing the plan or program that becomes a curriculum.

Guiding *eidos*	Disposition	Action	Outcome

```
  ( eidos )  ───▶  ( techne )  ───▶  [ poietike ]  ───▶  ( product )
```
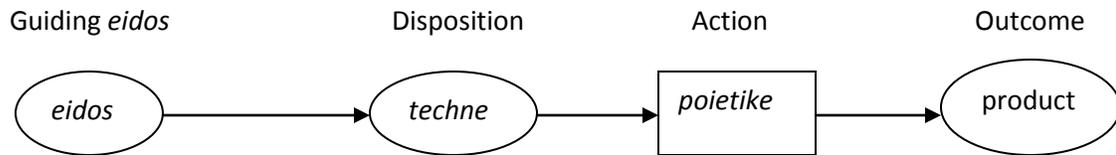
Figure 1: The technical relationship of ideas and actions (Grundy)

Grundy elaborates that the skill of the professor (*techne*) brings the idea (*eidos*) into being for the student. On the other hand, the outcome of the curriculum (product) is prescribed by the *eidos*. Thus, even when professors bring varying dispositions to the subject matter, from an Aristotelian perspective, the outcomes will still retain a familial form when launched by the same eidos. In the context of this study, the guiding *eidos* revolves around computers.

Case for Cooperation

The heart of the argument rests in identifying the degree to which programs in Information Systems and Computer Science differ, or conversely the extent to which their *eidos* might be considered of a class. As discussed earlier, the original four faculties at the University of Paris were Theology, Law, Medicine and the Arts. The obvious distinctions in this list leave precious little room for overlap. With the information technology age less than a century old, the opportunities for this degree of distinction have not yet developed. Whether computer science predated information systems on a given campus or the other way around, each sprung from the same seed of digital technology that has become the information technology industry.

A group of researchers explored a more empirical approach to this question, even if they came to the problem from a different direction. Reichgelt (et al) investigated whether a growing trend for a third discipline, a degree in information technology, could rationally exist on campuses that already offered degrees in computer science and information systems. While concluding their study in the affirmative, their data also underscores the related nature of the degrees in question. In specific, they studied the programs of study at twelve universities that offer all three of the computer-related degrees in question, from George Mason University and Purdue, to Macon State College and the University of

South Alabama. In studying the structure of these programs, they classified the courses that schools included in the degree programs in one of seven categories:

- Business related courses (B)
- Courses concentrating on interpersonal communication (IC)
- Software related courses (SW)
- Courses on networking, web-related technologies or databases (NWD)
- Electronics or signals (ES)
- Hardware (HW)
- Mathematics and science (MS).

Repeating this study would allow for adjusting the method in terms of course classification and would certainly expand the potential number of schools in the sample field. Even so, the results by Reichgelt and his colleagues illuminate the *eidos* of these degrees.

Among the twelve schools included in the study, the researchers ended up with a sample of eight programs each for computer science and information systems. They found no information systems programs requiring a course in electronics or signals. Otherwise, the average response for both programs required classes in each of the other areas of study. The emphasis shifts from one program to the next, yet the evidence shows that classes in software, hardware, database, and math constitute a greater part of the study for students in either program. The following table summarizes the results of this study. (Note: eliminating the Information Systems program at Capella: E-Business, which was included in the study but requires only 31 classes in business and one class in interpersonal communication, sheds truer light on this discussion.)

Distribution of courses between average programs in CS & IS								
	B	ES	HW	IC	NWD	MS	SW	Total
Average CS Program	0.59	1.16	1.95	1.13	2.54	8.06	10.03	25.46
Average IS Program	14.33		0.17	1.58	4.27	1.5	2.63	24.48

Figure 2: Summary of the average number of 3-hour courses by program (Riechgelt, et al)

A final perspective on this discussion involves the issue of accreditation for computer science and information systems programs. While most colleges and universities obtain regional accreditation covering the entire catalogue, individual programs or schools will seek more specific or more prestigious

accreditation of their programs to demonstrate a level of excellence not reflected in the regional accreditation. For over 75 years, ABET has represented excellence in technical education on par with the ABA for law schools or the AMA for medical schools. Since 1985, ABET has also accredited programs of computer science (www.abet.org). Less than a decade ago, ABET added programs in Information Systems (or similarly named programs) to its suite to foster increased levels quality in a discipline that it considers closely related to the other technology and engineering programs they deal with.

ABET does not accredit schools, but rather individual programs of study. Most deans and professors consider ABET accreditation the gold standard. Many companies and graduate schools consider an ABET accredited degree of greater value than one without that endorsement. That ABET adopted Information Systems into its technically heavy sphere underscores the relationship that IS programs should enjoy with other ABET-recognized programs. Having these programs in a single academic unit on campus would validate the relationship insinuated by the ABET accreditors.

Case Study

At Liberty University, the School of Business offered a degree in Information Systems (IS) while the Department of Mathematics (in the College of Arts and Sciences) offered a degree in Computer Science (CS). In the Fall of 2002, the University reorganized to bring these two degrees together into a separate unit, the Center for Computer and Information Technology (CCIT).

The CCIT continued to maintain and develop the Computer Science and Information Systems programs to more closely align them with the suggested curricula guidelines of organizations like ACM and AITP. This differentiation was important so that students were more readily able to distinguish the differences in the two programs now that they resided under the CCIT banner.

During the CS and IS programs tenure under the CCIT banner, the programs continued to mature and develop into programs that offered some collaboration between the CS and IS faculty and students. This process enabled these two programs with similar *eidos* to foster collaborations between the CS and IS faculty in a return to the spirit of the cooperation in teaching students from different disciplines but as a result of the same *eidos*.

In 2005 the joint faculty in CCIT began discussing the idea to incorporate the concepts of CS and IS along with classes in visual communications (arts) with a goal of developing a Web Technology and Design program. Since the Internet and World Wide Web have become a major part of the Digital Technology *eidos,* the faculty believed that this discipline would provide an appropriately distinct third course of study within the CCIT.

The results of the discussions about the web technology program included the idea that this program should also incorporate a multi-disciplinary approach to the program to foster the spirit of cooperation and collaboration that was missing in many separated digital technology programs. Therefore it was decided that the web technology program would be developed to include IS and CS, but also Web and Graphic Design elements. These three disciplines would form the backbone of the designated Wed Technology and Design program (WTD).

The WTD was initiated in Fall 2005, as the third program in the CCIT. The WTD was designed to give students the opportunity to develop skills in cooperation with CS faculty, IS faculty, and Graphic Design faculty leverage the spirit of collaboration between the three disciplines.   The Graphic Design (GD) curriculum was incorporated to give GD students the ability to crossover from their design emphasis and put their design education into practice in web design.

The combination of CS, IS, and GD gives students the opportunity to leverage not only the programming skills from CS, and the technology skills from IS, but also the graphic skills from GD, to design cutting edge Internet-based applications. This combination gives the students a better skill set that spans several related disciplines, thus allowing the students more opportunities after graduation.

The actual design of the WTD major is outlined below:

		Major: Web Technology and Design (42 hours)
CSCI	111	Introduction to Programming
CSCI	112	Advanced Programming
CMIS	212	Object-Oriented Programming
CSCI	215	Algorithms and Data Structures
MATH	250	Introduction to Discrete Mathematics
CMIS	310	Web Architecture and Development
CSCI	325	Database Management Systems

CSCI	340	Studies in Information Security
CSCI	345	Introduction to Unix
CMIS	351	Systems Analysis and Design
CSCI	355	Computer Network Architecture and Programming
ENGS	375	Introduction to Human-Computer Interaction
CMIS	470	Executive Perspectives on E-Commerce Technology
CMIS	3xx/4xx	312 or 410 or 430
		Graphic Design (18 hours)
VCAR	222	Desktop Publishing
VCAR	332	Digital Illustration
VCAR	341	Graphic Design
VCAR	351	Digital Imaging
VCAR	371	Advanced Graphics
VCAR	4xx	472 or 473 or 497(3D Graphics)

In June 2007 Liberty launched four new engineering degrees, which it placed with the CS, IS and WTD programs to create the School of Engineering and Computational Sciences (SECS). This school became the home for CS, IS, and WTD along with Electrical, Industrial & Systems, Computer, and Software Engineering programs. All seven programs in the school revolve around the focus of electronics, digital technology and systems.

Since the beginning of the SECS the WTD program has undergone several revisions in order to present the program to students with all courses and prerequisites in a logical progression leading to graduation. These revisions have resulted in the major degree courses as listed above.

Another aspect of the WTD is that students have the choice of emphasizing one of three areas of study in the major; they are Java Programming, Web Page Design, or Networking. The CMIS 312 programming course, the CMIS 410 Web Technologies course, and CMIS 430 Advanced Networking course allow the student to emphasize one of these three areas of study and potential earn industry certification to complement their baccalaureate degree. This gives the student a chance to more specialize in a particular area of Internet/Web Technology.

The results of the combination of CS, IS, Web, and GD, gives students the opportunity to experience the type of collaboration and spirit of cooperation not often experienced in the current academic environment. The ability to mingle with other students and professors in related fields of study provide for a richer educational experience than found in may academic settings today.

The primary benefit of the WTD program is that students now have an emphasis on collaboration and cooperation in the spirit of academic tradition when students were exposed to many different disciplines in order to enhance their particular discipline upon graduation.

Conclusion

The benefits of combining Computer Science and Information Systems into a single academic unit seem clear. Students benefit from working with other students in related disciplines; professors find easier and more ad hoc opportunities for collaboration; administrators find opportunities for savings through greater use of resources. The drawbacks from such an organization are difficult to identify. Aligning Information Systems with the Computer Science program either in a school of science or a school of engineering would seem to most closely represent the nature of what ABET seeks in its role as accrediting agency. Further study in this area is possible along the lines of the Reichgelt, et al, study. Rather than seeking to justify further delineation of new technology programs, though, a similar construction should investigate the similarities of programs rather than the differences.

References

American Psychological Association Board of Affairs (1997). *Learner-centered Psychological Principles: A Framework for School Redesign and Reform*. Retrieved from http://www.apa.org/ed/lcp.html

Barrow, R. (1984).   Giving *Teaching Back to Teachers: A Critical Introduction to Curriculum Theory*. Brighton, Wheatsheaf.

Baxter-Magolda, M.B. (1999). *Creating Contexts for Learning and Self-authorship*. Nashville: Vanderbilt University Press.

Boyatzis, R.E., S.S. Cowen, and D.A. Kolb (1995).   *Innovation in Professional Education: Steps on a Journey from Teaching to Learning*. San Fransisco: Jossey-Bass.

Bransford, J.D., A.L. Brown, and R.R. Cocking (2000). *How People Learn: Brain, Mind, Experience and School*. Washington D.C.: National Academy Press.

Grundy, S. (1987). *Curriculum: Product or Praxis?* London: The Falmer Press.

Keeton, M.T., B.G. Sheckley, and J.K. Griggs (2002).   *Efficiency and Effectiveness in Higher Education*. Dubuque, IA: Kendall/Hunt Publishing Company.

King, P.M. (2003).   Student Learning in Higher Education.   In S.R. Komives, D.B. Woodward Jr. and Associates (Eds.), *Student Services: A Handbook for the Profession*.   234-268, San Fransisco: Jossey Bass.

Kohn, Alfie. (1986) *No Contest: The Case Against Competition*. New York: Houghton Mifflin Company.

Light, R.J. (2001).   *Making the Most of College: Students Speak their Minds*.   Cambridge, MA: Harvard University Press.

Marsh, C. and K. Stafford (1984). *Curriculum: Australian Practices and Issues*. Sydney: McGraw-Hill.

Mentkowski, M., & Associates (2000).   *Learning that Lasts: Integrating Learning, Development and Performance in College and Beyond*. San Fransisco: Jossey Bass.

Neagley, R.L. and N.D. Evans (1967). *Handbook for Effective Curriculum Development*. Englewood Cliffs, NJ: Prentice-Hall.

Reichgelt, Han, Barry Lunt, Tina Ashford, Andy Phelps, Erick Slazinski, and Cheryl Willis (2004). A Comparison of Baccalaureate Programs in Information Technology with Baccalaureate Programs in Computer Science and Information Systems. *Journal of Information Technology Education* (3), 19-34.

Surendran, Ken, Ike Ehie, Chellappan Somarajan (2005). Enhancing Student Learning across Disciplines: A Case Example using a Systems Analysis and Design Course for MIS and ACS Majors. *Journal of Information Technology Education* (4), 257-274

Zull, J.E. (2002). *The Art of Changing the Brain: Enriching Teaching by Exploring the Biology of Learning*. Sterling, VA: Stylus.

SPENDING WISELY IN HARD ECONOMIC TIMES: USING THE KANO METHOD TO BEEF UP MBA PROGRAMS

Ajay K. Aggarwal, Millsaps College, Jackson, MS 39210, (601) 974-1270,
aggarak@millsaps.edu

ABSTRACT

MBA programs enjoy tremendous popularity in business schools around the country. A tremendous source of pride and much needed revenue, MBA programs are often in a state of flux. In an effort to balance the changing and sometimes conflicted needs of students, employers, and faculty, surveys have become a popular tool of choice for decision makers to determine future direction. This paper suggests an innovative technique that can be used in surveys to maximize customer satisfaction and minimize customer dissatisfaction. The technique is illustrated with data from three surveys.

INTRODUCTION

The Masters of Business Administration degree remains a popular degree in the marketplace today. Boasting average starting salaries in excess of $80,000, the MBA degree inspires potential students to fork out significant sums of money in its quest. Often a significant source of pride and revenue for business schools, the MBA degree is not without its challenges. To ensure employability and boost rankings of their schools in the eyes of potential employers, most schools attempt to appease their key demands. The faculty and students also have their own expectations or demands from the program.

ATTRIBUTE	AUTHORS
Relevant and Accountable to Market Needs	Bok (1986), McEvoy & Kragen (1987), Keys & Wolfe (1988)
Split between Practice and Theory	Fortunato et al (1995)
Analytically Detached	Muller et al (1991)

Integration of Arts and Science	Boyatzis et al (1995)
People Skills	Whetten and Clark (1996)
Global Management Skills	McEvoy (1998), Bennis & O'Toole (1995)
Understanding Multiple Cultures	Shimoni & Bergmann (2006)
Leadership, Interpersonal Skills, Communication	Pfeffer and Fong (2002), Richards-Wilson (2002)
Diversification, Projects with Global Themes	Sharma & Ann Roy (1996)
Social Development to Compete Globally	Kedia and Harveston (1998)

TABLE 1: Ever Changing Expectations from MBA Programs (Source: Adapted from [1])

Keeping pace with the ever-changing demands of multiple constituencies (see Table 1), some of which may be ranked differently, or be in direct conflict with others, can be a challenge. In tough economic times, this balancing act can assume a strategic importance. Surveys are a popular vehicle for gauging consumer behavior. Tabulating responses to questions on an established Likert scale, computing their significance, and ordinal rank ordering them has become a standard feature in the marketing literature. The traditional survey instruments often request consumer ratings on various attributes (e.g. My MBA program should be technically competitive). These are often compared with competitors or some desired standard and measures are put in place to influence it in the desired direction. The House of Quality (HOQ) technique in the quality and operations management literature provides a vivid example of this.

The Kano method adds value to the traditional survey model by providing customer satisfaction and dissatisfaction information based on all attributes. In addition, it classifies each customer attribute into one of five types. This provides important information that can guide the decision maker. For instance, it is helpful to know that spending money on a particular attribute will not influence customer satisfaction.

The Kano method, an invention of Professor N. Kano of Japan, greatly improves upon the understanding of customer responses by researchers. Historically, researchers assumed a linear relationship between customer satisfaction improvement ratio and importance increment ratio. This suggested that paying more attention to attributes held dear by the customer would increase customer satisfaction and vice versa. Kano argued that while the assumption was intuitively appealing, it wasn't necessarily true. If a customer

expected certain things to be there (e.g. a scratch-free car), putting more effort there would not yield additional satisfaction. He suggested that all customer desired attributes could be classified, and each one would have its own functional relationship with customer satisfaction.

In absence of the Kano method, the decisionmaker can be left in a quandary. Responders may rank the importance of several items at the highest level. Which items should the decisionmaker pursue? This takes on increasing importance in a period of limited or shrinking budgets. The potential risk of losing future students due to action or inaction on key issues is a source of serious concern. How can one prioritize multiple items that received the same ordinal ranking? The Kano method offers help in this regard. It does that by asking the survey takers to respond to each traditional survey question in two format – functional and dysfunctional.

A traditional survey may pose the following question:

On a 5-point scale, 5 being the highest, rank the importance of having international programs in the MBA program.

The Kano method would ask the same question in two formats:

On a 5-point scale, 5 being the highest, how do you like it **if you hav**e international programs in the MBA program? [*Functiona*l *format*]

On a 5-point scale, 5 being the highest, how do you like it **if you don'**t **hav**e international programs in the MBA program? [*Dysfunctiona*l *format*]

The responses on the two formats for each question help classify it into one of six categories – must-be (M), one-dimensional (D), attractive (A), reverse (R), indifference (I), and sceptical (Q). Figure 1 shows the different combinations of response values that result in the various classifications. A "must-be" or "M" classification implies that the requirement must be fulfilled as stated to avoid order loss (i.e. Not having international programs will result in losing potential students from the MBA program). A

"onedimensional" or "D" classification means that fulfillment of the requirement will directly increase customer satisfaction while absence will increase customer dissatisfaction (i.e. students will be very pleased if international programs are included in the MBA program and very displeased otherwise). An "attractive" or "A" classification implies that absence of the requirement will not produce any dissatisfaction. However, its presence will add to customer satisfaction. A "reverse" or"R" rating implies that absence of the requirement will not produce any dissatisfaction. However, its presence will add to customer dissatisfaction. The indifference or "I" classification produces no effect on customer

		Dysfunctional Performance				
		5	4	3	2	1
Functional Performance	5	Q	A	A	A	D
	4	R	I	I	I	M
	3	R	I	I	I	M
	2	R	I	I	I	M
	1	R	R	R	R	Q

FIGURE 1: Five Types of Kano Classification

satisfaction or dissatisfaction whether or not the requirement is fulfilled. The "Q" category shown in the figure implies that the response giver is completely inconsistent in the responses afforded. For instance, voting a "5" on both functional and dysfunctional statements would show confusion in the responder's mind, and is that is certainly cause for skepticism in the researcher's mind. Since the "R", "I" and "Q" classifications do not impact customer satisfaction or dissatisfaction by their absence, the Kano method limits the classification of attributes to "A", "D," or "M."

THE SURVEYS Three surveys of former MBA graduates were conducted sequentially using the web. It was felt that three surveys were needed to limit the individual survey size and the completion time. To enhance the response rate for the surveys a modest prize was announced for the first 50 respondents. The surveys had 24, 30, and 30 questions respectively, based on 12, 15, and 15 issues. A summary of the issues is presented in figures 2, 3, and 4. The surveys presented each of the questions in functional and dysfunctional formats.

1	Your MBA program has great scholarships
2	Your MBA program is well-known nationally
3	Your MBA program has strict admission requirements
4	Your MBA program is highly integrated and seems like one big course
5	Your MBA program provides degrees for specific industries
6	Your MBA program has a strong internship program for students lacking work experience
7	Your MBA program offers students an opportunity to study abroad
8	Ample parking exists near your classroom building
9	Your MBA program is known for quality in the region
10	Your MBA program has a waiting list of applicants
11	Your MBA program offers a degree in one or more specialized areas
12	Your MBA program faculty members have Doctorate degrees

Figure 2: Self-Stated Importance Questionnaire for your MBA Program

The issues raised in the first survey included scholarships, reputation of program and faculty, curriculum issues, and parking. Figure 2 shows the details. The second survey collected data on issues of intellectual challenge, technology, teamwork, liberal arts, accreditation, business leaders, employers' recommendation, offering times, and distance learning. Figure 3 shows the details.

1	Your MBA program is intellectually challenging
2	Your MBA has a strong writing program
3	Your MBA program uses wireless technology
4	Your MBA program emphasizes real world applications
5	MBA program has high tech classrooms
6	Teamwork skills are stressed in your MBA program
7	Your MBA has a strong quantitative orientation

8	Your MBA program offers on-line or electronic courses
9	Your MBA program has faculty that interact with students
10	Your MBA program is part of a Liberal Arts college
11	Your MBA program is AACSB accredited
12	Business leaders and employers regularly speak to classes
13	Employers recommend your MBA program
14	Your MBA program has part-time and week-end courses
15	Your MBA program uses Distance Learning

Figure 3: Self-Stated Importance Questionnaire for your MBA Program(2)

The third survey dealt with issues of placement, recruitment, alumni support, curriculum, graduation rate, jobs, salaries, geographic diversity, ethnic diversity, executive MBA, communication, and work experience. Figure 4 shows the details.

1	Your MBA program has a strong job placement program
2	The graduates of your MBA program are heavily recruited
3	The alumni provide great support for your MBA program
4	Your MBA program is highly integrated and seems like one big course
5	Alumni are frequently requested to give to your MBA program
6	Your MBA Program has a high graduation rate
7	Your MBA program graduates get jobs in their chosen fields
8	Your MBA graduates improve their salary by 10% after MBA
9	Your MBA graduates improve their salary by 20% after MBA
10	Your MBA graduates improve their salary by 30% after MBA
11	Your MBA program has a geographically diverse student body
12	Your MBA program has an ethnically diverse student body
13	Your MBA program has an Executive MBA
14	Administrators listen to students in your MBA program
15	Students in your MBA classes have 2 or more years of business experience

Figure 4: Self-Stated Importance Questionnaire for your MBA Program(3)

THE RESULTS

Surveys #1, 2, and 3 produced 114, 98, and 79 responses respectively. While all three surveys were emailed to 437 former graduates, the response rate went a little down with each additional survey, despite the prize inducement. The highest response rate achieved was 26%, for the first survey. Figures 5, 6, and 7 present a

summary of the results.

	#Q	#A	#1-D	#R	#I	#M
#1	1	34	21	0	44	14
#2	0	0	0	99	15	0
#3	1	63	21	0	20	9
#4	0	1	0	51	62	0
#5	0	15	18	1	43	37
#6	3	1	0	60	47	3
#7	2	12	2	10	83	5
#8	5	7	0	29	71	2
#9	1	23	4	2	82	2
#10	0	0	0	64	50	0
#11	0	37	22	0	42	13
#12	0	0	0	64	49	1

Figure 5: Frequency Distribution Results for Survey #1

	#Q	#A	#D	#R	#I	#M
#1	0	4	38	0	4	52
#2	0	0	0	95	3	0
#3	0	18	35	0	19	26
#4	1	0	0	74	23	0
#5	1	35	4	0	57	1
#6	0	0	0	48	48	2
#7	3	15	31	1	16	32
#8	1	1	0	77	19	0
#9	0	41	7	0	41	9
#10	1	0	0	45	52	0
#11	0	13	25	4	34	22
#12	1	3	0	68	26	0
#13	0	28	12	0	39	19
#14	0	0	0	44	47	7
#15	0	21	3	7	67	0

Figure 6: Frequency Distribution Results for Survey #2

	#Q	#A	#D	#R	#I	#M
#1	0	16	30	1	17	15
#2	1	0	0	67	11	0
#3	0	20	32	0	11	16
#4	0	0	0	62	17	0
#5	0	22	13	0	34	10
#6	0	0	0	30	47	2
#7	0	11	3	3	59	3
#8	1	1	0	30	47	0
#9	0	21	9	0	46	3
#10	0	0	0	34	45	0
#11	0	15	13	0	26	25
#12	0	0	0	64	14	1
#13	0	22	28	1	8	20
#14	0	0	1	60	18	0
#15	0	10	17	1	26	25

Figure 7: Frequency Distribution Results for Survey #3

In order to classify the attributes into categories "A", "D", and "M", the frequencies of the attributes in the various categories were examined. If the frequency of the attribute was highest in the "A", "D" or "M" categories, that category was chosen. If not, whichever of the "A", "D", or "M" category had the highest frequency was chosen, provided it was at least 25% of the survey response. If the minimum criterion was not met, it was assumed that no classification was possible. It should be pointed out that while it's possible to get the classifications of "indifferent" (I), "reverse" (R), and "skeptical" (Q), the rare occurrence of "Q" attribute, the lack of impact on customer satisfaction for the "I" category causes the research focus on "A", "D", and "M" nodes. The results are as follows:

A: #1, #3, #11 (survey 1), #5, #9, #13 (survey 2), #5, #9 (survey 3)

D: None (survey 1), #3, #11 (survey 2), #1, #3, #13 (survey 3)

M: #5 (survey 1), #1, #7 (survey 2), #11, #15 (survey 3) These results suggest that in order to be viable, the MBA program must have focus on specific industries, be intellectually challenging, have a strong

quantitative orientation, and admit a diverse student body with two or more years of work experience.

Customer satisfaction would be greatly enhanced by wireless technology and AACSB accreditation, strong job placement program, great alumni support, and having an executive MBA program.

There would be no customer dissatisfaction by their absence, but students would get additional satisfaction by scholarships, strict admission requirements, degrees in specialized areas, high tech classrooms, faculty interaction with students, employers' recommendation of program, asking alumni to give frequently, and MBA graduates improve their salaries by 20% after graduation.

CONCLUSION

The Kano method provided helpful guidance by identifying attributes that will make the MBA program viable. The MBA director will find this information invaluable since absence of these attributes will keep students from selecting the program. Of the 42 attributes examined, 5 are needed to make the program viable, 4 increase customer satisfaction by their presence and vice versa, and 8 have no impact on customer dissatisfaction but do have the potential to increase customer satisfaction when present.

REFERENCES

[1]. Belasen, A.T. & Rufer, R. "Building a Competency Based MBA from the Ground Up: Curriculum Design and Program Delivery," Academy of Management Proceedings, 2007, pp.1-6.

[2]. Kano, N., Seraku, N., Takahashi, F., & Tsuji, S. "Attractive Quality and must-be quality," Hinshitsu Quality, The Japanese Journal for Quality Control, 14, 1984, pp.39-48.

(Other references available from author upon request)

ENGAGED MINDS WANT TO KNOW…A LOOK AT EFFECTIVE LEARNING TECHNIQUES FOR ENGAGED LEARNING

ABSTRACT

Engaged learning has many different meanings to different people. However, there is no question that it can be an effective methodology inside the classroom as well as beyond the walls. This practical workshop will discuss possible learning methodologies that can be classified as engaged learning. These methodologies vary greatly but are characterized by three factors. The activities are challenging, authentic, and integrative. Four experienced faculty members will lead a discussion of various types of engaged learning that has been successfully utilized in their classrooms. These include active learning, research, service projects, internships, and technology. As Neil Armstrong said when he stepped on the moon, "That's one small step for man, one giant leap for mankind." We will focus on small steps that can yield great results for your students.

Real GDP and Economic Indicators

LOOKING INTO THE FUTURE OF OUR ECONOMY

Contents

Eric Peterson
Liberty University
Undergraduate, Industrial & Systems Engineering
edpeterson2@liberty.edu

Real GDP and Economic Indicators
LOOKING INTO THE FUTURE OF OUR ECONOMY

This document will analyze the driving factors of United States Gross Domestic Product and predict the future value of GDP in the next quarter. Certain economic data can indicate how the GDP will change in the following quarter. Here we take a look into some of the most telling factors.

THE OBJECTIVE

The objective of this procedure is to model and predict the US GDP in the near future based on other economic *indicators*. A history will be compiled and the effects of the indicators on its value will be analyzed. Then the current values of the indicators will be used to predict the next GDP value.

GATHERING THE DATA

Any number of indicators can be used, but five series have been chosen from www.economagic.com and www.data360.org. These are consumer price index, unemployment, prime rate, industrial production index, and inflation. We are comparing this with Real GDP in billions of 2000 dollars, published quarterly by the US Bureau of Economic Analysis.

In a spreadsheet, we will line up all this data in columns with headers for the different data sets.

Date	CPI	U	PR	IPI	Inf	GDP
1/1/1969	35.833	3.40	7.06	42.99	5.79	3,750.20
4/1/1969	36.433	3.43	7.74	43.18	5.67	3,760.90
7/1/1969	36.967	3.57	8.50	43.70	5.59	3,784.20
10/1/1969	37.500	3.57	8.50	43.43	6.63	3,766.30
1/1/1970	38.000	4.17	8.46	42.37	6.52	3,760.00
4/1/1970	38.633	4.77	8.00	42.14	5.34	3,767.10
7/1/1970	39.067	5.17	7.94	41.99	4.20	3,800.50
10/1/1970	39.600	5.83	7.23	41.08	6.26	3,759.80
1/1/1971	39.900	5.93	5.87	41.87	2.04	3,864.10
4/1/1971	40.333	5.90	5.41	42.25	5.11	3,885.90
7/1/1971	40.767	6.03	5.97	42.38	3.00	3,916.70
10/1/1971	40.967	5.93	5.64	43.37	2.87	3,927.90
1/1/1972	41.267	5.77	4.89	45.20	2.98	3,997.70
4/1/1972	41.600	5.70	5.00	46.07	2.93	4,092.10
7/1/1972	42.000	5.57	5.34	46.67	3.90	4,131.10
10/1/1972	42.400	5.37	5.76	48.27	3.86	4,198.70

The data available ranges from January (Q1) 1969 to October (Q4) 2008

The data I've collected dates back to 1969. However, if we use the most recent seven years, that will be a total of 28 quarters, which is an appropriate number for a *multivariate regression*, the statistical analysis we will use.

CHOOSING A MODEL

Most multivariate regressions are linear, assuming the data takes the form

$$y = b_0 + b_1 x_1 + b_2 x_2 + \cdots + b_n x_n + \varepsilon$$

Where GDP Y is represented as a linear combination of all the different driver variables plus a noise variable ε. However, a more accurate *variable elasticity* model is

$$y = b_0 * e^{b_1 x_1} * x_1^{b_2} * e^{b_3 x_2} * x_2^{b_4} * \ldots * e^{b_{2n-1} x_n} * x_n^{b_{2n}}$$

However, this is very complex and nonlinear. If we take the natural log of both sides and simplify, the equation becomes

$$\ln y = b_0' + b_1 x_1 + b_2 \ln x_1 + b_3 x_2 + b_4 \ln x_2 + \cdots + b_{2n-1} x_n + b_{2n} \ln x_n$$

This form of a variable elasticity model is much easier estimated by linear multivariate means. Here you can see the actual model is of $\ln y$, but once we've forecasted the natural log of GDP, we can simply raise e to that power to have our actual estimate of GDP.

PERFORMING THE REGRESSION

To perform a regression on a spreadsheet, the data sets need to be organized into columns. In addition to our GDP column, we now need an "Ln GDP" column for our y values and columns for the natural logs of all of our x_i's. The GDP columns should be shifted so that they display the GDP one quarter *after* the indicators. In essence, we are lining up rows of nine inputs and one output. The inputs are the economic indicator values of each particular quarter and the output is the GDP one quarter later. The layout looks as so:

	x_1	x_2	x_3	x_4	x_5	$\ln x_1$	$\ln x_2$	$\ln x_3$	$\ln x_4$	y	$\ln y$
Date	CPI	U	PR	IPI	Inf	Ln CPI	Ln U	Ln PR	Ln IPI	**GDP in 1 Qtr**	**ln GDP**
1/1/2002	177.900	5.70	4.75	98.69	2.51	5.1812	1.7405	1.5581	4.5920	10,031.60	9.213495
4/1/2002	179.833	5.83	4.75	100.11	2.51	5.1920	1.7630	1.5581	4.6063	10,090.70	9.219369
7/1/2002	180.600	5.73	4.75	100.64	2.70	5.1963	1.7457	1.5581	4.6116	10,095.80	9.219875
10/1/2002	181.167	5.87	4.45	100.55	2.23	5.1994	1.7699	1.4929	4.6107	10,126.00	9.222862
1/1/2003	183.000	5.87	4.25	101.28	4.72	5.2095	1.7699	1.4469	4.6179	10,212.70	9.231387
4/1/2003	183.667	6.13	4.24	100.52	-1.70	5.2131	1.8132	1.4446	4.6103	10,398.70	9.249436
7/1/2003	184.567	6.13	4.00	101.15	4.44	5.2180	1.8132	1.3863	4.6166	10,467.00	9.255983
10/1/2003	184.600	5.83	4.00	102.18	0.88	5.2182	1.7630	1.3863	4.6268	10,543.60	9.263274
1/1/2004	186.267	5.70	4.00	102.89	3.50	5.2272	1.7405	1.3863	4.6337	10,634.20	9.271831

These are our x-values for the regression.

Select these y-values.

In the data analysis tools (I'm using MS Excel 2007), we now perform a regression on our data, selecting the rows of indicators as the x-input and the column of ln GDP as the y-input. The output will contain the coefficients of our model, as well as other statistical values.

Notice that there is no $\ln x_5$ column because inflation contains negative values, which are not in the domain of the ln function. For simplicity I have omitted this column, although it would also be possible to make a column for $\ln(x_5 + c)$, where c is some constant added to all the inflation values to make them all positive.

READING THE OUTPUT

The regression output will be a box that looks like this:

SUMMARY OUTPUT

Regression Statistics					
Multiple R	0.98954		n	28	
R Square	0.97918		Ybar	9.299	
Adjusted R Square	0.97026		n*Ybar^2	2421	
Standard Error	0.01992		sumsqY	2508	
Observations	31		k	0.96549	
			R(U)	0.99975	

This is the uncorrected R-square that we compute.

ANOVA

	df	SS	MS	F	Significance F
Regression	9	0.391884	0.043543	109.74151	1.30015E-15
Residual	21	0.008332	0.000397		
Total	30	0.400217			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	91.1092	23.7398	3.8378	0.0010	41.7396	140.4787
CPI	0.043002	0.0338	1.2712	0.2176	-0.0273	0.1134
Unemp	0.089779	0.1752	0.5124	0.6137	-0.2746	0.4542
PR	0.137302	0.0354	3.8764	0.0009	0.0636	0.2110
IPI	0.142588	0.1018	1.4004	0.1760	-0.0692	0.3543
Inf	-0.001782	0.0011	-1.5628	0.1331	-0.0042	0.0006
Ln CPI	-7.50330	7.0238	-1.0683	0.2975	-22.1102	7.1036
Ln Unemp	-0.57511	0.9886	-0.5817	0.5669	-2.6311	1.4808
Ln PR	-0.81405	0.1943	-4.1904	0.0004	-1.2181	-0.4101
Ln IPI	-13.85876	11.1129	-1.2471	0.2261	-36.9693	9.2518

The b_i coefficients are listed in the "Coefficients" column, and many other statistics are included as well. One statistic that is helpful to compute is the uncorrected r-square. To do this, we first compute the k value, which is the number of y-values, 28, times the square of the average y-value, divided by the sum of all the squared y-values. The R(U) square is the R square times $1 - k$ plus the k value. Ours is 0.99975, which means our model explains 99.975% of the data in our history.

Our specific model for GDP is

$$\ln GDP = 91.1 + 0.043 * CPI + 0.090 * Unemp + 0.137 * Prime\ Rate + 0.143 * IPI - 0.00178$$
$$* Inflation - 7.5 * \ln CPI - 0.575 * \ln Unemp - 0.814 * \ln PR - 13.859 * \ln IPI$$

And $\quad\quad GDP = e^{\ln GDP}$

Page 3

APPLYING THE MODEL AND FORECAST

Now that we've calculated the coefficients to our model, we can use our historical drivers to make a model of GDP and use the drivers that we know now to estimate the current GDP.

Date	GDP	ln GDP	Mod ln	Model	|A%E|
4/1/2006	11,291.70	9.3318	9.387825	11942.1	5.76%
7/1/2006	12,965.90	9.4701	9.431378	12473.7	3.80%
10/1/2006	13,060.70	9.4774	9.464055	12888.04	1.32%
1/1/2007	13,099.90	9.4804	9.460402	12841.04	1.98%
4/1/2007	13,204.00	9.4883	9.473027	13004.2	1.51%
7/1/2007	13,321.10	9.4971	9.510416	13499.6	1.34%
10/1/2007	13,391.20	9.5024	9.51752	13595.86	1.53%
1/1/2008	13,366.90	9.5005	9.500241	13362.94	0.03%
4/1/2008	13,415.30	9.5042	9.496445	13312.32	0.77%
7/1/2008	13,324.60	9.4974	9.503823	13410.9	0.65%
10/1/2008	13,141.90	9.4836	9.48456	13155.04	0.10%
1/1/2009	12,925.40	9.4669	9.45791	12809.09	0.90%
4/1/2009	12,892.40	9.4644	9.469185	12954.32	0.48%
7/1/2009			9.516754	**13585.44**	

Since we know the current values of all our drivers, we can calculate the GDP for next quarter. Based on our data, the model says first quarter Real GDP for the 3rd Quarter of 2009 will be 13,585 billion 2000 dollars, a start of a recovery. On April 29, 2009 the Bureau of Economic Analysis published the Q1 2009 GDP as 11,340.9 billion 2000 dollars. All these drivers were available well before the release and predicted it within 98.9%.

The column labeled |A%E| is the absolute percent error, which is the absolute value of the difference between the model and historical, divided by the historical value. Most are all well within 98%. The |AA%E|, average absolute percent error, is 1.14%. This is a very accurate model.

GDP History vs. Forecast
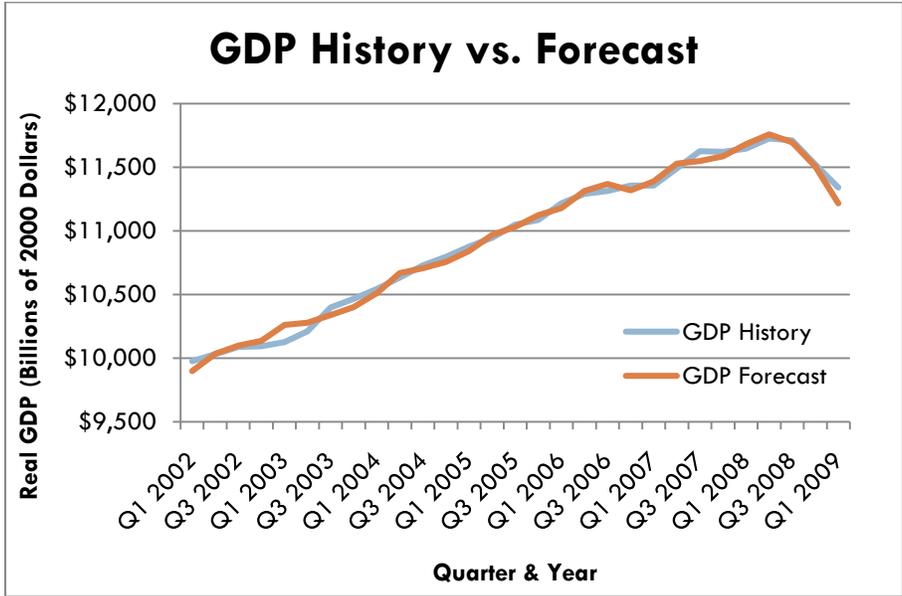
SUMMARY

This forecast can be done in a few easy steps. First, choose the value you want to forecast. This could be GDP, the price of a certain product, total sales in a company, or any other desired value. Next, choose a handful of indicators that you think might be influencing that value. The indicators I've listed above are only a small amount of all the economic indicators out there. For business, indicators can be marketing budgets, capital spending, depreciation, total assets, stockholder's equity, and many more.

Once the target and indicators have been chosen, gather their historical values across a few dozen intervals and shift the target values forward as far as you want to predict. In essence, gathering the data by months and shifting the target two months forward will be like asking, "How do these values on such-and-such a month correlate with the desired value two months later?"

Perform the regression. The large box of all the indicators will be the x's, and the target column will be the y's. Check the accuracy of the regression – it is usually given with the output.

Use the coefficients given in the regression output to construct a model of the target value. It will always be of the basic form:

$$y = b_0 + b_1 x_1 + b_2 x_2 + \cdots + b_n x_n$$

Now use this formula to model the values in your history. If the model values are similar to the historical values, the model does a good job explaining the data. Now use that same formula and enter the most current values of the indicators, and the result will be the forecasted future value. When the parameters are chosen correctly, this will be a very accurate forecast.

BEYOND THE REGULATION DEBATE: ANALYZING ASSUMPTIONS, INCENTIVES, AND THE RELATIONSHIP BETWEEN STAKEHOLDERS IN THE MORTGAGE CRISIS

REBECCA JOHNSEN, Department of Economics & Business, Randolph-Macon College

P. O. Box 5005 Ashland, VA 23005-5505

ABSTRACT

This paper analyzes the decision-making processes of six stakeholders involved in the mortgage crisis. The following stakeholders were selected: homebuyers, loan officers, loan originators, investment institutions, rating agencies, and investors. This paper identifies incentives among these stakeholders to assess their decision-making processes, demonstrating rewards for individualistic behavior. The general outlook on risk management is profiled by examining the comprehension and communication of information and subsequent risk. Information asymmetries are explained through the stakeholders' shared trust and universal assumptions concerning the soundness of the markets. A survey of economists documents their opinions on how risk was understood, investigated, and communicated; levels of trust and influence between and within the stakeholders; and general assumptions and incentives in these markets. The results of this survey are discussed with attention to correlations between information asymmetry and trust.

INTRODUCTION

Experiencing the effects of the burst housing bubble and credit crunch, regulators, stakeholders, and consumers alike have scrambled to find a single cause for the financial crisis. Specifically, stakeholders involved in the creation and securitization of subprime mortgages have been indicated as primary culprits. Charles Calomiris, a researcher for the National Bureau of Economic Research summarizes the problem, "The current global financial crisis grew out of banking losses in the United States related to subprime lending" [1].

There were clear instances where the risks of subprime mortgages and securitization went unnoticed or ignored. Due to low interest rates and Congressional support for equitable housing, the period from the mid-1990s to the middle of this decade was characterized by a growth in housing, and subsequently mortgage lending. Spurred by high demand, mortgage companies and commercial banks issued mortgages with high risks of defaulting, and the scope of the problem was both broadened and magnified when the mortgages were resold to investment institutions. Investment institutions securitized mortgages and rating agencies favorably rated many mortgage-backed securities. Allured by higher yields and "safe" ratings, investors worldwide bought these investment options. Along the supply-demand chain that converted homebuyer's mortgages into highly demanded investments, the stakeholders were making substantial short-term gains and transferring the long-term risk onto the final holders of the securities, the investors.

Unfortunately, it is impossible to micromanage the actions of millions of homebuyers, loan officers, investment bankers, ratings employees, and investors. Instead of assigning blame to certain stakeholders, the premise of this research is to understand why so many individuals made poor decisions. This research is based on the notion that in order to properly assess and address the failures of the mortgage crisis, one must investigate the actions and behaviors of the stakeholders.

ASSESSING THE DECISION-MAKING PROCESSES OF THE STAKEHOLDERS

Incentives

In order to understand the flaw in the housing and financial markets, it is essential to understand why so many individuals made poor decisions. Thomas Sowell assumes a broad perspective on evaluating the causes of the financial crisis: "Any realistic assessment of the decision-making process in the market or in government must examine the incentives and constraints facing those who operate in these two venues" [2]. In accordance with this assertion, this section will examine the incentives acting upon six of the primary stakeholders in the mortgage and financial markets: the homebuyers, the loan officers, the loan originators, the investment institutions, the rating agencies, and the investors.

Increased Homeownership

The belief that subprime mortgages would aid equitable housing was widely asserted. In a testimony before the House of Representative's Committee on Financial Services, Federal Reserve Board Director Sandra Braunstein concludes, "The expanded access to subprime mortgage credit has helped fuel growth in homeownership" [3]. While interviewed for the CNBC special House of Cards, Alan Greenspan remarked on one of the reasons that many were excited about the burgeoning subprime market: "…It looked as though we were dealing with a major increase in home ownership, which is an unquestioned value to society" [4]. Mr. Greenspan's and Ms. Braunstein's statements were supported by data collected by the U.S. Department of Commerce's 2007 Census report; from 1981 to 1994, the homeownership rate remained consistently at 64%, but by 2004 had increased to 69% [5].

As such a universally accepted social good, homeownership served as an incentive for several groups. Clearly, individual citizens benefited from homeownership, and because of this, companies involved in the creation and financing of homes were able to validate their practices by arguing that they were promoting increased homeownership. For example, loan originators could justify issuing more subprime mortgages because they were seen as facilitators of equitable housing. In an article for the Heritage Foundation, senior research fellow Ronald Utt remarks, "Although subprime and other risky mortgages were relatively rare before the mid-1990s, their use increased dramatically during the subsequent decade" [6]. However, the question is whether these companies were truly interested in promoting social goods, or if their decisions were encouraged by another key incentive: profit.

Profit

Joseph Stiglitz is an economist who won the 2001 Nobel Prize for his work on information asymmetries, a field which will be discussed in this paper. In a testimony before the House of Representative's Financial Services Committee, Stiglitz makes a key generalization concerning incentives to the stakeholders of the financial market:

> Markets only work well when private rewards are aligned with social returns…In spite of their failure to perform their key social functions, financial markets have garnered for themselves in the US and some of the other advanced industrial countries 30% or more of corporate profits—not to mention the huge compensation received by their executives [7].

In the home loan and financial markets, the fact that profit would serve as an incentive is not surprising. A basic precept in macroeconomics is that in a free market, producers and consumers act rationally to pursue their own greatest personal utility. Financial prosperity allows for further investment and further growth, so profits and wealth can be labeled as types of personal utility for stakeholders.

In the mortgage industry, homebuyers, loan officers, and loan originators all had a financial stake in the creation and execution of mortgage agreements. As homes increasingly served as investments, homebuyers profited in the short run by being able to buy and sell homes more quickly. In describing loan officers, the Bureau of Labor statistics states that "most are paid a commission based on the number of loans they originate", so loan officers had an incentive to sell as many loans as possible [8]. In addition, due to the demand for mortgages from investment institutions, loan originators could resell their mortgages and earn a profit, so their personal utility depended on the number of mortgages they could sell.

The high demand for financial products also prompted investment institutions and rating agencies to take advantage of profitable opportunities. In his book *Financial Shock*, Economist Mark Zandi reports, "Wall Street's securitization machine went into overdrive during the housing boom, producing frenzy in the mortgage securities market. At its peak in 2005, more than $1.1 trillion in [residential mortgage-backed securities] were issued and sold to investors" [9, p.116].

High-Yield Investment Opportunities

Residential mortgage-backed securities were highly demanded because they were lauded as safe due to the process of securitization. Securitization was believed to diversify the risk of subprime mortgages, and investor fears were assuaged by the claims of rating agencies and federal regulators alike. In a publication for the Financial Policy Forum, research assistant Ivo Kolev summarizes the allure of MBSs:

> From investors' point of view, the MBS securitization process converted non-rated, illiquid loans into securities that are highly liquid, have low credit risk and offer competitive rates of return…MBSs offer higher yield than Treasury notes and corporate bonds. This higher yield compensates partially for the higher credit risk, market risk and especially the embedded prepayment option [10].

Essentially, the public perception was that these investment options offered greater returns than other low-risk bonds; this combination of higher yield and lower risk made residential mortgage-backed securities desirable.

Incentives: Demonstrating Individualistic Behavior

Due to the incentives of increased homeownership, profitable opportunities, and high-yield investment opportunities, it appeared that each of the stakeholders benefited from the process that generated and securitized subprime mortgages. In the housing market, homebuyers were able to buy houses both as primary residences as well as lucrative investments, loan officers earned sizeable commissions from the booming lending industry, and loan originators were able to reap profits by either holding onto the mortgages or reselling them to eager investment institutions. On Wall-Street, mortgage-backed securities were an easy sell to enterprising investors, and investment institutions and rating agencies both profited from the active market.

ASSESSING THE RISK MANAGEMENT POLICIES OF THE STAKEHOLDERS

Information Control

During the housing and financial boom, each stakeholder acted in ways that bolstered financial growth. One of the ways that these stakeholders were able to net profits was through the control of information. Joseph Stiglitz highlights the implications of such behavior: "The success of a market economy requires not just good incentive systems but good information —transparency…But there are often incentives,

especially in managerial capitalism (where there is a separation of ownership and control), for a lack of transparency" [11].

Due to the incentive to make profits in the lending market, homebuyers, loan officers, and loan originators all benefited from lowering barriers to issuing mortgage loans. As such, they had a vested interest in how mortgage agreements were arranged. Because there were a limited number of consumers that needed to take out mortgage loans, loan officers and originators had incentives to solicit as many potential borrowers as possible, regardless of creditworthiness. Under the existing system of assessing creditworthiness, oftentimes the only way to legitimize issuing credit to subprime borrowers was to either alter or omit aspects of their personal information. As the risk of the mortgage loans was transferred from homebuyers to lenders, less was known about the nature of these individual mortgages. In addition, information control spanned the financial market. For example, investment institutions have been accused of not making their securities easy for the buyers to understand. In an interview with the *Financial Times*, Stiglitz comments:

> "One of the problems with subprime mortgages is…the lack of transparency, as they've hidden these products into complex products where they slice and dice the risk… It wasn't clear in the process of slicing and dicing and reassembling that they were actually adding much tailoring to the different risk needs of different groups" [12].

As a result, assuming these stakeholders to be rational, many must have believed that they would benefit by controlling information.

Negative Implications of Information Asymmetry

Market failure

However, instead of benefiting from the control of information, the lack of "perfect" information had a detrimental effect upon the livelihoods of many of the stakeholders. Information asymmetry describes situations in which one party in a transaction has more information than the other party or parties, which is created when one or more stakeholders control information. In a speech to the Institute of International Bankers, Federal Reserve Governor Randall Kroszner explains how information asymmetry can pose a major threat to the efficiency of markets:

> "A core principle of economics is that markets are…more efficient, when accurate information is available to both buyers and sellers. But for markets to work best, market participants must utilize available information…In the case of new and innovative products, there might be a particularly strong demand for information. Then this information must be processed appropriately before decisions are made about whether to buy or sell" [13].

Information asymmetry was a hindrance to effective risk management policies because with a lack of information, stakeholders were unable to appropriately assess the risk of the mortgages and subsequent securities. On a larger scale, without appropriate information, stakeholders could not make informed decisions when interacting with each other, entailing a substantial market failure.

Ethical Failure

Information asymmetry represents more than a market failure; there are also ethical implications to not promoting "perfect" information. Rushworth Kidder, the founder of the Institute for Global Ethics, asserts that there was a lack of information disclosed by investment banks when marketing their mortgage-backed securities and financial instruments to investors. In his book *The Ethics Recession*

Kidder states, "truthfulness, it would seem, requires full disclosure of risk and an honest desire for clarification, which Acuff [a financial expert Kidder interviewed] finds missing here" [14, p.13].

In addition, Kidder addresses the instances where home buyers would exaggerate their personal information in order to finance their new homes. He acknowledges the reasoning behind these "little white lies": "As a culture, we've long winked at little white lies on the grounds that they're victimless crimes, isolated and harmless" [15, p.17]. However, Kidder points to this collective deception as a contributor to disastrous decision-making: "…when little white lies grow gray and concentrated, they turn black as a cloud of locusts, making us all victims as they devour everything in their path" [16, p.17-18].

There is a reason why ethicists would assume a stance in this debate. A pillar in the ethics of consumer marketing is the contract view of business's duties to consumers. Manuel Velasquez, a professor of Business Ethics at Santa Clara University, outlines the contract view in his text, *Business Ethics: Concepts and Cases*: "…the relationship between a business firm and its customers is essentially a contractual relationship, and the firm's moral duties to the customer are those created by this contractual relationship" [17]. He notes that according to traditional moralists, the key moral duties involved in a contractual relationship all depend on the free sharing of information. Specifically,

1. "Both of the parties to the contract must have full knowledge of the nature of the agreement they are entering.
2. Neither party to a contract must intentionally misrepresent the facts of the contractual situation to the other party" [18].

The first moral duty gives credence to Dr. Kidder's argument that the seller is responsible for effectively disclosing necessary information to the buyer. In addition, Kidder's assertion about the detrimental effects of "little white lies" on the part of many borrowers is supported by the second moral duty. From this, it can be claimed that the stakeholders who distorted the flow of information during the boom market violated certain ethical duties. Nonetheless, despite making markets less efficient, and violating the due contract theory, information asymmetries were not widely acknowledged. This was partially due to the level of trust in the system and shared between the stakeholders.

Level of Trust

It is clear that anything that hindered the sale of loans or securities would have acted as constraints to these stakeholders. Overlooking the basic regulatory systems put in place, it is probable that the level of trust between the stakeholders could have served as a constraint to business. If the stakeholders had assumed more responsibility for their actions rather than relying upon each other for information and risk management, the subprime mortgage and securitization industries may not have run rampant. Instead, because the housing and financial boom yielded rewards for each of the stakeholders, fewer stakeholders were paying attention to the ethics behind these decisions. Trust was convenient for those who preferred to ask "how much" and "when", rather than "what" and "why".

In his publication *The Ethics Recession,* Kidder illuminates the foundations of trust between organizations: "In two centuries, we've managed to create an astonishing standard: a broadly shared expectation that most people will do the right thing". Noting this expectation for morality that has pervaded Western democracy, Kidder asks a series of key questions: "Can democracy and free enterprise survive without deliberate, conscious attention to their moral compasses? If those principles decay – or, worse still, go untaught and undefended – must these institutions collapse?" [19, p. 37]

Zandi aptly summarizes the role of trust in the financial system: "At every point in the financial system, there was a belief that someone—*someone else*—would catch mistakes and preserve the integrity of the process…As the process went badly awry, everybody assumed someone else was in control. No one

was" [20, p.3]. As described before, a lack of adequate information may have caused stakeholders to invest inappropriate levels of trust in each other.

MODEL

This research has been designed to explore beyond the argument that regulatory failures are responsible for the decisions and subsequent market failures that lead to the mortgage and financial crises. The model for this research is derived from the literature review above; it explores several variables to cover the complexities of the stakeholders' behavior. The next few pages include a description and illustration of this model.

The left column establishes a hypothetical model for what variables could have constrained the mortgage-securitization process. First, in regards to decision-making, appropriate regulatory pressure should have neutralized inappropriate competitive pressures and distorted incentives, ensuring that private rewards aligned with social returns. Also, in this ideal model, effective risk management would have been attainable if there had been better information sharing between the stakeholders. In addition, a more prudent investment of trust between stakeholders and in the system may have squashed several fatal assumptions. As such, stakeholders may have prepared themselves better for risks like falling housing prices, rising interest rates, insufficient regulation, and failures in securitization.

The right column summarizes the variables that could have initiated the market failures that characterized the financial crisis. First, a lack of appropriate regulatory pressure entailed that there was no external force that balanced competitive pressures or distorted incentive systems. Due to this, the decision-making processes of the stakeholders were altered, and the needs of society were not met through the actions of the stakeholders. Similarly, information asymmetry and inappropriate trust sharing lead to improper risk management practices because stakeholders assumed less responsibility for their actions. Finally, due to trust in the overall "system" of converting mortgages to MBSs, many stakeholders assumed that housing prices would continuously rise, interest rates would stay low, regulation was sufficient, and securitization diversified any risks inherent in the subprime mortgages.

What Should have Constrained the Mortgage-Securitization Process	What Facilitated the Mortgage-Securitization Process
Foundation for Decision-Making	***Foundation for Decision-Making***
Appropriate Regulatory Pressure: = **Balanced pressure** between stakeholders and within stakeholders	Lack of Appropriate Regulatory Pressure: = **High pressure** between stakeholders and within stakeholders
Reasonable Incentives: Private rewards = social returns	**Distorted Incentives**: Private rewards are believed to equal social returns, but they do not
Foundation for Risk Management	***Foundation for Risk Management***
"Perfect" Information: Properly assessing, investigating, and communicating risk	**Information Asymmetry:** Improperly assessing, investigating, and communicating risk
Appropriate Level of Trust between stakeholders and in the system • Between stakeholders • In the "system"	**Inappropriate Level of Trust** between stakeholders and in the system • Between stakeholders • In the "system"
No Assumptions: Contingencies **for:** • Falling housing prices • Rising interest rates • Insufficient regulation • Risks of securitization	**Assumptions:** Lack of Contingencies for: • Falling housing prices • Rising interest rates • Insufficient regulation • Risks of securitization

METHOD

From this model, several key variables emerge. The foundations for decision-making are comprised by the pressures exerted between and within stakeholders, as well as the incentives for each stakeholder. Information control, levels of trust, and assumptions all play a role in the foundations for risk management. In order to see if these variables truly played a role in the financial crisis, it was preferable to acquire as many perspectives as possible concerning the relationship between these stakeholders.

Surveying Economists and Researchers

Due to its historic effect on economies worldwide, the housing boom and subsequent financial crisis have been dissected and discussed by economists and researchers. There are several advantages to surveying economists and researchers instead of the stakeholders themselves. First, working for universities, the federal government, or independent research institutions, these individuals have devoted their time studying the larger implications of the stakeholders' actions. Also, because many do not work for the companies themselves, they may be less fettered by corporate allegiances or personal bias. In addition, within the academic world, it is much easier to locate economists and researchers with varying opinions because economic theory itself is so broad.

Survey Sample: The Virginia Association of Economists

For these reasons, this research centers upon the perceptions of economists and researchers instead of directly focusing on the individual stakeholders. A web-based survey was distributed to 398 members of the Virginia Association of Economists. On its webpage, the VAE describes its objective as "to promote inquiry into economics, to improve economic education, and to develop understanding of the operations of the Virginia economy" [21]. It also describes its members as "individuals who have an interest in theoretical or applied economics, economic education, or the Virginia economy" [22]. Members are also either residents of or employed by the Commonwealth of Virginia.

VAE members were first contacted by postcards, where they were asked to follow a link to participate in the web-based survey. A week after the postcards were mailed, 226 additional emails were sent, reminding participants to take the survey. After having been contacted, 38 useable surveys were collected, so the response rate was about 9.5%. After an initial informed consent section and an introductory page defining the surveys' terms, the survey had six pages of questions. The questions themselves were a combination of multiple-choice and open-ended text fields. The survey was designed to take 5 to 15 minutes to complete.

Survey Purpose and Design

The purpose of the survey was to solicit well-informed opinions from a variety of economists and researchers, and to glean a better understanding of what individuals believe occurred during the mortgage crisis. This feedback would help to determine the applicability of the variables previously listed. Each section of the survey focused on a variable outlined in the model and gathered the participants' opinions on its importance. For further reference, a copy of the survey may be found in the appendix copied to the back of this paper.

Section 1: Assessing Information Sharing between the Stakeholders

The first set of question assessed the economists' and researchers' opinions on how much information was shared between the stakeholders. The participants were provided with a scale (Not at all, Barely, Somewhat, Mostly, and Completely), and were asked to first rate how each stakeholder understood the risk of the mortgages and securities these stakeholders were working with. The rest of this section followed a similar format, using the same scale to glean each participant's opinion on how the stakeholders investigated this risk, and finally how each stakeholder communicated the risk of the mortgages and securities to the next stakeholder. The purpose of this section was to solicit the participants' opinion on which stakeholders possessed better information, which pursued better information, and which communicated better information. These three variables had been selected to glean a better understanding of the nature of information asymmetry in these markets.

Section 2: Assessing Trust Sharing between the Stakeholders

The second section asked each participant's opinion on the significance of information sharing between the stakeholders. These questions prompted participants to rate how much they believed each stakeholder relied upon the information provided to them by the stakeholders they interacted with. The scale used before (Not at all, Barely, Somewhat, Mostly, and Completely), is repeated here. Whereas the first section dealt with how much initiative each stakeholder took in order to obtain and communicate information, this section pertained to how much each stakeholder trusted the other's information and how that impacted their own decisions. The format of this section was based on the generalization that information was shared only down the chain of stakeholders. Specifically, homebuyers only shared information with loan officers, loan officers with lending institutions, lending institutions with investment institutions, investment institutions with rating agencies, and rating agencies with investors. Because of this, each of the statements only applied to two stakeholders at a time.

Section 3: Assessing Pressures between and within the Stakeholders

The third section was designed to also measure how each stakeholder is believed to have influenced each other. However, this section gleaned the participants' opinions on the pressure each stakeholder exerted on one another to accomplish their own goals. As explained earlier, each of the stakeholders' livelihoods depended on the actions of other stakeholders. As such, it is likely that each stakeholder exerted pressure on each other to have their demands met. In addition, due to the high levels of competition in these markets, participants within the same stakeholder group also influenced each other. As a result, this section separately investigated pressures between and within the stakeholders.

In both of these parts, participants were provided with a series of statements applied to each of the stakeholders. In the first section, each of the statements was phrased in this way: "[one stakeholder] was influenced by [the other stakeholder] to [meet the influencing stakeholder's demand]". Similarly, the second section contained statements like "[one stakeholder] was influenced by [its peers] to [engage in competition]". For each of the statements, the participants were asked to rate how much they disagreed or agreed (Completely Disagree, Mostly Disagree, Neutral, Mostly Agree, or Completely Agree).

Section 4: Assessing Assumptions among the Stakeholders

The rest of the survey provided each participant the opportunity to include their own feedback in their responses. This section specifically tested what assumptions the participants believe drove the actions of each stakeholder. Each question dealt with an individual stakeholder, and provided a list of assumptions based on existing literature. Participants could select as many or as few of the assumptions that they believed were applicable to each stakeholder. For example, the assumptions provided for homebuyers were "consistently rising housing prices", "consistently low interest rates", "sufficient regulation", and

that "lenders would issue appropriate loans". In addition, each question included a text field where participants could detail any additional key assumptions. This section was designed to analyze the stakeholders' understanding and trust of their own markets.

Section 5: Assessing Incentives among the Stakeholders

Similar to the last section, this section solicited the participants' feedback to determine which incentives determined the decision-making of the stakeholders. Although several of the incentives overlapped between stakeholders, each question applied to a particular stakeholder. Once again, even though the questions provided a list of incentives, participants were able to enter personalized responses. By selecting which incentives they believed shaped the decisions of these stakeholders, participants helped to profile the individualistic behavior of these stakeholders.

Section 6: Opinions on Risk Management Policies among the Stakeholders

The final section was a series of five open-ended questions that gave participants the freedom to provide their opinions outside the constraints of rating scales or multiple-choice answers. Each of the questions was designed to encourage the participants to share their varied opinions on information sharing, assumptions, risk management, and preventative measures in the future:

1. Do you believe that the stakeholders exchanged the appropriate amount of information as the mortgages were created, securitized, and sold as investments?
2. Do you believe that the assumption that housing prices would continue to rise was a reasonable one? If so, why do you believe individuals allowed it to govern their actions?
3. Do you believe that any of the stakeholders magnified the inherent risk from these mortgages through their actions? If so, which stakeholders, and how?
4. Do you believe that each stakeholder was aware of the risk involved in their actions? If so, how do you believe they justified their actions?
5. Do you have any suggestions for risk management policies that could prevent a similar situation from occurring in the future?

Participants were encouraged to write extended responses; this section served to cover whatever variables related to the stakeholders' decision-making and risk management policies that were not addressed by the previous five sections.

RESULTS/ANALYSIS

In order to make the survey questions as clear as possible, each section of the survey had its own format in regards to types of questions and responses. Because of this, it was impossible to use the same method in analyzing the survey data. For example, the first three sections all employed rating scales to record the participants' opinions. Each rating was assigned its own numerical value, so it was easy use statistical analysis on the results. However, because the fourth and fifth sections also included text fields, it was essential to go farther than analyzing means and values. Finally, the last section was entirely text-based, so interpreting these results required a comprehensive review of each response.

Data Analysis

Results for Information Sharing between the Stakeholders

There are several questions that may be answered by examining the results of the first section. First, by calculating the means of the participants' responses, it demonstrates how much the participants believed

each stakeholder understood, investigated, and communicated the risk of the mortgage loans and securities. Higher mean values entail that the participants believed the stakeholder to engage in better information sharing. The highest mean values are shaded in dark gray; the lowest mean values are indicated by light gray shading.

Understanding Risk		
Stakeholder	N	Mean
Homebuyers	39	2.74
Loan Officers	38	3.55
Lenders	38	3.71
Investment Institutions	38	3.63
Rating Agencies	38	3.37
Investors	37	2.81

Investigating Risk		
Stakeholder	N	Mean
Homebuyers	38	2.34
Loan Officers	37	2.92
Lenders	38	3.13
Investment Institutions	38	3.24
Rating Agencies	37	2.97
Investors	37	2.65

When the responses were averaged for each stakeholder, the participants believed that homebuyers and investors understood risk the least, and that lenders understood risk the most. The results were only slightly different for investigating risk; according to the participants, homebuyers and investors investigated risk the least, and investment institutions investigated risk the most.

Communicating Risk		
Stakeholder	N	Mean
Homebuyers	36	2.25
Loan Officers	37	2.27
Lenders	37	2.46
Investment Institutions	36	2.39
Rating Agencies	37	2.38
Investors	36	2.22

And finally, the results for the stakeholders' communication of risk mirrored their perceptions of each stakeholder's understanding of the risk. Once again, the participants believed that homebuyers and investors communicated risk the least, and lenders communicated risk the most.

Analysis of Information Sharing between the Stakeholders

There are a few unsurprising trends in this data. First, the different averages between the stakeholders for Understanding Risk implied that many participants believed that there were information asymmetries. If participants rated one stakeholder higher than another in understanding risk, that implies that that one stakeholder possessed more or better information than the other. Also, the fact that homebuyers and investors were rated lower on information sharing than the other stakeholders can be explained by their status as individual consumers. Because homebuyers and investors were the only stakeholders not affiliated with companies, the participants may have believed that these stakeholders had fewer legal or ethical obligations to effective information sharing. As such, in all cases of understanding, investigating, and communicating risk homebuyers and investors were the weak links in information sharing.

Nonetheless, there are things to note in these results. For each of the stakeholders, the means for Understanding Risk were highest, the means for Investigating Risk were lower, and the means for Communicating Risk were the lowest. This implies that the participants believed that stakeholders consciously communicated less information than they fully understood or investigated. And another

trend in the data may demonstrate the effect of such information control. As information was shared from homebuyers to loan officers to lenders, the average rating for Understanding Risk increased. However, as soon as information was transferred from lenders to investment institutions, the average rating fell. This trend continued to investors, where perceived levels of information sharing were low, similar to that of homebuyers. Interestingly enough, this trend was largely mirrored in Investigating Risk and Communicating Risk.

These ratings entail that as the risk of these mortgages was transferred between stakeholders in the residential mortgage market, the stakeholders understood, investigated, and communicated information better.   However, once the mortgages were securitized, rated, and resold in the financial market, stakeholders understood, investigated, and communicated information worse. This may insinuate that the participants perceived greater failings in risk management in the financial market than in the residential mortgage market.

Results for Assessing Trust Sharing between the Stakeholders

Calculating the mean of each question also reveals the general perspective on the stakeholders' trust of one another. The table below illustrates the averages for each questions' responses. The highest means are indicated by the dark gray shading, and the lowest mean is shaded in light gray. Once again, the higher the mean, the more the participants believed that the stakeholder relied upon the stakeholder it shared information with.

Question	Mean
How much do you believe homebuyers relied upon loan officers to sell them responsible mortgages?	3.97
How much do you believe loan officers relied upon homebuyers to provide complete information about their creditworthiness?	2.94
How much do you believe lenders relied upon the reports of the loan officers to assess the risk of their mortgages?	3.35
How much do you believe investment institutions relied upon the reports of the lenders to assess the risk of their mortgages?	3.19
How much do you believe rating agencies relied upon the reports of the investment institutions to assess the risk of the mortgage-backed securities?	3.51
How much do you believe investors relied upon the reports of the rating agencies to assess the risk of mortgage-backed securities?	4.00

As demonstrated by the table, the participants rated that homebuyers and investors relied the most upon their partner stakeholders. However, the participants label loan officers as the stakeholder that relied the least upon the stakeholder it interacted with, homebuyers.

Analysis of Trust Sharing between the Stakeholders

As with before, this section had both predictable and unpredictable results. First, because homebuyers were rated among the lowest in understanding risk, it is clear why loan officers would be rated the least in trusting homebuyers. Loan officers possessed better information about the general risk of mortgages, so they would be less inclined to depend on homebuyers' information. The fact that loan officers are rated to trust the homebuyers' information the least entails that the participants not only saw major instances of information control, but that the loan officers were aware of it themselves.

Trusting Stakeholder	IR Mean	Trust Mean	Trustee Stakeholder
Homebuyers	(Low) 2.34	(High) 3.97	Loan Officers
Loan Officers	2.92	(Low) 2.94	Homebuyers
Lenders	3.13	3.35	Loan Officers
Investment Institutions	(High) 3.24	(Low) 3.19	Lenders
Rating Agencies	2.97	3.51	Investment Institutions
Investors	(Low) 2.65	(High) 4.00	Rating Agencies

In addition, with the exception of the loan officers, the rating for Investigating Risk is inversely proportional to their rating for trust sharing. This relationship is highlighted by the dark gray shading of the highest means and the light gray shading of the lowest means. The stakeholders that investigated risk the most relied the least upon the reports of their partner stakeholders, and vice versa. According to these ratings, how much stakeholders depended on information provided to them could have determined how much they investigated risk. This would support the assertion that the more the stakeholders trusted one another, the less effort they put into investigating the risk of the mortgage loans and securities.

Results for Pressures between and within the Stakeholders

As described before, this section served to profile the pressures exerted on stakeholders that may have affected their decision-making processes. This was accomplished by asking the participants to rate how much they disagreed or agreed with each of the following statements. The higher the mean value was, the more the participants on average agreed with each statement (on a scale from 1-5). The majority of responses fell in the "Mostly Agree" category, entailing that the participants perceived influences between and within the stakeholders to be common.

Pressures between Stakeholders	Mean
Homebuyers were influenced by loan officers to agree to mortgage loans.	3.73
Loan officers were influenced by lenders to increase the number of mortgage loans they sold.	4.16
Lenders were influenced by investment institutions to resell more mortgage loans.	4.14
Investment institutions were influenced by investors to meet increasing demand for securities.	4.00
Rating agencies were influenced by investment institutions to rate securities so that they could be easily resold.	3.78

Pressures within Stakeholders	Mean
Homebuyers were influenced by other homebuyers to be involved in favorable mortgages.	3.57
Loan officers were influenced by each other to remain competitive with other loan officers.	4.05
Lenders were influenced by each other to remain competitive with other lenders.	4.14
Investment institutions were influenced by each other to remain competitive with other investment institutions.	4.16
Rating agencies were influenced by each other to remain competitive with other rating agencies.	4.00
Investors were influenced by each other to be involved in large investment returns.	4.08

From the participants' perspective, loan officers experienced the most inter-stakeholder influence at the hands of lenders. Conversely, the ratings denote that homebuyers and rating agencies were not as influenced by other stakeholders. In regards to competitive pressures from within stakeholders, lenders and investment institutions were rated to be the most influenced, and homebuyers and rating agencies were again the least influenced.

Analysis of Pressures between and within the Stakeholders

The participants' responses may be explained by their perceptions of different kinds of competition and regulation acting upon these stakeholders. For example, the stakeholders' status as either individuals or companies helps to explain the specific competitive pressures affecting their decisions. As displayed by the data, homebuyers were rated to have lower demand and competition pressures. As individuals whose business was sought after by the loan officers and lenders, if they felt unjustly pressured by another stakeholder, they could go to a competing loan underwriter. In addition, as individuals, homebuyers didn't need to compete as much with their peers in order to be successful in their markets. As such, the status of homebuyers as individual consumers may have impacted the participants' perception of the influences acting upon their decisions.

Loan officers were perceived to be the most influenced by its partner stakeholder; lenders and investment institutions were also rated to experience high competitive pressures. This suggests that the corporate stakeholders felt the greatest inter- and intro- stakeholder pressures. Nonetheless, there was the exception that rating agencies felt among the lowest demand pressures as well as competition pressures.

The variation in demand pressures between the corporate stakeholders may be explained by the function each company served. For example, loan officers may have been rated so highly because they oftentimes directly served as employees for the lenders. If loan officers did not meet the demand of the lenders, they did not just risk losing business; their jobs were threatened as well. However, rating agencies had a more privileged status, so they largely protected against such pressures. Because of their function, they were perceived as almost regulatory agencies in themselves, and so it was their obligation to act independent of external pressures.

The competition for each stakeholder varied; this may account for different ratings for competitive pressures between the stakeholders. For example, lenders and investment institutions were believed to experience the highest competitive pressures. And considering that the size and number of lenders and investment institutions grew rapidly during the housing boom, it is reasonable that this would generate high levels of competition. There were a limited number of mortgages being issued every year, so these organizations in particular had to compete in order to profit from these markets. Nonetheless, competition for the lowest rated stakeholder, the rating agencies, was notably different. The Securities and Exchange Commission regulates which rating agencies are certified to rate securities, so that is a substantial barrier for new competing rating agencies. As such, there were only a few rating agencies handling the business of many investment institutions, so it is understandable that they would feel less competitive pressure. The results of this section serve as a reminder that in evaluating the decisions made during the housing boom, each stakeholder must be judged according to the specific pressures acting upon them at the time.

Feedback Review

In order to account for specific opinions and insight, the following questions allowed the participants to include their own feedback in regards to assumptions, incentives, and risk management policies pertaining to the stakeholders.

Review of Assumptions among the Stakeholders

In identifying key assumptions held during the housing boom, participants were provided with a preset list of assumptions identified by other literature. From this list, they could select as many of the assumptions that they believe applied to each stakeholder. The results below illustrate how often each assumption was selected by the participants, indicating the perceived influence of each assumption.

The most selected assumption was consistently rising housing prices; this assumption was the most selected assumption across all of the stakeholders. The assumptions that lenders would issue appropriate loans and consistently low interest rates had comparable weight according to the participants, but participants did not believe that sufficient regulation was a significant assumption for the stakeholders. This implies that the homebuyers had trusted the loan officers, which correlates to their high levels of trust in section two, in addition to trusting that macroeconomic variables would remain favorable. In regards to open responses, a participant indicated "they could avoid the legal consequences of their actions" as an additional assumption held by homebuyers.

The data for loan officers complements that of the homebuyers. Similarly, the participants believed that the assumptions of consistently rising housing prices and consistently low interest rates held weight in among the loan officers, denoting general trust in the market. Sufficient regulation was not believed to be significant among this stakeholder. Instead, one participant indicated that the opposite, "No effective oversight/regulation" served as an assumption that drove the actions of the loan officers.

The result for assumptions among lenders and among investment institutions represented a pattern. The participants rated that these stakeholders assumed consistently rising housing prices and consistently low interest rates less often than the previous stakeholders. However, the assumption that risky mortgages could still be resold to investment institutions emerged as a dominant assumption. This may imply that as mortgages were resold and securitized, the economic variables determining the risk of these mortgages became less important. In its place, these stakeholders trusted that the process of securitization would disperse this risk.

With the lenders, the open feedback included: "They could avoid the legal consequences of their actions", and "Credible guarantees that the Government would bail out bad decisions". One participant repeated his/her opinion that "They could avoid the legal consequences of their actions" was a primary assumption for investment institutions as well. This repeated assertion entails that at least one of the participants considered the actions of several stakeholders not only unethical, but illegal.

This greater trust in securitization continued with the rating agencies. However, sufficient regulation was selected more frequently as an applicable assumption. This infers that rating agencies depended on the system of securitization and regulation of securitization to base their decisions. The open responses also supported that the rating agencies somewhat trusted the system rather than seeking better information; participants indicated the assumptions of "Mistaken reliance on recent history", and "Risk models with parameters estimated over much different environment and with different default drivers".

Assumptions that denoted trust in both markets reemerge in the results for investors. According to the participants, their assumptions were more balanced between all aspects of the mortgage to securitization chain. In regards to the mortgage market, the investors assumed consistently low interest rates and rising housing prices, elements that reduced the risk of mortgages defaulting. In addition, the participants believed that investors based their actions upon trust in securitization and sufficient regulation of this process. The notion that investors would assume these things complements the assertion that investors did not understand the risk of these mortgages as well as the other stakeholders.

Review of Incentives among the Stakeholders

As described before, this section follows a similar format to the last. This time, the responses illustrate how much the participants believed certain incentives shaped the actions of the stakeholders. Once again, these incentives were selected due to numerous references in other literature.

According to the participants, homebuyers were motivated the most by the incentives for increased homeownership and better housing. Nonetheless, they were almost as equally allured by long-term investment opportunities. Short –term profits were designated the least influential incentive. As such, the participants believed that speculation and investment was a substantial driver for homebuyers; one participant indicated "Some markets for 'flipping' houses" as a primary incentive for homebuyers.

The participants indicated primarily individualistic incentives for the corporate stakeholders. For example, short-term profits reigned as the principle incentive for loan officers, lenders, investment institutions, and ratings agencies. In addition, for each corporate stakeholder, job promotion opportunities was the second-most selected incentive. "Long-term profits" was also provided by several participants as a key incentive. The distribution of these incentives is more equal with investment institutions and rating agencies, yet the incentives pertaining to personal gain (profits, job promotion) still outweigh the incentives for social goods (investment opportunities, increasing the securities market).

There were only a few incentives mentioned by the literature in the review, so for assessing investors survey participants had only two preset incentives to select: Long-term investment opportunities, and Short-term profits. The participants believed that investors were motivated substantially more by short-term profits than long-term investment opportunities. In fact, one participant notes "No career or pay incentives to think long term "as something that drove the actions of the investors. This trend toward short-term rewards may offer insight to the demand and competitive pressures in the securities market.

 Review of Opinions on Risk Management Policies among the Stakeholders

As displayed by the results for the previous five sections, there are a variety of opinions concerning the actions of the stakeholders. This section contains a sample of the different perspectives on the decision-making processes and the risk management policies among the stakeholders.

Do you believe that the stakeholders exchanged the appropriate amount of information as the mortgages were created, securitized, and sold as investments?

(Of the responses, 22 participants replied "yes", and 4 participants replied "no")

> "More information should have been exchanged at all levels"
> "Information was available, but rarely emphasized…Much of the information was disclosed in the fine print"
> "Clearly not. Information asymmetries were part of the problem, but information about new products is often costly - and sometimes impossible - to obtain. In this case risk models were applied that had been developed for different instruments and estimated over different environments. Virtually all commentators - including those within the industry, academia, and the regulatory community - wrote that risks were contained but that the new products had not been through a credit cycle that would allow for accurate estimation of defaults"

Do you believe that the assumption that housing prices would continue to rise was a reasonable one? If so, why do you believe individuals allowed it to govern their actions?

(Of the responses, 4 participants replied "yes", and 13 participants replied "no")

> "Any individual's best guess about the future is usually that it will be the same as today"
> "No, based on historical data. But it did govern actions"
> "For the long-term, the assumption was not reasonable. However, for the short-term, many home buyers probably felt that prices would continue to increase and that they needed to "act now" before prices went too high"
> "Maybe. Individuals are motivated by something akin to maximizing their happiness and in the absence of believing that things will not get worse, why not rely on the assumption?"
> "Yes, given the historical record it seemed reasonable that prices would keep rising although no necessarily continuously"

Do you believe that any of the stakeholders magnified the inherent risk from these mortgages through their actions? If so, which stakeholders, and how?

(Of the responses, 17 participants replied "yes", and 7 participants replied "no")

> "Yes, those who securitized batches of mortgages"
> "Lenders, because they provided loans to people who didn't meet standard creditworthiness"
> "Yes. All of the stakeholder groups took on too much risk"
> "No, stakeholders under-played the risks involved"
> "Yes. Homebuyers exaggerated qualifications. Mortgage brokers falsified homebuyer qualifications. Lenders did not require documentation. Institutions did not understand collateral cash flows for bonds they sold. Investors did not understand how bonds they purchased were created"
> "No, the risk was inherent and present from the beginning"

Do you believe that each stakeholder was aware of the risk involved in their actions? If so, how do you believe they justified their actions?

(Of the responses, 3 participants replied "yes", and 23 participants replied "no")

> "No, they preferred not to know. What value would the information have?"
> "Yes. They justified it by believing housing prices would continue to rise and interest rates would stay low"
> "They may have been, but 'greed is good' to the current generation"
> "No. The system was terribly non-transparent"
> "In my view, homebuyers and security investors were the most likely to have been less than well informed. Most homebuyers had little forward-looking risk information. Many were generally aware that risk existed, but based their assessment on the current experiences of others or on information from real estate and finance professionals"

Do you have any suggestions for risk management policies that could prevent a similar situation from occurring in the future?

> "Adequate regulation of new financial instruments. Enforcement of existing regulations for mortgages"

"Yes, focus on medium to long-term profits, not short term ones and remember what occurred in this catastrophe"

"Strong regulation; abolishment of incentive systems based on extremely large bonuses"

"I don't that that there are policies that would prevent this situation without causing undue regulatory burden"

"Mortgage originators need to keep a long term stake in their mortgages"

"The current (summer '09) debacle in home appraising makes it clear that changing governmental policy to achieve less risk will be challenging. The low hanging fruit will be to require mortgage originators to retain at least some credit risk in the loans they originate. In addition, financial institutions will be required to hold more capital with less leverage"

"Allow failures to fail. Do not have a policy of too big or too important to fail. Failure is a necessary part of market organization. It acts as a reality check"

From this feedback, it is clear that there are many legitimate arguments about the market failures in that lead to the mortgage crisis. Experts and members of the academic elite themselves are at odds to discover a reasonable way to assess and address the causes of the mortgage crisis. Perhaps, the broadness of the mortgage crisis makes it nearly impossible to examine it from purely a theoretical perspective.

CONCLUSION

This research consisted of two primary parts: first, two models were derived from the prevailing political and academic perspectives on the stakeholders of the mortgage crisis. These models served to detail several key variables that shaped the stakeholders' decision-making and risk management practices. Then, a survey solicited the opinions of academic experts concerning the variables from these models. Specifically, the participants were asked to provide their opinion on information sharing, trust, pressures, assumptions, and incentives between the stakeholders. The results from this survey highlighted key differences between the stakeholders, namely, the way each was pressured to act as they did. Even though there was variability in these answers, the primary opinion was that information asymmetry did exist between the stakeholders. In addition, the participants did perceive that trust, pressures, assumptions, and incentive systems shaped the decisions of the stakeholders.

Limitations

In reviewing these results, it is essential to identify the limitations of this study. First, this survey solicited the perspectives of those who have studied the mortgage crisis rather than collecting primary data from the stakeholders themselves. As such, the responses must be always considered as opinion rather than fact, so discussion of the data is not as clear.

In addition, the response rate of this survey could have been higher, indicating a more representative sample of the Virginia Association of Economists. As mentioned before, around 400 participants were contacted at their work addresses by post cards, soliciting them to take the survey, and 250 of those participants were reminded via email. In total, there were 38 useable surveys, so the response rate was around 9.5%. This low response rate may be attributed to the fact that the reminders were sent during the summer, and that participants may have not have visited their workplaces regularly. In addition, because the survey was web-based, survey participants had to be able to access the internet and copy the web link in order to take the survey. Because of this, participants were faced with barriers to accessing the survey.

Generalizability

As discussed earlier in this paper, the mortgage crisis' detrimental effect on the economy has made it a much debated subject between politicians, regulators, and the media. Nonetheless, amidst the heated arguments concerning broad regulatory and economic reform, there is still a need for the stakeholders to reassess their decision-making processes and the external forces acting upon them. Ultimately, it was the actions of many individuals which perpetuated the subprime mortgages and securities market, so these individuals should not forget their role in the situation. The results of this research can help further investigations into the relationships of these stakeholders. This literature and primary data cited in this research have demonstrated that many variables influenced the decision-making and risk management policies of the stakeholders, so financial regulators should avoid generalizations when assessing and attempting to prevent another similar occurrence.

Recommendations for Future Work

The purpose of this survey was to provide a comprehensive view of the variables influencing the stakeholders' decision-making processes and risk management policies; as such, this survey tested several variables. Because the mortgage crisis is still a highly relevant topic in understanding the current national economy, there is much room for research. There are two immediate options that may be pursued for future work. First, one could apply a similar model as in this paper and survey each of the stakeholders directly. This would require substantial effort in obtaining a representative sample of these groups, as well as additional tailoring to the survey's design to suit each stakeholder. Nonetheless, soliciting information from the stakeholders themselves would provide first-hand data and clearer analysis. Another way to further this research is to continue surveying economists and researchers, but to focus on only a few variables. This survey explored several variables, but none were investigated in great detail. In particular, a new study could be crafted to further test the nature of information asymmetries between these stakeholders.

REFERENCES

[21] [22] *About the VAE*. (n.d.). Retrieved June 20, 2009, from Virginia Association of Economists: http://www.vaecon.org/vae-about.htm

[12] Authers, J. (2007, November 28). *Special Report: Joseph Stiglitz.* Retrieved August 4, 2009, from Finanial Times: http://www.ft.com/cms/s/2/8a6d7106-91f3-11dc-8981-0000779fd2ac.html

[1] Calomiris, C. W. (2008). *Banking Crises.* Retrieved February 9, 2009, from NBER Reporter: Research Summary 2008: http://www.nber.org/reporter/2008number4/calomiris.html

[4] *House of Cards* (2009). [CNBC Special Report].

[14] [15] [16] [19] Kidder, R. M. (2009). *The Ethics Recession: Reflections on the Moral Underpinnings of the Current Economic Crisis.* Rockland, Maine: The Institute for Global Ethics.

[10] Kolev, I. (2004, July 29). *Mortgage-backed securities.* Retrieved August 3, 2009, from Financial Policy Forum: http://www.financialpolicy.org/fpfprimermbs.htm#_ftn2

[13] Kroszner, R. S. (2007, 22 October). *At the Institute of International Bankers Annual Breakfast Dialogue, Washington, D.C.* Retrieved August 14, 2009, from Board of Governors of the Federal Reserve System: http://www.federalreserve.gov/newsevents/speech/kroszner20071022a.htm

 [2] Sowell. *The Housing Boom and Bust.* p. 119

[7] Stiglitz, J. (2008, October 21). *Testimony on "The Future of Financial Services Regulation".* Retrieved July 23, 2009, from House Financial Services Committee: http://www.ft.com/cms/s/2/8a6d7106-91f3-11dc-8981-0000779fd2ac.html

[3] *Subprime Mortgages: Testimony Before the Subcommittee on Financial Institutions and Consumer Credit, Committee on Financial Services, U.S. House of Representatives.* (2007, March 27). Retrieved August 3, 2009, from Board of Governors of the Fereal Reserve System: http://www.federalreserve.gov/newsevents/testimony/Braunstein20070327a.htm

[8] [11] The Bureau of Labor Statistics. (2007, December 18). *Loan Officers.* Retrieved June 13, 2009, from Occupational Outlook Handbook, 2008-09 Edition: http://www.bls.gov/oco/ocos018.htm#nature

 [5] U.S. Department of Commerce. (2007, October 26). *Census Bureau Reports on Residential Vacancies and Homeownership.* Retrieved August 3, 2009, from U.S. Census Bureau News: http://www.census.gov/hhes/www/housing/hvs/qtr307/q307press.pdf

[6] Utt, R. D. (2008, April 22). *The Subprime Mortgage Market Collapse: A Primer on the Causes and Possible Solutions.* Retrieved August 3, 2009, from The Heritage Foundation: http://www.heritage.org/Research/Economy/bg2127.cfm

 [17] [18] Velasquez, M. G. (1992). *Business Ethics: Concepts and Cases* (3 ed.). Englewood Cliff: Prentice Hall.

 [9] [20] Zandi, M. (2009). *Financial Shock: A 360 Look at the Subprime Mortgage Implosion, and How to Avoid the Next Financial Crisis.* Uppper Saddle River, New Jersey: Perason Education, Inc.

1. Informed Consent

* 1. This consent form gives you information about the research study. Please read the information below and check that you agree to participate.

This survey will aid a student undergraduate research study to trace information and trust between the stakeholders of the 2001-2007 housing boom.

Your participation in this study will consist solely of the completion of this online survey. All participation is voluntary. We intend to use the results to clarify some of the misconceptions in the debate of what caused the financial crisis. All responses to this survey will be kept confidential. We do not ask for your name or identifying information. Your identity will not be linked in any way to the research data.

Your participation is voluntary. You may refuse to participate, or may discontinue at any time. If you have a question about your participation in this study, you can contact:

Rebecca Johnsen
rebeccajohnsen@students.rmc.edu

By checking the box below and clicking the "submit" button at the end of the survey you agree to participate in this research.

jn   I have read the terms listed above and consent to them.

2. Survey Description

Thank you for agreeing to aid my research in gathering opinions concerning the relationship between stakeholders of the mortgage crisis.

For the duration of this survey, the questions will focus around six primary stakeholders of the housing and financial boom from 2001-2007:

1. Homebuyers: consumers who purchased homes during 2001-2007.
2. Loan officers: mortgage brokers, mortgage bankers, and wholesale lenders that sold mortgage loans to homebuyers during 2001-2007.
3. Lenders: organizations that underwrote mortgage loans and resold them to investment institutions during 2001-2007.
4. Investment institutions: organizations that bought mortgage loans and securitized them for resale to investors during 2001-2007.
5. Ratings agencies: organizations that were certified to rate the mortgage-backed securities for the benefit of investors during 2001-2007.
6. Investors: individuals or larger organizations who purchased the mortgage-backed securities during 2001-2007.

In addition, any reference to "securities" applies to the mortgage backed securities, collateralized debt obligations, and other derivatives created from mortgages issued during the housing boom.

If you have any questions or comments about the phrasing of this survey, please contact Rebecca Johnsen at rebeccajohnsen@students.rmc.edu.

3. Information Sharing Between Stakeholders

1. For each of the following stakeholders, how well did each understand the risk of the mortgages they were buying, selling, or assessing?

	Not at all	Barely	Somewhat	Mostly	Completely
Homebuyers	jn	jn	jn	jn	jn
Loan officers	jn	jn	jn	jn	jn
Lenders	jn	jn	jn	jn	jn
Investment institutions	jn	jn	jn	jn	jn
Rating Agencies	jn	jn	jn	jn	jn
Investors	jn	jn	jn	jn	jn

2. For each of the following stakeholders, how well did each investigate the risk of the mortgages or mortgage-backed securities they were buying, selling, or assessing?

	Not at all	Barely	Somewhat	Mostly	Completely
Homebuyers	jn	jn	jn	jn	jn
Loan officers	jn	jn	jn	jn	jn
Lenders	jn	jn	jn	jn	jn
Investment institutions	jn	jn	jn	jn	jn
Rating Agencies	jn	jn	jn	jn	jn
Investors	jn	jn	jn	jn	jn

3. For each of the following stakeholders, how well did each communicate the risk of the mortgages or mortgage-backed securities they were buying, selling, or assessing?

	Not at all	Barely	Somewhat	Mostly	Completely
Homebuyers	jn	jn	jn	jn	jn
Loan officers	jn	jn	jn	jn	jn
Lenders	jn	jn	jn	jn	jn
Investment institutions	jn	jn	jn	jn	jn
Rating Agencies	jn	jn	jn	jn	jn
Investors	jn	jn	jn	jn	jn

4. Trust Sharing Between Stakeholders

1. How much do you believe homebuyers relied upon loan officers to sell them responsible mortgages?

jn Not at all   jn Barely   jn Somewhat   jn Mostly   jn Completely

2. How much do you believe loan officers relied upon homebuyers to provide complete information about their creditworthiness?

jn Not at all   jn Barely   jn Somewhat   jn Mostly   jn Completely

3. How much do you believe lenders relied upon the reports of the loan officers to assess the risk of their mortgages?

jn Not at all   jn Barely   jn Somewhat   jn Mostly   jn Completely

4. How much do you believe investment institutions relied upon the reports of the lenders to assess the risk of their mortgages?

jn Not at all   jn Barely   jn Somewhat   jn Mostly   jn Completely

5. How much do you believe rating agencies relied upon the reports of the investment institutions to assess the risk of the mortgage-backed securities?

jn Not at all   jn Barely   jn Somewhat   jn Mostly   jn Completely

6. How much do you believe investors relied upon the reports of the rating agencies to assess the risk of the mortgage-backed securities?

jn Not at all   jn Barely   jn Somewhat   jn Mostly   jn Completely

5. Pressures During the Housing and Financial Boom

1. How much do you disagree/agree with the following statements pertaining to the relationships between the stakeholders?

	Completely disagree	Mostly disagree	Neutral	Mostly agree	Completely agree
Homebuyers were influenced by loan officers to agree to mortgage loans.	jn	jn	jn	jn	jn
Loan officers were influenced by lenders to increase the number of mortgage loan they sold.	jn	jn	jn	jn	jn
Lenders were influenced by investment institutions to resell more mortgage loans.	jn	jn	jn	jn	jn
Investment institutions were influenced by investors to meet increasing demand for securities.	jn	jn	jn	jn	jn
Rating agencies were influenced by investment institutions to rate securities so that they could be easily resold.	jn	jn	jn	jn	jn

2. How much do you disagree/agree with the following statements pertaining to the relationships within each kind of stakeholder?

	Completely disagree	Mostly disagree	Neutral	Mostly agree	Completely agree
Homebuyers were influenced by other homebuyers to be involved in favorable mortgages.	jn	jn	jn	jn	jn
Loan officers were influenced by each other to remain competitive with other loan officers.	jn	jn	jn	jn	jn
Lenders were influenced by each other to remain competitive with other lenders.	jn	jn	jn	jn	jn
Investment institutions were influenced by each other to remain competitive with other investment institutions.	jn	jn	jn	jn	jn
Rating agencies were influenced by each other to remain competitive with other investment institutions.	jn	jn	jn	jn	jn
Investors were influenced by each other to be involved in large investment returns.	jn	jn	jn	jn	jn

6. Assumptions During the Housing and Financial Boom

1. What primary assumptions do you believe drove the actions of the homebuyers?

- Consistently rising housing prices
- Consistently low interest rates
- Sufficient regulation
- Lenders would issue appropriate loans

Other (please specify)

2. What primary assumptions do you believe drove the actions of the loan officers?

- Consistently rising housing prices
- Consistently low interest rates
- Sufficient regulation
- Lenders would be able to assume the risk of these mortgages.

Other (please specify)

3. What primary assumptions do you believe drove the actions of the lenders?

- Consistently rising housing prices
- Consistently low interest rates
- Sufficient regulation
- Risky mortgages could still be resold to investment institutions.

Other (please specify)

4. What primary assumptions do you believe drove the actions of the investment institutions?

- ∈ Consistently rising housing prices

- ∈ Consistently low interest rates

- ∈ Sufficient regulation

- ∈ Risky mortgages could be securitized into safer investments.

Other (please specify)

[   ]

5. What primary assumptions do you believe drove the actions of the rating agencies?

- ∈ Consistently rising housing prices

- ∈ Consistently low interest rates

- ∈ Sufficient regulation

- ∈ Risky mortgages could be securitized into safer investments.

Other (please specify)

[   ]

6. What primary assumptions do you believe drove the actions of the investors?

- ∈ Consistently rising housing prices

- ∈ Consistently low interest rates

- ∈ Sufficient regulation

- ∈ Ratings on securities are failsafe ways to determine risk.

Other (please specify)

[   ]

7. Incentives During the Housing and Financial Boom

1. What primary incentives do you believe drove the actions of the homebuyers?

- ∈ Short-term profits
- ∈ Long-term investment opportunities
- ∈ Better housing
- ∈ Increased homeownership

Other (please specify)

2. What primary incentives do you believe drove the actions of the loan officers?

- ∈ Short-term profits
- ∈ Job promotion opportunities
- ∈ Increasing homeownership
- ∈ Promoting freer credit

Other (please specify)

3. What primary incentives do you believe drove the actions of the lenders?

- ∈ Short-term profits
- ∈ Job promotion opportunities
- ∈ Increasing homeownership
- ∈ Promoting freer credit

Other (please specify)

4. What primary incentives do you believe drove the actions of the investment institutions?

- ⊜ Short-term profits
- ⊜ Job promotion opportunities
- ⊜ Increasing the securities market
- ⊜ Providing more investment opportunities

Other (please specify)

[   ]

5. What primary assumptions do you believe drove the actions of the rating agencies?

- ⊜ Short-term profits
- ⊜ Job promotion opportunities
- ⊜ Increasing the securities market
- ⊜ Providing more investment opportunities

Other (please specify)

[   ]

6. What primary incentives do you believe drove the actions of the investors?

- ⊜ Short-term profits
- ⊜ Long term investment opportunities

Other (please specify)

[   ]

8. Risk Management between the Stakeholders

Thank you so much for your feedback. This section is optional, but we would value your input.

1. Do you believe that the stakeholders exchanged the appropriate amount of information as the mortgages were created, securitized, and sold as investments?

2. Do you believe that the assumption that housing prices would continue to rise was a reasonable one? If so, why do you believe individuals allowed it to govern their actions?

3. Do you believe that any of the stakeholders magnified the inherent risk from these mortgages through their actions? If so, which stakeholders, and how?

4. Do you believe that each stakeholder was aware of the risk involved in their actions? If so, how do you believe they justified their actions?

5. Do you have any suggestions for risk management policies that could prevent a similar situation from occurring in the future?

9. Submission Page

Thank you so much for your participation in this survey.

As mentioned before, your input in this survey will aid undergraduate research conducted under Randolph-Macon College's Shapiro Undergraduate Research Fellowship.

If you have any further questions or comments concerning the survey, please email Rebecca Johnsen at rebeccajohnsen@students.rmc.edu.

Sincerely,

Rebecca Johnsen

COMPETITIVE BALANCE IN NCAA SPORTS

Katie Raulerson, Department of Economics/Business,
Randolph-Macon College, Ashland, VA, katieraulerson@students.rmc.edu

ABSTRACT

This paper attempts to determine variations in competitive balance of NCAA college sports since the induction of women's sports in 1982. The previous research that pertains to this study has been focused solely on changes in competitive balance of NCAA Division IA College Football. These past studies fail to make any comparisons between the different sports, especially women's sports, governed by the NCAA. This paper uses two common measures of competitive balance: the standard deviation of winning percentages and the Herfindahl-Hirschmann Index. It compares competitive balance across sports, divisions, conferences, and gender in the NCAA as a whole.

INTRODUCTION

The Nation Collegiate Athletic Association (NCAA) acquired control of all women's collegiate sports in 1982. The purpose of this paper is to investigate variations in competitive balance for NCAA college sports since then. The vastness of the NCAA has yet to be examined as it corresponds to competitive balance. I attempt to investigate competitive balance across different sports, seasons, divisions, conferences, and genders. I use two separate methods, the standard deviation of winning percentages and the Herfindahl-Hirschman Index to conduct my measurements.

This paper is organized as follows. The next section is a presentation of the various literatures on the study of competitive balance. It provides some background information on the topic and how competitive balance is measured. The third section analyzes the data and discusses some interesting observations. The final section concludes the paper and offers possibilities for future studies on the topic.

LITERATURE REVIEW

The study of competitive balance has been examined from many different perspectives and in the context of all types of sports. Simon Rottenberg (1955) conducted one of the first studies involving the economics of sports by investigating the labor markets of professional baseball. He noted that the ability of competitors must be approximately equal for teams in any sport to achieve financial success. His article has led to further research across the area of sports economics, including extensive research into the topic of competitive balance. This section reviews the literature in the back ground and importance of competitive balance, the ways competitive balance can be measured, the factors affecting competitive balance, and the effects of changes in competitive balance.

Introduction to Competitive Balance and Its Importance to Fans

Competitive balance is a study of how evenly distributed player talent, winning percentages, and championships are across different teams in their respected league. There is no way to determine the exact appropriate level of competitive balance because optimal balance is a determinate of the opinions and preferences of fans. Humphreys (2002, p 133) states that, "competitive balance reflects uncertainty about the outcomes of professional sporting events" and that, "to induce fans to purchase tickets to a game or to tune in to a broadcast, there must be some uncertainty regarding the outcome." Sanderson and Siegfried (2003) examine competitive imbalance as a problem, showing how closely payroll and market

size correlate with winning as one determinate corresponding with competitive balance and discuss a number of resolutions to the problem. They refer to a national poll conducted by the MLB in 2001 where 75% of the 1000 fans polled believed that competitive balance was a serious problem and 42% indicated that they would lose interest if more teams did not have a realistic chance of winning. Zimbalist (2002) bases his study on the assumption that fans prefer uncertainty of outcomes, or in the words of MLB commissioner Allan "Bud" Selig, fans want to begin each season with hope and expectation. If the outcome of a game is easily predictable because competitors are so unevenly matched, fans aren't likely to be interested in the game because they can already determine the outcome.

Measures of Competitive Balance

There are many different ways in which one can measure competitive balance. One of the more frequently used metrics is the standard deviation of win percentages which measures the winning percentages in a given year for a league or over time for a team. Another method is the Herfindal-Hirschman Index which measures the concentration of first-place finishes or championships.

The actual standard deviation of win percentages in year t is defined by the equation

(1)
$$\sigma_{w,t} = \sqrt{\frac{\sum_{i=1}^{N}(WPCT_{i,t} - .500)^2}{N}},$$

where N is the number of teams in the league and .500 is the average winning percentage. The actual standard deviation is often accompanied by the concept of an idealized standard deviation of win percentages, which assumes that all teams are equally competitive. The ideal controls for the problem associated with the actual standard deviation, where the number of games varies across sports and seasons. This idealized standard deviation measure represents perfect parity where each team has a 50/50 chance of winning each game and is shown as

(2)
$$\sigma_I = \frac{.5}{\sqrt{G}},$$

with G representing the number of games played during the season by each team. The ratio of the actual to ideal standard deviations allows for comparisons between different sports and is shown as

(3)
$$R = \frac{\sigma_{w,t}}{\sigma_I},$$

The measure is appropriate for determining competitive balance in a single season, but does not function properly when applied to a large number of seasons.

Humphreys (2002) illustrates this point by considering the won-loss records for teams in two hypothetical five-team leagues in each of five seasons (refer to Table I). He finds that the idealized and actual standard deviations are the same for each league despite a significant difference in relative standings between them. League 1 was dominated by Team A, which claimed all five championships in the five sample years and had identical relative standings for each year. League 2 saw more variation with each of the five championships won by a different team who also finished last once during the five seasons. Clearly League 2 is more competitively balanced than League 1, however, the actual and idealized standard deviations show them to be of equal competitive balance.

Table I: Won-Loss Records in Two Hypothetical Leagues

League 1						League 2					
Team	1	2	3	4	5	Team	1	2	3	4	5
A	4-0	4-0	4-0	4-0	4-0	F	4-0	3-1	2-2	1-3	0-4
B	3-1	3-1	3-1	3-1	3-1	G	3-1	2-2	1-3	0-4	4-0
C	2-2	2-2	2-2	2-2	2-2	H	2-2	1-3	0-4	4-0	3-1
D	1-3	1-3	1-3	1-3	1-3	I	1-3	0-4	4-0	3-1	2-2
E	0-4	0-4	0-4	0-4	0-4	J	0-4	4-0	3-1	2-2	1-3

A solution to the problem of measuring competitive balance across seasons is found in the Herfindahl-Hirschman Index, or *HHI*. *HHIs* are determined by a concentration of championships in a sports league over time measured by the distribution of the shares of championships. The actual *HHI* is calculated by finding the sum of the squares of the percentage shares of championships each team has for a certain number of seasons. The equation for *HHI* is

$$(4) \qquad HHI = \sum_{i=1}^{N}(WS_i)^2,$$

where WS_i is share of championships earned by each team in a league for a particular amount of time, and N is the number of teams.

A problem arises with the actual *HHI*, which requires the number of teams to remain consistent when comparing leagues of different sizes. A measure of concentration the *HHI* will always decrease as the number of firms in a market or teams in a league increases. Depken (1999) provides a way to solve this problem. *HHIs* are similar to the standard deviation method in that they both require the comparison of actual measures to idealized measures. Perfect parity, which means each team in a league wins an equal share of championships, is found in the ideal index of

$$(5) \qquad HHI = \frac{1}{N},$$

where N again represents the number of teams in a league. Comparisons can be made across leagues of different sizes by finding the normalized HHI which is

$$(6) \qquad dHHI = HHI - \frac{1}{N}.$$

Factors Influencing Competitive Balance in Various Sports

For the past half a century there have been numerous studies on changes in the competitive balance of professional and colligate sports leagues. There are also a vast number of factors that have been known to or could potentially influence competitive balance in the various sports.

Major League Baseball is one of the most frequently tested sports in the area of competitive balance. Depken (1999) conducted a study to determine how the competitiveness of baseball teams was affected by the removal of the reserve clause and the introduction of free-agency. In order to test the affects these factors had on competitive balance he calculated the *dHHI* of teams wins from 1920 to 1996 for the American League and the National League. He also factored in a set of explanatory variables, such as the distribution of playing talent and the designated hitter, which he believed altered parity across the leagues.

He found that free-agency has made the AL less competitive, while the NL has not been affected. Eckard (2001) used various measures of competitive balance to determine changes in the American League and the National League. He investigated market size and expansion as two factors responsible for changes in parity of baseball across different expansion periods, including the period primarily in question, 1995-1999. In comparing his tests, Eckard found consistent data confirming no change or a positive change towards more balance for the National League. He found mixed results for the American League, with certain tests indicating a decline in balance, others showing no change, and some even suggesting an increase in balance. Eckard believed there is a positive, but weak relationship between market size and winning for the American League and no existing relationship for the National League. Sanderson and Siegfried (2003) believed that variations in the market were very influential to the competitive structure of the MLB. They concluded that market size and location, as well as the preferences of fans and their willingness to act on those preferences all played a role in determining the appropriate level of competitive balance that is desired.

The competitive balance of English Soccer has often been used as a comparison for other sports leagues. Zimbalist (2002) described the characteristics of soccer's promotion/relegation leagues where successful teams rise to higher leagues and unsuccessful teams fall to lower leagues. He attributed the higher degree of competitive balance that is generally found in English Soccer to these characteristics, and concluded that because league membership is not fixed, teams do not have monopoly control over their territories.

There have also been an extensive amount of studies done on factors contributing to the changes in competitive balance of NCAA football. Bennett and Fizel (1995) tested the winning percentages of all nine Division I football conferences to determine the outcome of the Supreme Court decision to terminate NCAA control of college football telecasts. They found that on average competitive balance increased after the individual schools were granted property rights to college football telecasts. Sutter and Winkler (2003) studied the effects of changes in NCAA scholarship limits on competitive balance in college football. They measured changes in parity by comparing levels of competitive balance from periods after scholarship limits were implemented to periods prior to implementation. They also took into account other changes that could have led to less balance, thus offsetting the effect of scholarship limits, by including dummy variables into their calculations. Their research has led them to conclude that current scholarship limits have not produced greater parity.

Eckard (1998) tested the effect of the lack of NCAA cartel enforcement on college football on the basis that the economic theory of cartels suggests that one consequence may be reduced competitive balance. He developed a hypothesis that NCAA regulations inhibit the improvement of weaker programs and protect the more successful programs from competition. To test this hypothesis, he used data on national rankings and standings of major football conferences from the 1920's to 1995. He took measurements of competitive balance on a conference level using the variances of time and cumulative won-lost percentages across conference members, as well as on a national level using the HHI. The evidence from his tests suggests that balance has progressively worsened since the mid-1950s, corresponding to a trend toward more extensive regulation, tighter enforcement, and harsher penalties.

Depken and Wilson (2004) conducted another study on the effects of NCAA regulatory changes in Division I college football. For each year from 1888 to 2001, they calculated performance points for each team, where two points were allotted for each victory and one point for each tie, and the market share of those performance points for each team. They then calculated the HHI and dHHI for performance points for each year by using the market shares. The institutional changes they sought to investigate were the initial formation of the NCCA, the Sanity Code, the creation of a credible enforcement mechanism, minimum high-school GPA requirements, relegation of many schools to Division I-AA status, and the creation of the Bowl Championship Series system. They also find that increased NCAA regulations and enforcement has caused Division I-A football to become less balanced.

Effects of Changes in Competitive Balance

An appropriate level of competitive balance is determined by the preferences of fans. The issue of how competitive balance affects attendance has often been discussed in literature. Fan interest, in general, is directly related to the uncertainty of how a sporting event will end. Schmidt and Berri (2001) examined the relationship between competitive balance and attendance in the case of Major League Baseball. In their study, they confirmed that league competitive balance had a significant impact on league attendance. In other words, attendance rose when competitive balance improved, thus proving that fans observe a greater interest for contests that they cannot predict the outcome of. Fan interest and attendance is incredibly important to sports leagues and teams because they are directly related to how much revenue that league or team generates. If fans lose interest in sports, they will no longer purchase tickets to see the games, spend money on merchandise, or watch games on television. Without competitive balance, the demand for sports will eventually cease to exist.

ANALYSIS

In this study I attempted to measure competitive balance in NCAA sports with two different types of methods. I used the dHHI in accordance with Depken (1999) to measure parity for twelve different sports across each of the three divisions. I also measured the standard deviation for five sports in four Division I conferences dating back to the time that they became stable.

Frequency of Championships

For my first study, I found the lists of championship winners for a select group of sports across the three divisions from 1982 to the present. I then found the frequency of those championships for each team in a sport to determine the share of total championships for each team. I summed the squares of those shares to get the HHI (equation 4) for each sport, then subtracted the ideal HHI (equation 5) to get the dHHI (equation 6). I obtained the data in this study from the history pages of the various sports on the NCAA fan website.[1] The observations in this study can be found in Tables A1-A3 in the Appendix.

I observed Division I sports to be the least competitively balanced with an average dHHI of 0.177. This number is considered high in comparison to the average dHHI's of the other two divisions (refer to Table II). The Division I sports with a higher dHHI than the other divisions are baseball, softball, men's and women's basketball, and women's soccer.

Division I women's soccer is the least competitively balanced sport in this study with a dHHI of 0.506. North Carolina claimed the championship for 19 out of the past 28 years, resulting in the high dHHI that I found doing this study. Division II women's field hockey also has a low competitive balance of 0.392 because Bloomsburg has won the championship 12 out of the past 20 years. Men's lacrosse for Division I and Division III are also poorly balanced with dHHIs of over 0.23. In Division I Syracuse, Johns Hopkins, and Princeton are the main competitors and Hobart and Salisbury hold the two largest shares of championships in Division III. Division I softball also has a high dHHI because of the strength of the softball programs at Arizona and UCLA. Division II women's lacrosse also has a high dHHI but the reason for that is most likely that there have only been recorded for the past 9 years and there is an average of only 35 teams.

---

[1] http://www.ncaa.com/

Table II: Frequency of Championships
(dHHI for selected sports in each division)

Sports	Division I	Division II	Division III
Baseball	0.105	0.082	0.076
Softball	0.245	0.064	0.106
Men's Basketball	0.066	0.062	0.061
Women's Basketball	0.150	0.100	0.058
Men's Lacrosse	0.236	0.150	0.256
Women's Lacrosse	0.155	0.231	0.185
Men's Soccer	0.122	0.086	0.109
Women's Soccer	0.506	0.109	0.116
Men's Volleyball	0.164		
Women's Volley	0.119	0.077	0.196
Football	0.073	0.097	0.166
Field Hockey	0.189	0.392	0.156
Average	0.177	0.132	0.135

Certain sports, such as men's basketball and football, have a relatively high level of competitive balance. There is very little variation in competitive balance for men's basketball in each of the divisions. All three of the dHHI measures are right in the range of 0.06 (refer to Table II). In Football, there is an increase of 0.02 in the measurement of competitive balance from Division I to Division II as well as Division II to Division III. It seems that the longer a sport has been established, the more competitively balanced that sport is able to be. Some other sports with high levels of competitive balance are baseball in all divisions, women's basketball in Division III, and softball, men's soccer and women's volleyball in Division II. In Division III women's basketball there have been 21 different champions in the past 28 years.

Dispersal of Winning Percentages

The other half of my study consists of a collection of actual and ideal standard deviations of winning percentages for five sports in four different conferences. The conferences are the Pac-10, the Big Ten, the Big 12, and the SEC. The sports are baseball, men's and women's basketball, football, and softball, (see Tables A4-A7 in the Appendix). I found the data for this study in the media guides for the various sports on each conference websites.[2]

I recorded the win/loss records for each year from the earliest stable period in each conference sport to the present, and then calculated the winning percentages across all the years and sports represented. I found the actual standard deviation of the winning percentages for each year and an ideal standard deviation based on the number of games played by each team for that season. The measurements that I use for comparison in this study are a collection of ratios of ideal to actual standard deviations. I display these

---

[2] http://www.bigten.org/
http://www.big12sports.com/
http://www.pac-10.org/genrel/070909aae.html
http://www.secsports.com/

ratios in three different types of tables in order to more clearly understand the data. The tables represented are as follows: a set of five tables (Tables III – VII) to compare the ratios of the four conferences in each of the five sports, a set of four tables (Tables VIII – XI) to measure the ratios of the five sports across each conference, and a table (Table XII) to measure gender differences by finding the average of the ratios of all conferences each year for men's and women's basketball, baseball and softball.

In comparing the ratios by sport, the Big 12 was the most unbalanced conference in baseball with an average ratio of 1.735. The average ratios of the Pac-10 and the SEC were almost identical. Both had ratios of 1.528 with variations found only in the lower decimal places. The Big Ten experienced two particularly balanced seasons in 1995 and 2002 where the ratios were 0.805 and 0.960, respectively. The Pac-10 also achieved two seasons with ratios below 1.0 in '06 and '08.

Table III: Dispersal of Winning Percentages in Baseball
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Big Ten	Big 12	Pac-10	SEC
1991-1992	1.403			1.221
1992-1993	1.476			1.355
1993-1994	2.011			1.982
1994-1995	0.805			1.488
1995-1996	1.906			1.996
1996-1997	1.459	2.004		1.843
1997-1998	1.726	1.586		1.814
1998-1999	2.101	2.555	1.860	1.678
1999-2000	1.535	2.060	1.926	1.939
2000-2001	1.827	1.590	1.741	1.459
2001-2002	0.960	1.438	1.568	1.771
2002-2003	1.578	1.985	1.568	1.225
2003-2004	1.466	1.910	1.080	1.401
2004-2005	1.343	1.550	2.407	1.329
2005-2006	1.441	1.688	0.958	1.379
2006-2007	1.829	1.404	1.414	1.072
2007-2008	1.782	1.547	0.913	1.161
2008-2009	2.041	1.252	1.376	1.400
Average	1.594	1.736	1.528	1.529

	Overall Average	1.597	

Table IV: Dispersal of Winning Percentages in Men's Basketball
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Big Ten	Big 12	Pac-10	SEC
1978-1979			1.707	
1979-1980			2.288	
1980-1981			2.266	
1981-1982			2.051	
1982-1983			2.108	
1983-1984			1.792	
1984-1985			1.772	
1985-1986			1.352	
1986-1987			1.474	
1987-1988			1.912	
1988-1989			2.534	
1989-1990			2.131	
1990-1991			1.133	
1991-1992			2.200	1.638
1992-1993	2.119		2.049	1.638
1993-1994	1.520		1.950	1.989
1994-1995	2.044		2.049	1.732
1995-1996	1.826		2.000	1.537
1996-1997	1.978	1.758	2.049	1.846
1997-1998	2.121	1.758	2.244	1.745
1998-1999	1.729	1.834	1.618	1.679
1999-2000	2.098	2.216	2.166	1.665
2000-2001	1.732	1.895	2.309	1.537
2001-2002	1.533	2.000	2.073	1.225
2002-2003	1.581	1.846	2.233	1.895
2003-2004	1.688	1.977	1.721	1.492
2004-2005	2.156	1.638	1.663	1.919
2005-2006	1.396	1.552	1.721	1.651
2006-2007	2.110	1.784	1.988	1.187
2007-2008	2.261	1.537	2.037	1.706
2008-2009	1.687	2.023	1.444	1.523
Average	1.858	1.832	1.937	1.645

	Overall Average	1.817

For men's and women's basketball, the Pac-10 proved to be the least balanced conference and the SEC the most balanced. The Pac-10 average ratios were 1.936 for men's basketball and 2.219 for women's basketball. The average ratios for the SEC were 1.644 for the men's and 1.897 for the women's teams. The Big Ten and the Big 12 had similar average ratios in men's and women's basketball. Men's basketball showed average ratios of 1.85 for the Big Ten and 1.83 for the Big 12. Women's basketball showed average ratios of 2.07 for the Big Ten and 2.00 for the Big 12.

Table V: Dispersal of Winning Percentages in Women's Basketball
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Big Ten	Big 12	Pac-10	SEC
1986-1987			2.177	
1987-1988			2.320	
1988-1989			2.120	
1989-1990			2.444	
1990-1991			2.131	
1991-1992			2.108	1.636
1992-1993	2.394		1.886	1.809
1993-1994	2.261		2.465	1.863
1994-1995	1.703		2.131	1.933
1995-1996	2.377		1.937	1.553
1996-1997	1.775	2.023	2.582	2.000
1997-1998	1.857	1.989	2.485	1.809
1998-1999	2.049	1.706	2.309	1.659
1999-2000	2.025	2.023	2.049	2.064
2000-2001	2.324	2.126	1.695	1.879
2001-2002	1.732	1.989	2.553	1.809
2002-2003	1.857	2.365	2.012	2.233
2003-2004	2.258	2.078	1.899	1.838
2004-2005	2.419	2.246	2.404	2.064
2005-2006	2.313	2.100	2.131	1.879
2006-2007	2.133	1.651	2.465	2.162
2007-2008	1.713	1.834	2.309	2.186
2008-2009	2.098	1.883	2.424	1.780
Average	2.076	2.001	2.219	1.898

Overall Average   2.048

Of all five sports, football was the most competitively balanced sport with a total average ratio of 1.540. The Pac-10 was the football conference that showed the most competitive balance over time with an average ratio of 1.426. However, the other three conferences represented high levels of competitive balance as well with average ratios in the range of 1.56 to 1.58. Football was the only sport of the five to never experience a season with a ratio above 2.0 for all four conferences.

Table VI: Dispersal of Winning Percentages in Football
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Big Ten	Big 12	Pac-10	SEC
1978-1979			1.310	
1979-1980			1.291	
1980-1981			1.267	
1981-1982			1.502	
1982-1983			1.416	
1983-1984			1.212	
1984-1985			1.528	
1985-1986			1.119	
1986-1987			1.339	
1987-1988			1.416	
1988-1989			1.456	
1989-1990			1.204	
1990-1991			1.213	
1991-1992			1.700	
1992-1993			1.302	1.466
1993-1994	1.692		1.202	1.726
1994-1995	1.368		1.333	1.712
1995-1996	1.672		1.586	1.627
1996-1997	1.732	1.679	1.491	1.651
1997-1998	1.789	1.651	1.667	1.567
1998-1999	1.789	1.651	1.700	1.859
1999-2000	1.517	1.679	1.374	1.651
2000-2001	1.140	1.784	1.528	1.414
2001-2002	1.095	1.679	1.700	1.446
2002-2003	1.789	1.567	1.453	1.606
2003-2004	1.643	1.679	1.333	1.732
2004-2005	1.517	1.446	1.700	1.624
2005-2006	1.612	1.414	1.700	1.595
2006-2007	1.789	1.243	1.227	1.567
2007-2008	1.378	1.477	1.186	1.279
2008-2009	1.483	1.679	1.757	1.477
Average	1.563	1.587	1.426	1.588

Overall Average   1.541

Softball was the least competitively balanced sport with a total average ratio of 2.200. The most balanced conference was the Big 12 with an average ratio of 1.983, and the least balanced was the SEC with a ratio of 2.463. SEC softball had the highest average ratio of all the sports in all the conferences represented in this study and never experienced a season with ratios below 2.0. Softball was also the only sport with a season ratio over 3.0, observed in the season of 1995 by the Pac-10 conference.

Table VII: Dispersal of Winning Percentages in Softball
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Big Ten	Big 12	Pac-10	SEC
1992-1993			2.848	
1993-1994			2.968	
1994-1995			3.304	
1995-1996	2.441	2.152	2.959	
1996-1997	2.596	2.124	2.651	2.676
1997-1998	1.958	2.090	2.493	2.217
1998-1999	2.146	1.351	1.797	2.279
1999-2000	1.854	2.092	2.029	2.316
2000-2001	1.908	1.982	2.394	2.382
2001-2002	2.276	2.251	2.225	2.228
2002-2003	1.791	2.114	2.163	2.296
2003-2004	1.683	2.185	2.109	2.298
2004-2005	2.051	1.728	1.475	2.828
2005-2006	1.867	1.882	1.743	2.736
2006-2007	2.018	2.135	1.401	2.626
2007-2008	2.145	2.197	2.213	2.688
2008-2009	2.241	1.485	2.057	2.456
Average	2.070	1.983	2.284	2.464

			Overall Average	2.200

The second set of tables looked at ratios by conference. In Big Ten sports, football had the highest level of competitive balance with an average ratio of 1.562, closely followed by baseball with an average ratio of 1.593. Women's basketball was the least competitively balanced with an average ratio of 2.075, which was just slightly higher than the ratio 2.069 for softball. Big Ten women's basketball experienced ten seasons with ratios over 2.0 and baseball had two seasons with ratios below 1.0. There was also a dramatic change in competitive balance for baseball between the 1994 and 1995 seasons where ratios dropped from 2.011 to 0.805.

Table VIII: Dispersal of Winning Percentages in the Big Ten
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Baseball	Men's Basketball	Women's Basketball	Football	Softball
1991-1992	1.403				
1992-1993	1.476	2.119	2.394		
1993-1994	2.011	1.520	2.261	1.692	
1994-1995	0.805	2.044	1.703	1.368	
1995-1996	1.906	1.826	2.377	1.672	2.441
1996-1997	1.459	1.978	1.775	1.732	2.596
1997-1998	1.726	2.121	1.857	1.789	1.958
1998-1999	2.101	1.729	2.049	1.789	2.146
1999-2000	1.535	2.098	2.025	1.517	1.854
2000-2001	1.827	1.732	2.324	1.140	1.908
2001-2002	0.960	1.533	1.732	1.095	2.276
2002-2003	1.578	1.581	1.857	1.789	1.791
2003-2004	1.466	1.688	2.258	1.643	1.683
2004-2005	1.343	2.156	2.419	1.517	2.051
2005-2006	1.441	1.396	2.313	1.612	1.867
2006-2007	1.829	2.110	2.133	1.789	2.018
2007-2008	1.782	2.261	1.713	1.378	2.145
2008-2009	2.041	1.687	2.098	1.483	2.241
Average	1.594	1.858	2.076	1.563	2.070

Overall Average   1.832

As with Big-10 sports, the Big 12 was found to be the most competitively balanced in the sport of football, which had an average ratio of 1.586, and the least in women's basketball which had an average ratio of 2.000. Baseball was also the second most balanced sport and softball was just slightly less balanced than women's basketball with an average ratio of 1.983. Baseball and men's basketball had only two seasons each with ratios of 2.0 or higher, and softball only experienced 5 of 14 seasons with ratios below 2.0.

Table IX: Dispersal of Winning Percentages in the Big 12
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Baseball	Men's Basketball	Women's Basketball	Football	Softball
1995-1996					2.152
1996-1997	2.004	1.758	2.023	1.679	2.124
1997-1998	1.586	1.758	1.989	1.651	2.090
1998-1999	2.555	1.834	1.706	1.651	1.351
1999-2000	2.060	2.216	2.023	1.679	2.092
2000-2001	1.590	1.895	2.126	1.784	1.982
2001-2002	1.438	2.000	1.989	1.679	2.251
2002-2003	1.985	1.846	2.365	1.567	2.114
2003-2004	1.910	1.977	2.078	1.679	2.185
2004-2005	1.550	1.638	2.246	1.446	1.728
2005-2006	1.688	1.552	2.100	1.414	1.882
2006-2007	1.404	1.784	1.651	1.243	2.135
2007-2008	1.547	1.537	1.834	1.477	2.197
2008-2009	1.252	2.023	1.883	1.679	1.485
Average	1.736	1.832	2.001	1.587	1.983

Overall Average   1.828

Pac-10 sports are on average the least competitively balanced of all the conferences with a total average ratio of 1.878. Again football is the sport shown to be the most balanced with an average ratio of 1.426, followed by baseball with an average of 1.528. However, in the Pac-10 the least competitively balanced sports are softball and then women's basketball with respective ratios of 2.283 and 2.219. Women's basketball and softball achieved only four seasons each with ratios below 2.0. Baseball also had two seasons with ratios below 1.0 and only one season with a ratio above 2.0. In baseball there was also a large increase in competitive balance from the 2005 to 2006 seasons where ratios fell from 2.406 to 0.958. Softball's first six seasons were considerably unbalanced with average ratios of over 2.5.

Table X: Dispersal of Winning Percentages in the Pac-10
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Baseball	Men's Basketball	Women's Basketball	Football	Softball
1978-1979		1.707		1.310	
1979-1980		2.288		1.291	
1980-1981		2.266		1.267	
1981-1982		2.051		1.502	
1982-1983		2.108		1.416	
1983-1984		1.792		1.212	
1984-1985		1.772		1.528	
1985-1986		1.352		1.119	
1986-1987		1.474	2.177	1.339	
1987-1988		1.912	2.320	1.416	
1988-1989		2.534	2.120	1.456	
1989-1990		2.131	2.444	1.204	
1990-1991		1.133	2.131	1.213	
1991-1992		2.200	2.108	1.700	
1992-1993		2.049	1.886	1.302	2.848
1993-1994		1.950	2.465	1.202	2.968
1994-1995		2.049	2.131	1.333	3.304
1995-1996		2.000	1.937	1.586	2.959
1996-1997		2.049	2.582	1.491	2.651
1997-1998		2.244	2.485	1.667	2.493
1998-1999	1.860	1.618	2.309	1.700	1.797
1999-2000	1.926	2.166	2.049	1.374	2.029
2000-2001	1.741	2.309	1.695	1.528	2.394
2001-2002	1.568	2.073	2.553	1.700	2.225
2002-2003	1.568	2.233	2.012	1.453	2.163
2003-2004	1.080	1.721	1.899	1.333	2.109
2004-2005	2.407	1.663	2.404	1.700	1.475
2005-2006	0.958	1.721	2.131	1.700	1.743
2006-2007	1.414	1.988	2.465	1.227	1.401
2007-2008	0.913	2.037	2.309	1.186	2.213
2008-2009	1.376	1.444	2.424	1.757	2.057
Average	1.528	1.937	2.219	1.426	2.284

Overall Average   1.879

The SEC was the conference with the lowest total average ratio of 1.824 despite the repeatedly high average ratios of softball. Baseball was the most balanced sport in this conference with an average ratio of 1.528, followed by football which had an average ratio of 1.588. Softball was clearly the least competitively balanced sport with all season ratios of well over 2.0 and an average ratio of 2.463. The season ratios for baseball, men's basketball, and football were all below the 2.0 level. Women's basketball also saw an average ratio that was below 2.0.

Table XI: Dispersal of Winning Percentages in the SEC
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Baseball	Men's Basketball	Women's Basketball	Football	Softball
1991-1992	1.221	1.638	1.636		
1992-1993	1.355	1.638	1.809	1.466	
1993-1994	1.982	1.989	1.863	1.726	
1994-1995	1.488	1.732	1.933	1.712	
1995-1996	1.996	1.537	1.553	1.627	
1996-1997	1.843	1.846	2.000	1.651	2.676
1997-1998	1.814	1.745	1.809	1.567	2.217
1998-1999	1.678	1.679	1.659	1.859	2.279
1999-2000	1.939	1.665	2.064	1.651	2.316
2000-2001	1.459	1.537	1.879	1.414	2.382
2001-2002	1.771	1.225	1.809	1.446	2.228
2002-2003	1.225	1.895	2.233	1.606	2.296
2003-2004	1.401	1.492	1.838	1.732	2.298
2004-2005	1.329	1.919	2.064	1.624	2.828
2005-2006	1.379	1.651	1.879	1.595	2.736
2006-2007	1.072	1.187	2.162	1.567	2.626
2007-2008	1.161	1.706	2.186	1.279	2.688
2008-2009	1.400	1.523	1.780	1.477	2.456
Average	1.529	1.645	1.898	1.588	2.464

Overall Average   1.825

In comparing ratios by gender, I decided to exclude football as it did not correspond to a comparable women's sport. Baseball was the most balanced sport with a total average of all four conferences of 1.593. Baseball only saw one season in which the average of the four conference ratios was over 2.0. There was about 0.7 point difference between baseball and its sister sport, softball, which had the highest total average ratio of 2.315. It was only in the 1999 season that the average of the four conference ratios for softball dropped below 2.0. Interestingly, it was in this same season that the average of conference ratios rose above 2.0. The difference between men's and women's basketball is not as great, with the men's ratio at 1.854 and women's at 2.086. There were only three seasons where the average of the four conference ratios for women's basketball was less than men's.

Upon completion of this part of the study I have come to the conclusion that men's sports overall show more competitive balance than women's sports. I base this conclusion on the evidence shown in the comparisons of the ratios of these five different sports.

Table XII: Dispersal of Winning Percentages in Gender
(Ratio of Actual to Ideal Standard Deviations)

Academic Year	Baseball Averages	Softball Averages	Men's Basketball Averages	Women's Basketball Averages
1978-1979			1.707	
1979-1980			2.288	
1980-1981			2.266	
1981-1982			2.051	
1982-1983			2.108	
1983-1984			1.792	
1984-1985			1.772	
1985-1986			1.352	
1986-1987			1.474	2.177
1987-1988			1.912	2.320
1988-1989			2.534	2.120
1989-1990			2.131	2.444
1990-1991			1.133	2.131
1991-1992	1.312		1.919	1.872
1992-1993	1.416	2.848	1.935	2.030
1993-1994	1.997	2.968	1.820	2.196
1994-1995	1.146	3.304	1.942	1.922
1995-1996	1.951	2.517	1.788	1.956
1996-1997	1.769	2.512	1.908	2.095
1997-1998	1.709	2.190	1.967	2.035
1998-1999	2.048	1.893	1.715	1.931
1999-2000	1.865	2.073	2.036	2.040
2000-2001	1.654	2.166	1.868	2.006
2001-2002	1.434	2.245	1.708	2.021
2002-2003	1.589	2.091	1.889	2.117
2003-2004	1.464	2.069	1.720	2.018
2004-2005	1.657	2.020	1.844	2.283
2005-2006	1.367	2.057	1.580	2.106
2006-2007	1.430	2.045	1.767	2.103
2007-2008	1.351	2.311	1.885	2.011
2008-2009	1.517	2.060	1.669	2.046
Total Average	1.593	2.316	1.854	2.086

CONCLUSIONS

The observations I have made throughout this study have lead me to draw two basic conclusions about variations of competitive balance in NCAA sports. Firstly, I have found evidence to show that Division I sports on average have less competitive balance than Division II or Division III. The simplest explanation for this is the presence of cartel effects in Division I. Regulations and restrictions put on sports by the NCAA often benefit the strong teams because they do not allow for growth of the weaker teams. It is also the case that successful, high ranking conferences have the incentive to collude against possible future competition in other conferences. Those strong conferences often earn high revenues and are often concerned with protecting their revenues.

My second conclusion is that men's sports are typically more balanced than women's sports. The explanation for this is possibility the occurrence of life cycle effects in competitive balance. Men's sports are more mature and established than women's sports, thus leading to more stability in the parity of the sport. Possible future research on this topic could explore the progression of competitive balance through time for men's sports in order to prove the existence of life cycle effects in competitive balance.

REFERENCES

[1] Bennett, R. W., & Fizel, J. L. (1995). Telecast Deregulation and Competitive Balance: Regarding NCAA Division I Football. *The American Journal of Economics and Sociology*, 54, 183-199.

[2] Depken, C. A. (1999). Free-Agency and the Competitiveness of Major League Baseball. *Review of Industrial Organization*, 14(3), 205-217.

[3] Depken, C. A., & Wilson, D. P. (2004). Industrial Change in the NCAA and Competitive Balance in Intercollegiate Football. *Economics of Collegiate Sports*, 197-209.

[4] Eckard, E. W. (1998). The NCAA Cartel and Competitive Balance in College Football. *Review of Industrial Organization*, 13, 347-369.

[5] Eckard, E. W. (2001). Baseball's Blue Ribbon Economic Report: Solutions in Search of a Problem. *Journal of Sports Economics*. 2(3), 213-227.

[6] Humphreys, B. R. (2002). Alternative Measures of Competitive Balance in Sports Leagues. *Journal of Sports Economics*, 3(2), 133-148.

[7] Sanderson, A. R., & Siegfried, J. J. (2003). Thinking about Competitive Balance. *Journal of Sports Economics*, 4(4), 255-279.

[8] Schmidt, M. B., & Berri, D. J. (2001). Competitive Balance and Attendance: The Case of Major League Baseball. *Journal of Sports Economics*, 2(2), 145-167.

[9] Sutter, D.,& Winkler, S. (2003). NCAA Scholarship Limits and Competitive Balance in College Football. *Journal of Sports Economics*, 4(1), 3-18.

[10] Zimbalist, A. S. (2002). Competitive Balance in Sports Leagues: An Introduction. *Journal of Sports Economics*, 3(2), 111-121.

APPENDIX

Table A1: NCAA Division I Championship Winners

Academic Year	Baseball	Basketball (M.)	Basketball (W.)	Field Hockey	Football	Lacrosse (M.)	Lacrosse (W.)	Soccer (M.)	Soccer (W.)	Softball	Volleyball (M.)	Volleyball (W.)
1981-1982	Miami (Fla.)	North Carolina	Louisiana Tech	Old Dominion	Penn St.	North Carolina	Massachusetts	Indiana	North Carolina	UCLA	UCLA	Hawaii
1982-1983	Texas	North Carolina St.	Southern California	Old Dominion	Miami (Fla.)	Syracuse	Delaware	Indiana	North Carolina	Texas A&M	UCLA	Hawaii
1983-1984	Cal St. Fullerton	Georgetown	Southern California	Old Dominion	Brigham Young	Johns Hopkins	Temple	Clemson	North Carolina	UCLA	UCLA	UCLA
1984-1985	Miami (Fla.)	Villanova	Old Dominion	Connecticut	Oklahoma	Johns Hopkins	New Hampshire	UCLA	George Mason	UCLA	Pepperdine	Pacific
1985-1986	Arizona	Louisville	Texas	Iowa	Penn St.	North Carolina	Maryland	Duke	North Carolina	Cal St. Fullerton	Pepperdine	Pacific
1986-1987	Stanford	Indiana	Tennessee	Maryland	Miami (Fla.)	Johns Hopkins	Penn St.	Clemson	North Carolina	Texas A&M	UCLA	Hawaii
1987-1988	Stanford	Kansas	Louisiana Tech	Old Dominion	Notre Dame	Syracuse	Temple	Indiana	North Carolina	UCLA	Southern California	Texas
1988-1989	Wichita St.	Michigan	Tennessee	North Carolina	Miami (Fla.)	Syracuse	Penn St.	Santa Clara, Virginia	North Carolina	UCLA	UCLA	Long Beach St.
1989-1990	Georgia	UNLV	Stanford	Old Dominion	Georgia Tech	Syracuse	Harvard	UCLA	North Carolina	UCLA	Southern California	UCLA
1990-1991	LSU	Duke	Tennessee	Old Dominion	Miami (Fla.)	North Carolina	Virginia	Virginia	North Carolina	Arizona	Long Beach St.	
1991-1992	Pepperdine	Duke	Stanford	Old Dominion	Alabama	Princeton	Maryland	Virginia	North Carolina	UCLA	Pepperdine	Stanford
1992-1993	LSU	North Carolina	Texas Tech	Maryland	Florida State	Syracuse	Virginia	Virginia	North Carolina	Arizona	UCLA	Long Beach St.
1993-1994	Oklahoma	Arkansas	North Carolina	James Madison	Nebraska	Princeton	Princeton	Virginia	North Carolina	Arizona	Penn St.	Stanford
1994-1995	Cal St. Fullerton	UCLA	Connecticut	North Carolina	Nebraska	Syracuse	Maryland	Wisconsin	Notre Dame	UCLA	UCLA	Nebraska
1995-1996	LSU	Kentucky	Tennessee	North Carolina	Florida	Princeton	Maryland	St. John's (N.Y.)	North Carolina	Arizona	UCLA	Stanford
1996-1997	LSU	Arizona	Tennessee	North Carolina	Michigan	Princeton	Maryland	UCLA	North Carolina	Arizona	Stanford	Stanford
1997-1998	Southern California	Kentucky	Tennessee	Old Dominion	Tennessee	Princeton	Maryland	Indiana	Florida	Fresno St.	UCLA	Long Beach St.
1998-1999	Miami (Fla.)	Connecticut	Purdue	Maryland	Florida State	Virginia	Maryland	Indiana	North Carolina	UCLA	Brigham Young	Penn St.
1999-2000	LSU	Michigan St.	Connecticut	Old Dominion	Oklahoma	Syracuse	Maryland	Connecticut	North Carolina	Oklahoma	UCLA	Nebraska
2000-2001	Miami (Fla.)	Duke	Notre Dame	Michigan	Miami (Fla.)	Princeton	Maryland	North Carolina	Santa Clara	Arizona	Brigham Young	Stanford
2001-2002	Texas	Maryland	Connecticut	Wake Forest	Ohio State	Syracuse	Princeton	UCLA	Portland	California	Hawaii	Southern California
2002-2003	Rice	Syracuse	Connecticut	Wake Forest	Louisiana State	Virginia	Princeton	Indiana	North Carolina	UCLA	Lewis	Southern California
2003-2004	Cal St. Fullerton	Connecticut	Connecticut	Wake Forest	Southern California	Syracuse	Virginia	Indiana	Notre Dame	UCLA	Brigham Young	Stanford
2004-2005	Texas	North Carolina	Baylor	Maryland	Texas	Johns Hopkins	Northwestern	Maryland	Portland	Michigan	Pepperdine	Washington
2005-2006	Oregon St.	Florida	Maryland	Maryland	Florida	Virginia	Northwestern	UC Santa Barb.	North Carolina	Arizona	UCLA	Nebraska
2006-2007	Oregon St.	Florida	Tennessee	North Carolina	Louisiana State	Johns Hopkins	Northwestern	Wake Forest	Southern California	Arizona	UC Irvine	Penn St.
2007-2008	Fresno St.	Kansas	Tennessee	Maryland	Florida	Syracuse	Northwestern	Maryland	North Carolina	Arizona St.	Penn St.	Penn St.
2008-2009		North Carolina	Connecticut				Northwestern			Washington	UC Irvine	

Table A2: NCAA Division II Championship Winners

Academic Year	Baseball	Basketball (M.)	Basketball (W.)	Field Hockey	Football	Lacrosse (M.)	Lacrosse (W.)	Soccer (M.)	Soccer (W.)	Softball	Volleyball (W.)
1981-1982	UC Riverside	Dist. Columbia	Cal Poly Pomona	Lock Haven	Texas St.			Florida Int'l		Sam Houston St.	UC Riverside
1982-1983	Cal Poly Pomona	Wright St.	Virginia Union	Bloomsburg	North Dakota St.			Seattle Pacific		Cal St. Northridge	Cal St. Northridge
1983-1984	Cal St. Northridge	Central Mo.	Central Mo.		Troy St.			Florida Int'l		Cal St. Northridge	Portland St.
1984-1985	Fla. Southern	Jacksonville St.	Cal Poly Pomona		North Dakota St.			Seattle Pacific		Cal St. Northridge	Portland St.
1985-1986	Troy	Sacred Heart	Cal Poly Pomona		North Dakota St.			Seattle Pacific		Stephen F. Austin	UC Riverside
1986-1987	Troy	Ky. Wesleyan	New Haven		Troy St.			Southern Conn. St.		Cal St. Northridge	Cal St. Northridge
1987-1988	Fla. Southern	Mass.-Lowell	Hampton		North Dakota St.			Florida Tech	Cal St. East Bay	Cal St. Bakersfield	Portland St.
1988-1989	Cal Poly	N.C. Central	Delta St.		Mississippi Col.			Southern N.H.	Barry	Cal St. Bakersfield	Cal St. Bakersfield
1989-1990	Jacksonville St.	Ky. Wesleyan	Delta St.		North Dakota St.			Southern Conn. St.	Sonoma St.	Cal St. Bakersfield	
1990-1991	Jacksonville St.	North Ala.	North Dakota St.		Pittsburg St.			Florida Tech	Cal St. Dom. Hills	Augustana (S.D.)	West Tex. A&M
1991-1992	Tampa	Virginia Union	Delta St.	Lock Haven	Jacksonville St.			Southern Conn. St.	Barry	Mo. Southern St.	Portland St.
1992-1993	Tampa	Cal St. Bakersfield	North Dakota St.	Bloomsburg	North Ala.	Adelphi		Seattle Pacific	Barry	Fla. Southern	Northern Mich.
1993-1994	Central Mo. St.	Cal St. Bakersfield	North Dakota St.	Lock Haven	North Ala.	Springfield		Tampa	Franklin Pierce	Merrimack	Northern Mich.
1994-1995	Fla. Southern	Southern Ind.	North Dakota St.	Lock Haven	North Ala.	Adelphi		Southern Conn. St.	Franklin Pierce	Kennesaw St.	Barry
1995-1996	Kennesaw St.	Fort Hays St.	North Dakota St.	Bloomsburg	Northern Colo.	C.W. Post		Grand Canyon	Franklin Pierce	Kennesaw St.	Neb.-Omaha
1996-1997	Cal St. Chico	Cal St. Bakersfield	North Dakota	Bloomsburg	Northern Colo.	NYIT		Cal St. Bakersfield	Franklin Pierce	California (Pa.)	West Tex. A&M
1997-1998	Tampa	UC Davis	North Dakota	Bloomsburg	Northwest Mo. St.	Adelphi		Southern Conn. St.	Lynn	California (Pa.)	Hawaii Pacific
1998-1999	Cal St. Chico	Ky. Wesleyan	North Dakota	Bloomsburg	Northwest Mo. St.	Adelphi		Southern Conn. St.	Franklin Pierce	Humboldt St.	BYU-Hawaii
1999-2000	Southeastern Okla.	Metro St.	Northern Ky.	Lock Haven	Delta St.	Limestone		Cal St. Dom. Hills	UC San Diego	North Dakota St.	Hawaii Pacific
2000-2001	St. Mary's (Tex.)	Ky. Wesleyan	Cal Poly Pomona	Bentley	North Dakota St.	Adelphi	C.W. Post	Tampa	UC San Diego	Neb.-Omaha	Barry
2001-2002	Columbus St.	Metro St.	Cal Poly Pomona	Bloomsburg	Grand Valley St.	Limestone	West Chester	Sonoma St.	Christian Bros.	St. Mary's (Tex.)	BYU-Hawaii
2002-2003	Central Mo. St.	Northeastern St.	South Dakota St.	Bloomsburg	Grand Valley St.	NYITM	Stonehill	Lynn	Kennesaw St.	UC Davis	North Ala.
2003-2004	Delta St.	Kennesaw St.	California (Pa.)	Bloomsburg	Valdosta St.	Le Moyne	Adelphi	Seattle	Metro St.	Angelo St.	Barry
2004-2005	Fla. Southern	Virginia Union	Washburn	Mass.-Lowell	Grand Valley St.	NYIT	Stonehill	Fort Lewis	Neb.-Omaha	Lynn	Grand Valley State
2005-2006	Tampa	Winona St.	Grand Valley St.	Bloomsburg	Grand Valley St.	Le Moyne	Adelphi	Dowling	Metro St.	Lock Haven	Tampa
2006-2007	Tampa	Barton	Southern Conn. St.	Bloomsburg	Valdosta St.	Le Moyne	C.W. Post	Franklin Pierce	Tampa	SIU Edwardsville	Concordia-St. Paul
2007-2008	Mount Olive	Winona St.	Northern Ky.	Bloomsburg	Minn.-Duluth	NYIT	West Chester	Cal St. Dom. Hills	Seattle Pacific	Humboldt St.	Concordia-St. Paul
2008-2009	Lynn	Findlay	Minn. St. Mankato			C.W. Post	Adelphi			Lock Haven	

Table A3: NCAA Division III Championship Winners

Academic Year	Baseball	Basketball (M.)	Basketball (W.)	Field Hockey	Football	Lacrosse (M.)	Lacrosse (W.)	Soccer (M.)	Soccer (W.)	Softball	Volleyball (W.)
1981-1982	Eastern Conn. St.	Wabash	Elizabethtown	Ithaca	Augustana (Ill.)	Hobart		UNC Greensboro		Eastern Conn. St.	La Verne
1982-1983	Marietta	Scranton	North Central (Ill.)	TCNJ	Augustana (Ill.)	Hobart		UNC Greensboro		TCNJ	Elmhurst
1983-1984	Ramapo	Wis.-Whitewater	Rust	Bloomsburg	Augustana (Ill.)	Hobart		Wheaton (Ill.)		Buena Vista	UC San Diego
1984-1985	Wis.-Oshkosh	North Park	Scranton	TCNJ	Augustana (Ill.)	Hobart	TCNJ	UNC Greensboro		Eastern Conn. St.	Elmhurst
1985-1986	Marietta	SUNY Potsdam	Salem St.	Salisbury	Wagner	Hobart	Ursinus	UNC Greensboro	Rochester	Eastern Conn. St.	UC San Diego
1986-1987	Montclair St.	North Park	Wis.-Stevens Point	Bloomsburg	Ithaca	Hobart	TCNJ	UNC Greensboro	Rochester	TCNJ	UC San Diego
1987-1988	Ithaca	Ohio Wesleyan	Concordia-M'head	TCNJ	Dayton	Hobart	TCNJ	UC San Diego	William Smith	Central (Iowa)	UC San Diego
1988-1989	N.C. Wesleyan	Wis.-Whitewater	Elizabethtown	Lock Haven	Allegheny	Hobart	Ursinus	Elizabethtown	UC San Diego	TCNJ	Washington-St. Louis
1989-1990	Eastern Conn. St.	Rochester	Hope	TCNJ	Ithaca	Hobart	Ursinus	Rowan	Ithaca	Eastern Conn. St.	UC San Diego
1990-1991	Southern Me.	Wis.-Platteville	St. Thomas (Minn.)	TCNJ	Wis.-La Crosse	Hobart	TCNJ	UC San Diego	Ithaca	Central (Iowa)	Washington-St. Louis
1991-1992	Wm. Paterson	Calvin	Alma	William Smith	Mount Union	Nazareth	TCNJ	Kean	Cortland St.	TCNJ	Washington-St. Louis
1992-1993	Montclair St.	Ohio Northern	Central (Iowa)	Cortland St.	Albion	Hobart	TCNJ	UC San Diego	TCNJ	Central (Iowa)	Washington-St. Louis
1993-1994	Wis.-Oshkosh	Lebanon Valley	Capital	Cortland St.	Wis.-La Crosse	Salisbury	TCNJ	Bethany (W.V.)	TCNJ	TCNJ	Washington-St. Louis
1994-1995	La Verne	Wis.-Platteville	Capital	TCNJ	Mount Union	Salisbury	TCNJ	Williams	UC San Diego	Chapman	Washington-St. Louis
1995-1996	Wm. Paterson	Rowan	Wis.-Oshkosh	TCNJ	Mount Union	Nazareth	TCNJ	TCNJ	UC San Diego	TCNJ	Washington-St. Louis
1996-1997	Southern Me.	Ill. Wesleyan	New York U.	William Smith	Mount Union	Nazareth	Middlebury	Wheaton (Ill.)	UC San Diego	Simpson	UC San Diego
1997-1998	Eastern Conn. St.	Wis.-Platteville	Washington-St. Louis	Middlebury	Pacific Lutheran	Washington (Md.)	TCNJ	Ohio Wesleyan	Macalester	Wis.-Stevens Point	Central (Iowa)
1998-1999	N.C. Wesleyan	Wis.-Platteville	Washington-St. Louis	TCNJ	Mount Union	Salisbury	Middlebury	St. Lawrence	UC San Diego	Simpson	Central (Iowa)
1999-2000	Montclair St.	Calvin	Washington-St. Louis	William Smith	Mount Union	Middlebury	TCNJ	Messiah	TCNJ	St. Mary's (Minn.)	Central (Iowa)
2000-2001	St. Thomas (Minn.)	Catholic	Washington-St. Louis	Cortland St.	Mount Union	Middlebury	Middlebury	Richard Stockton	Ohio Wesleyan	Muskingum	La Verne
2001-2002	Eastern Conn. St.	Otterbein	Wis.-Stevens Point	Rowan	St. John's (Minn.)	Middlebury	Middlebury	Messiah	Ohio Wesleyan	Ithaca	Wis.-Whitewater
2002-2003	Chapman	Williams	Trinity (Tex.)	Salisbury	Linfield	Salisbury	Amherst	Trinity (Tex.)	Oneonta St.	Central (Iowa)	Washington-St. Louis
2003-2004	George Fox	Wis.-Stevens Point	Wilmington (Ohio)	Salisbury	Mount Union	Salisbury	Middlebury	Messiah	Wheaton (Ill.)	St. Thomas (Minn.)	Juniata
2004-2005	Wis.-Whitewater	Wis.-Stevens Point	Millikin	Salisbury	Mount Union	Salisbury	TCNJ	Messiah	Messiah	St. Thomas (Minn.)	Wis.-Whitewater
2005-2006	Marietta	Va. Wesleyan	Hope	Ursinus	Wis.-Whitewater	Cortland State	TCNJ	Messiah	Wheaton (Ill.)	Rutgers-Camden	Juniata
2006-2007	Kean	Amherst	DePauw	Bowdoin	Mount Union	Salisbury	Franklin & Marshall	Middlebury	Wheaton (Ill.)	Linfield	Washington-St. Louis
2007-2008	Trinity (Conn.)	Washington-St. Louis	Howard Payne	Bowdoin		Salisbury	Hamilton	Messiah	Messiah	Wis.-Eau Claire	Emory
2008-2009	St. Thomas (Minn.)	Washington-St. Louis	George Fox			Cortland State	Franklin & Marshall			Messiah	

Table A4: Big Ten

Academic Year	Baseball Sdwin	Baseball Sdideal	Men's Basketball Sdwin	Men's Basketball Sdideal	Women's Basketball Sdwin	Women's Basketball Sdideal	Football Sdwin	Football Sdideal	Softball Sdwin	Softball Sdideal
1991-1992	0.133	0.094								
1992-1993	0.141	0.096	0.250	0.118	0.282	0.118				
1993-1994	0.191	0.095	0.179	0.118	0.266	0.118	0.299	0.177		
1994-1995	0.077	0.095	0.241	0.118	0.213	0.125	0.242	0.177		
1995-1996	0.183	0.096	0.215	0.118	0.297	0.125	0.296	0.177	0.251	0.103
1996-1997	0.142	0.097	0.233	0.118	0.222	0.125	0.306	0.177	0.272	0.105
1997-1998	0.169	0.098	0.265	0.125	0.232	0.125	0.316	0.177	0.202	0.103
1998-1999	0.200	0.095	0.216	0.125	0.256	0.125	0.316	0.177	0.221	0.103
1999-2000	0.146	0.095	0.262	0.125	0.253	0.125	0.268	0.177	0.226	0.122
2000-2001	0.178	0.098	0.217	0.125	0.290	0.125	0.202	0.177	0.213	0.112
2001-2002	0.088	0.092	0.192	0.125	0.217	0.125	0.194	0.177	0.270	0.118
2002-2003	0.143	0.090	0.198	0.125	0.232	0.125	0.316	0.177	0.209	0.117
2003-2004	0.130	0.089	0.211	0.125	0.282	0.125	0.290	0.177	0.189	0.112
2004-2005	0.121	0.090	0.270	0.125	0.302	0.125	0.268	0.177	0.239	0.117
2005-2006	0.128	0.089	0.175	0.125	0.289	0.125	0.285	0.177	0.217	0.116
2006-2007	0.167	0.091	0.264	0.125	0.267	0.125	0.316	0.177	0.248	0.123
2007-2008	0.159	0.090	0.266	0.118	0.202	0.118	0.244	0.177	0.244	0.114
2008-2009	0.210	0.103	0.199	0.118	0.247	0.118	0.262	0.177	0.252	0.112

Table A5: Big 12

Academic Year	Baseball		Men's Basketball		Women's Basketball		Football		Softball	
	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal
1995-1996									0.238	0.110
1996-1997	0.185	0.092	0.220	0.125	0.253	0.125	0.297	0.177	0.267	0.126
1997-1998	0.150	0.095	0.220	0.125	0.249	0.125	0.292	0.177	0.257	0.123
1998-1999	0.241	0.094	0.229	0.125	0.213	0.125	0.292	0.177	0.173	0.128
1999-2000	0.190	0.092	0.277	0.125	0.253	0.125	0.297	0.177	0.249	0.119
2000-2001	0.148	0.093	0.237	0.125	0.266	0.125	0.315	0.177	0.242	0.122
2001-2002	0.140	0.097	0.250	0.125	0.249	0.125	0.297	0.177	0.268	0.119
2002-2003	0.192	0.097	0.231	0.125	0.296	0.125	0.277	0.177	0.251	0.119
2003-2004	0.187	0.098	0.247	0.125	0.260	0.125	0.297	0.177	0.263	0.121
2004-2005	0.150	0.097	0.205	0.125	0.281	0.125	0.256	0.177	0.205	0.119
2005-2006	0.164	0.097	0.194	0.125	0.262	0.125	0.250	0.177	0.224	0.119
2006-2007	0.139	0.099	0.223	0.125	0.206	0.125	0.220	0.177	0.254	0.119
2007-2008	0.149	0.097	0.192	0.125	0.229	0.125	0.261	0.177	0.260	0.119
2008-2009	0.122	0.097	0.253	0.125	0.235	0.125	0.297	0.177	0.176	0.119

Table A6: Pac-10

Academic Year	Baseball		Men's Basketball		Women's Basketball		Football		Softball	
	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal
1978-1979			0.201	0.118			0.241	0.184		
1979-1980			0.270	0.118			0.240	0.186		
1980-1981			0.267	0.118			0.236	0.186		
1981-1982			0.242	0.118			0.276	0.184		
1982-1983			0.248	0.118			0.264	0.186		
1983-1984			0.211	0.118			0.229	0.189		
1984-1985			0.221	0.125			0.277	0.181		
1985-1986			0.159	0.118			0.200	0.179		
1986-1987			0.174	0.118	0.257	0.118	0.243	0.181		
1987-1988			0.225	0.118	0.273	0.118	0.271	0.192		
1988-1989			0.299	0.118	0.250	0.118	0.268	0.184		
1989-1990			0.251	0.118	0.288	0.118	0.221	0.184		
1990-1991			0.134	0.118	0.251	0.118	0.220	0.181		
1991-1992			0.259	0.118	0.248	0.118	0.300	0.177		
1992-1993			0.241	0.118	0.222	0.118	0.233	0.179	0.307	0.108
1993-1994			0.230	0.118	0.290	0.118	0.212	0.177	0.307	0.103
1994-1995			0.241	0.118	0.251	0.118	0.236	0.177	0.312	0.094
1995-1996			0.236	0.118	0.228	0.118	0.280	0.177	0.289	0.098
1996-1997			0.241	0.118	0.304	0.118	0.264	0.177	0.253	0.095
1997-1998			0.264	0.118	0.293	0.118	0.295	0.177	0.238	0.095
1998-1999	0.190	0.102	0.191	0.118	0.272	0.118	0.300	0.177	0.171	0.095
1999-2000	0.197	0.102	0.255	0.118	0.241	0.118	0.243	0.177	0.223	0.110
2000-2001	0.180	0.103	0.272	0.118	0.200	0.118	0.270	0.177	0.263	0.110
2001-2002	0.160	0.102	0.244	0.118	0.301	0.118	0.300	0.177	0.243	0.109
2002-2003	0.160	0.102	0.263	0.118	0.237	0.118	0.257	0.177	0.236	0.109
2003-2004	0.110	0.102	0.203	0.118	0.224	0.118	0.236	0.177	0.233	0.110
2004-2005	0.246	0.102	0.196	0.118	0.283	0.118	0.300	0.177	0.161	0.109
2005-2006	0.098	0.103	0.203	0.118	0.251	0.118	0.300	0.177	0.191	0.110
2006-2007	0.144	0.102	0.234	0.118	0.290	0.118	0.205	0.167	0.154	0.110
2007-2008	0.093	0.102	0.240	0.118	0.272	0.118	0.198	0.167	0.241	0.109
2008-2009	0.132	0.096	0.170	0.118	0.286	0.118	0.293	0.167	0.226	0.110

Table A7: SEC

Academic Year	Baseball		Men's Basketball		Women's Basketball		Football		Softball	
	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal	Sdwin	Sdideal
1991-1992	0.126	0.103	0.249	0.125	0.247	0.151				
1992-1993	0.130	0.096	0.249	0.125	0.273	0.151	0.259	0.177		
1993-1994	0.191	0.096	0.205	0.125	0.281	0.151	0.305	0.177		
1994-1995	0.142	0.095	0.217	0.125	0.291	0.151	0.303	0.177		
1995-1996	0.185	0.093	0.192	0.125	0.234	0.151	0.288	0.177		
1996-1997	0.169	0.092	0.231	0.125	0.289	0.144	0.292	0.177	0.257	0.096
1997-1998	0.169	0.093	0.218	0.125	0.242	0.134	0.277	0.177	0.210	0.095
1998-1999	0.154	0.092	0.210	0.125	0.222	0.134	0.329	0.177	0.211	0.093
1999-2000	0.181	0.093	0.208	0.125	0.276	0.134	0.292	0.177	0.220	0.095
2000-2001	0.133	0.091	0.192	0.125	0.251	0.134	0.250	0.177	0.222	0.093
2001-2002	0.164	0.092	0.153	0.125	0.242	0.134	0.256	0.177	0.207	0.093
2002-2003	0.112	0.092	0.237	0.125	0.298	0.134	0.284	0.177	0.212	0.092
2003-2004	0.128	0.091	0.187	0.125	0.246	0.134	0.306	0.177	0.212	0.092
2004-2005	0.122	0.092	0.240	0.125	0.276	0.134	0.287	0.177	0.261	0.092
2005-2006	0.126	0.092	0.206	0.125	0.251	0.134	0.282	0.177	0.251	0.092
2006-2007	0.100	0.093	0.148	0.125	0.289	0.134	0.277	0.177	0.249	0.095
2007-2008	0.107	0.092	0.213	0.125	0.292	0.134	0.226	0.177	0.257	0.095
2008-2009	0.128	0.092	0.190	0.125	0.238	0.134	0.261	0.177	0.239	0.097

Marginal Tax Rates in the US: 1918-2008
and Implications for Retirement Planning

Robert J. Angell
Charles W. Cole
Department of Economics & Finance
North Carolina A&T State University

Nominal federal income tax rates have been anything but constant since federal taxation of income began in 1918. It is obvious that if nominal tax rates had been constant over the period, effective tax rates would have increased for taxpayers as inflation would have pushed taxpayers into higher brackets as their incomes rose. However, tax rates have been changed through numerous iterations of tax law changes throughout the past 90 years.

This paper first presents a review of the effective marginal tax rates adjusted for inflation for various incomes from $10,000 to $5,000,000. Table 1 presents marginal tax rates for each class from 1918 to 2008.

Table 1
Marginal Tax Rates

Real TI	2008	2003	1998	1993	1988	1983	1978	1973	1968
$5,000,000	35.0%	35.0%	39.6%	39.6%	28.0%	50.0%	70.0%	70.0%	70.0%
$3,000,000	35.0%	35.0%	39.6%	39.6%	28.0%	50.0%	70.0%	70.0%	70.0%
$1,000,000	35.0%	35.0%	39.6%	39.6%	28.0%	50.0%	70.0%	70.0%	68.0%
$800,000	35.0%	35.0%	39.6%	39.6%	28.0%	50.0%	70.0%	68.0%	64.0%
$600,000	35.0%	35.0%	39.6%	39.6%	28.0%	50.0%	68.0%	64.0%	60.0%
$400,000	35.0%	35.0%	39.6%	39.6%	28.0%	50.0%	62.0%	58.0%	55.0%
$200,000	33.0%	28.0%	31.0%	31.0%	33.0%	48.0%	53.0%	48.0%	42.0%
$100,000	25.0%	25.0%	28.0%	28.0%	28.0%	40.0%	36.0%	32.0%	28.0%
$90,000	25.0%	25.0%	28.0%	28.0%	28.0%	35.0%	36.0%	28.0%	25.0%
$80,000	25.0%	25.0%	28.0%	28.0%	28.0%	35.0%	32.0%	28.0%	25.0%
$70,000	25.0%	25.0%	28.0%	28.0%	28.0%	30.0%	28.0%	25.0%	22.0%
$60,000	15.0%	15.0%	28.0%	28.0%	28.0%	26.0%	25.0%	25.0%	22.0%
$50,000	15.0%	15.0%	15.0%	15.0%	15.0%	23.0%	22.0%	22.0%	22.0%
$40,000	15.0%	15.0%	15.0%	15.0%	15.0%	19.0%	22.0%	22.0%	19.0%
$30,000	15.0%	15.0%	15.0%	15.0%	15.0%	17.0%	19.0%	19.0%	19.0%
$20,000	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	16.0%	19.0%	17.0%
$10,000	10.0%	10.0%	15.0%	15.0%	15.0%	11.0%	0.0%	16.0%	15.0%

	1963	1958	1953	1948	1943	1938	1933	1928	1923	1918
5000000	91%	91%	92%	91%	88%	70%	59%	25%	50%	75%

3000000	91%	91%	91%	91%	88%	64%	57%	25%	50%	72%
1000000	81%	78%	80%	89%	81%	35%	36%	23%	37%	46%
800000	75%	75%	75%	84%	32%	35%	30%	21%	29%	39%
600000	69%	69%	68%	78%	69%	28%	24%	17%	21%	32%
400000	62%	62%	66%	72%	64%	23%	18%	12%	13%	25%
200000	47%	47%	48%	59%	49%	12%	11%	7%	4%	18%
100000	30%	30%	34%	38%	34%	9%	9%	3%	9%	14%
90000	30%	30%	29%	38%	30%	8%	8%	3%	9%	14%
80000	26%	26%	29%	34%	30%	8%	8%	3%	9%	13%
70000	26%	26%	29%	30%	26%	8%	8%	3%	8%	12%
60000	26%	26%	25%	30%	26%	4%	4%	3%	8%	12%
50000	22%	22%	25%	26%	26%	4%	4%	2%	4%	6%
40000	22%	22%	25%	26%	22%	4%	4%	2%	4%	6%
30000	22%	22%	22%	22%	22%	4%	4%	2%	4%	6%
20000	20%	20%	22%	22%	19%	4%	4%	2%	4%	6%
10000	20%	20%	22%	20%	19%	4%	4%	2%	4%	6%

Figure 1 is a graphical display of the data for three of the categories, The rates are for taxpayers (filing jointly) earning the inflation-adjusted equivalent of $1,000,000, $90,000 and $30,000 in taxable income in 2008.

Figure 1
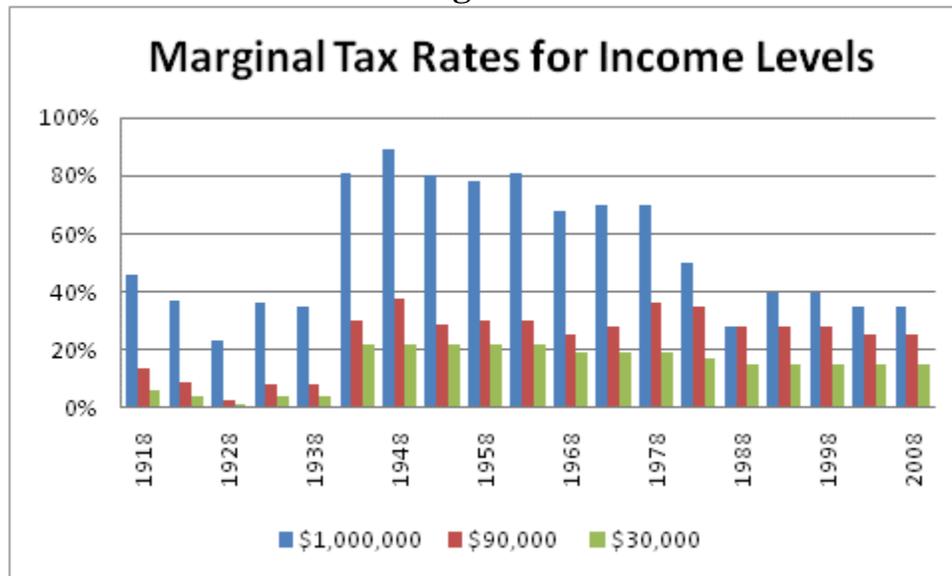
The figure shows that tax rates were much higher after WW2, especially for high income earners. The increase in tax rates came with WW2 and remained high as the size of government increased. As can be seen in Figure 2, with the federal debt as a percent of GDP cresting at just over 120% in 1947, marginal tax rates rose to post-war highs. Beginning in the 1980s, tax rates declined as federal debt levels subsided, especially for those in higher tax brackets. The rates

have remained at their present levels for some time, even in the face of rising debt to GDP levels. What is important in the conversion decision is not the past rates but future rates. History suggests that after a large increase in government expenditures, tax rates may very well rise.

Figure 2

Federal Debt As Percent GDP
1940-2007
Unadjusted Dollars; 2004-2007 estimates
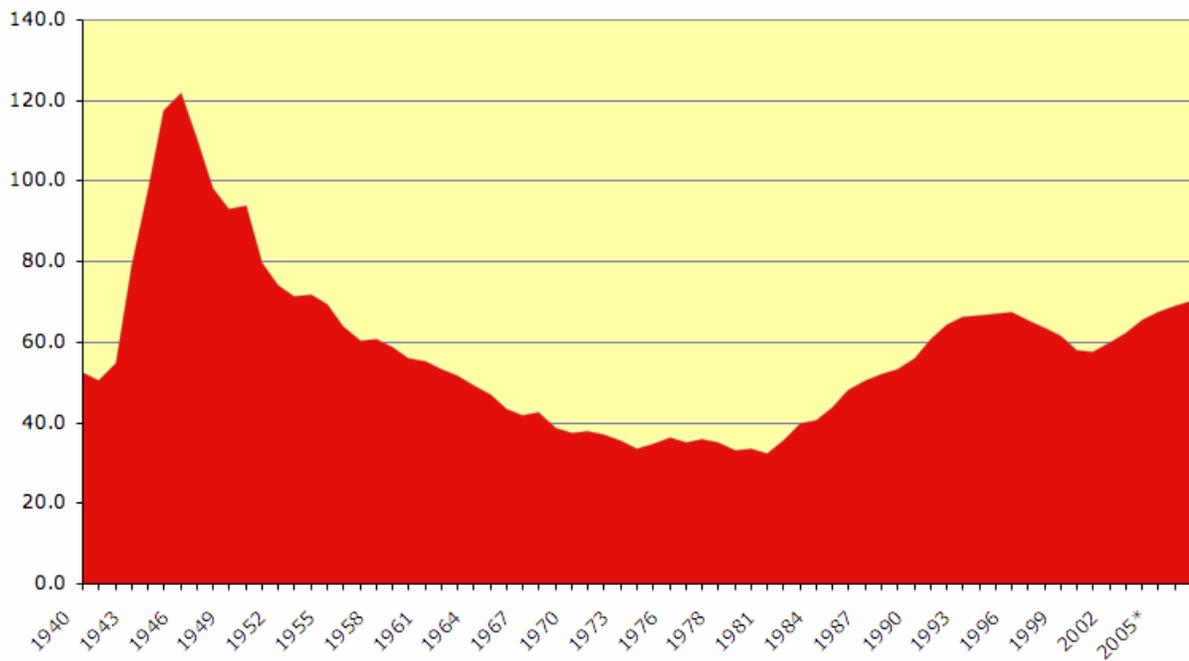
With the current stimulus program and potential increase in government expenditures due to possible changes in health care, particularly Medicare and Medicaid spending, we might expect to see an increase in tax rates. And as time passes, increased taxes seem imminent.

The paper also analyzes the effect of changes in tax rates and tax legislation for investors making decisions related to Roth-IRA and traditional deductible and nondeductible IRA investing as can be done under the special conversion provisions permitted in tax year 2010 under the federal Tax Increase Prevention & Reconciliation Act. The desirability of investing in one over another is primarily a function of investor expectations of and uncertainty surrounding future tax rates. For a fully tax-sheltered investment, one in which the original investment as well as the subsequent income escapes taxation until withdrawn (the traditional deductible IRA), the after-tax rate of return the investor earns on the investment is

$$(1+BTR)[(1-TR_n)/(1-TR_0)]^{1/n} - 1$$

where BTR is the before tax rate of return earned in the account, TRn is the tax rate at the time the funds are withdrawn from the investment, TR_0 is the tax rate at the time of investment and n is the number of years of investment [1]. Setting TR_n equal to TR_0 results in the after-tax rate of return for the investor equal to the before-tax rate earned from the investment. In a Roth-IRA, the investor's returns are earned free of federal taxes after contributions have been taxed. Therefore, whether or not the Roth-IRA earns a higher rate than the fully tax-sheltered investment or the nondeductible traditional IRA depends upon whether the investor's tax rate increases or decreases from the time the investment is made to the time at which it is withdrawn.

Financial planners and advisors have suggested that income needed for retirement in order to maintain one's standard of living represents only a portion of pre-retirement income. If one has his/her mortgage paid, pays no social security taxes on retirement income, etc. one needs less income during retirement. Suggested percentages of retirement income to pre-retirement income vary from as low as 64% to 90%. Often individuals think that having less income will automatically result in lower tax rates during retirement. As can be seen from historical data, being subject to a lower tax rate may not be the case. We find periods of time when tax rates increase and also those in which tax rates decrease. In recent years tax rates have declined for most taxpayers. But there have also been periods in which the effective tax rates have increased, after adjusting for inflation. As we have shown, this is particularly true during war-time and afterwards when federal deficits as a percentage of GDP were significantly higher than average. Furthermore, the increases and decreases have not necessarily been parallel across income levels.

We now examine the circumstances under which IRA holders & their beneficiaries would voluntarily pay taxes associated with a Roth IRA conversion in 2010 in order to receive tax-free withdrawals in the long-term as well as the value of such conversion compared to alternatives.

For example, consider an investor with $30,000 current taxable income. Assume the investor expects taxable income to increase over time due to inflation and real increases by a total of 4 percent per year. At the end of the 20-year period, taxable income would be $65,733. If the person retires at that point with taxable income of only 64 percent of the $65,733, the individual would have taxable income of $42,069. Such an investor with a balance of $1,000 in a traditional IRA might consider converting into a Roth-IRA. This would require a tax payment of $150, due to the marginal tax rate on $30,000 of taxable income of 15 percent. Twenty years later, assuming no changes in the tax brackets, the investor would still be paying a marginal tax rate of 15 percent. Even with retirement taxable income of 90 percent of the $65,733, the investor would be subject to the same 15 percent marginal tax rate if tax brackets and rate remain constant. In such cases, the effect of converting is that for paying tax of $150, the investor would get the profit from investing that $150 for the 20-year period. The rate earned on the tax payment would be the before-tax rate earned in the Roth-IRA. In addition, the investor would remove the risk associated with an increase in the effective marginal tax rate. If the investor believes that effective tax rates are going to rise, converting to the Roth-IRA would be a rational decision.

Now consider the case for the investor with $90,000 of current taxable income. At a retirement income of 64 percent of the ending income, the marginal tax rate is 25 percent for both current

and retirement income, assuming no changes in tax brackets or tax rates. However, at 90 percent the investor is pushed into the higher 28 percent bracket, making an even stronger case for converting to the Roth-IRA. Furthermore, would not a taxpayer with a $90,000 taxable income be more likely to generate a higher rate of increase in taxable income than the taxpayer with a $30,000 taxable income? The higher the expected rate of increase in taxable income, the more likely the tax rate at withdrawal would be higher and the investor more willing to convert to the Roth-IRA.

However, other factors affect the decision as well. In each of the above examples, the period before withdrawal was assumed to be 20 years. Shorter investment periods prior to withdrawal would lead to less growth in taxable income and a greater probability of a reduction in tax rates. In addition, we assumed only a $1,000 balance in the traditional IRA. Converting large balances from the traditional IRA to a Roth-IRA is also likely to move the investor into a tax bracket with a higher tax rate and higher taxes to be paid at the time of conversion, thus reducing the likelihood of conversion. In addition, such a case might lead to a partial rather than a full conversion in order to avoid being taxed at higher rates upon conversion. The decision is ultimately going to be dependent upon the investor's expectation of future changes in marginal tax rates, which is a function of a number of variables. To reach the better decision, each case must be evaluated individually.

This paper presents the history of federal tax rates, a history of changing rates. If we follow the pattern of post WW2, we may be forced into higher tax rates due to the massive spending program associated with the economic recovery efforts. Thus, we may very well see higher tax rates at retirement for many investors. This is probably even more likely for those investors with a significant period of time prior to retirement. How one views the chances for higher taxes is of particular interest to those considering shifting funds from traditional IRAs to Roth-IRAs.

References

1. Angell, R. J. and Lindbeck, R. S. "Tax-sheltered Retirement Plans: A Sensitivity Analysis of the Rate of Return." University of Michigan Business Review, Vol. 29, No. 4 (July, 1977).

2. Burman, L. E., Gale, W. G., Weiner, D. "Six Laws Later: How Individual's Marginal Federal Income Tax Rates Changed Between 1980 and 1995." National Tax Journal. (May, 1998).

3. Burman, L. E., Gale, W. G., Weiner, D. "The Taxation of Retirement Saving: Choosing Between Front-Loaded and Back-Loaded Options." May, 2001.

4. Crain, T. L. and Austin, J. R. "An Analysis of the Tradeoff Between Tax Deferred Earnings in IRAs and Preferential Capital Gains." Financial Services Review, Vol. 6, No. 4 (1997).

5. Horan, S, M. and Peterson, J. H. "A Reexamination of Tax-Deductible IRAs, Roth IRAs, and 401(k) Investments." Financial Services Review, Vol. 10 (2001).

6. Horan, S, M., Peterson, J. H. and McLeod, R. "An Analysis of Nondeductible IRA Contributions and Roth IRA Conversions." Financial Services Review. Vol. 6, No. 4 (1997)

7. Http://uspolitics.about.com/od/thefederalbudget/ig/Political-Economic-Measures/index_t.htm

8. Table Containing History of CPI-U U.S. All Items Indexes and Annual Percent Changes From 1913 to Present. Bureau of Labor Statistics. http://www.bls.gov/cpi/tables.htm

9. U.S. Federal Individual Income Tax Rates History, 1913-2009. http://www.taxfoundation.org/taxdata/show/151.html

IS A BAILOUT NEEDED FOR THE U.S. RETIREMENT SYSTEM?

Robert L. Howard

Department of Economics and Finance

North Carolina A&T State University

Greensboro, NC, 27411

roberth@ncat.edu

336-334-7744 ext. 7018

ABSTRACT

Within the last year there has been a bailout of commercial banks, investment banks, AIG Insurance Company, the two giant secondary mortgage companies (Fannie Mae and Freddie Mac), and the US automobile industry. These bailouts have cost taxpayers billions of dollars. Bailouts are now being requested by state and local government entities that had invested operating funds in conservative, interest-bearing securities until needed. Those safe, highly rated securities were issued by Lehman Brothers, and became worthless when the firm failed. The purpose of this paper is to evaluate another area where another bailout may be requested in the not too distant future, the U.S. retirement system. The paper will explore the causes of the crisis that is developing in our retirement system, the consequences on the economy, and what can be done now by individuals, employers, and the federal government to avert the problem.

INTRODUCTION

We have a free market system that has provided for greater prosperity for its residents than any other country in the world. Companies have the freedom to develop products and services which can result in substantial returns for the owners when operations are run profitably. Individuals have the opportunity to reap substantial benefits from the system as owners, employees, and consumers. The system also allows for negative outcomes; losses can result in bankruptcy, loss of jobs, and the evaporation of investment assets.

In the capitalist system it is expected that there will be profits and losses, expansions and recessions, bull markets and bear markets -- without significant governmental interference; when businesses, institutions, and individuals are negatively impacted, it is just a part of the normal vicissitudes of the economy. However when the results are such that policy makers feel that the viability of the economy is threatened, there is deemed to be a need for some type of governmental intervention. The crisis in housing and in our financial institutions and the recession has created a need for several bailouts.

NEED FOR BAILOUTS

The decline in the stock market in early 2008 indicated that there was a serious potential problem with the economy. It was the collapse of Lehman Brothers and the financial chaos that followed that alerted the policy makers that governmental action was necessary [7]. Lehman Brothers was one of the oldest and most respected investment banking firm in the country, and its collapse had a major impact on world financial markets. There was a need to restore confidence in the financial system since several other large institutions had failed or were close to failure.

Bailout of Commercial Banks

Commercial banks have long ago moved away from their traditional lending business - making short term loans to businesses to carry their inventories and accounts receivable. To increase their profits, banks in recent years have made substantial investments in the mortgage market by purchasing mortgage backed securities. These securities were assumed to be safe investments since 1) the securities were backed by mortgages and homeowners were expected to make every effort to pay their mortgages; 2) rising home prices were expected to keep the value of the property above the balance due on the mortgage; and 3) the securities were rated AAA by the rating agencies [8]. However, many of the mortgages went into foreclosure and the resulting decline in the value of the securities related to those mortgages drove some banks toward insolvency. Potential bank failures were also related to insider loans, credit card defaults, and problems in the commercial mortgage market [3]. To reduce future loan defaults, banks became very stringent in making new loans.

To prevent the failure of a large part of the commercial banking industry, a government bailout was prepared. Congress approved $700 billion which was designed to help banks get rid of their "toxic assets" and to encourage them to increase their lending to businesses. The rescue plan included the purchase of some of the banks' "toxic assets," guarantees against losses on some other assets, and the purchase of bank stock [18] [17]. The banking system seems to be recovering; some banks have already repaid the funds they obtained from the government.

Bailout of Investment Banks

Investment in mortgage related securities also led to the demise of the largest investment banking firms. Lehman Brothers was allowed to fail, but with government assistance Bear Stearns was merged into J.P. Morgan Chase and Merrill Lynch was acquired by Bank of America. The other two large firms, Goldman Sachs and Morgan Stanley, were reorganized into bank holding companies.

Auto industry

The industry-wide drop in auto sales in 2008 forced the three U.S. automakers to request government assistance. The drop in sales was exacerbated by the guaranteed health care and pensions that the automakers' retirees were receiving. Most of the foreign automobile competitors did not have these legacy costs, and thus had a competitive advantage in the market place. Ford decided that it did not need government funds, but General Motors and Chrysler received bailout funds [18]. In spite of this assistance, these firms filed for bankruptcy.

Housing

It is widely recognized that the heart of problem in our current financial downturn is the large number of foreclosures. There are several factors that have lead to this problem [4]:

1. homeowners who stretched their finances to the limit to move from one neighborhood to acquire a more expensive house in a "better" neighborhood
2. people who lied about their income to get loans they could not afford (mortgage fraud)
3. lenders who made loans knowing that borrowers were misstating their income
4. people who did not read (or did not understand) the contracts on their initial low rate loans, and were unable to make the higher monthly payments when the contracted interest rate increased
5. Borrowers who used the interest only loan with the intention of refinancing at a later time when their incomes had increased
6. low or no downpayment loans, a situation that increased some borrowers willingness to walk away from their loans
7. people who used their home equity as an ATM to remodel, take vacations, buy cars, and make normal monthly payments, including the mortgage payment
8. people who refinanced several times as property values rose; funds used to pay down credit card balances; but higher mortgage balances meant higher monthly payments, and when property values declined, this source of funds was no longer available
9. government attempts to increase homeownership among low income households; the great majority of loans made to these borrowers are current, but their foreclosure rate is higher than that of the standard market
10. The location of houses in the vicinity of foreclosed properties causes those houses to decline in value and decreases the desirability of the neighborhood, making it difficult to refinance or sell the houses
11. The decline in property values that in many cases reduced the market value of the house below the balance owed on the mortgage; if a need to sell the house arose, these homeowners were not able to sell because of this underwater situation
12. Investors who used maximum leverage to make real estate investments based on the belief that housing prices would always rise
13. Homeowners' financial mismanagement
14. Loss of a job as the current recession has deepened

To help homeowners threatened with foreclosure, $75 billion was made available to provide refinancing for borrowers as long as their mortgage was no more than 105% of the home's value [14]. To encourage new home buyers to enter the market, an $8,000 tax credit has been provided.

AIG and other Insurance Companies

By far the largest amount of bailout funds made to an individual company was the $85 billion loan made to AIG, one of the world's largest insurance company[5]. Several other insurance companies have also received bailout funds [10] [21].

These bailouts have cost the taxpayers billions of dollars, but they were undertaken because of a perceived need to protect the economy. Recent developments in the economy suggest that another bailout might be needed: there is a need to protect the retirement income of a large number of elderly retirees.

RETIREMENT SYSTEM PROBLEMS

We are moving to a society of two types of retirees: those who have adequate retirement income and those who do not. There are a number of reasons why we are facing a retirement situation that might be in need of a bailout.

Employer Sponsored Defined Benefit Plans

Retirees have traditionally depended on a pension from their employers. One works for 30 or 35 years, retires, and then receives a pension for the remainder of his life. There is no requirement, however, that a firm provide a retirement plan for its employees. According to data from the Bureau of Labor Statistics, only 64% of employees at organizations with 100 or more employees were covered by a retirement plan, and for employers with less than 100 employees the figure was 34% [20]. Thus, there is a vast number of workers who are not covered by an employer-sponsored retirement plan.

For those firms that offered retirement plans, the traditional plan has been the defined benefit plan. Planned retirement benefits are available based on contributions made to a fund by the employer (and sometimes by the employee) and earning on the fund. There were approximately 130,000 of these pension plans in 1985, but there are only about one quarter of that amount today [1]. Some firms that still offer these plans do not permit new employees to join them. The problem is the many companies have found that it is too expensive to maintain their defined benefit plans; they are not able to pay the promised benefits. As revenues have declined in this recession, firms have attempted to reduce costs in any way possible, and reducing or eliminating their retirement plan contributions is one approach taken. Furthermore, returns on retirement investments have been lower than anticipated, and benefits have been underestimated; all of the risk in supporting these plans is with the employer. Thus, for many firms defined benefit plans are no longer viable. Most companies that have dropped their defined benefit plans have adopted a defined contribution plan, the most popular of which is the 401(k) plan.

401(k) Plans

The 401(k) plan gives the employee the option to contribute toward his retirement, and if the employee contributes, the sponsoring firm has the option to match a portion of that contribution. These

contributions are invested in a fund, and retirement benefits are based on these contributions and the return earned on the fund. Thus the employee is fully responsible for funding his retirement plan and is subject to investment risk in the plan. Unfortunately, many employees do not make any contributions to their plans, and thus they have no retirement assets. For those that do contribute, many contribute only moderate amounts. A survey by Northwestern Mutual found that only 6% of employees with 401(k) plans contributed enough to qualify for their company's entire matching contribution [15]. To meet current obligations some employees have borrowed or withdrawn funds from their 401(k) accounts, and in recent years many companies have reduced or eliminated their matching contribution [2] [9].

Thus, there are millions of employees who will reach retirement age with little or no retirement benefits from their employers.

Personal Savings

Personal savings could take up the slack from employer sponsored plans, but many individuals have relatively small amounts in savings accounts. Studies by the Center for Retirement Research at Boston College indicated that only 39% of workers were adequately saving for retirement [9]. A MetLife survey indicated that 44% of employees live paycheck to paycheck, and Edward Wolff, an economist specializing in the study of poverty and income distribution, found that 48% of American households have less than $5,000 in liquid assets [13].

Layoffs

The recession has resulted in a record number of layoffs as companies attempt to reduce costs. There were approximately 2.6 million job losses in 2008, the most since 1945, and job losses are continuing in 2009 [6]. Many laid off workers have some savings, but it gets spent if a new job not found soon. To pay monthly bills it may be necessary to use credit cards, use home equity lines of credit, and use funds from IRAs and 401(k) accounts. Thus many individuals who have been laid off find themselves with substantial debt and little or no savings.

Personal Bankruptcy

The downturn in the economy has pushed thousands of families into bankruptcy. In 2007 there were 819,115 personal bankruptcy filings; the number increased to 1,086,130 in 2008, and the American Bankruptcy Institute estimates the number could hit 1.4 million in 2009 [11] [12]. In order of stave off bankruptcy, many persons will exhaust their savings, investment, and retirement accounts. Thus, persons going through a bankruptcy will emerge with little or no retirement assets.

Foreclosure

There has been a similar rise in foreclosures. The Center for Responsible Lending estimated that there were 2.2 million subprime foreclosures in 2008; it is projecting 2.4 million foreclosures of all loans in 2009, and 9 million during 2009 - 2012 [16]. Many homeowners heading toward foreclosure will also exhaust their savings, investment and retirement accounts in an attempt to save their homes. After foreclosure they will have little or no retirement assets. Of course, there are some homeowners with adequate financial resources who could continue making their monthly payments, but chose not to do so and walked away from their homes. And there have been many foreclosures on properties owned by investors, many of whom had substantial wealth but chose to let the properties go into foreclosure [19].

IMPACT ON THE ECONONY

Because of the drop in company sponsored retirement plans, low savings rates, lay offs, personal bankruptcies, and foreclosures, millions of Americans will enter retirement with little more than social security income. The impact on the economy of a large group of individuals with reduced spending capability will be tremendous. There would be a drop in consumer spending, which would reduce national income. Seniors would ask for a real bailout from the government, which, if granted, would cost the treasury billions of dollars. Those seniors who owned their homes could take advantage of a reverse mortgage, but persons with little savings would probably not own their homes.

Those seniors who are physically capable could continue working; others would become dependent on family members. There would be a temptation by some individuals to take extreme investment risks for a quick payoff and others might play the lottery, thus losing what little money they had. Those in society who prey on the elderly would find easy victims and crime by the elderly would probably increase.

None of these potential impacts is desirable and efforts must be undertaken to prevent the problem from occurring.

WHAT MUST BE DONE

The majority of Americans are well prepared for retirement: they have generous pension plans, they maximize their contributions to their 401(k), 403(B), and 457 plans, and they have investments in IRAs, stock, bonds, real estate, and other assets. It is those others who are facing a financial nightmare as they approach retirement. There is a real prospect that not in the too distant future there will be millions of elderly Americans who will not be able to take care of themselves financially. This crisis can be prevented, however, if action is taken now. A bailout is needed, but it is not the type that will cost the taxpayers billions of dollars. Appropriate actions should be taken by individuals, employers, and the federal government.

Individuals

Individuals have a duty to take care of themselves; it is important that they develop the discipline to save regularly and in reasonable amounts. Persons with 401(k) plans should save an amount at least equal to their employer's match; going beyond that amount is certainly desirable. Persons without employer sponsored plans could take advantage of IRAs. A payroll deduction plan, where fixed amounts are systematically set aside each pay period, will work well for most workers.

Some individuals who have invested for their retirement have still arrived at retirement with meager assets because of risks taken. Some investors are willing to take great risks for the higher potential returns, while others are more conservative and settle for lower returns and less risk. It is the younger employees who should invest in riskier portfolios; but as one approaches retirement it is important to reduce the risk. Financial planners have developed a number of strategies in an attempt to accomplish this goal.

Adequate diversification must be at the heart of any retirement plan. Persons who placed the bulk of their retirement funds in the local bank (the bedrock of the community, but many of these later failed), the

seventh largest company in the country (Enron), or the largest company in its industry and a dominant force in the American economy (General Motors) found that their assets, some of which had been amassed over a lifetime, evaporated when these firms failed.

Other investors have seen their retirement assets evaporate because of scams and fraud. In the recent Bernie Madoff scheme hundreds of investors, some with over a million dollars in assets, lost everything. It is important that investors understand what their funds are invested in.

Employers

In spite of any discussion about payroll deduction plans, the risk-return tradeoff, and diversification, there are thousands of individuals who will not save voluntarily. For these workers, there is a need for a mandatory employer sponsored retirement plan. A specified percentage of each employee's income would be deducted and set aside for retirement.   The employer would have the option of matching the employee's contribution, and the employee should have the option of setting aside an amount greater than the specified percentage. This approach is certainly not a novel one. For example, employees of the state of North Carolina have a mandatory 6% of their gross income deducted for retirement purposes. The state makes an additional contribution, and these amounts are invested in the state plan or with TIAA-CREF (the employee decides which to use). At retirement the employee can choose from a number of monthly income options.

To insure that the funds are available for retirement, 1) withdrawals and borrowing from the fund should not be permitted, 2) lump-sum distributions should not be permitted if the employee leaves the employer; the funds should remain invested until retirement; and 3) lump sum distributions should not be permitted at retirement; several monthly income options should be made available.

The downturn in the economy has caused companies to place a tremendous emphasis on managing costs. It would not be wise to introduce a program of required mandates that would substantially increase firms' operating costs. This plan to require employee contributions would impose minimal costs to the employer. The plan would be a defined contribution plan, not a defined benefit one; thus there would be no required employer contributions. There would be administrative costs, but these costs could be borne by the investment funds of the employees.

Government

Governmental intervention will be necessary to fully implement a plan of mandatory retirement savings. Many employees will not save voluntarily and it is likely that many employers will not act to require that their employees save on a regular basis. A bailout is envisioned in the form of legislation that would require the establishment of mandatory employer sponsored retirement plans. The legislation would require consistent employee contributions, no borrowing or withdrawals from the plan, no lump sum distributions, and monthly payments at retirement. There would be a need to establish guidelines and qualifications for companies that manage the accounts. The administrative costs of managing the accounts would be borne by the participants, not by the government. This bailout plan, then, would not be a tax-payer funded give away; it would not require the spending of billions of dollars in an attempt to fix a broken down system; nor would there be a need for any new bureaucracy.

Governmental action to force individuals to act in their own best interests may be paternalistic, but it is certainly not new. There are seat belt laws, helmet requirements for motorcycle riders, anti-drug laws, and age limitations for the purchase of cigarettes and alcoholic beverages. A partnership between the government and our retirement system is needed to secure the financial future of millions of Americans. A real problem in retirement income is developing, but it can be prevented if we begin to act now.

REFERENCES

[1] Barron, R. M. "Retirement Planning Shifts to Employees." *News and Record*, January 17, 2009, A1, 4.

[2] Dale, A. "More People Tap Retirement Accounts." *The Wall Street Journal*, May 9, 2009, D5.

[3] Hopkins, S.M. "Banks Lend Heavily to Insiders Amid Financial Crisis." *News and Record*, March 22, 2009, A9.

[4] Howard, R.L. "Is Retirement Income Our Next Financial Crisis." *Journal of the Academy of Finance,* Forthcoming.

[5] Karnitschnig, M. et al. "U.S. to Take Over AIG in $85 Billion Bailout; Central Banks Inject Cash as Credit Dries Up." *The Wall Street Journal*, September 16, 2008, (WWW document) URL http://online.wsj.com/article/SB122156561931242905.html

[6] Kells, T. "Layoffs List: Lob Losses in 2008 and 2009." *NowPublic News Coverage,* January 9, 2009 (WWW document). URL http://www.nowpublic.com/tech-biz/layoffs-list-job-losses-2008-and-2009-ongoing

[7] Krugman,P. "Bailouts for Bunglers." *The New York Times*, February 2, 2009, A19.

[8] Morgenson, G. "House Panel Scrutinizes Rating Firms." *The New York Times*, October 23, 2008, B1, 5.

[9] Nittoli, J. M. "Now Is No Time to Skimp on Retirement Plans." *The Wall Street Journal*, A13.

[10] Patterson, S and Scism, L. "The Next Big Bailout: Insurers." *The Wall Street Journal*, March 12, 2009, A1 – 2.

[11] "Personal Bankruptcies soar 33%." *CreditCards.com*. February 2, 2009**.** (WWW document). URL **http://articles.moneycentral.msn.com/Banking/BankruptcyGuide/personal-bankruptcies-soar-33-percent.aspx**

[12] "Rising Number of Americans File for Personal Bankruptcy." *Balita-Dot-ph*, August 12, 2009. (WWW document). URL http://balita.ph/2009/08/12/rising-number-of-americans-file-for-personal-bankruptcy/

[13] Scelfo, J. "After the House is Gone." *The New York Times*, October 23, 2008, D1, 6.

[14] Simon, R. and Hagerty, J. R. "House-Price Drops Leave More Underwater." *The Wall Street Journal,* May 6, 2009, A3.

[15] Singletary, M. "Resolved: to Build a Financial Foundation by Learning to Invest Wisely." *The Washington Post,* January 3, 2002.

[16] "Soaring Spillover: Accelerating Foreclosures to Cost Neighbors $502 Billion in 2009 Alone; 69.5 Million homes lose $7,200 on Average." *Center for Responsible Lending.* (WWW document) URL http://www.responsiblelending.org/mortgage-lending/research-analysis/soaring-spillover-3-09.pdf

[17] Staff Reports, National Briefs. "Treasury Gives Out Another $15 Billion to Seven Banks*." News and Record*, January 6, 2009, A4.

[18] Thomas, C. "Thanks, Big 3, for the Ride; It's Time to Say 'bye*." News and Record*, February 20, 2009, A7.

[19] Ulam, A. "Investors Defaulting to Make Money." *New York Real Estate News*, July 31, 2009. (WWW document). URL http://therealdeal.com/newyork/articles/investors-defaulting-to-make-money

[20] U.S. Department of Labor, Bureau of Labor Statistics. "Employee Benefits in Private Industry." *News*, USDL 01-473 in Employee Benefits Institute ." May 7, 2002. "The 2002 Small Employer Retirement Survey (SERS) Summary of Findings." (WWW document). URL **http://www.ebri.org/sers/index.htm**

[21] Zonnas, J. M. "Insurers to Receive Billions in U.S. Aid." *News and Record*, May 16, 2009, B8.

I Can't Retire Now: A Fallacy of Composition

George S. Lowry, PhD, Department of Economics/Business, Randolph-Macon College, glowry@rmc.edu

Edward J. Schmidt, Department of Economics/Business, Randolph-Macon College, eschmidt@rmc.edu

Wesley M. Jones, Jr., PhD, School of Business Administration, The Citadel, jonesw1@citadel.edu

ABSTRACT

Recent economic events have caused some to re-evaluate their planned retirement dates, assuming the decline in current portfolio values has eroded their wealth. This paper explores some definitions and perceptions of wealth, but also offers a counter argument suggesting that plans to retire may not be thwarted. Presenting a less biased approach to evaluating potential wealth offers solace to those concerned with the current recession and confidence for the future.

INTRODUCTION

Wealth can be defined in several ways. Generally, wealth is measured by the accumulation of economic value, most generally considered in the form of assets. For present purposes regarding retirement planning, financial assets (e.g. equities, bonds, and the like) constitute the majority position in the retirement portfolio. And as market values for these assets fluctuate, so does the perception of wealth. Many perceived great wealth when the Dow topped 14,000 in October of 2007 but claimed they could not retire when it fell through 8,000 and (supposedly) bottomed at 6,594.44 on March 5, 2009. These evaluations are flawed for two reasons.

First, no single point-in-time measure of wealth is sufficient unless the stock of assets is liquidated at that moment. Instead, retirement endowments are drawn down over time and are, thus, subject to variations in value across a much longer future investment horizon. That leads to the second condition. Because the endowment is not reduced to zero at retirement, the reinvestment horizon allows time for recovery from the regular and normal market swings—both up and down.

Some suggest the possibility of a "kinked" long-term return line, arguing the credit market problems have irreversibly altered the market return line. Others counter with claims that the physical capital assets have not disappeared in response to the credit market collapse, but instead are simply undervalued by the hysteria and over-reaction of the markets. Such behavioral responses may be nothing more than a manifestation of market forces at work—a correction. A third view argues that a trend is established across a defined time period. If the consequences of the credit market affect any short-term period (as the current decline evinces), the longer-term trend will simply be slightly flatter.

Over the period 1928 to present, the DJIA has earned annual average returns of just over 6% but has varied greatly. Using calendar year periods, the greatest swings occurred in 1931

where the value fell by 52.67% and rose by 66.69% in 1933. Similarly, the S&P 500 has seen ups and downs with declines of 20.47% in October of 1987 and advances of 11.58% in October of 2008.

This paper suggests objective criteria for evaluating retirement wealth centering on comparisons of portfolio performance relative to long-term average returns rather than single day market quotes. Using historical data, long-term annual average market returns (proxied by the DJIA) are compared against the annual returns for various buy-and-hold retirement portfolios. These portfolios are constructed using simple asset allocation models combining equities, corporate bonds, and U.S. government Treasury securities. The intention is to demonstrate (1) how returns tend to regress to the mean and (2) that interest and concern over short-term performance is misplaced when realistic investment horizons are considered. Of specific interest is a measurement of the deviation from the long-term trend (the expected rate of return) rather than a focus on short-term (year-to-year) returns. That is, examining the over-confidence exhorted in 2007 (and the unrealistic presumption of wealth) off-set by the downturn in 2008 and 2009.

DATA

Historical data form the basis for this study and are comprised of the Dow Jones Industrial Average--DJIA (YahooFinance), the Standard and Poor's 500 Index--S&P (Economagic), the consumer price index--CPI (Bureau of Labor Statistics), AAA Corporate Bonds and the 1-year U.S. treasury securities (FRED, St. Louis). Average annual returns are calculated for each asset's reported historical period and applied to the respective portfolios using a weighted average approach.

METHOD

This present study applies a post-test only approach comparing various investment portfolios against the commonly used benchmark, the DJIA. Two disciplined investment approaches are employed in portfolio construction. The first shifts risk from equities to fixed income securities as the investor ages in what is sometimes referred to as the "100 less current age model". In the investor's earlier life, a greater proportion is invested in equities, but in later years, the proportions shift in favor of fixed income securities. The second approach simply allocates 50% to equities and 50% to fixed income throughout the investor's lifetime.

For purposes of this study, the S&P will serve as the proxy for equities, but fixed income will consider corporate bonds and 1-year US treasuries individually and combined. The fixed income portion will represent (1) 100% in corporate bonds, (2) 100% in 1-year US treasuries, and (3) 50% in corporate bonds and 50% in 1-year US treasuries. Therefore, 3 portfolios are constructed for comparison purposes, shown in Table I.

2

TABLE I: Construction of Portfolios

Portfolio	Construction
A	Equities with Corporate Bonds
B	Equities with 1-year US Treasuries
C	Equities with Corporate Bonds and 1-year US Treasuries

Several simplifying assumptions are made to construct a personalized investor profile to demonstrate the investment outcomes. The investor is a college graduate who shows good potential for growth and development. In 1966, the investor is 22 years of age and begins work with a starting salary of $5,000. Across a 43-year working career, income increases at an average of 6% per year and the total annual contribution to a retirement account is 10% of gross wages. (Although not relevant, assume a 5% employee contribution and 5% from the employer.) The investor wishes to retire at age 65, at the start of 2009. All cash flows are assumed to be made in full at the beginning of each year.

RESULTS

The Benchmark

Of interest is a measure of investment success. To make such a comparison requires a yardstick or benchmark of returns. Because the DJIA is so often referenced as "the market", and to a large extent, shapes the daily perceptions of current wealth, it serves as the basis for comparison in this study. As such, then, some value of the DJIA must be assumed. For present purposes, the historical record is employed, but by two means of determination.

Assuming the investor uses a wholly naïve approach, the period 1926 to 1965 would serve as the basis for future projections. The average annual return for the DJIA for that period is 5.89% in nominal terms (4.08% in real or inflation adjusted terms). The investor could project a similar pattern for the future, and for example (and simplicity) assume 6% nominal and 4.1% real returns for the future. Alternatively, assuming the investor had the capacity to foresee the DJIA's performance for the next 43 years—a clear crystal ball, so to speak—the nominal and real returns would be 6.16% and 2.89%, respectively. Or assume the investor incorporates the new information gained from each succeeding year's market performance and includes that into the long-term historical average. That is, add 1966's performance to that of the 1926-1965 period, and so forth. The nominal and real returns are 5.62% and 2.59%, respectively. For each historical period, the average compound (geometric) returns are also calculated to establish the actual growth rate of returns. Table II shows these returns as well as the average annual compound rates of return.

3

TABLE II: Annual Returns for the DJIA (in %)

Period of Review	Average Nominal Annual Return	Average Real Annual Return	Average Nominal Compound Returns	Average Real Compound Returns
1926-1965	5.8870	4.0818	2.8669	1.4073
1926-2008 (Crystal Ball)	6.1613	2.8899	4.1159	0.8467
1926-2008 (Add-a-year)	5.6183	2.5912	3.1719	0.9437

Obviously, the choice of the benchmark is made more difficult. Because most investors think in nominal terms, relying on fund statements and media reports for performance metrics, this paper limits the analysis to nominal returns. Further, because all alternatives are subject to the same forces of inflation, its consideration is not relevant to this study. For purposes of this study, the Annual Nominal Compound Return (add-a-year) is used. This value captures the variations of increases and decreases across the entire investment horizon into a single, levelized determinant. At 3.17%, the investor should expect the accumulated wealth at age 65 to be $74,943.68.

Actual Returns

Table III shows the dollar and percentage rates of return when the two disciplined investment approaches with associated asset allocations are employed. The compound rate of return for each asset is derived from the actual returns occurring in the period 1966 through 2008 and is used to calculate the portfolio returns.

TABLE III: Portfolio Performance, in dollar and compound percentage returns

Portfolio	Construction	Returns 100-less-age	Returns 50—50
A	S&P + AAA Bonds	$146,151.99 5.54%	$142,914.85 5.46%
B	S&P + Treasuries	$115,789.43 4.72%	$85,123.93 3.63%
C	S&P + AAA Bonds + Treasuries	$127,228.91 5.05%	$110,169.60 4.54%

[For those interested, a portfolio wholly comprised of the S&P would return $147,733.23 or 5.57%.]

Remembering the benchmark of expected returns for the DJIA of 3.17% or $74,943.68, the disciplined approaches to investment generate better outcomes. In all cases, the returns are greater than those reasonably expected from the market (i.e. the DJIA).

4

CONCLUSION

This study seeks to objectively address a misconception in current thinking. Many claim they cannot afford to retire because the value of their investment portfolios has declined significantly over the last several years. This evaluation rests on a fallacy of the composition of the original premise; that is, they could afford to retire prior to the decline. Because most retirees gradually draw down their retirement endowments over a period of years, they are subject to the on-going variations in returns accruing to their investment accounts. Even if retirement had occurred when the markets were at their all-time highs, those investors would currently face the same financial wealth position. Coupling the decline in market value and any endowment draw-downs would have made matters worse. In short, the unrealistic perception of wealth led many to overvalue their expected retirement endowments.

Securities markets demonstrate wide variations in returns over their history and subjective evaluation of wealth based on point-in-time measures is misleading. Unless investors liquidate their holdings, their measure of true wealth is reduced to expected values. Using today's market value as a valid measure of wealth—when that wealth is intended to fund financial demands for many years into the future—defies logic. Instead, setting expectations using some rational basis, such as historical growth rates, can help avoid the illusions created by market bubbles or declines.

As already mentioned, the low for the DJIA for this year was 6,594.44, set on March 5, 2009. To date, the high, set on August 7, 2009 was 9,370.07. Anyone capitalizing their positions on March 5 and selling on August 7 would have earned more than a 42% return (less commissions, of course). By extension, those who are invested in market securities must also believe they are wealthier because the market has rebounded by that amount. But that does not tell the whole story. The closing value on January 2, 2009 was 9,034.69, so by August 7, the value increased by only 3.7%. This form of wealth measurement is ephemeral and flawed.

The only solace to this situation is how widely it is shared. While misery may love company, it doesn't generate better financial returns. And even if the market were to enjoy another upswing, the illusion of newly-found wealth would be met disappointment as values eventually fell. The evidence within this current research suggests that the DJIA generates nominal annual returns of about 6% in any given year (and about 4%, on average, in all years). Expecting the market to do better than the nominal return is reasonable, but so is the expectation that it will do worse.

The concluding advice from this study directs investors to re-calibrate their expected returns from their retirement accounts to more reasonably represent the historical average returns and discount current wealth estimates in favor of longer-term measures.

LIMITATIONS

Many simplifying assumptions were made to create the sample case. The timing of funding of retirement accounts, steady-state estimates of income growth and retirement account contribution rates, and the choice of securities are unrealistically portrayed. Using the DJIA as a benchmark for performance is debated and often dismissed in the literature. The effects of inflation are treated as non-relevant to the analysis. Finally, there was no attempt to explore sub-

5

sets of the historical data for confirmation of the reliability of the rates of returns reported and employed.

REFERENCES

Helman, R., Copeland, C., and vanDerhei, J. (April 2009). "The 2009 Retirement Confidence Survey: Economy Drives Confidence to Record Lows; Many Looking to Work Longer." Employee Benefit Research Institute. No. 328.

McManus, T., Anderbert, J., and Lazarus, H. (2007.) "Retirement, an Unaffordable Luxury." Journal of Management Development. 26:5, 484-492.

Mitchell, O.S. and Moore, J.F. (1998). "Can Americans Afford to Retire? New Evidence on Retirement Saving Adequacy." The Journal of Risk and Insurance. 65:3, 371-400.

Web Sources for Data

http://au.biz.yahoo.com/finance/investing/historical/

http://research.stlouisfed.org/fred2/

http://www.bls.gov/cpi/

www.economagic.com

6

Declining Trust and Confidence in Financial Markets as a Societal Challenge: A Theoretical Framework Utilizing the Fishbein Multi-Attribute Model

Stacy R. Barnes
College of the Albemarle
1208 North Road Street
Elizabeth City, NC 27906
Email: srbarnes@albemarle.edu

Submitted to the Southeastern Chapter of INFORMS Conference
Myrtle Beach, South Carolina, October 1-2, 2009

Track: The Recent Financial Crisis

Abstract

On the basis of the more recent breakdown of the U.S. financial system, investor risk attitudes and risk perceptions are in flux, which may have significant consequences for the future outlook of financial markets. Changes in future outlook or investor expectations can be theorized in terms of risk attitudes and changing risk preferences. More specifically, the investor loses his/her stronger reliance upon subsequent motivation to the point that it will be atypical. It is the purpose of this paper to provide a framework for examining the possible effects of declining trust and confidence in financial markets on investor risk perceptions and attitudes, which is considered by many observers to be a societal issue. If trust and confidence have been eroded, the dynamics and ongoing methods of investor information search and processing may distort risk expectations resulting in frustration and conflict concerning their needs and beliefs. Based upon declining trust and confidence in financial markets as a societal challenge, this paper proposes a theoretical framework utilizing the Fishbein multi-attribute model, which attempts to encapsulate overall attitudes into one score based upon a simple computational method.

Theoretical Premise and Selected Literature

Trust and Confidence and Risk/Reward

Investing is based upon the ability of the investor to ascertain risk/reward. However, it is the anticipation of the reward that is crucial to the investor's, confident, expectations and energetic behavior. In addition, as the reward increases, investors feel positive, are more confident, and will often add to their participation. Expectations have a tendency to not only rise but rise faster than they can be fulfilled. And they continue to do so until a breaking point is reached and disappointment becomes inevitable. Thus, it can have both positive and negative aspects, which may not always be easy to determine. It is the potential of profit that motivates investors. Although market indicators influence investors' decisions, these indicators such as price-earnings, revenues, profit margins, etc. only have an effect on a company's stock price if people are motivated to act.

However, market participants will not act if the investing public's attitudes toward trust and confidence have become embedded in society as a whole. Logically, as an efficient market hypothesis would suggest, investors are assumed to have access to complete information. As such, a company's stock price, its future value and changes in its stock price is reflected in investors' risk perceptions and attitudes. Perhaps the single best predictor for the success of financial markets is investor trust and confidence, which is manifested in investor perceptions, attitudes and expectations about the future.

Therefore, the overall positive experiences and outcomes depend on the depth of trust and confidence that reinforce and increase the likelihood that the investor will continue sustained participation in financial markets. Accordingly, to obtain the most profitable rewards, optimum functioning of the financial market system is essential. As a consequence, the behavior of market participants impacts economic outcomes (The Durable Investor, 2009). There is sparse argument among financial economists as to its relevancy. For example, aggressive marketing of financial products, or aggressive marketing of easy credit may have repercussions for the financial health of the economy and may also provoke social consequences. Correspondingly, academic researchers and interested observers contend that *perception* influences risky complex investing decisions.

Changes in risk attitudes are tantamount to changing preferences, which tend to change investor behavior through *learning*. As Assael (2004) contends, in the sense of knowledge, it is what one needs to learn when one needs to learn it. A change in risk perception and attitudes has been utilized to explain short term developments in financial markets, which theorizes that changes in risk perception and attitudes affect actions undertaken in more risky situations. For example, as a function of outcomes, Weber and Milliman (1997) found that when investors' risk perception/attitude, information acquisition, and stock selection change, investor stock selections and perception of the risk of the same stocks were different in a series of decisions in which they lost money than in a series in which they made money. If the discrepancy between investor lost was the result of fraud/corruption the financial markets, then any erosion in trust and confidence

could perhaps be explained through changing investor risk preferences and thus risk perception and attitude especially with respect to future market participation.

With these precepts in mind, one might infer that from an investor's standpoint today's financial markets in fact distort investor risk preferences, which would indicate changing risk perceptions and attitudes. More financial economists now agree that there are many reasons for the erosion of trust and confidence. Foremost is faulty due diligence and neglect of fiduciary responsibilities and business ethics and may be viewed by investors as a societal issue. Providing investors believe this to be true, then there may be a genuine crisis of trust and confidence apparently made worst by large financial institutions, political and government regulatory agencies that were relied upon to protect the sacredness of free markets and the legal framework upon which they function. For that reason, many observers may now see trust and confidence in the financial markets as one with societal magnitude. One observer, Schiller (2009) expresses the idea of trust and confidence by employing "animal spirits" in the moral fiber of that expressed by Keynes interpretation. Schiller explains:

> The term "animal spirits," popularized by John Maynard Keynes in his 1936 book "The General Theory of Employment, Interest and Money," is related to consumer or business confidence, but it means more than that. It refers also to the sense of trust we have in each other, our sense of fairness in economic dealings, and our sense of the extent of corruption and bad faith. When animal spirits are on ebb, consumers do not want to spend and businesses do not want to make capital expenditures or hire people.

The Human Response to Inequality and Fairness

Classical economic theory can reveal something interesting about the human response to inequality and fairness. One of these can be explained through the so-called *"ultimatum game"* developed by Forsythe, Horowitz, Savin and Sefton (1994) in (McCabe, 2003). The ultimatum game makes two predictions about outcomes: (1) the offer by the proposer will always be unfair, and (2) the unfair offer will always be accepted by the responder. Assuming both participants are rational, it is understood by both that a small amount of money is inherently better than no money at all. As such, reason and greed will triumph over ethical notions of fairness. Presume there are two participants who are told that they have the opportunity to split $10. If one participant is informed that as a first proposer, he/she makes a onetime offer that allows him/her to split the $10 as they wish.

Now assume the other participant is informed that he/she (as the responder) acquires the opportunity to either accept or reject this onetime offer (no matter the split). If the offer is rejected, both participants end up with nothing. This "something or nothing" negotiation is the work of experimental economists Werner, Schmittberger and Schwarze (1982) in (McCabe, 2003) who were the first to study this idea. In the end, these economists got a surprise. In economic science, game theory predicts an unequal split favoring the participant who makes the offer. So, if a participant offers a ($9, $1) split where the second participant receives $1, should not the second participant accept it? One would speculate that $1 is better than nothing. However, instead of acceptance, a majority of the offers were distributed equally as a 50-50 split. Of course, this is not an altogether terrible strategy. In some cases, the responder is willing to

reject unequal offers. And although this occurs, it does not occur often. What can explain the equal split offers? Is it fear of rejection?

First of all, experiments have shown that most proposers offer about $4, which is quite fair and totally irrational from a self-interest standpoint. If irrational, then why do proposers engage in such generosity? According to Forsythe, Horowitz, Savin and Sefton (1994) in (McCabe, 2003), it is because they are able to visualize how the responder will suffer if the offer is unfair. And second, the proposer knows that an unfair proposal will produce anger in the responder, which will lead the responder to reject the offer and leave both participants with nothing. As a consequence, proposers restrain their greed, and thereby split the $10 equitably giving the appearance of fairness for everyone. Nonetheless, there's one easy way to change the behavior of participants during the *ultimatum game* according to researchers. When participants are given a test before the money is distributed (the type of test is of no consequence) and then the "high scorers" receive the $10 to distribute, responders are willing to accept unfair offers. In other words, people are willing to tolerate inequality when they think it's deserved. These researchers surmise that this may explain why people are not normally outraged when Wall Street hands out obscene bonuses.

Why? They assume the executives deserved the bonuses. Then again, people now see it differently. Why? The normal sense of fairness breaks down. After witnessing this injustice, a cascading of undesirable events can ensue including disruptive markets. When proposers do something to deserve their monies, nobody complains. Then again, when they are rewarded for no justifiable reason and then refuse to fairly distribute their reward, participants get upset. They begin doubting the integrity of the system, and become more sensitive to perceived inequalities. As a result, their risk perceptions and attitudes as to expectations change perhaps in the end rejecting the very premise of fair markets. The global significance of "fairness" is reflected in a recent comment by Simon Johnson (2009) (Professor MIT Sloan's School of Management & former IMF Official) who reflected on the state of global financial markets:

> The crash of the financial markets has laid bare many unpleasant truths about the United States. One of the most alarming is that the finance industry has effectively captured the U.S. Government—a state of affairs that more typically describes emerging markets, and is at the center of many emerging-market crises. If the IMF's staff could speak freely about the U.S., it would tell us what it tells all countries in this situation: recovery will fail unless we break the financial oligarchy that is blocking essential reform. And if we are to prevent a true depression, we're running out of time.

The Precariousness of Investor Trust and Confidence

Shiller (2009) contends that there appears to be sparse data available for quantitative evidence on investor perception, and so those who think that there are important changes in these perceptions. Over time analysts are obliged to rely mostly on their own casual and informal observations. Most data and research on investor perception, he insists refer to simple expectations for price change or indicators of these expectations. So far, there has been no admission of responsibility in what financial institutions did to help bring about the current financial crisis. Even so, there is an apparent confirmation of poor risk management, unsound models, irresponsible lending, and markedly leveraged investment strategies.

At their worst, many observers feel that these institutions acted with ethical and moral coldness. As many now realize, these institutions knew the way they were conducting business was on the blink. They seemed to have forgotten that trust and confidence in financial institutions is essential in a capitalistic system. Without well functioning markets, markets will simply implode if not in the short term, certainly in the longer term. Even more dangerous is to ignore countermeasures that swiftly punish those for breaking the rules (that requires a functioning legal framework). Unfortunately, the very people in charge either do not see swift punishment as an imperative or worst do not understand the precariousness of investor trust and confidence. Others assert that the unevenness of justice and punishment can have repercussions beyond boundaries not yet tested. In any event, it is the long term unintended consequences that are at risk.

According to Peterson (2009), dedicated to investor psychology, behavioral finance, and neuro-finance, studies show that people will pay to punish others who violate "social norms" and will do it with self-confident righteousness, which fuels revenge. Conversely, the more unusual aspect of this is that many people will use their own hard-earned income to punish those responsible for breaking the rules, even if they are not affected. Put another way, they simply want revenge. Though not gender-specific, it tends to be even stronger in men. Some recent observers assign having a higher baseline testosterone level in the morning, independent of other events may increase the aggressiveness of risk-taking and lead to higher markets returns. However, one might be skeptical of the research since the sample size was fairly small (17) and homogenous (Petersen, 2008). Petersen (2008) also cites Knutson's study (2006), which explains the dopamine surge when in sight of a sexy photo. He contends that this and other stimuli increases financial risk taking going forward.

In fact, again according to Peterson (2009), studies also show that the neuro-chemical dopamine is released in the brain (reward system) of people who take revenge on others. They actually get satisfaction from punishing those who break the rules, which can be addictive since it undoubtedly feels pleasurable to them. Of the essence, observers contend is that it seems likely that the U.S. economy and its reputation are going to continue to suffer the cost of which is anybody's guess. As a result, financial institutions have lost trust in each other, investors have lost trust in the markets to provide a comfortable long term return, and now we are all losing faith in the ability of government to solve major problems.

The Effect of Values on Attitudes and Perceptions

Free market enthusiasts insist that the term rational expectation is still appropriate because whenever new relevant information appears, the behavior of market participants is to revise their expectations accordingly. That is, any one participant can be wrong about the market, but it remains that the market is always right. This interpretation may be entirely true in a market environment where unethical, manipulative and fraudulent intent is minimized.

All the same, if one assumes normal market functionality when the intent by financial management in large firms and others are to circumvent the legal framework upon which other participants rely, then one would be suspicious that indeed such market activity may be

unreliable. However, what if market participants interpret such information as relevant, when in fact; it is irrelevant or perhaps manipulative and worst false.

Whether unintended outcomes or not, the results are markets where prices do not accurately reflect risk. In the short term, the market simply cannot account and respond to different questionable intent, especially when such practices may ultimately undermine trust and confidence. Based upon real market extremes, free market enthusiasts may counter this argument and consider irrational behavior as the norm. Behaviorists disagree with the perception that markets behave consistently as posed by free market advocates. Clearly, in leading up to the current financial crisis, the free market mechanism did not correctly predict underlying financial institutions' future results. If so, it would have been reflected in the legal framework set forth in the tradition of participation based upon a sense of fairness (ethics). A focus on how well free markets in the financial sector perform may be obstructed by changing American values and attitudes about its economic system.

If the ability of the U.S. economy to grow is impeded by substantial corruption, then financial behaviorists would reject the idea that real markets are efficient. Does the context of the current financial crisis reflect changing American values? From the perspective of the financial sector, Johnson (2009) thinks so and has made that clear with convincing narration of how America has been changed by oligarchs. His contention is that the American financial industry reaped political power by gathering a class of cultural capital in the sense of a belief system. Over the past decade, the attitude became that what was good for Wall Street was good for the country. The banking-and-securities industry has become one of the top contributors to political campaigns benefiting from the fact that Washington insiders already believed that large financial institutions and free capital markets were crucial to America's position globally (Johnson, 2009).

Pryor (2005) argues that only when a significant share of a capitalist society's population share certain economic values (shared values of society about what is good and what is not) and attitudes (which is rooted in Protestantism) will the free market system maintain its viability over the long term. While free market purest would argue that economic values and attitudes change only as the level of economic growth increases; financial behaviorists, on the other hand would not ignore the impact of society's values. In light of changing societal values, these observers would see a convergence of activities of a limited number of economic players and the absence of particular capitalist characteristics such as strict property rights, enforceable contracts, or low information costs. A quantitative measure of the relationship between economic values, ethics, morality and economic growth is difficult yet essential, especially if one is interested in enhancing the validity of so-called "free" markets, which relies upon society's attitudes toward this institution.

Again, Johnson (2009) makes Pryor's (2005) point. He says leaving aside the taxpayer fairness issue regarding bank bailouts, the government's velvet-glove tactic with the banks is deeply disturbing in that it is not enough to change the behavior of a financial sector accustomed to conducting business on its own terms, at a time when that behavior must change.

The Theoretical Framework

As a part of the theoretical framework for this paper, several requisite explanations are presented in the ensuing narration. In the financial investment literature, risk attitude and perception are thought to be essential to evaluation of investment opportunities and return on invested monies. Risk can be defined as partial knowledge which entails probabilities (that a negative event will occur) and possible known outcomes as expressed in Webster's New World Finance and Investment (2003). Risk attitude refers to the investor's general or consistent tendency towards risks. An attitude is a favorable or unfavorable evaluative response toward something or someone displayed by ones beliefs, feelings, or intended behavior (Myers, 2004). Risk attitudes are commonly modeled within an expected utility framework. Risk perception reflects the investor's interpretation of the likelihood of risk exposure and is defined as the investor's assessment of the risk inherent in a given investment opportunity.

It is a social orientation, an underlying inclination to respond to something either favorably or unfavorably (i.e., this supposes that beliefs play a causal role in the development of behavior). Investors' overall belief (i.e., the term "belief" refers to the attitude one has, generally, whenever one takes something to be the case or regard it as accurate) (Schwitzgebel, 2006) as to whether, for example trust and confidence in financial markets is high or low. With these clarifying prerequisites, an attribute model is suggested as a basis for establishing investor attitudes surrounding trust and confidence in financial markets. In the Fishbein multi-attribute model, risk attitudes are theoretical constructs that are latent or are theoretical variables in that they cannot be directly observed. Instead, they must be inferred from observable responses. The multi-attribute attitude model is used to organize the key concepts of behavior as reflected in attitudes. The Fishbein multi-attribute model (attitudes toward financial markets) has been utilized widely, which attempts to encapsulate overall attitudes into one score employing the equation (Fishbein, 1963):

$$A_{\mathrm{b}} = \sum_{i=1}^{n} W_i X_{ib}$$

Where:

A_b = belief attribute
W_i = weight or importance of each belief
X_{ib} = evaluation of belief

The model views an attribute object as processing multiple individual attributes that establish the basis for attitudes. It can also offer a fundamental conceptual framework for analyzing the linkage between overall attitudes toward trust and confidence in financial markets and perceptions about various attributes associated with investor future expectations concerning those markets. That is, for each belief, a weight or importance (W_i) of that belief and multiply it with its evaluation (X_{ib}). For example, an investor believes that well-functioning free markets is moderately important, or a (four) 4 on a scale from (one) 1 to 7 (seven). The investor believes

that financial transparency is very important, or a (six) 6 on a scale from 1 to 7. Hence, trust and confidence in financial markets is important 4(6) =24 (Perner, 2009).

On the other hand, if the investor believes that the potential for corruption and fraud are extremely important seven (7), and financial markets fare moderately shoddily, at a score of (minus four) -4, on this attribute (since this is a negative belief, negative numbers are utilized from -1 to -7, with -7 being worst). Accordingly, we now have 7(-4) = -28. Had these two beliefs been the only beliefs the investor held, the investor's total, or aggregated, attitude would have been 24+ (-28) = -4. In practice, of course, individuals tend to have many more beliefs that would have to be utilized in order to obtain meaningful accuracy. Changing attitudes toward societal issues such as financial markets is a difficult task since attitudes are most always deep-seated. According to Assael (2004), to restore financial market trust and confidence, some success may be effective through marketing communications.

The following characterizes the parameters surrounding the use of the Fishbein model in the context of the literature described above, which include:

1. Fishbein (1963) refers to beliefs, attitudes, and intentions and can be identified as the cognitive, affective, and behavioral components of attitudes, which relies on Katz's functionalist theory. It holds that attitudes are determined by the functions they serve for people…that they embrace given attitudes because these attitudes help them achieve basic goals (Katz, 1960). In this paper, the basic goals are based on Katz's four types of psychological functions that attitudes meet. These include:

   - Instrumental - people want to maximize rewards and minimize penalties and people are more likely to change their attitudes if doing so allows them to realize goals or avoid undesirable consequences;
   - Knowledge- attitudes provide a meaningful, structured environment since people seek some degree of order, clarity, and stability as a personal frame of reference;
   - Value-expressive – people express basic values and reinforce self-image. For example as an investor, people can reinforce that image by adopting investor class beliefs and values;
   - Ego-defensive - some attitudes serve to protect people from acknowledging basic truths about themselves or the harsh realities of life. People with feelings of inferiority may develop attitude of superiority when a part of the investor class, which serves as a defense mechanism (Katz, 1960).

2. Assumptions of the Fishbein model include:

   - Behavioral intentions are the only direct determinant of behavior;
   - Behavioral intentions are determined by affective attitudes and subjective norms;
   - Affective attitudes are a function of beliefs about consequences (subjective evaluation of those consequences);
   - Subjective norms are a function of beliefs about the expectations of others times my motivation to comply with them (Fishbein, 1963).

3. It is also of the essence to understand that the Fishbein multi-attribute model risk attitudes are theoretical constructs, which means they are theoretical variables. That is, they cannot be directly observed. As an alternative, they must be contingent upon observable responses. The multi-attribute attitude model is used to organize the strategic concepts of behavior and to predict behavior (Hailu, 2004).

4. In using the Fishbein model as a framework, what possible outcomes may occur?

  - Expectations may not be confirmed;
  - Information may be inconsistent with previous beliefs which may lead to attitude change;
  - Investors may behave in a counter-attitudinal manner…people who say they one thing but do another;
  - Investor attitudes may become non-instrumental, because of the high monetary costs of market participation;
  - Value-expressive…investing may become inconsistent with the trust and confidence most people expect, so they adopted anti-market attitudes.

Is there an attitude-behavior relationship? Measuring attitudes is difficult. In many situations, individuals do not consciously catalog how positively or negatively they feel about, for example financial markets. When a researcher asks a subject about their beliefs concerning financial markets, how important these beliefs are, and their evaluation of financial markets with respect to these beliefs, subjects often will not give very consistent answers. As a consequence, subjects may act consistently but behave based upon their real attitudes, which were never discovered because in fact measurement was not accurate (Perner, 2009). This may in part explain the current financial investment environment, which has overridden the original intent of a well functioning financial market system as a working rationing price mechanism for society's welfare.

Conclusion

While there are many other investor attitudes that might also be studied, it appears that these two may deserve particular consideration, namely trust and confidence. Schiller (2009) alleges their importance because of their assumed tendency to change significantly through time and their potential consequences for the behavior of markets. This research has presented a theoretical framework set in the Fishbein multi-attribute model in which the model hypothetically plays a role in changing investor attitudes in relation to a social issue, namely to ascertain investor attitudes toward trust and confidence in financial markets. Further studies may embellish the appropriateness of the Fishbein model as a measure of investor beliefs, attitudes, and intentions principally when trust and confidence in financial markets weighs heavily on future economic outcomes.

References

Assael, H. (2004). Consumer Behavior: A Strategic Approach. In H. Assael, *Consumer Behavior: A Strategic Approach.* Boston: Houghton Mifflin Company.

CalUniversity. (2008). MKT. 646- Consumer Behavior. In CalUniversity. Diamond Bar: CalUniversity.

Cooper, D. R., & Schindler, P. (2008). *Business Research Methods.* NewYork City: McGraw-Hill Irwin.

Fishbein, M. (1963). An Investigation of the Relationships Between Beliefs about an Object and the Attitude Towaed that Object. *Human Relations* , 233-240.

Hailu, G. (2004, August 5). *Impact of Decsion Makers Divergence in Risk Atitudes and Perceptions on Cooperative Management in Canada* . Edmonton, Alberta, Canada.

Hesmondalgh, D. (2002). *The Cultural Industries.* Thousand Oaks: Sage Publications.

Johnson, S. (2009, March). *The Atlantic* . Retrieved March 30, 2009, from The Atlantic: http://www.theatlantic.com

Katz, D. (1960). *The Functional Apporach to the Study of Attitudes.* Johnson Reprint Corporation.

McCabe, K. (2003, September 24). *Neuroeconomics.* Retrieved March 27, 2009, from Center for the Study of Neuroeconomics at Georeg Mason University: http://neuroeconomics.typepad.com

Meyers, D. (2004). *Social Psychology.* New York: McGraw-Hill Education.

Mowen, J. C., & Minor, M. (2007). *Personality and Pychographics.* Retrieved March 20, 2009, from Consumer Behavior: http://www.consumerbehavior.net

Parasuraman, A., & Grewal, D. K. (2007). *Marketing Research.* Boston: Houghton Mifflin Company.

Perner, L. (2009). *Consumer Psychologists.* Retrieved March 5, 2009, from University of Southern California: http://www.consumerpsychologist.com

Peterson, R. L. (2009). *MarketPsych.* Retrieved March 27, 2009, from MarketPsych: http://www.marketpsych.com/investorbrain

Schutt, R. K. (2009). *Investigating the Social World: the Process and Practice of Research.* London: Pine Forge Press.

Schwitzgebel, E. (2006). *Stanford Encyclopedia of Philosophy*. Retrieved March 27, 2009, from Metaphysics Lab Stanford University: http://plato.stanford.edu/entries/belief

Shiller, R. (2009, January 27). *The Wall Street Journal.* Retrieved March 25, 2009, from A Wall Street Journal Website: http://online.wsj.com/article/sb123302080925418107

The Durable Investor. (2009, March 12). Retrieved March 25, 2009, from The Durable Investor: http://durableinvestor.wordpress.com/category/behavioral

Weber, E., & Milliman, R. A. (1997). Perceived Risk Attitudes: Relating Perception to Risky Choice . *Management Science* , 123- 144.

Webster's New World Finance and Investment . (2003). Indianapolis: Wiley's Publishing Inc.

The Mortgage Crisis and Credit Crunch:

From Housing Losses to Balance Sheet Analysis to Diminished Economic Growth

David Brat
Randolph-Macon College
Ashland, VA 23005
804-752-7353
dbrat@rmc.edu

Sydney Jones
Randolph-Macon College
Ashland, VA 23005

Economics and Finance Tracks

Abstract

The mortgage crisis makes headline news by the day. This paper was written in the summer of 2008, prior to the Lehman credit shock. While not cutting edge any more, it is very useful to review the economic story of that day as it is quite informative. TARP is not yet in the air. The broader economy is not yet damaged. At this point in time, what do we see? At this point in time, the talking heads were talking about Structured Investment Vehicles (SIVs) and off-balance sheet accounts. Every day another bank announces $2 Billion dollars in losses written off the books. Then prices on these assets fall still further and other banks are forced to reevaluate their balance sheets with these new lower prices in place. What caused the mortgage crisis? What is the credit crisis? How has the crises impacted the broader economy? By studying the past five year history, we can see that a lack of regulation, poor investment decisions, major shocks to the economy, and historically low interest rates all played a part in the crisis. This paper will show the links between the credit crisis, firm balance sheets, and the damage we can expect to the macro economy. With a case study on Countrywide Financial Corporation's balance sheets, we can track the firm's failure and see the credit crisis' major effect on firms. We can expect continued declines in the GDP growth rates and the stock market until this credit environment is restored to health.

I. Introduction

The mortgage crisis makes headline news by the day. The talking heads refer to Structured Investment Vehicles (SIVs) and Collateralized Debt Obligations (CDOs) and off-balance sheet accounts. Every day another bank declares $2 Billion dollars in losses written off the books. Then, it appears, that prices on these assets fall still further and other banks are forced to reevaluate their balance sheets with these new lower prices in place. It all sounds bad. But how bad is it? How does one put these events into perspective? How does the action of a single bank affect the macro economy? That part is not in the news. That is the goal of this paper. We will investigate a few major questions related to this crisis and attempt to place them in a single economic narrative. First, we will ask what caused of the mortgage crisis and the credit crunch? Second, we will investigate bank behavior at the micro level by investigating bank balance sheets. Finally, we will measure the extent of this crisis at the national level and estimate the impact on the macro economy. How large is this crisis? How many people will be affected by it? How will it impact economic growth? We will answer these questions by following this ongoing narrative and by using the economic tools provided by the discipline.

II. What caused the credit crisis?

According to many experts, initially there was a lack of regulation on banks between the 1980's and 1990's. For example, under the Basel II Act, "banks are able to reduce their capital requirements by packaging up assets, securitizing them and holding investment-grade rated tranches 'slices' of the securitization rather than the whole loans."[1] In addition, there were also five major shocks to the economy between 2000 and 2005: mini recession (2001-2003), 9/11

---

[1] Beach, P, Heap, A, & Smith, D Risk Transparency in the Aftermath of the Credit Crisis. *Atos Consulting*

(2001), War on Terror (2001-present), Dot Com Bubble (1995-2001), Housing Bubble (2001-2005). To recover from these shocks, the Federal Reserve printed more money and lowered the federal funds rate 11 times between May 2000 at 6.5% to December 2001 at 1.75%. The increase in money supply and the lower federal funds rate caused market interest rates to also decline in turn. Banks began to use these lower interest rates to their advantage and start lending with adjustable rates. Also, Firms began "buying billions of dollars' worth of subprime loans from nonblank mortgage lending firms."[2] Thus, investors were buying subprime loans in the early 2000's, revealing that everyone had bought into this new type of financial product and invested in these subprime loans.[3]

Not only did banks lend out high risk loans to gain profits, but they also had political pressure to make homes more affordable to people. Regulation on lending loans was not as strict, allowing banks to lend money to high risk borrowers. For the first time ever, borrowers were able to borrow without making a down payment. But, one key variable that had been overlooked made a grand appearance on the financial stage. Housing prices began to dip. People began to

---

[2] Muolo, P., & Padilla, M. *Chain of Blame*.Hoboken: (John Wiley & Sons, Inc., 2008) 7.
[3] Iacono, T. The Mortgage Crisis According To Alan Greenspan. *Seekng Alpha*, Retrieved July 2008, from
    http://seekingalpha.com/article/57147-the-mortgage-crisis-according-to-alan-greenspan

speculate and become anxious about the housing market, causing prices to go down. For many analysts, the fact that the Federal funds rate was set at 1% in 2003 showed that the rates stayed too low for too long, igniting a housing bubble that began to burst in the summer of 2005. This bubble was due to over-building of homes because, before 2005, the housing market was booming with profits. In addition, many investors bought into mortgages they could not afford. As seen in figure above, the Federal Funds Rate began to increase in 2005, causing interest rates to also rise and because many of the the loans were adjustable, banks were able to raise interest rates on those loans, causing mortgage payments to be unaffordable. [4]

III. SIV Story

SIV's, or structured investment vehicles are a major story:

A pool of investment assets that attempts to profit from credit spreads between short-term debt and long-term structured finance products such as <u>asset-backed securities</u> *(ABS). Funding for SIVs comes from the issuance of commercial paper that is continuously renewed or rolled over; the proceeds are then invested in longer maturity assets that have less liquidity but pay higher yields. The SIV earns profits on the spread between incoming cash flows (principal and interest payments on ABS) and the high-rated commercial paper that it issues. SIV's often employ great amounts of leverage to generate returns.*

SIVs are less regulated than other investment pools, and are typically held off the balance sheet by large financial institutions such as commercial banks and investment houses. They gained much attention during the housing and subprime fallout of 2007; tens of billions in the value of off-balance sheet SIVs were written down as investors fled from subprime mortgage related assets.

Many investors were caught off guard by the losses because little is publicly known about the

---

[4] Unknown, (May 2008). Subprime Crisis Impact Timeline. Retrieved June 2008, from Wikipedia Web site: http://en.wikipedia.org/wiki/Subprime_crisis_impact_timeline

specifics of SIVs, including such basics as what assets are held and what regulations determine their actions. SIVs essentially allow their managing financial institutions to employ leverage in a way that the parent company would be unable to due to capital requirement regulations. [5]

The SIV's cause uncertainty in the true value of the mortgage debt. When housing prices fall, the credit shrinks up because of the uncertainty, causing the falling in prices. The SIV's began to fail in 2007.

IV. The Housing Bubble

The low Fed interest rates and lack of regulation allowed banks to make higher risk loans, which made purchasing homes more attractive. Prices on homes began to sky rocket as demand surged, but in 2005, the housing bubble burst. The graphs below reveal the major increase in housing prices.

Inflation-adjusted U.S. home prices, Population, Building costs, and Bond yields (1890–2005)
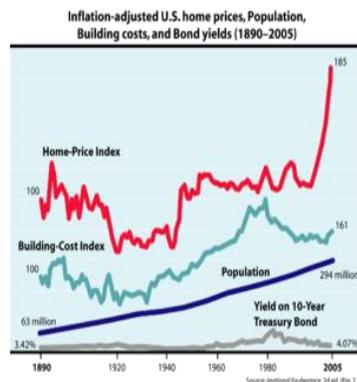
The graph above shows the housing bubble, as building costs are lower than housing prices.
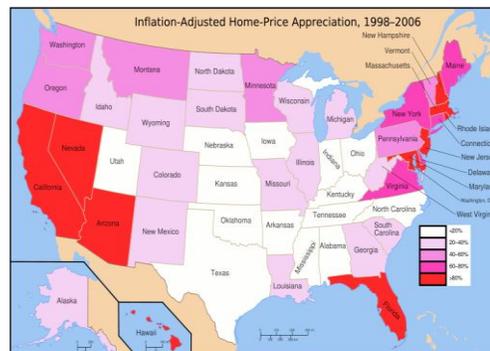
Inflation-Adjusted Home-Price Appreciation, 1998–2006

---

[5] Forbes, (2008). Structured Investment Vehicle- SIV. Retrieved July 2008, from Investopedia Web site: http://www.investopedia.com/terms/s/structured-investment-vehicle.asp

The chart above reveals home price appreciation by state. Notice that the bubble affected most states dramatically by 2006. Banks and other mortgage lenders noticed weakness in the housing market. New houses sit unsold and foreclosures rise as people who bought homes with adjustable-rate mortgages see sharp spikes in their monthly payments. Central bankers and other watchdogs are caught by surprise. The question in many boardrooms became: What else is at risk? (Washington Post, 06.16.08) Editing this paragraph in summer of 2009, it appears that this was indeed the question.

V. The Housing Bubble Bursts and the Damage Begins

In 2006, prices are flat and home sales fall, causing a major build up in inventory. Home construction also began to fall. By mid August, the U.S. Home construction Index was down by over 40% compared to August of 2005. Major foreclosures are occurring as seen in the figure below. By the fourth quarter of 2007, 2% of all mortgage borrowers were delinquent. This rate is almost twice as much as the rate from the end of 2008.[6] Yet very few are able to extrapolate from this sector's damage to a full blown credit crisis.

---

[6] Bernanke, B. (May 05, 2008). Mortgage Delinquencies and Foreclosures. *Board of Governor's of the Federal Reserve System*, June 2008, from http://www.federalreserve.gov/newsevents/speech/Bernanke20080505a.htm

Figure 3: Change in Mortgage Delinquency by County
(4th quarter 2004 to 4th quarter 2007)

Basis Point Change in Mortgage Borrowers 90-Days or More Delinquent
- Lowest two quintiles (less than -10)
- Middle quintile (-10 to 30)
- Highest two quintiles (greater than 30)

Source: TrenData from TransUnion, LLC
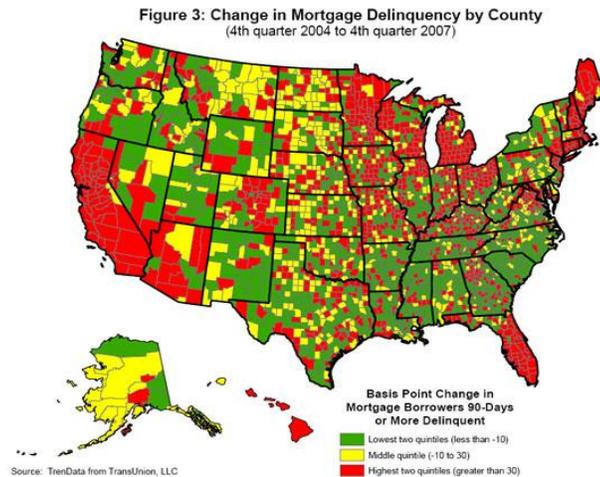
VI. Balance Sheets: What a Credit Crisis looks like from the Inside

"At the top of the credit cycle, the income statement for a financial institution shows 'the best of times' – but buried in the balance sheet is 'the worst of times' to come." –Minyan Peter

According to The New York Times Dictionary of Money and Investment, a balance sheet is "A summary of a company's assets, liabilities, and net worth at a moment in time." A bank's balance sheet reveals all of its financial successes, or rather, its losses. The balance sheet tells the story of the crisis from the inside, where banks are writing off billions of dollars by the quarter. Where did it all go wrong?

In 2005, Countrywide Financial became the largest mortgage lender in the United States.[7] As indicated by Paul Muolo and Mathew Padilla's book "Chain of Blame," the CEO of Countrywide, Angelo Mozilo, made Countrywide dominate the mortgage market and wrote more

---

[7] Julio Rotemberg, Subprime Meltdown: American Housing and Global Financial Turmoil (Harvard Business School: 2008) 4.

subprime loans than any other firm. Countrywide even ranked as the fourth largest public firm by market capitalization earning $19,588.1 in millions in market capitalization and $13,469.3 in millions according to reports on 7/7/04, which are up from the results of 7/7/03 where Countrywide has $9.469.3 in millions in market capitalization and $10,663.1 in millions in revenues.[8] So, what happened to Countrywide's success?

"By the second quarter of 2007, loan delinquencies were rising to 20 year highs. Subprime borrowers were defaulting on their payments. Since 2002, subprime lending accounted for 20% of new mortgages written in the US. In the past 5 years, home lenders originated $2.6 trillion in mortgages to people with bad credit. Home prices were falling to 5-year lows. Countrywide wrote more subprime loans than anyone else, and became part of the story when there were doubts about the ability for subprime borrowers to pay on mortgages backed by homes that were now worth less."

"Countrywide's earnings were down by 1/3 to $400 million by the second quarter results of 2007. Fifteen out of every 100 loans in the US were closed by Countrywide, which measures the size of loans made by Countrywide. Mozilo, CEO of Countrywide, made comments in a press conference in 2007; "We are experiencing a huge price depression, one we have not seen before-not since the Great Depression." These comments caused damage to the stock market, as people feared another crash and the Dow Jones Industrial Average decreased by 226 points. Within a month, the average would fall by 1000 points. Kenneth Bruce wrote a research report on Countrywide and predicted with enough "financial pressure" it could go bankrupt. People began to pull money out of Countrywide because of a fear of bankruptcy, even though

---

[8] http://findarticles.com/p/articles/mi_m5072/is_29_27/ai_ni14864352

Countrywide had $190 billion in loans it could lend out. Countrywide was able to borrow this money from other Wall Street firms."

"Because of the fear of bankruptcy, investors in Countrywide's stock had seen billions of dollars in value disappear. Countrywide could go belly-up because of the mortgage market meltdown- 20% of home borrowers were subprime borrowers and the market seized up- home prices were falling and defaults were rising. Because of Bruce's comments about bankruptcy, Countrywide was facing major damage, even though it had earned almost $2 billion the year before. Countrywide's shares kept decreasing in value- Bank of America invested $2billion in preferred stock that was convertible to common stock which paid a 7.25% dividend. But by January 2008, Countrywide's shares were down to $8, causing Bank of America to also have losses of well over $1 billion."[9] On January 11, 2008, Bank of America bought Countrywide for $4 billion after its shares plunge 48%.[10]

[11]

In Millions Segment	Pre-tax Earnings
PRODUCTION	$ -737
SERVICING	-243
CLOSING SERVICES	86
■ MORTGAGE BANKING	$ -894
BANKING	$ 10
CAPITAL MARKETS	-103
INSURANCE	429
GLOBAL	19
OTHER	-64
□ OTHER BUSINESS SEGMENTS	$ 291
TOTAL	$ -602
9 Months Ended 9/30/07	

By looking at key features of its balance sheet, the results show that the firm has suffered severe losses because of the choice to lead in subprime lending.. Countrywide's total earnings

---

[9] Muolo, P., & Padilla, M. *Chain of Blame.*

[10] Felton, A., & Reinhart, C. (June 2008). The First Global Financial Crisis of the 21st Century. *Centre for Economic Policy Research (CEPR)*. 183-190.

[11] JLP, (January 08, 2008). What Does the Future Hold For Countrywide?. *All Financial Matters*, Retrieved July 2008, from http://allfinancialmatters.com/2008/01/08/what-does-the-future-hold-for-countrywide/

```
COUNTRYWIDE FNCL IND.                                    Splits:▼
as of 7-Jan-2008
    50
    40
    30
    20
    10
     7
            Mar07      May07      Jul07      Sep07      Nov07
  300.0
  200.0
  100.0
    0.0
Copyright 2008 Yahoo! Inc.              http://finance.yahoo.com/
Splits:20-Jul-92 [3:2], 04-May-94 [3:2], 18-Dec-03 [4:3], 13-Apr-04 [3:2], 31-Aug-04 [2:1]
```
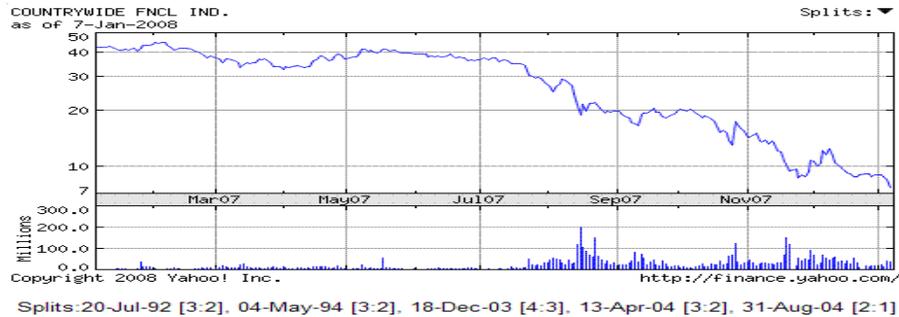
are negative, as shown in the chart above. Nearly 36% of Countrywide's subprime loans were delinquent at the end of March 2007. The firm faced a liquidity crisis; 61% of its capitalization ($15 billion) evaporated in 2007 due to rising default rates.[12]

The stock price graph above is a one year chart for Countrywide Financial. It's stock price has gone from over $45 per share to $5.47 (January 07 closing price) over the last year. This chart shows Countrywide going bankrupt, as the value of its market shares are decreasing drastically.[13] Countrywide Financial had a press release from PRNewswire on April 29, 2008 about its first quarter results. The firm reported a net loss of $893 million. Essentially, Countrywide collapsed because the mortgage market continued to collapse and people could not pay on their mortgages. No one would buy mortgages anymore and there was no money available to make new mortgages, causing major losses. But, Countrywide is not the only firm who experienced major losses.

VII. The Spillover of the Mortgage Crisis into the Credit Crisis: Bank Losses and Federal Reserve Actions: A Brief Timeline[14]

In 2006, we see the first mortgage company file for bankruptcy. On December 28, 2006, Ownit Mortgage Solutions files for bankruptcy. [15] We begin the see the spillover of the mortgage

---

[12] JLP, What Does the Future Hold For Countrywide?.
[13] JLP, What Does the Future Hold For Countrywide?.
[14] Felton, A., & Reinhart, C. The First Global Financial Crisis of the 21st Century.
[15] Felton, A., & Reinhart, C. The First Global Financial Crisis of the 21st Century.

crisis into the credit crisis. The spillover occurred <u>when major banks began announcing</u> major net losses, which are apparent on many of their balance sheets. Banks need positive assets to make loans. When the banks write off losses, they are unable to make loans, causing the credit crisis, thus there is no liquidity and banks are trying to gain their trust back with consumers.

In 2007, more banks begin filing for bankruptcy and the housing market begins to plummet. On April 02, 2007, New Century Financial filed for bankruptcy. Home sales fall 8.4% during March, which is the biggest decline in 18 years. All subprime businesses begin to take a turn. General Electric sells their subprime business, WMC Mortgage. Countrywide Financial, the biggest mortgage lender in 2005, is forced to sell 16% of the firm to Bank of America. Four other large financial institutions are forced to borrow a total of $2 billion from the Federal Reserve to try to regain losses from the crisis by August 23, 2007. Then, on August 31, 2007, Ameriquest files for bankruptcy. The Federal Reserve is then forced to cut the federal discount rate by 50 points, down to 4.75%, for the first time since 2003.

More and more losses are announced including USB and Citigroup at $3.1 billion and 3.7 billion by October 01, 2007. By October 15, Citigroup's losses had reached $5.9 billion. Countrywide Financial reports its first loss in 25 years of $1.2 billion in the third quarter of 2007. Merrill Lynch then announces losses of $7.9 billion, along with the resignation of their CEO. Between October and November of 2007, the Fed cuts the Federal Funds Rate to 4.75% and injects $41 billion into the money supply. By injecting money and lowering the federal funds rate, the Fed hoped to lower interest rates and provide liquidity to avoid more losses. Citigroup experiences more losses. Out of $55 billion in subprime investments, the value of those investments declined in value by between $8 and $11 billion.

In November, Morgan Stanley announced a $3.7 billion dollar mortgage loss; Wachovia announced another $1.7 billion loss; Bank of America announced a $3 billion loss in subprime alone; and Freddie Mac announced a $2 billion loss. Again, the Federal Funds Rate was lowered by another 25 base points down to 4.25% and made $20 billion available to commercial banks in December 2007. In December, Washington Mutual's losses reached $1.6 billion and Citigroup took $49 billion worth of SIV assets back on their balance sheets. Because Morgan Stanley's subprime losses reached $9.4 billion, they were forced to sell 9.9% stake in the company. By January 2008, Bear Stearns announced $1.9 billion in subprime losses. Merrill Lynch doubles their subprime losses to $15 billion. Citigroup reports a $9 billion loss for the fourth quarter, not including an $18 billion loss in the mortgage portfolio. By February 2008, "AIG announces fourth-quarter 2007 losses of $5.3 billion due to more than $11billion of losses on its credit-default swap portfolio.

The investment firm, Carlyle Capital, defaults on $17 billion of debt. The fund is leveraged more than 30:1 and invests mostly in agency-backed residential mortgage-backed securities (RMBS).The investment bank Bear Stearns is acquired by JPMorgan Chase for $2 per share. Bear Stearns stock had been trading at $60 the previous week before a run pushed it to near insolvency. The Federal Reserve Bank of New York agrees to guarantee $30 billion of Bear Stearns assets, mostly mortgage-related.

The Federal Reserve cuts the federal funds rate by 75 basis points to 2.25%.JPMorgan

Profit Eraser

Six of Wall Street's largest investment banks have written down about half of their profits since the beginning of 2004 because of the subprime mortgage crisis.

Banks' financials since the beginning of the subprime crisis:

	Earnings 2004 through 1st half of '07	Writedowns 2nd half of '07 through 1st qtr. of '08	Writedowns as a percentage of earnings ▼
Merrill Lynch			153%
Lehman Brothers*			58%
Morgan Stanley			50%
Citigroup			57%
JPMorgan Chase			15%
Bank of America			15%
Goldman Sachs			12%

$10 billion 20 30 40 50 60 70 80

Sources: Company filings; Bloomberg   THE NEW YORK TIMES

Chase raises its bid for Bear Stearns to $10 per share and agrees to indemnify the Federal Reserve Bank of New York against the first $1 billion of losses on the $30 billion that it guaranteed. The IMF's Global Financial unit estimates that the total credit losses will be $1 trillion. Citigroup announces another $12 billion of losses related to subprime mortgages, leveraged loans, exposure to monoline insurers, auction-rate securities and consumer credit. By April, The Federal Reserve lowers the federal funds rate by 25 basis points to 2.0%."All of these facts reveal how the mortgage crisis has spilled over into a credit crisis, which causes a broader impact on the real economy. The chart above quantifies write downs versus earnings for seven major firms.

VII. What is the broader economic impact?

UNEMPLOYMENT

In August 2007, employment cuts reached 79,459, which is 85% higher than July's levels and 22% higher than August 2006- the financial sector accounted for nearly half of job losses. By September 2007 YTD total 125,758 jobs lost, more than double the 2006 total, as shown in the figure below.
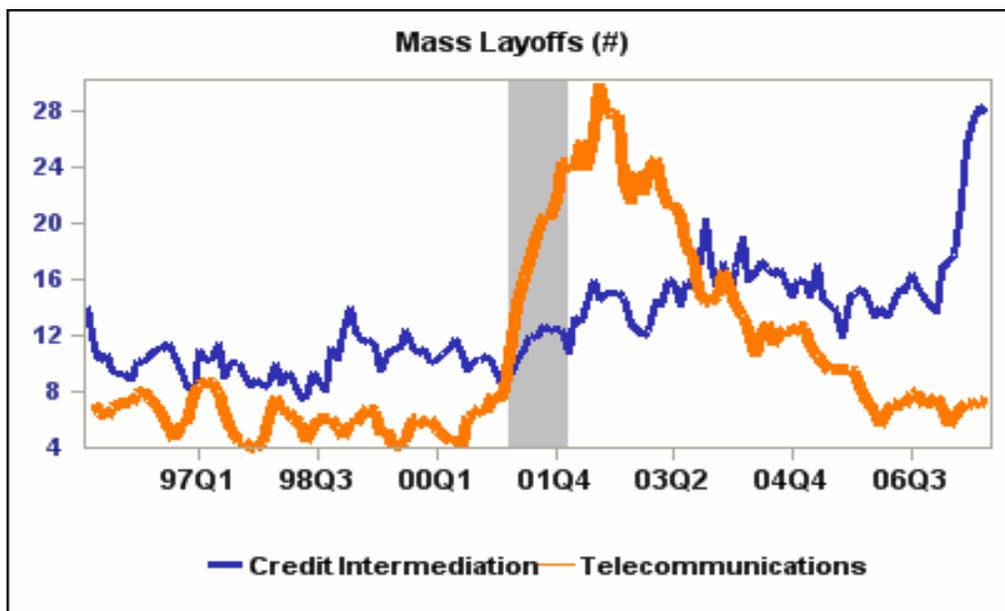
Source: Moody's Economy.com

The next figure also shows the unemployment effects of the credit crisis. Many parts of the country show increases in unemployment rates and mortgage delinquencies. "The data suggest that increases in unemployment rates account for at least some of the recent increases in mortgage delinquencies." [16]

Figure 4: Unemployment Rate Change by County
(2004 to 2007)

Basis Point Change in Unemployment Rate, by Quintile

Lowest quintile (Less than -143)
Second quintile (-142 to -87)
Middle quintile (-86 to -49)
Fourth quintile (-48 to -6)
Highest quintile (Greater than -5)

Source: Bureau of Labor Statistics
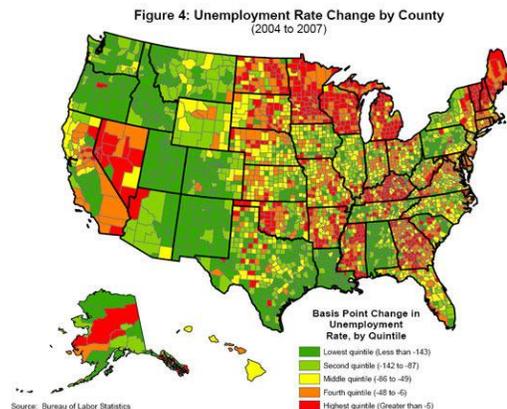
STOCK MARKET LOSS

According to the S&P 500, as of September 2007, the financial service sector became largest sector moving ahead of both technology and energy - it increased from a weight of roughly 5% in 1980 to nearly 22% currently. "As interest rates reflect the cost of credit, falling interest rates have led to an increase in the demand for credit as it has become cheaper to borrow, which fueled the growth of the financial sector."[17] Refer to Figure 1 which shows the growth of the financial sector.

---

[16]Bernanke, B. (May 05, 2008). Mortgage Delinquencies and Foreclosures.
[17] Puplava, C. (September 05, 2007). Will Financials Be to This Bull Market and Economy. *Financial Sense Wrap-Up*, Retrieved June 2008, from http://www.financialsense.com/Market/cpuplava/2007/0905.html
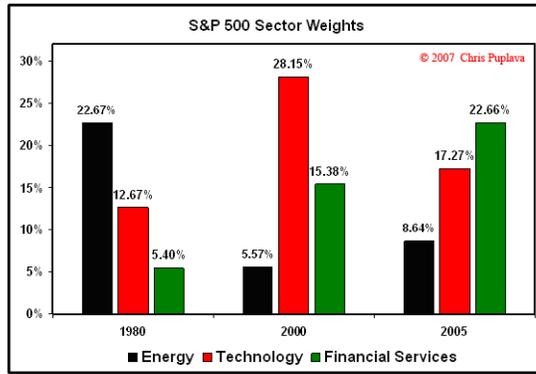
Figure 1 Source: [Barra](#)

As of September 2007, the <u>Dow Jones Industrial Average</u> fell 143.39 points to close at

<u>13305.47</u> (-1.07%), the S&P 500 lost 17.13 points to close at 1472.29 (-1.15%), and NASDAQ

gave up 24.29 points to close at 2605.95 (-0.92%). [18] The stock market indicates the expected

future value of the general market, or at least of the stock in their pool. When the stock prices are

low, it shows that the general market's value is also low. Refer to the next graph. It shows the top

ten financial institutions in the country in terms of profit. [19] As you can see, the impact of the

bubble bursting has spilled over into a major credit crisis because the value of the stocks for

---
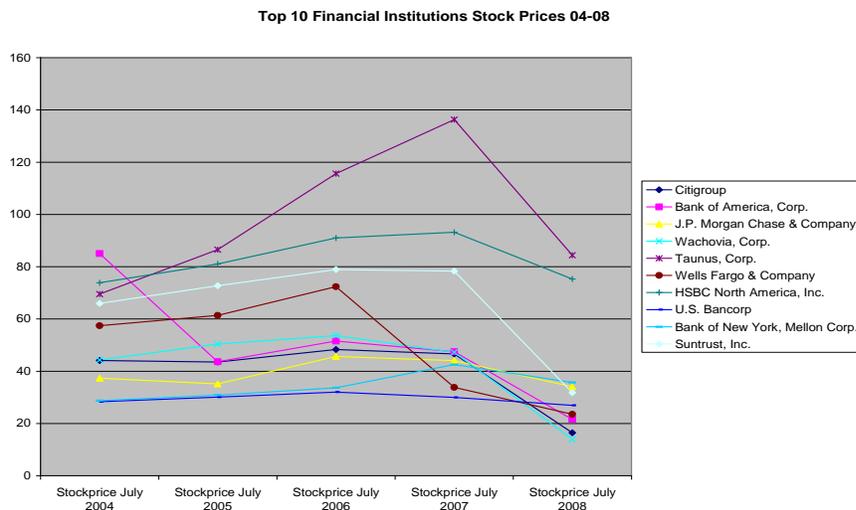
[18] Puplava, C. (September 05, 2007). Will Financials Be to This Bull Market and Economy

[19] Yahoo Financial

these major financial institutions has plummeted, which in turn means their market value is also down.

GDP

According to Global Insight, "The decline in real GDP that we feared for the first half of the year has been avoided—but we believe it has merely been postponed. Overall, our GDP growth forecast for 2008 is higher than last month (at 1.6%, rather than 1.4%), helped by a better-than-expected first half, but we have cut our growth forecast for 2009 (to 0.9%, from 1.3%)."The GDP rate is supposed to be at 3% historically and the economy is forecasted to be less than 1% in 2009, as seen in the graph below. The executive summary explains, "Housing remains the biggest drag on growth. The excess supply of homes for sale—expressed as a monthly selling rate—has not yet turned down. We expect housing starts to hit bottom only in the fourth quarter of 2008, at just 818,000 units (annual rate). House price declines have accelerated, and we expect the OFHEO house price index to drop 10.6% from the first quarter of 2008 to the first quarter of 2009." [20]

GDP Decline Postponed, Not Avoided
(Real GDP, percent change, annual rate)
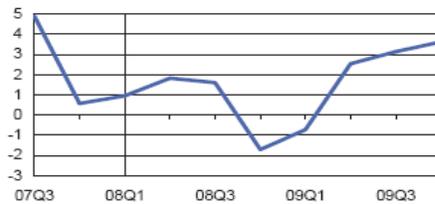
Contacts:
Nariman Behravesh, 781-301-9101, nariman.behravesh@globalinsight.com
Nigel Gault, 781-301-9093, nigel.gault@globalinsight.com
Global Insight Web Site, htpp://www.globalinsight.com

---

[20] U.S. Economic Service Global Insight. (2008). *U.S. Executive Summary: The Outlook is Darkening*

The Executive Summary also explains that "The Deflationary Impact of the Housing/Subprime Crisis Will Linger Through Next Year: Despite early evidence that the worst of the housing-related credit crunch may be behind us, financial markets and the economy are not out of the woods yet. Home prices and housing activity continue to fall. Housing starts and residential construction are unlikely to hit bottom until the end of this year or early next year. Similarly, home prices will probably keep falling through early 2009. The harsh reality that banks are being hit with a double whammy—a stock market that is in bear territory and mortgage-backed securities whose value keeps plummeting—is making the hunt for new capital that much tougher. In other words, the financial sector continues to struggle, and credit remains tight."[21]

VIII. Conclusion and Future Work

Initially, this was going to be a paper investigating the ethics of the financial crisis. Unfortunately, at this time, (August 2008) very few authors have written on the subject and there was not enough source material to pursue a summer research project in this area. Revising this paper for submission in August of 2009, it appears that both the economic forecasters and the ethics forecasters were asleep at the wheel.

Knowing that ethics has to be based on a factual foundation, we instead decided to trace the evolution of the mortgage crisis into what was to become a major credit crisis. We have shown some of the major causes of the crisis. We linked the crisis to the micro foundations of bank balance sheets and we took a closer look at Country Wide to see what transpired in a typical firm which speculated in a highly leveraged sector. We then started to enter some ethical

---

[21] U.S. Economic Service Global Insight. (2008).

territory by trying to assess the damage done to the broader economy by the innovative mortgage products and the new taste for risk and leverage the market seemed willing to absorb. The major forecasting houses have done their best to assess the damage to GDP, employment and the stock markets. In hindsight, the forecasters missed the mark by plenty. The Dow was still at 13,000 and no one knew the pain ahead. At the time of this writing, ethics was in the air, but by the summer of 2009, it is very interesting that the ethics have faded from conversation and now politics is in the air. The talk is all about government intervention and regulation. It will be very interesting to see how we assess this crisis when we can look back with solid data and when hopefully the Dow is back to at least 12,000. We would like to be optimistic and hope that an ethical assessment would be forthcoming in the future but the winds are not blowing in that direction at the moment. We will do our best to follow the story and deliver an ethical assessment at next year's Informs.

References

Beach, P., Heap, A., & Smith, D Risk Transparency in the Aftermath of the Credit Crisis. *Atos Consulting*, *2*, Retrieved July 30, 2008, from http://www.de.origin-it.com/en-us/Business_Insights/Thought_leadership/Thought_leadership_Container/wp_Risk_transparency_in_the_credit_crisis.htm.

Bernanke, B. (May 05, 2008). Mortgage Delinquencies and Foreclosures. *Board of Governor's of the Federal Reserve System*, Retrieved June 2008, from http://www.federalreserve.gov/newsevents/speech/Bernanke20080505a.htm

Felton, A., & Reinhart, C. (June 2008). The First Global Financial Crisis of the 21st Century. *Centre for Economic Policy Research (CEPR)*. 183-190.

Forbes, (2008). Structured Investment Vehicle- SIV. Retrieved July 2008, from Investopedia Web site: http://www.investopedia.com/terms/s/structured-investment-vehicle.asp

Iacono, T. The Mortgage Crisis According To Alan Greenspan. *Seekng Alpha*, Retrieved July 2008, from http://seekingalpha.com/article/57147-the-mortgage-crisis-according-to-alan-greenspan

JLP, (January 08, 2008). What Does the Future Hold For Countrywide?. *All Financial Matters*, Retrieved July 2008, from http://allfinancialmatters.com/2008/01/08/what-does-the-future-hold-for-countrywide/

Muolo, P., & Padilla, M. (2008). *Chain of Blame*.Hoboken: John Wiley & Sons, Inc.

Puplava, C. (September 05, 2007). Will Financials Be to This Bull Market and Economy. *Financial Sense Wrap-Up*, Retrieved June 2008, from http://www.financialsense.com/Market/cpuplava/2007/0905.html

Unknown, (May 2008). Subprime Crisis Impact Timeline. Retrieved June 2008, from Wikipedia Web site: http://en.wikipedia.org/wiki/Subprime_crisis_impact_timeline

U.S. Economic Service Global Insight. (2008). *U.S. Executive Summary: The Outlook is Darkening*

THE IRRATIONAL AGENT: HARD FACT OR THEORETICAL ARTIFACT?[1]

Shabnam Mousavi, Georgia State University, Robinson College of Business, Atlanta 30303, GA, USA. smousavi@gsu.edu.

Reza Kheirandish, Clayton State University, School of Business, Morrow 30260, GA, USA. rkheiran@clayton.edu.

ABSTRACT

Behavioral finance questions the traditional framework for analyzing financial markets. It highlights realities of human mind and behavior, such as biases and irrationalities, which are consistently recorded in market transactions. These behaviors are called irrational in comparison with (for instance) a CAPM world, where fully rational agents interact in completely transparent markets. But would the actual behavior of investors be justified, if an alternative reference replaces the familiar homoeconomicus? Below, we discuss some possibilities towards answering this question.

WHAT IS THE QUESTION?

Baker, Ruback, and Richards (2005) provide a comprehensive review of behavioral corporate finance. They present that the literature in this field takes one of two approaches in modeling market phenomena. Either the managers are acting irrationally in a rational market, or the investors behave irrationally when all else is completely consistent with rational rules. Models generated based on these approaches, would consider irrationality at one of the two sides depending on the kind of anomaly they aim to explain. For instance, if the issue is to make sense of agency problems the model will assume irrational managers acting in a rational set-up (i.e., working for rational investors.) In reality, however, the so-called irrationalities arise from all agents in the market.

How can we come up with more realistic models of the actual behavior in the corporate world? It is widely acknowledged that investors make mistakes. These so called mistakes are the focus of managers who exploit them and cater to them. Also, there is no doubt that managers make mistakes. Regulators and boards are put in place to control and prevent these mistakes. The interesting question, here, is that of combining the two sides of irrationalities. That is, specifying corresponding criteria for different types of

---

[1] This piece presents primary notes and thoughts that the authors are currently researching for a large project.

management decisions, such as capital budgeting, financing, payout policy, etc. in a set-up where investors' financial decisions allow for mispricing.

Why is this question interesting? The way in which models are constructed so far, provides some descriptive power, especially on the irrational investor side. However, what can be recommended based on the insight provided by these two approaches is not compatible. As Baker et al. remark, "the two approaches take very different views about the role and quality of managers, and have very different normative implications as a result." When irrational managers are acting in a rational set-up, efficiency increases by any mechanism that forces managers to react properly to market signals, whereas, rational managers serving irrational investors must be given ample discretion in deviating from short-term shareholder satisfaction.

In what follows, we first provide a summary of Baker et al. They, too, notice this intriguing possibility of combining irrational investors and irrational managers in one framework, and outline a potential approach. We reflect on their proposed approach and provide our alternative for constructing a framework that allows the simultaneous modeling of observed irrationalities in the financial market. (for the case of IPOs see Loghran and Ritter, 2002).

TWO FORMS OF IRRATIONALITY IN THE FINANCIAL MARKET

We mentioned in the last section that irrationality is either attributed to the investors or (exclusively) to the managers in the existing models that incorporate behavioral phenomena. A rational manager exploits mispricing opportunities that result from irrational investors' decisions. Assuming mispricing exists, the trouble is to also accept that managers are aware of such mispricing, can locate them, and have the ability to recognize fundamental values in such circumstances. The conditions under which such circumstances can exist satisfies at least three qualities for corporate managers: superior information about their own firms (allowing extra return on trades), advantageous positions compared to money managers (because corporate managers are judged based on longer horizon outcomes), and successful rules of thumb (such as issuing equity when market is liquid).

A liquid market suggests irrational investors who overvalue, which makes issuing equity a successful strategy. Theoretical models for this scenario have been developed by several authors (e.g., see Stein, 1996), but there is a major empirical trouble with implementing and testing them. Measuring inefficiency or deviation from the fair and true value in a dynamic market is still an open line of research. Nonetheless, it is well documented that investment is sensitive to mispricing proxies, especially to "short-term mispricing when managerial horizons are shorter." (Baker et al, 2005)

Now consider another scenario that can equally well explain the same phenomenon, with different behavioral assumptions. In a set-up where investors are irrationally overvaluing assets, a manager does not necessarily need to be a rational exploiter to cater to the investors' preferences and beliefs. If the managers are simply optimistic themselves, they would act in the exact same way that they do as smart exploiters. Can these two explanations be detangled at a lower level? How can we reliably attribute the observed managerial behavior to one or the other? There is no answer to these questions as far as we know. Similar cases are found in the matter of other corporate managerial decisions such as capital

2

structure, debt issues, and dividends, to name a few. (see Ayers and Di Miceli, 2007) The challenge remains to find a justification for attaching theoretically-split descriptive accounts to the observed phenomena in a reliable and testable manner.

RELATING INVESTOR AND MANAGERIAL SENTIMENT

Exploring the behavioral patterns in corporate managerial decisions have mainly employed a specific psychological framework developed originally by Kahneman and Tversky's prospect theory and the work generated by that. The idea is that boundedly rational agents use less than fully rational strategies in making decisions. As we mentioned in the previous section, the actors in the financial market have been modeled separately (not together) as acting boundedly rational. So, either investor or manager is always assumed to have access to full information and the ability to process all available information, whereas, the other agent suffers from cognitive limitations. Thus, real behavior or what is referred to as sentiment in financial literature has not been assumed to be applicable to every actor.

Here is a sketch of an alternative. We want to developing a model of behavior that in its simplest form uses two types of agents: investors and managers. Decision rules are specified that generate final outcomes for both groups. Where these decision rules are not type-specific, they result in different outcomes when used by different types. The reason is that the same problem triggers different search/stopping rules in different types. The main idea is to develop a model of heuristic in the tradition of fast and frugal heuristics (See Gigerenzer et al., 1999), where a process model of choice can be constructed as having three elements: 1) a search rule, 2) a stopping rule, and 3) a decision rule.

The neoclassical assumption of rationality (in the sense of subjective expected utility) will not be imposed. Agents are believed to be ecologically rational, in that they match their strategies according to the best (perceived) fit to the environment. Environment is the context of the problem at hand. It includes the structure of information and the ease (or difficulty) of accessing information. Stopping rules are simple and are drawn from an adaptive toolbox available to all humans as an evolved capacity.

Some preliminary characteristics of such approach are as follows. Agents do not exhaust the possible set of information. That is, a smart system of ignorance is in place that avoids using all available information, much in line with the idea of "less is (sometimes) more." Agents rely on rules of thumb that they have learned from experience, or simply collected by imitation. Imitating the average, or the successful are two possible cases, each fitting a different situation.

POTENTIAL OUTCOME

If both investors and managers are using rules of thumb, and if a heuristic model of decision reveals structurally similar patterns followed by both investors and managers, then one unified theory can account for behavioral observations collected from both types. This theory would then also provide useful insights for setting 'realistic' rules that managers can use in response to different situations that they face. For example, managerial tasks can be categorized based on the context (and content) of management, and relative rules and regulations would emerge that fit those situations.

3

A careful examination of the real corporate world and the way it performs could reveal that certain structural patterns are already in place. What we seek can be described as a theory that potentially brings all these emerged structures under one overall formal representation. Then each observed phenomena will be a special case of the general theory for given specific parameters (or in a specific range of fundamental variables.) Noteworthy is that in this proposed framework there is minimal importance placed on personality traits. The reason being that if general rules exist that connect our decision processes to the structure of information in the environment, then categorizing agents based on intrinsic personality types would become at best irrelevant in favor of specifiable decision mechanisms.

CONCLUDING REMARKS

The dominant psychological view utilized in behavioral finance relies on maintaining the neoclassical rational framework as a benchmark. Modeling choice behavior under this operational constraint has led to the generation of contradictory implication. Also, the artificial division in modeling corporate decision-making in two exclusive structure that allocates all the irrationalities either with the investors or with the managers, has provided multiple descriptive accounts for the same phenomenon depending on which side have been considered irrational. Could this be an artifact of the presupposed theoretical framework? If so, would more coherent results and therefore useful insights be generated by utilizing an alternative framework? One fact is clear. Market inefficiency exists and plays an important role. If this was not the case, moves such as name change, should be completely irrelevant to investment decisions as predicted by the rationality framework. We reviewed Baker et al.'s view on this issue and provided a sketch of an answer based on alternative (to the traditional psychological) approach.

REFERENCES

Ayers, Lucas; Di Miceli, Alexandre (2007). "Overconfidence, Managerial Optimism and the Determinants of Capital Structure," http://ssrn.com/abstract=953273.

Baker, Malcom; Ruback, Richards; Wurgler, Jeffery (2005). "Behavioral Corporate Finance: A Survey," In Epsen Eckbo, *Handbook in Corporate Finance: Empirical Corporate Finance*.

Gigerenzer, Gerd; Todd, Peter; and the ABC Research Group (1999). Simple Heuristics that Make Us Smart. Oxford University Press.
Kahneman, Daniel; Tversky, Amos (1979). "Prospect theory: An analysis of decision under risk," *Econometrica* 47, 263-291.

Loghran, Tim; Ritter, Jay (2002). "Why Don't Issuers Get Upset About Leaving Money on the Table in IPOs?" *Review of Financial Studies* 15, 413-443.

Stein, Jeremy C. (1996). "Rational Capital Budgeting in an Irrational World," *Journal of Business* 69, 429-455.

4

TRANQUILITY, VOLATILITY, AND CORE INFLATION

C. Barry Pfitzner and Steven D. Lang, Department of Economics/Business,
Randolph-Macon College, Ashland, VA, bpfitzne@rmc.edu and slang@rmc.edu

ABSTRACT

This paper investigates the behavior of inflation over the recent past with primary focus on volatility, not the level of inflation. Over the past 60 years, the inflation rate has shown periods of tranquility as well as periods of volatility. Recent evidence suggests that inflation, after a period tranquility during the 1990s, became more volatile early in the new century (perhaps even as early as 1999)—prior to the current run-up in the energy and food sectors. Evidence of the increased volatility is presented and the volatility is modeled with a relatively simple autoregressive conditional heteroskedasticity (ARCH) model. We also attempt to offer some explanation for the recent volatility.

INTRODUCTION

The autoregressive conditional heteroskedasticity (ARCH) model was developed by Robert Engle [3] to explain volatility "clustering," that is, periods in which the variance of a time series is tranquil and other periods in which the variance of the series is more volatile. The ARCH model and its extension, generalized ARCH (GARCH), have been applied to numerous economic and financial series. These models are important in identifying periods of volatility and they also aid in producing more realistic interval forecasts. In a prior paper [6], we found evidence of ARCH effects for the Consumer Price Index (CPI). That index includes food and energy prices, components known to be more volatile that the general index. Excluding food and energy prices from the CPI results in what is known as "core" inflation—a measure many economists favor as a measure of overall price stability. Because it is widely recognized that the very recent past has been characterized by volatility in food and energy prices, it is prudent to test core inflation for volatility. That, then, is the objective of this project.

DATA, METHOD, PRELIMINARY RESULTS

We collected the monthly measure of the Consumer Price Index (CPI) excluding energy and food prices for the period January 1957 to March 2009. The measure of inflation is the monthly log difference in the core CPI at annual rates. That series is shown in Figure 1.

Casual observation of Figure 1 suggests that inflation was quite volatile in the 1970s and early 1980s. Periods of tranquility seem to be evident beginning in the mid-eighties. It is well known that simple inspection of the variance of a series can be misleading when the series is autocorrelated. To correct for this, we fit an autoregressive model to the inflation rate. The lags were chosen using standard penalized likelihood model selection criteria. The form of the autoregressive model can be represented as follows:

$$INFL_t = a_0 + \sum_{i=1}^{p} b_i INFL_{t-i} + e_t \tag{1}$$

where $INFL$ is annualized monthly inflation, t indexes time, e_t is a white noise disturbance term and the b_i $(i = 1,..., p)$ are the lag coefficients, and p indicates the order of the lags. The two standard penalized likelihood selection criteria are the Akaike information criterion *(AIC)* and the Schwarz information criterion *(SIC)* represented as follows:

$$AIC = (2k / T) + \log(\sigma) \tag{2}$$

$$SIC = [k \log(T) / T] + \log(\sigma), \tag{3}$$

where k is the total number of estimated coefficients in the VAR, T is the number of usable observations, and σ is the scalar estimate of the variance of the equation's disturbance term. If the *AIC* and the *SIC* differed on the number of lags, each indicated model was estimated, with evidence presented here for the most parsimonious model. The *SIC* chose $p = 6$, and we present additional evidence based on that model.

Figure 1: Monthly Core Inflation at Annualized Rates
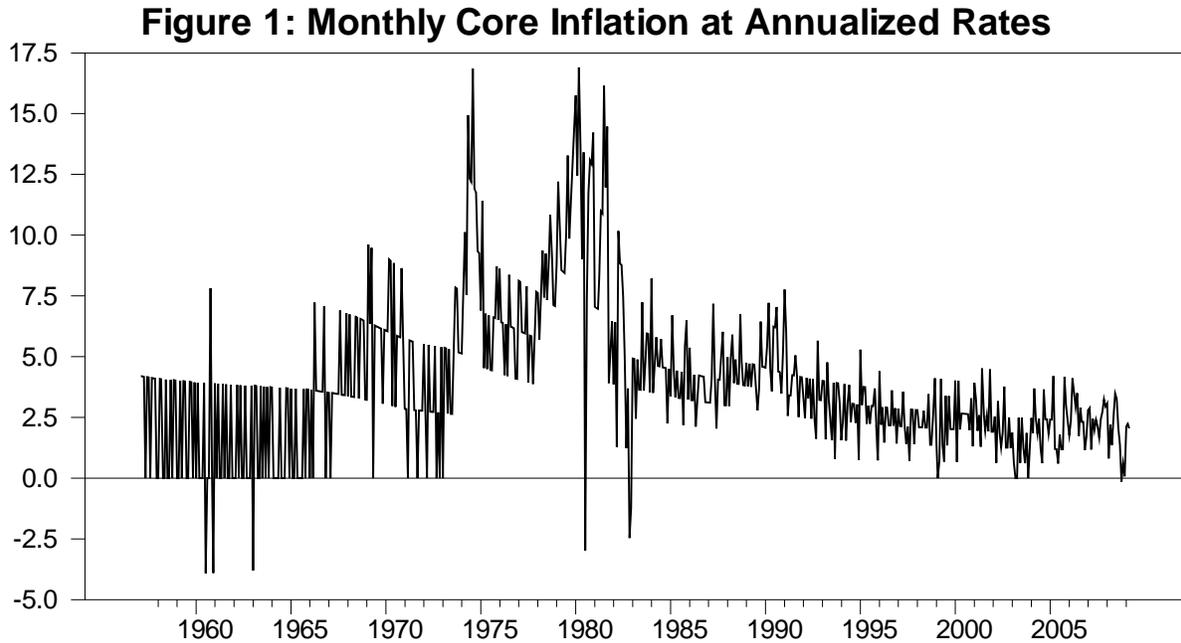
Figure 2 depicts the residuals from the autoregressive model for inflation, with the same periods of volatility and tranquility evident, with the possible addition of a spike in the variance at about 1960.

Testing for volatility is usually accomplished by analysis of the squared residuals from an autoregressive model, such as depicted in Figure 3. The reasoning for testing the squared residuals is simple. The residuals from the autoregressive model (see Figure 2) will be serially uncorrelated as a result of the autoregressive lag fit. Those residuals are, however, not independent. Small (in absolute value) residuals are likely to be followed by additional small residuals, and large residuals are likely followed by other large residuals—that is the meaning of volatility clustering.

Figure 2: Residuals From the AR Model
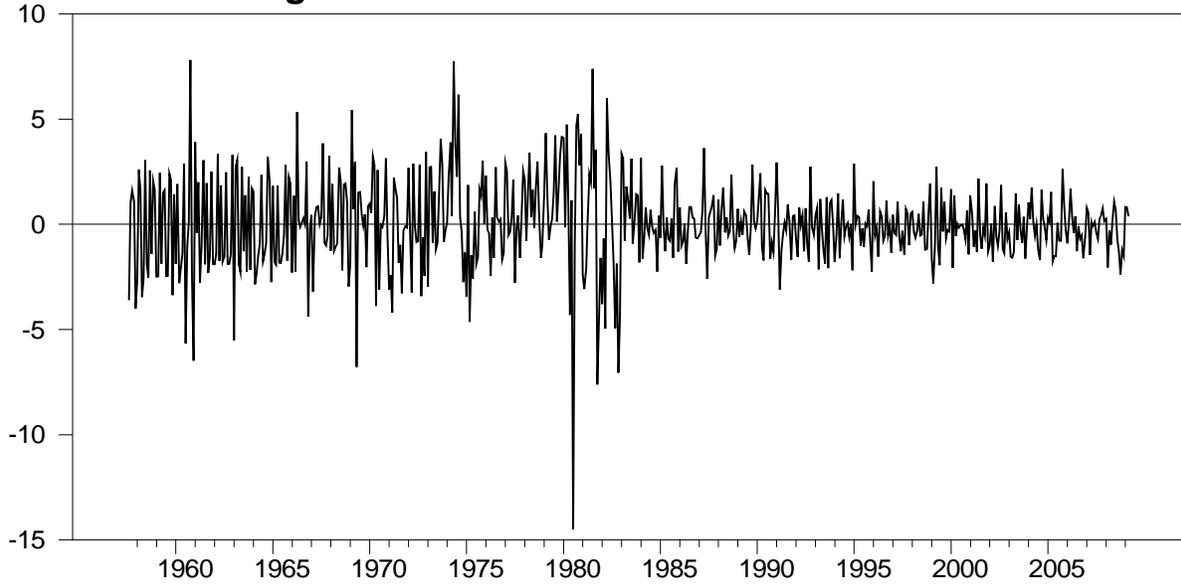
Figure 3: Squared Residuals From the AR Model
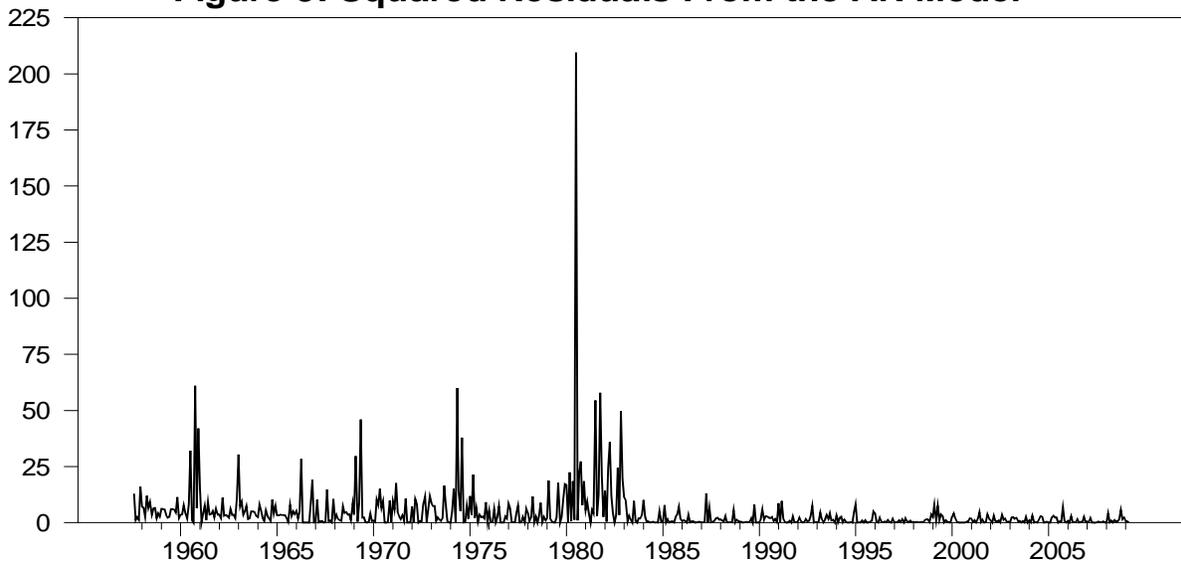
Figure 3 shows the same clustering effect for the squared residuals. To test for ARCH errors, a second regression was run:

$$e_t^2 = c_0 + \sum_{i=1}^{p} d_i e_{t-i}^2 + v_t \tag{4}$$

where e_t^2 represents the squared residuals from equation 1, and the d_i $(i = 1,..., p)$ are lag coefficients and p again indicates the order of the lags. If there are no *ARCH* effects, then equation 4 will have little explanatory power, i.e., R^2 will be very low. The existence of *ARCH* effects can be tested in two ways. First with a sample of T residuals, TR^2 is distributed as χ^2 with p degrees of freedom. Alternatively, an F-test that all d_i coefficients are jointly zero will also indicate whether or not *ARCH* effects are present. The *SIC* chooses 3 lags for equation 4.

The estimated equation for (4) is:

$$\hat{e}_t^2 = 2.70 + 0.023\hat{e}_{t-1}^2 + 0.18\hat{e}_{t-2}^2 + 0.17\hat{e}_{t-3} \tag{4'}$$

$R^2 = 0.0637$
$T = 617$

The null hypothesis of no *ARCH* effects can be written:

H$_0$: $d_1 = d_2 = d_3 = 0$ (there are no *ARCH* effects)
H$_1$: some $d_i \neq 0$ (there are *ARCH* effects)

As expected, the null hypothesis is rejected resoundingly for either the χ^2 test (χ^2 = 41.12, p-value = 0.0000), or the F-test ($F_{(df = 3,613)}$ = 14.97, p-value = 0.0000). We conclude that the process of inflation is subject to *ARCH* effects. Thus we have confirming statistical and visual evidence that small squared residuals tend to be followed by small squared residuals, and large squared residuals are more often followed by other large squared residuals.

OTHER RESULTS

The *ARCH* errors model is typically estimated simultaneously with the autoregressive model of inflation by maximum likelihood methods. That estimation also yields an estimate of the variance of the series, typically known as the h series. Again choosing $p = 6$ for the autoregressive presentation for inflation, and $p = 3$, for the variance of the series, we present the portion of the equation that represents the variance (here, h) of the inflation series (here we are less interested in the autoregressive parameters of the estimate of inflation, since many alternative inflation forecasting models are possible):

$$h_t = 1.41 + 0.17\hat{e}_{t-1}^2 + 0.40\hat{e}_{t-2}^2 + 0.15\hat{e}_{t-3}^2 \tag{5}$$
$$(2.76) \quad (6.06) \quad (2.65)$$

where h is the estimated conditional variance in inflation and the numbers in parentheses are t-statistics.

Figure 4 represents the conditional variance of inflation based on the *ARCH* model estimated by maximum likelihood methods. Two things from Figure 4 are striking for recent inflation. First, consistent with prior results, there was a marked period of tranquility, beginning near 1985 and lasting through the most recent data. This result is in marked contrast to our prior work on "headline" inflation—where we found that a new period of volatility began in approximately 1999 and extended through the current period.

As a final visual for the effects on forecasting of the increase in volatility, we offer Figure 5, an estimate of 95% error bands for inflation forecasts. In the graph, we limit the time period to the 1990s until the end of the dataset and, for simplicity, we assume a 2.5% forecast of inflation.

Figure 4: Estimated Variance of Core Inflation from the ARCH Model
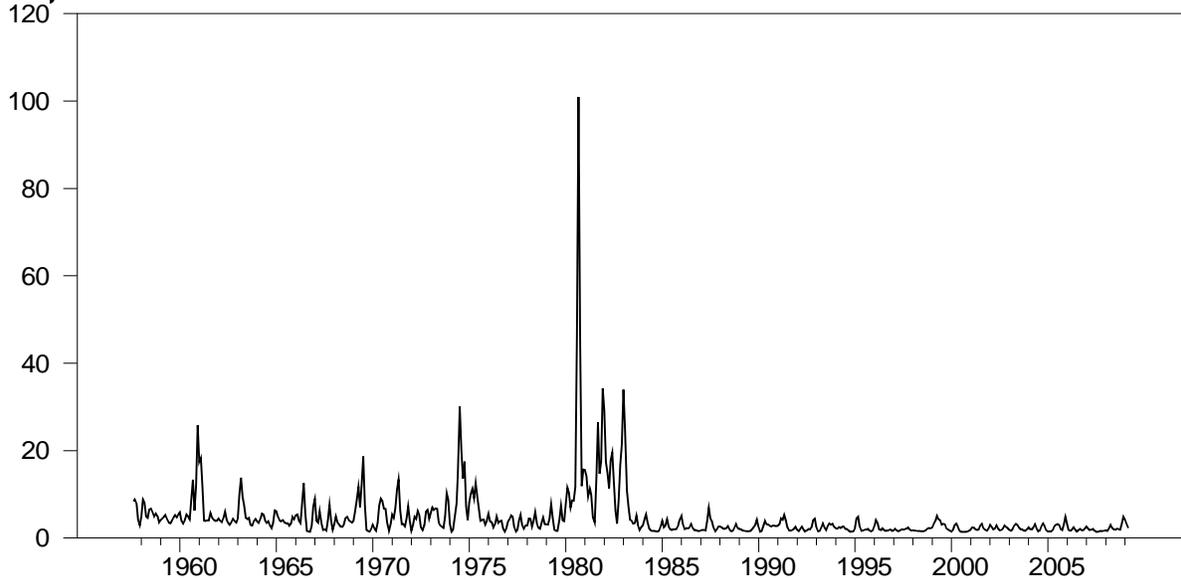
Figure 5: Ninety-Five Percent Error Bands for Core Inflation Forecasts
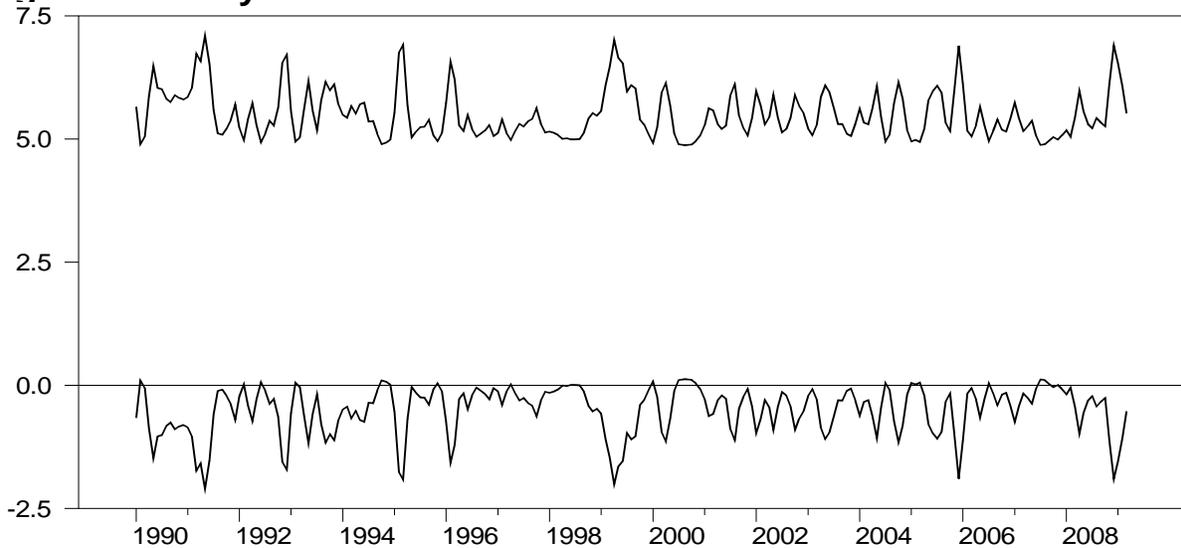
In the graph, it is once again clear that the variance in inflation, and hence the 95% confidence interval around inflation forecasts was relatively narrow from the early 1990s and has had no tendency to widen during the last ten or so years, again in contrast to our earlier findings.

To summarize the results of this section, we find in favor of *ARCH* effects for the inflation series. The statistical and visual evidence are (we think) very clear. That result is interesting, but not particularly

surprising. We do find surprising that the extremely tranquil period through most of the 1990s extends through the end of the data period.

ECONOMIC EVENTS AND INFLATION

The tranquil period of the 1990s can be considered a part of *The Great Moderation*. This term, coined by Stock and Watson [7], refers to the simultaneous reduction in the volatility of inflation and real output that began in 1984. Bernanke [1] popularized this moniker and explained that economists attribute its occurrence to structural changes in the economy, improved monetary policy, and good luck. Structural changes include the smaller share of output attributed to durable goods production, improvements in inventory management, and increased openness in international trade and capital flows. The change in monetary policy refers to the increased emphasis on fighting inflation that began in 1979. Good luck took the form of fewer exogenous shocks, such as oil and other commodity price increases and financial crises. The empirical evidence on the relative importance of these three classes of causes of decreased economic volatility is decidedly mixed and it remains an important area of research.

As noted above, our earlier research documented an increased volatility of headline inflation over the past few years. The terrorist attacks on New York and Washington, wars in Afghanistan and Iraq, oil and food price shocks, and the bursting of two speculative bubbles can all be classified as exogenous shocks. The fact that the earliest of these shocks, namely the precipitous decline in stock prices in 2000, occurred in the year *after* the current period of "headline" inflation volatility began is surprising and interesting to us.

Core inflation, on the other hand, shows no tendency at all to increased volatility since the early 1990s. Such a result may indicate that monetary policy maintained relative price and variance stability even during a period of new macroeconomic shocks to the economy.

CONCLUSIONS

This research finds in favor of modeling inflation as an *ARCH* process, consistent with much other research on inflation. Our primary findings in this paper include the following three conclusions. First, the decline in core inflation variance that began in the 1980s extends through the current period. Second, the increased variance in headline inflation that followed the period of 1990s is notably absent from the core inflation series. Third, the increased volatility noted in headline inflation is likely due solely to energy and food sectors.

REFERENCES

[1]   Bernanke, Ben S. "The Great Moderation." speech before Eastern Economic Association. Washington, DC, February 20, 2004.

[2]   Enders, Walter. *Applied Econometric Time Series.* John Wiley & Sons, Inc.: NY,   2004.

[3]   Engle, Robert F. "Autoregressive Conditional Heteroskedasticity with Estimates of the Variance of United Kingdom Inflation." *Econometrica*, 1982, 50(4), 987-1007.

[4]   Diebold, Francis X. *Elements of Forecasting*, 2nd edition. South-Western College Publishing: Cincinnati, OH, 2001.

[5]   Doan, Thomas. *RATS User's Manual*. Estima: Evanston, Illinois, 2007.

[6]   Pfitzner, C. Barry and Lang, Steven D. "When Did Inflation Become More Volatile and Why?" *2008 Southeastern Informs Conference Proceedings,* 328-334.

[7]   Stock, James and Watson, Mark. "Has the Business Cycle Changed? Evidence and Explanations." prepared for the Federal Reserve Bank of Kansas City symposium, "Monetary Policy and Uncertainty." Jackson Hole, Wyoming, August 28-30, 2003.

SITTING ON CASH – HOW AND WHEN DO YOU GET BACK IN?

Michael D. Evans, Winthrop University, evansm@winthrop.edu

ABSTRACT

In 2007 the author, a practicing financial planner, decided to adopt a new business model for managed money. This change necessitated that existing assets in most client accounts be sold in order to move to the new platform. The stock market reached a top in 2007 and subsequently declined in 2008. The author maintained the cash holdings for his clients throughout 2008 and into 2009. The market continued to decline in 2009, reaching a low on March 9th. There has been a significant rally from this point. The market, as represented by the Standard & Poor's 500 (S&P 500) is up 11.5% year-to date as of August 10th. Nonetheless, this index has a negative 7.5% three year annual return as of this date [11]. While the author was fortunate to sit on the sidelines during much of the market downturn, decisions must be made regarding when to get back into the market and how to do so. This paper explores alternative strategies for re-entering the market during a period of substantial uncertainty. The efficacy of modern portfolio theory and asset allocation will be challenged.

INTRODUCTION

The author is a Registered Representative of an independent broker-dealer firm. He has practiced as a financial planner since 1983. More recently, his practiced has focused on investment advisory services. His client base largely consists of families who are approaching retirement or are in retirement. Most clients seek a moderate growth portfolio. They are willing to under-perform when the market rises substantially. However, they expect to outperform when the market declines. Client portfolios have been designed with this objective in mind.

An institutional approach to managing money was implemented in which the basic tenets of modern portfolio theory were followed. Each client completed a questionnaire that documented investment objectives and assessed risk tolerance. A specific asset allocation was then developed for the client using asset allocation software and/or professional judgment. Either way, the goal was to minimize the level of risk for a given level of expected return. This was implemented by designing a portfolio that consisted of asset classes that had varying correlations to the market as a whole and to each other. Accordingly, allocations were typically made to:

- Domestic equities
- International equities
- Bonds
- Cash
- Real Estate

Further, equity investments were categorized based on market capitalization and style (i.e. value or growth).

Mutual funds are the investment vehicle of choice. Mutual funds offer professional management and diversification. They can be readily researched and selected for inclusion in a portfolio. Morningstar is used extensively for mutual fund research. Morningstar categorizes equity mutual funds according to "nine style boxes" [14].

FIGURE 1 – MORNINGSTAR EQUITY STYLE BOXES

	Value	Blend	Growth
Large Cap			
Mid Cap			
Small Cap			

It was not uncommon to select funds in most, if not all, of the equity style boxes for each portfolio. The value and growth styles of investing tend to go in and out of favor. Similarly, there are periods when large cap stocks outperform. In other periods, small or mid cap stocks outperform. Accordingly, investments were made in most of the style boxes as a hedge. This approach worked reasonably well until the end of 2007 and all of 2008.

A NEW APPROACH

Prior to 2007 the author utilized C share mutual funds for client portfolios. C shares were viewed favorably because the client did not incur a front-end sales charge. There is typically a contingent deferred sales charge of 1%. However, this charge disappears if the client holds the fund for at least one year after purchase. The broker receives a smaller upfront commission when C shares are purchased. However, a continuing income stream is created as long as the client continues to hold the fund(s).

In more recent years, regulators have placed increased scrutiny on the use of C shares. The concern is that clients may incur higher expenses if C shares are held for long periods of time. This may occur because the expense ratio of a C share is higher than that of the corresponding A share of the same fund. While a client incurs an upfront commission when A shares are purchased, the client may pay less total fees if the fund is held for several years. Some broker-dealer firms have placed limits on the dollar amount of C shares that can be sold to a given client. There has been some discussion about prohibiting the sale of C shares.

Accordingly, the author decided to adopt a different platform in 2007. Clients were given the option to move to the Preferred Asset Management (PAM) Account. In this new model, clients agree to pay a fixed fee based on the value of assets under management. The use of no-load mutual funds, exchange-traded funds and individual securities is available. This model provides greater transparency of annual fees and expenses, more investment options and detailed quarterly reporting of investment performance.

All clients presented with the option to move to a PAM account elected to do so. There was one major catch. C share mutual funds are not allowed in PAM accounts. Accordingly, we were required to sell all

C share mutual funds in existing client accounts. The proceeds from sale were subsequently transferred to the new PAM accounts established. It was permissible to transfer A share mutual funds to the new PAM accounts if the client had held the A shares for at least two years prior to transfer. In many cases, clients ended up with a PAM account consisting entirely of cash.

Most clients realized gains when we sold C shares in 2007. Further, substantial losses were avoided because we remained in cash throughout 2008. In fact, a positive return was generated for the year because interest income received on the uninvested cash exceeded the expenses incurred. It must be noted that the move to cash was not part of some profound ability to time the market. The author did not forecast a substantial decline in the market. The sell-off of client assets was indeed fortuitous.

Nonetheless, we remained in cash throughout 2008. Doing so ran the risk that the market would take off and leave us behind. Fortunately, this did not occur. History has shown that being out of the market when the market moves up sharply over a few days can result in significant underperformance for the full year. Thus, those holding large cash balances must decide how and when to get back into the market.

Is It Time To Get Back In?

The stock market has rallied 45% from its lows in March, yet Jack Albin, Chief Investment Officer of Harris Private Bank, suggests that stocks will head higher in the next 12 to 18 months [1]. He bases this assessment on five indicators: valuation, the economic backdrop, liquidity, psychology and momentum. A growing number of prognosticators believe that the recession is over. Stocks have posted positive returns for the six month and twelve month periods following post-World War II recessions in 9 of the 10 occurrences [9]. In a poll conducted by Barron's, nearly 60% of the money managers polled described themselves as very bullish or bullish, 28% were neutral and 13% were bearish. There is a consensus that a sweet recovery is brewing for 2010 [13]. Alternatively, A. Gary Schilling , a well-respected economist, suggests that the demise of the bear market is greatly exaggerated [10]. A large number of money managers and economists believe that the economy remains deep in the woods and requires a surge in consumer spending, business investment and home buying for sustained growth [4].

The stock market may be roaring. However, net inflows to stock funds have been anemic. Flows to stock funds remain well below their 10-year average of $7.8 billion a month [12]. Investors are waiting on the sidelines. They wonder whether the recent run up in stock prices will last [6].

Against this backdrop of divided opinion among money managers, academicians and economists, the author has decided that the risk of being entirely out of the market is one not worth taking. Accordingly, a portion of the uninvested cash in each PAM account has been put to work.

A Challenging Time For Advisors

Many advisors are saddled with guilt regarding the decimation of client portfolios during the historic decline on Wall Street. Others are frozen into inaction due to the fear of making further missteps. There is a crisis of confidence afflicting advisers [7]. Some advisers have suggested that diversification didn't work and that modern portfolio theory (MPT) is dead. Brad McMillan believes that MPT worked well. The problem was many advisers became enamored with stocks and minimized the allocation to fixed investments. Some advisers felt that they had a diversified portfolio because they made allocations to domestic and international large, mid and small-cap stocks and real estate investment trusts [8].

Brent Bodeski, a financial adviser in Rockford, IL, recommends that investors who got out of the market should start stepping back in to get back to their target asset allocations. His firm's model portfolio for a taxable account consists of the following allocations [2].

- U.S. Stocks   46%
- Foreign Stocks   19.5%
- Bonds   27%
- Other   7.5%

His model portfolio includes twenty-five mutual funds. The largest allocation (15%) is to the Vanguard Total Stock Market Index.

Larry Carroll, a financial adviser in Charlotte, NC, recommends preferred shares for investors seeking income. Mr. Carroll invests client money in mutual funds, but he also invests a portion in individual securities. His model portfolio for income-oriented clients consists of the following allocations [3].

- U. S. Stocks, Preferred Shares &
  Asset Allocation Funds   45%
- Bonds   40%
- Cash   3%
- Foreign Stocks   7%
- Commodities   5%

CONCLUSION

No one knows the shape that this recovery will take. Will it be a V shape or will there be another significant decline and then a new leg up, a so-called W shape? Given the uncertainty, it makes sense to maintain some level of exposure to the market. However, it may be advisable to structure and manage portfolios differently than we have in the past. Market volatility will likely continue. Accordingly, advisers may need to take a more active approach to portfolio management. The concept of buy and hold appears less attractive. Similarly, it may be advisable for advisers to move away from fixed asset allocations for a more flexible approach. It should be noted that a client's risk tolerance changes over time and in response to economic events. Similarly, the risk in most investments is dynamic and relative. Going forward, advisers will need to be good listeners, educators and communicators in order to structure portfolios consist with client objectives [5].

The author has decided to gradually move back into the market by designing a custom asset allocation for each PAM account. Allocations may vary from one account to another based on the unique objectives, prior experiences, financial position and perceived risk tolerance of each investor. This approach recognizes that one size does not fit all – even when investors have similarities in age, income, etc.

Mutual funds have been categorized as follows:

- Core Equity
- Core Bond
- Growth
- Income & Growth
- Asset Allocation
- International
- Defensive

The percent of a client's assets allocated to each bucket will vary over time. However, the goal is to play offense and defense at the same time. The defensive category includes funds designed to provide protection against down markets (e.g. cash) and inflation (e.g. real estate, commodities and inflation-protected securities). Initial positions have been established in each category. Additions will be made via systematic investment (i.e. automatically adding to each fund on a monthly basis). This approach should prove reasonably successful if we experience gains in the market in 2010.

REFERENCES

[1] Albin, J. "For Stocks, the Signs Point Up." *Barron's*, August 10, 2009, 17.

[2] Anand, S. "Easing Back In." *The Wall Street Journal*, July 6, 2009, R9.

[3] Anand, S. "Taking a Preferred Route." *The Wall Street Journal*, August 3, 2009, R3.

[4] Browning, E. S. and Lobb, A. "Debt Burden to Weigh on Stocks." *The Wall Street Journal*, August 10, 2009, C1.

[5] Hayden, V. "What's More Important: Client Retention or Academic Theory?" *Journal of Financial Planning*, July 2009, 34-35.

[6] Jamieson, D. "Crisis of Confidence Afflicting Advisers." *InvestmentNews*, May 18-22, 2009, 1, 38.

[7] Kapadia, R. "When to Get Back in the Market." *SmartMoney*, July 2009, 39-47.

[8] McMillan, B. "Is Modern Portfolio Theory Dead?" *InvestmentNews*, July 20th, 2009, 26.

[9] Shell, A. "When Recessions End, Stocks Win.", *USA Today*, August 10, 2009, B1.

[10] Shilling, A. G. "False Bottoms." *Forbes*, August 3, 2009, 102.

[11] *The Wall Street Journal,* August 11, 2009.

[12] Waggoner, J. "Stock Rally Barely Tempts Fund Investors." *USA Today*, August 4, 2009, B1.

[13] Willoughby, J. "The Long View." *Barron's*, April 27, 2009, 26-34.

[14] Morningstar, www.morningstar.com

PARK STERLING BANK – IS THERE a TARP in YOUR FUTURE?

Michael D. Evans, Winthrop University, evansm@winthrop.edu

ABSTRACT

Park Sterling Bank, headquartered in Charlotte, North Carolina, opened for business in October 2006. Initially, $45 million was raised by the Board of Directors to capitalize the bank. This represented the largest capital raise by a North Carolina community bank in history. The bank experienced such rapid growth during 2007 and 2008 that additional capital would be required to fuel further growth. The Board of Directors considered several alternatives to raise additional capital. This paper chronicles the alternatives considered and the ultimate choice made.

INTRODUCTION

Over the years, investing in North Carolina community banks has provided an attractive rate of return. Community banks are smaller institutions that typically have local ownership. They tend to differentiate themselves from the larger banks by catering to small and mid sized businesses and providing more responsive decision making. It has been a common practice for individuals to start a community bank, grow the bank and then subsequently sell it to a larger institution. There are also instances where there is no intent to sell. Instead the goal is to continue to operate the bank on a profitable basis.

Approximately fifteen years ago, a group of individuals came together to start Park Meridian Bank. Park Meridian Bank was sold to Regions Bank after ten years of successful operation. Key management of Park Meridian was hired by Regions Bank. They were subject to a non-compete clause. Once the non-compete expired, Bryan Kennedy, formerly the number two executive at Park Meridian, decided to start another community bank. He approached Larry Carroll, a well-respected investment adviser who had served on the Park Meridian Board of Directors, to gauge his level of interest. Larry was extremely interested in starting a new community bank and agreed to serve as Chairman.

Other business leaders were "recruited" to serve on the board of the proposed new bank. The author was asked to serve as a director and readily accepted. Each proposed director was charged with making an investment in the bank as well as soliciting other investors. The North Carolina Banking Commission required our group to raise a minimum of $27 million and a maximum of $45 million. We were able to raise $45 million in approximately two months without the services of consultants or brokerage firms. In fact, we were oversubscribed by $5 million.

The bank began operations in October 2006 and immediately experienced rapid growth. This was largely attributable to the fact that management hired bankers who had a wealth of experience in the Charlotte market. These bankers already had a book of business and they were able to bring much of this business to the new bank.

The rapid growth in loans led to large losses in the early quarters of operation. As a de novo bank, we agreed to expense 1.5% of new loans for the first three years as a cushion against bad debts. It should be noted that this is a non-cash charge. The bank became cash positive in the second full quarter of operation. Profits were generated in the fifth quarter of the bank's existence.

Typically, capital can be leveraged approximately ten times (i.e. $45 million of capital can support approximately $450 million of assets). As our asset base grew, it became readily apparent that additional capital would be required to take advantage of opportunities in the marketplace.

ALTERNATIVES FOR RAISING ADDITIONAL CAPITAL

During 2008 the board considered two alternatives for raising additional capital.

- Issuing debt
- Issuing additional shares of common stock

The second alternative was quickly rejected. The stock price of banks had declined significantly and ours was no exception. Our shares were issued at $10 per share. They rose to a high of $18.75 before falling back below $10 per share. It should be noted that our stock price fell irrespective of the fact that we were profitable. Further, we did not have a problem with non-performing loans or other real estate owned (OREO) as did a number of our peers. Our shares are thinly traded. One trade can have a tremendous impact on our stock price. A few of our shareholders decided to sell their shares at any price in response to the market decline in 2008. This significantly deflated the price of our stock.

We decided to explore further the alternative of issuing subordinated debt. Management determined that we needed $5 – 10 million of new capital. Research was conducted to determine an appropriate rate of interest for a subordinated debt offering. Discussions were held with investment bankers. We reviewed the deal structure of community banks that had recently raised additional capital. We also considered the local market (i.e. what rate would induce our existing shareholders and others to invest in the debt offering?). We believed that we could market effectively a debt offering with a maturity of ten years and an interest rate of 11%. Investment bankers confirmed that 11% was an appropriate interest rate for the debt offering of a de novo bank. It was suggested that a higher rate would be required to market the shares to institutional investors. Our attorney was instructed to prepare the appropriate documents and offering memorandum.

TARP CAPITAL PURCHASE PROGRAM

In October 2008 the United States Treasury announced the TARP Capital Purchase Program (TARP). The intent of the program is to allow U. S. financial institutions to raise additional capital and to increase lending to businesses and consumers in order to stimulate the economy [4]. Under TARP, banks can receive up to the lesser of $25 billion or 3% of risk-weighted assets. The bank in turn issues preferred stock to the Treasury. The preferred shares carry a 5% dividend yield for the first 5 years and 9% thereafter [2].

Initially, the larger banks participated in order to repair their balance sheet. Community banks balked at participating. There was concern that participation would be viewed as a sign of weakness [3]. Banks were also concerned that the government would become intrusive in daily operations and promulgate regulations viewed as unfavorable.

The Board of Park Sterling Bank viewed TARP as a relatively inexpensive way to raise capital. There are no floatation costs. The dividends cannot be deducted. However, the blended dividend rate was projected to be slightly less than the after-tax cost of the proposed debt offering. Further, we were already well-capitalized and profitable. We were not concerned that the acceptance of TARP money would somehow taint the reputation of the bank.

The Board elected to apply for $10 million of TARP funds. The application was submitted in October 2008.

Only one Charlotte-based community bank, Bank of Commerce, has received TARP funds. Approximately 161 community banks across the country had received TARP funds through February 2009 [1]. We received a few requests for additional information. However, little information regarding the status of our application was received. Given the lack of feedback and uncertainty regarding TARP, the board decided to proceed with the subordinated debt offering while the TARP application was being considered.

SUBORDINATED DEBT

In May 2009 an offering memorandum and subscription offer form was mailed to existing shareholders, select customers and other potential investors. An information meeting for prospective investors was held at a prominent country club. Attendees were informed of our goal of raising $5 – 10 million via subordinated notes with the following terms:

- $50,000 minimum purchase amount
- 11% coupon
- Quarterly interest payments
- Optional redemption at par in 5 years
- Maturity in 10 years

Financial highlights were also shared. It was noted that loans and assets had grown to $387 million and $444 million respectively as of March 31, 2009. Net income for the first quarter of 2009 was $186,000. Net income for 2008 was $1.55 million. This included a benefit from the recognition of a deferred tax asset.

Completed subscription offer forms accompanied by a check for the full purchase amount were requested by June 15, 2009. $6.9 million was raised via this debt issue. Funds received increased risk based capital to 13.5%. 10% is the threshold for a bank to be considered well-capitalized.

MOVING FORWARD

Given the success of the subordinated debt offering and the lack of communication regarding our TARP application, we decided to withdraw the TARP application. We have sufficient capital to weather the current economic storm. Further, we are positioned for further growth, either organically or via an acquisition, as opportunities present themselves.

REFERENCES

[1] "A Statistical Look at Community Bank TARP Recipients."
http://www.bankbryancave.com/a-statistical-look-at-community-bank-tarp-recipients/

[2] "New Term Sheet for Private Banks." http://www.bankbryancave.com/new-term-sheet-for-private-banks/

[3] Salow, J. "Community Banks: TARP is Not a Bailout." *Huffington Post,* February 23, 2009, http://www.huffingtonpost.com/2009/02/23/community-banks-tarp-is-n

[4] "Treasury Announces TARP Capital Purchase Program Description."
http://www.treas.gov/press/releases/hp1207.htm

Financial and Other Implication of Accepting Foreign and Domestic Payments over the Internet

By

Albert E. Avery
Department of Finance
Towson University
410-704-3185
avery@towson.edu

August 2009

Financial and Other Implication of Accepting Foreign and Domestic Payments over the Internet

by
Albert E. Avery, Department of Finance, Towson University

Abstract

The author has accepted academic conference fees from attendees over the Internet using PayPal for ten professional conferences and others are underway. Most recently, attendees of a conference held in France were given the option of paying in U.S. Dollars or Euros. The self-authored software has evolved over time to expand operational capabilities and meet the challenges of a continuously changing environment. The purpose of this paper is to describe the logic of the software and its implementation. During the process, the practical side of PayPal operations as it relates to this software and conference management will be described, including observations on credit card payment business practices, exchange rate challenges and the difficulties in trying to withdraw Euros from a PayPal account as a U.S. citizen. As one might suspect, what will work in theory frequently does not work well in practice.

Background

Until the advent of PayPal (http://www.PayPal.com) and, later, Google (http://checkout.google.com), it was not practical for regional academic organizations, such as Southeastern Informs, to accept credit card payments. For a merchant or organization to be able to process Visa, MasterCard and other credit card charges in 2006, all services offered by the major credit card companies required a $60 per month fee plus an additional fee for each transaction. If you needed a machine to swipe a card, it cost $60 per month plus transaction fees. If you did not need a machine, but wanted to post credit card payments over the Internet, the software licensing cost was $60 per month plus transaction fees.

A typical per transaction charge for a regional conference would have been 1.5% plus $0.25. Paying $60 per month for months in which there are no transactions is enough to dissuade any small organization from accepting credit cards. The percentage rate was also variable, with the rate varying in inverse proportion to total monthly transactions volume. The volume for a regional academic organization is too low to qualify for a more attractive percentage rate.

Today, the major credit card companies do have "some" competition. For example, PaySimple (http://www.PaySimple.com) advertises $34.95 per month, plus 2.29% and $.29 per transaction. Their on-line information does not provide insight into whether their offerings include accepting payments in foreign currencies, which is a must for many academic conferences, or whether there would be additional foreign transaction fees, as there currently are with PayPal. The breakeven between MasterCard/Visa and PaySimple would be 363 credit card paying conference attendees for an organization with a $100 registration fee, with PaySimple being less expensive up to the breakeven point. Similarly, the MasterCard/Visa and PayPal breakeven is in PayPal's favor up to 497 attendees.

In addition to the basic cost of accepting funds by credit card, the major credit card companies and PaySimple required a credit card to be swiped through a machine connected to a telephone line or the information entered manually over the internet. This means that some person in the organization would have to manually enter a good deal of information without error for every transaction made by each conference registrant. This is a big negative.

In addition, there is the potential problem of data security. If credit card information is stolen, the merchant may have legal liability for subsequent misdeeds of the thief.

PayPal offered the first really workable alternative to hooking up with a major credit card company. To get very attractive percentage rates and the use of their software, merchants could pay a monthly fee of $30. However, one could opt for "PayPal Standard," which involved no monthly fee and basically the same per transaction charges of 1.9% to 2.9%, based on monthly volume, plus $0.30 per transaction. The volume for professional conferences is far short of the mark for more favorable rates, so the rate then and today, is 2.9%. The additional charges and challenges involved in international transactions are described below.

To take advantage of PayPal Standard, one has to develop suitable software to transfer needed information to PayPal, including a return path, and transfer the user to the secure PayPal site, when the user clicks a "Buy Now" button. After payment, the purchaser has to click the correct button on the PayPal screen to be returned to the merchant (ConferenceMgt.com) website, where the transaction would be automatically recorded in the database, using personally-written software. If the registrant does not return to the site, the payment has to be entered manually.

PayPal versus Google

As with most oligopolistic industries, there is little pricing difference between PayPal and Google. On domestic charges, paid in U.S. Dollars (USD), the fees are identical. Costs have not declined with Google's entry into the market or declined over time.

Google is late in the game and their merchant website does not contain any information on receiving funds in foreign currencies or in receiving U.S. Dollars from a buyer outside the United States. PayPal's help leaves a lot to be desired, but Google's help sends one to a list of questions submitted by inquiring merchants, and user (not Google) responses. The response is frequently "No responses."

PayPal has a "sandbox," where merchant software can be tested. It mirrors their real domestic transaction site except that no transaction actually takes place. A developer or merchant can set himself up as a customer and experience the screens that customers will encounter domestically. Since their documentation does not tell you everything you need to know, this is a very valuable tool.

PayPal's documentation is quite good, but the website operations are changed without a simultaneous change in documentation or notification. As such, your own "help desk" in most respects. To my knowledge, PayPal does not have a sandbox that would allow a domestic merchant to simulate the experience of a foreign purchaser. Google's on-line information does not indicate that they have a sandbox.

Considerations in Development and Implementation of the Software

For an organization to rely on the Internet for data processing, the interfaces have to be obvious and transparent, easy to use and understand, and have great reliability. One of the most important tasks in running a conference is managing the financial flows and the attendant record keeping. The record of financial inflows should be in one place only, and the software should not only accommodate payments over the Internet, but also cash and checks received by the Program Chair. Since most conferences require a registration fee be paid prior to submitting to the Proceedings, there has to be a mechanism to handle an account receivable, e.g. the check is in the mail. There must be one or more vehicles to perform an extensive audit.

At least two input interfaces need to be provided, one manual and one automated, as well as software to report receipt status to the Program Chair/Treasurer and to the individual registrant. Since PayPal fees are not entirely predictable, an additional interface for the PayPal administrator is needed to note additional transaction fees associated with foreign transactions.

Most organizations have things that might be purchased beyond a registration payment, and there may be different fees for different classes of registrants. The software should provide for various registration fees, automatically adjust for late fees, and allow for additional purchases, such as one or more extra luncheon tickets or tee shirts. This requires double-entry bookkeeping.

Web Software and Interfaces

The Web-CMS (Web Conference Management System) has a basic logic to its user interfaces in which only relevant choices are offered. For example, a button to click to edit a paper appears only after the logged in person has submitted a paper. Similarly, buttons associated with downloading and reviewing papers appear only after one or more reviews have been assigned to the person.

The user interface is totally driven by the database in that there are no static html pages. All pages seen by users are streamed out on the spot by the Web-CMS software. As such, information saved to the database is immediately incorporated in the next streamed out page.

Similarly, all screens that provide the opportunity to alter database information are given confirmation screens, so a user will know for sure that a desired change has been made. This predictability makes the interfaces comfortable to use and provides the user with confidence.

The Registrant Interface and Software

There are two software routines available to the registrant.

The First Financial Choice

This routine is activated by clicking on a button entitled "Pay Conference Registration and Fees." It provides a screen that shows the items that can be purchased and, after the user has selected items of interest, shows a second screen reporting a summary of purchase quantities, currency

amounts and total purchase amount. The transaction can be cancelled on either screen. The second screen contains the PayPal "Buy Now" button, and clicking it transfers the user to the secure PayPal site.

The software that provides the first screen prepares it live from the database. The top part optionally allows one to select a registration type, such as regular registration versus student registration. Through the use of radio buttons, only one type of registration can be selected. If there is a late fee, that fee will be shown after the date specified in the database.

Below the registration choices, any number of additional purchase choices can be displayed, including the number of items being purchased, such as extra luncheon tickets. To activate one or more of these, the user clicks a checkbox. There is no option to enter a non-standard payment amount. One chooses from the choices listed from the Payments Definition File.

Once the user has been transferred to the PayPal site, control is in PayPal's hands. If the user is an existing PayPal customer, he or she may use their account to pay fees. Otherwise, domestic payments can be conveniently made using a major credit card, without the need to become a PayPal customer. This is not necessarily true for those outside the United States. Further comments on this issue appear below.

The Second Financial Choice

The second software routine is initiated by clicking "See Charges and Payments," and reports the status of purchases and payments previously made, in double-entry style. The first line or lines show descriptions of one or more items purchased and individual debit amounts. The last line normally shows a credit amount and how the total amount was paid, such as through PayPal, by cash or by check. The debit versus credit orientation is from the perspective of the organization's balance sheet.

The Program Chair (or Treasurer) Interface and Software

Since the program chair (or treasurer) is also a regular registrant, the software described above is also available. The same financial screens are shown to both the program chair and treasurer. In addition to the regular user screens, there are two additional software choices.

The First Additional Financial Choice

This routine provides the mechanism for the program chair to enter information into the database on non-PayPal payments. In addition to being able to record cash and checks received from conference participants, the software provides a generic option so that anything can be recorded manually. The program chair enters the amount and the description. An example transaction would be a partial sponsorship of a coffee break being paid by check.

If there is a need for the sponsorship to be paid by credit card through PayPal, the specifics are manually added to the Payments Definitions File, so the paying individual can log in and pay. During the time this information is in the Payments Definition File, the sponsorship information is seen by anyone who is trying to pay fees, e.g. Coffee Break Sponsorship $400.00. It is

appropriate for the PayPal administrator to maintain full control over PayPal functions, so this shortcoming is livable. If it becomes necessary at some point, the software could be rewritten to show certain Payments Definition File items to selected users only.

If a registrant sends in a check to pay for something, the program chair or treasurer uses this routine. It offers all the alternatives seen by regular users, plus the generic option and the option to enter an account receivable, so that a person sending a check can upload a Proceedings submission without the cash actually being in hand.

An important difference is in the confirmation screen. The program chair can select the whether the payment is cash, check or an account receivable, and if by check, record the check number. There is provision to also include ledger account numbers, although this function has not been used to date.

The Second Additional Financial Choice

This routine shows all payment information organized alphabetically by registrant name, and credit lines are color coded to distinguish PayPal entries from others. Thereby, it is a complete record of conference cash receipts. In addition, there is a summary near the bottom that reports the item count and total dollar amount for each item. This provides an easy to use record of registrations by type, number of extra luncheon tickets and other things.

The reported amounts are before any adjustments for PayPal or other fees, so they represent gross sales. At the very bottom, the amounts net of fees are reported, so that the organization knows at any moment the cash to actually be received.

The PayPal Administrator Interfaces and Software

All the routines above are available to the PayPal administrator, plus an additional routine to record the specifics related to PayPal charges and administration charges. It is also used during the PayPal transactions audit. ConferenceMgt.com charges a flat 1.1% fee for services as PayPal administrator and this is built into the software. During this past year, a several unpredictable charges have been added by PayPal, so each payment requires manual scrutiny and possible data entry.

The PayPal administrator performs the following functions:
- Each charge has to be checked on the PayPal website. When a payment is made, PayPal sends a confirmation e-mail to the payee and to ConferenceMgt.com. The e-mail to the administrator used to contain invoice information that could be used to determine whose fees were being paid, but it is only occasionally provided now. This unilateral change by PayPal has notably added to the administrator's workload. Quite frequently, the payee is not the registrant, but another person, such as a department secretary. The record on the PayPal site has to be opened to reveal details to determine whose fees were paid.
- The payment has to be verified as correct in the database. In some cases, web users do not click on the correct button to return from PayPal to the ConferenceMgt.com website, so their payment is not automatically entered into the database. If not there, manual entry of the transaction is required on a timely basis.

- In the process of reviewing details on the PayPal site, processing charges are reported. For domestic transactions in U.S. Dollars (USD), the standard fee is 2.9% plus $0.30 per transaction. Additional fees apply for a U.S. resident who pays in a foreign currency or any foreign transaction. These fees are further discussed below. If the charges are non-standard, the additional fees must be manually recorded in the database, so that all PayPal fees are absorbed by the organization offering the conference.
- A fourth major function is to perform an audit of amounts paid by registrants versus the cash received from PayPal. There is very little profitability in accepting conference fees, so there is no room for error. As with other assistance provided to organizations offering professional conferences, this is viewed as a professional service contribution and not a profit making endeavor.
- Fortunately, the need to handle problems has not been a frequent occurrence. Problems encountered:
  - Duplicate registration payments require issuing a refund. This is not difficult.
  - If a person pays by e-Check, the funds are not released by PayPal until the check clears, so there is a need to monitor the situation until funds are released.
  - A more serious and time consuming problem occurs if a payee decides to cancel a payment or reports it as an unauthorized payment. As an example, a faculty member used a departmental credit card to register for a foreign conference and purchase additional items for a total payment of $900.00. The department secretary did not recognize the charge and reported it as an unauthorized charge (fraud). The credit card company refused to pay PayPal and PayPal withheld the funds from ConferenceMgt.com. The secretary notified the credit card company one business day later that she was wrong and the charge should go through. This should have resolved the situation within one week. However, the information was not processed in a timely fashion by either or both PayPal and the credit card company, and this set off a very slow resolution process that can take up to three months to resolve. In this case, it appears that the process will take the full three months.

PayPal Practices and Charges

The Experience of the Organization

It would seem logical to accept registration fees in Euros when the conference is sited in the European Union, so that bills to be paid in Euros could be paid directly. Based on experience, this may not be the case, and reviewing outcomes is one of the objectives of this paper.

With such compelling logic, a course was charted to accept conference fees either in Euros or in USD. The relevant software was rewritten to accommodate Euros and to provide the registrant with the choice of payment currency. Conference fees are published at least six months in advance, so the fee in USD and Euros becomes cast in stone. However, exchange rates can change dramatically in short period of time. Not only does this impact a potential attendee's interest in attending, it impacts the ultimate charges to be paid by the organization. Not enough money is involved to justify hedging, so the organization is exposed to these exchange rate changes.

With a specific foreign conference sited in France, the registration fee was set in USD based on the USD to Euro exchange rate at the time of publication. The USD weakened, so USD receipts no longer would provide the same purchasing power in Euros. In addition, some U.S. residents decided to pay in Euros to lower their cost, and an unplanned additional PayPal charge was assessed, as discussed below.

If the PayPal account was set to accept USD only, registrants paying in Euros would have paid currency conversion fees to USD, and their payment would appear in the PayPal account in USD in the correct amount. In this case, the customer bears the cost of currency conversion, although the organization also experiences an additional fee.

As mentioned earlier, standard PayPal charges for U.S. registrants paying in USD is 2.9% plus $0.30 per transaction. Approximately six months ago, PayPal unilaterally began assessing a 1% foreign transaction fee in addition to other charges. This also applies to a U.S. resident who chooses to pay in Euros, even though the customer appears to pay all currency conversion charges.

For payments received in Euros, logic suggests that the PayPal charges would also be 2.9% plus either $0.30 or 0.30€. However, the percentage becomes 3.9% due to a foreign transactions fee. The per transaction charge is more likely to be 0.40€, depending on the country of residence of the payee. Since conference registration fees are fairly large dollar amounts, the per transaction charge has little total impact and will not be discussed further.

For registrants in other countries, paying in their local currency and converting into either USD or Euros, the size of the currency conversion fees paid by registrants was not investigated, but PayPal personnel stated that charges for their services and business practices vary from country to country.

In the normal domestic case, PayPal receipts can be electronically transferred to a checking account by providing bank account information to PayPal and using their functions to transfer funds into or out of the bank account. No additional charges are incurred. However, it is a whole new world when a U.S. business entity has authorized the receipt of Euros and has Euros in the PayPal account. The challenge is how to best get the funds out of PayPal, so that bills can be paid by the organization.

Supposedly, U.S. citizens cannot have a bank account denominated in a currency other than USD, although some countries apparently overlook this. In the European countries where attempts were made to establish a checking account, a non-resident could not set up a bank account in the local currency or in Euros. If it were possible, it appeared that there would be substantial monthly charges to maintain the account. No investigated alternatives were viable.

In this country, many program chairs use their own funds for various things and are reimbursed dollar for dollar, so there is no taxable gain or loss. Associates in France would not agree to setting up an account in Euros to serve as a pass-through, due to differences in the way taxes are assessed or the way taxable income is tracked. However, even if they would have set up a Euro account, PayPal would not allow a transfer of Euros to a foreign bank account. This includes the bank account of a co-sponsoring French university.

Several alternatives remain. First, the Euros could be converted by PayPal to USD and the funds could be transferred to a U.S. bank account. The funds could then be converted back into Euros, so the organization could pay bills. This would involve two exchanges of currency, one at PayPal's rate and another at a banking retail rate. Based on current rates, 100€ would convert to $138.93, and using a same day quote from M&T Bank, converting back to Euros would yield 91.12€. This represents an overall 8.89% loss in spendable Euros.[1]

The second alternative is to charge foreign purchases on a personal credit card. The credit card company would convert the Euros into USD for billing purposes at a reasonable rate, and the bill is paid in USD. There are several difficulties here. First, the size of conference cash flows might exceed the program chair's credit limit. Second, the program chair becomes personally responsible and potentially liable should difficulties arise. Third, not all foreign business entities will accept credit cards from foreigners. This scenario has too many negatives and is not recommended.

In the specific case of the French foreign conference, the French partner university had or set up a PayPal account denominated in Euros. The Euros in the ConferenceMgt.com account were "paid" to this partner, with no additional charges to the U.S. organization's account. This seemed reasonable and viable, but it was not without cost. The foreign partner pays fees too. Specifically, the payment comes from a foreign country, so the foreign country transaction fee of 1% applies, plus 2.9%, plus 0.40€ transaction fee. 100€ therefore becomes 95.70€, or an overall 4.3% loss in spendable Euros. Essentially, PayPal earned more than twice its normal charges on the conference receipts. While this is a significant loss, it is smaller than converting to USD and converting back to Euros. It was the best of the available alternatives.

The Experience of the Registrant

Shortly after all things were put into place, foreign registrants began having difficulties when trying to pay by credit card, and they were reporting PayPal screens that were quite different from domestic screens. This all happened about the time that the foreign transaction fee appeared, so apparently PayPal changed business practices for foreigners without notifying U.S. merchants.

Repeated calls to PayPal produced no useful results. At the time, their help department was woefully undertrained in that they repeatedly asserted that foreign screens were essentially the same as domestic screens and the same operating rules applied. Not so on both counts.

In some countries, registrants were not able to pay using a credit card without revealing personal bank account numbers and having PayPal perform a small electronic deposit to prove that the account was real. Of course, with information to make direct deposits, the information could be used for direct withdrawals. The whole notion of paying by credit card is to keep banking information confidential and financial transactions at arm's length. In countries where corruption is wide-spread, citizens are very reluctant to reveal personal information, and for good reason.

---

[1] M&T's recently quoted retail rates consume just over 7% of the amount of funds involved when either buying or selling Euros. This compares favorably with rates offered in France by hotels and other retail establishments, where the loss is as large as 10%.

For these people, an alternative would be to send a check denominated in Euros. The organization would then be exposed to bank retail rates totaling approximately 14% to cash it in the U.S. and converting the funds into Euro currency. Obviously, this is not a viable option for the organization.

In some other countries, based on the experience of several registrants, they were not able to use a credit card directly, but had to open a PayPal account in their local currency. Again, this requires the registrant to reveal bank account and personal information, and then PayPal manipulates funds in their bank account to prove the veracity of the account.

PayPal's merchant assistance group repeatedly indicated that this was not the case, so it is not wise to rely on what PayPal says about its foreign business practices. A number of foreign registrants described their experience as poor, and characterized PayPal as less than friendly or customer-oriented. The good news is that foreign customer complaints seem to be on the decline, so PayPal may be improving its practices.

The PayPal Experience

PayPal has not been approached successfully for information on several fronts, so comments here will be limited to observations on their assessment of charges on ConferenceMgt.com transactions.

It would appear that most of PayPal's costs are not transaction based. With the computer infrastructure in place, the marginal cost of a transaction is likely to be negligible. As such, for domestic operations, the 2.9% plus $0.30 per transaction essentially goes directly to gross profit.

It appears that the same is true of the 1% foreign transactions fee. When a foreign customer pays in USD, they pay a conversion fee from their local currency, and in the past no additional charge was passed on to the merchant. The foreign transactions fee increases their profit and, due to lack of competition in the market, they can charge additional fees nearly at will.

PayPal's currency exchange rate is currently very reasonable at a 2.5% deviation from the relevant currency quote. This has been verified based on actual transactions, against the St. Louis Federal Reserve exchange rate quote for noon of the day and the CNBC.com quote, which is also reported on television.

With this recognition and also the fact that PayPal makes money on both sides of many transactions, their profit potential is very large. Even if Google steps up to be a serious international competitor, the marketplace is an oligopoly and this author does not believe it will be truly competitive. The retail rates of the banking community are so unattractive that banks should not be considered competitors in this situation.

Conclusions

From the point of view of an organization that puts on professional conferences, financial planning is difficult enough without uncertainties in the actual cash receipts. Recommendations depend on the specific circumstances.

Conferences Sited in the United States

For domestic conferences in which foreign registrants are not critically important to conference success, the recommended route is to let the registrant bear the currency translation risks by specifying registration and other fees in USD. At the time the registrant pays the registration fee, the exchange rate must be acceptable or registration would not take place. The cost is certain. The ultimate cost of travel, food and lodging are the registrant's risk exposure.

The organization pays bills in USD, so nearly all is known except for the total number of registrants, minus the PayPal charges, which are one percentage point higher for foreign registrants. It is possible to specify a different registration fee for foreign participants. Given the possible perception that foreign participation is being discouraged, additional fees are not recommended.

Accepting a foreign currency for a domestic conference introduces risk to the organization because conference fees will be received over time and conversion to USD produces an uncertain amount. The organization also bears the cost of currency conversion. Nevertheless, it may be an effective marketing tool to do so. If foreign participation is important to conference success, it might be advisable, given a sufficient margin.

Conferences Sited in Foreign Countries

While the Web-CMS software has been upgraded to accept payments in any foreign currency, the decision to actually do so is not easy. As described above, the practical details associated with accepting one or more foreign currencies are not inconsequential. If the conference offered in France did not have a French university as a sponsor that also had a PayPal account, the transaction fees would have been much higher.

The most important barrier to overcome is the belief that accepting a foreign currency will provide the same amount of funds to pay conference expenses. By planning on losing purchasing power through a combination of PayPal fees, ConferenceMgt.com fees and banking fees, the outcome becomes acceptable through proper pricing. Presuming what should theoretically work will actually work in practice, with an attendant assumption of insignificant fees, is a prescription for financial disappointment.

Assume that a conference will be offered in Europe. An untested, but possibly viable alternative to minimize fees is for a foreign partner to set up a PayPal account in Euros. It would seem that the payment software could be rewritten to direct USD payments to the U.S. PayPal account and the Euro payments directed to the foreign PayPal account. In the case of the French conference, Euros paid by a French registrant would be accepted without a foreign transactions fee, and the Euro balance could be transferred to the partner organization's Euro bank account with no additional charges. This approach has not been attempted, so there is no guarantee that it would work. It is highly likely that the server used to transfer control to PayPal for payment of Euros would have to be sited in France, making implementation complicated and difficult.

Final Thoughts

Putting on a foreign professional conference is a difficult undertaking and certainly more difficult than offering a domestic conference. For a U.S. based organization and in absence of a foreign partner, accepting only USD is highly recommended, based on experience.

If success of the conference is thought to hinge on accepting a foreign currency in addition to USD, reworking software for one or more foreign partners to accept currencies other than USD is no small task, with implementation difficult.

Following the steps actually taken with the French conference is certainly viable when the sponsoring organization has a foreign partner and correctly recognizes the probable size of cash receipts during the planning process. Again, based on experience, there may be unpleasant surprises, and not limited to PayPal unilaterally changing the terms of business.

A COMPARISON OF APPROACHES TO ESTIMATING TRANSACTION EXPOSURE AND VALUE AT RISK

Robert C. Winder, Luter School of Business, Christopher Newport University, 1 University Place, Newport News, Virginia, 23606

Kashi Khazeh, Perdue School of Business, Salisbury University, 1101 Camden Avenue, Salisbury, Maryland, 21801

ABSTRACT

This paper measures the transaction exposure of a hypothetical multinational corporation doing business in five different foreign currencies for two recent time periods using the value at risk methodology. While earlier articles by the authors of this paper have assumed the expected percentage change in the exchange rate is zero, this paper employs an adaptive expectations model whereby the MNC expects the exchange rate to change by the same percentage as over the most recent 15-day period. These results are compared to the earlier calculations. This comparison could provide real-world MNCs with critical insight about how to estimate and manage the risks related to their international transactions.

INTRODUCTION AND OVERVIEW

Throughout the 1980s, the growing interdependency of the world's capital and goods markets led businesses to think and act globally. At the same time, increased competition led firms to design production processes that disregarded national boundaries. But these new opportunities to do business across borders and continents created new risks as well as new opportunities.

In the 1990s, the invention and use of complicated derivative securities created another layer of complexity not seen before. Moreover, increased volatility of interest rates and exchange rates resulted in enhanced risk exposure. Some well publicized failures of both financial and nonfinancial corporations resulting from these additional layers of risk heightened awareness that the business environment had, indeed, changed. Business managers, regulators, and even the general public sensed that the risk of insolvency had been underestimated. As a result, there was an effort to better identify and quantify the risk of a catastrophic failure in a worst case scenario.

Ultimately, this new reality led to the development and widespread use of the "value at risk" methodology for assessing risk. Value at risk is a probabilistic approach to measuring downside risk (i.e., the maximum loss) that is likely to occur within a specific time frame at a particular level of confidence. It is a specific number (e.g., a dollar value) that can be readily used to assess a corporation's risk exposure.[1] Both financial and nonfinancial companies can use this methodology. For multinational corporations, the risk of unexpected movements in foreign exchange rates is a key concern. Multinationals can employ the value at risk methodology to assess the transaction exposure associated with net cash flows denominated in one or more foreign currencies.

---

[1] As Hull (2009) describes, the usefulness of the value at risk methodology results, in part, from its relative simplicity. Senior managers don't want an arcane statistics lesson. They want to know, very simply, "how bad can things get?" (p. 452)

This research paper measures the "value at risk" (VAR) for a hypothetical multinational corporation transacting business in five specific foreign currencies for two recent time periods. The value at risk for each individual currency (for each time period) are computed and evaluated. While earlier articles about value at risk by the authors of this paper have assumed that the "expected percentage change in the exchange rate" is zero (i.e., the exchange rate is not expected to change over the relevant time period), this paper assumes an adaptive expectations model whereby the MNC expects the exchange rate to change by the same percentage as over most recent 15-day period. In short, this paper estimates value at risk including a forecasted change in the exchange rate. [See Khazeh and Winder (1) and Khazeh and Winder (2)]

The results of the more sophisticated value at risk calculations are then compared to the earlier (and simpler) calculations which implicitly assumed the MNC expected the relevant exchange rates not to change over the designated time period. Comparing these two different approaches to estimating "value at risk" for two different time periods should provide real-world MNCs with critical insight about how to estimate and manage the risks related to their international transactions.

TRANSACTION EXPOSURE AND VALUE AT RISK

Because they conduct business in a variety of currencies, multinational corporations are exposed to exchange rate risk on a continuing basis. One form of exchange rate risk is "transaction exposure" (or transaction risk). This is the risk that the MNC's cash flows will be affected by exchange rate changes. Both receivables and payables denominated in foreign currencies contribute to this risk.[2]

Optimally, this risk should be viewed on a consolidated basis; that is, across all the firm's divisions and across all countries. The transaction exposure associated with payables denominated in one particular currency (in any division) will be offset, in whole or in part, by any receivables denominated in that same currency. However, any positive (or negative) net cash flow in a particular currency will subject the MNC to transaction exposure due to potential fluctuations in exchange rates.

In certain circumstances, an MNC may decide not to hedge its transaction exposure. In other circumstances, the MNC may decide to hedge this risk using one or more techniques including a money market hedge, a futures hedge, a forward hedge, a currency option hedge, or some other technique. But in order to make these decisions (i.e., to hedge or not to hedge) in an optimal fashion, the corporation needs an objective assessment of exactly how much risk it faces. One particular approach to assessing risk that has become increasing popular since the middle of the 1990s is an approach described as "value at risk." While the value at risk approach has wide applicability, it is increasingly used by MNCs to assess transaction exposure. Articles about this approach to measuring risk are now common in the literature.

This "value at risk" technique is a probabilistic approach to measuring downside risk (i.e., the maximum loss) that is likely to occur within a specific time frame at a particular level of confidence. An MNC may utilize this methodology to assess the transaction exposure associated with net cash flows denominated in one (or each) particular currency in which it does business. If the expected percentage change in the exchange rate is zero, the downside risk (maximum loss) is a function of the standard deviation in the percentage changes of the particular exchange rate, the

---

[2] Madura (2008) provides an excellent overview of the types of risks that may result from exchange rate fluctuations, including transaction exposure.

(dollar) value of the net cash flow itself, and the desired confidence level. The "value at risk" (the maximum loss) is positively associated with each of these three variables. If the exchange rate is expected to change over the relevant time period (i.e., the "expected percentage change" is not zero), then the estimate for the expected percentage change in the exchange rate also becomes a factor in the value at risk calculation.

In addition, an MNC may utilize this basic approach to assess the riskiness of the net cash flows associated with the "portfolio" of currencies in which it transacts business. This use of the model, which measures the transaction exposure associated with the net cash flows associated with an entire "portfolio" of currencies, is particularly valuable for MNCs that transact business in multiple currencies on a routine basis. Based on standard portfolio theory, the transaction exposure (i.e., the maximum loss) in this latter case is a function of the proportions of the total portfolio in each currency, the standard deviations of the percentage changes in each exchange rate, the correlation coefficients of the percentage changes of the relevant exchange rates, the (dollar) value of the net cash flows, and the desired confidence level. If the expected percentage changes in the relevant exchange rates are not zero, then the estimates for these (nonzero) expected percentage changes also become factors in the value at risk calculations.

Of course, a portfolio of currencies whose values are highly volatile vis-à-vis the dollar (i.e., the standard deviations in percentages changes in the dollar exchange rates are high) will have a high level of transaction risk, ceteris paribus. Portfolios of currencies that possess positive and high correlation coefficients will also face more "value at risk," other things equal. On the other hand, portfolios of currencies that have low (or even negative) correlation coefficients will have less value at risk due to internal (or natural) diversification effects.

Value at risk is sensitive to the "holding period" (i.e., the particular time period being considered). For example, if a particular exchange rate varies more over a month than over a week, or if the anticipated net cash flow denominated in a particular currency is greater for the next month than the next week, then the value at risk (i.e., the maximum loss) will be greater for the next month than the next week, given the same level of confidence. Because MNCs can predict their net cash flows with far more accuracy over relatively shorter periods of time, the value at risk model is most often used for predicting the maximum loss over relatively short periods of time. However, it may be that an MNC would find it useful to predict the value at risk for longer time periods, as well.

REVIEW OF THE LITERATURE

While the expression "value at risk" is widely used, the expression does not refer to one unique methodology (or approach) to quantifying risk. Rather, it refers to a family of related approaches including: 1) the variance-covariance approach (also called the "delta normal "approach" or the "parametric approach"), 2) historical simulation, and 3) the use of Monte-Carlo simulations. Linsmeier and Pearson (2000) provide an excellent overview of the advantages and disadvantages of these three approaches to estimating value at risk.

Al Janabi (2006) provides an excellent primer on the variance-covariance method to measuring value at risk. The article by Glasserman, Heidleberger, and Shahabuddin (2002) discusses the use of Monte Carlo simulations to estimate value at risk. The following articles provide good overviews of VAR methodology or empirical tests of the different approaches: Carrada-Bravo, Hosseini, and Fernandez (2006), Tardivo (2002), Stambach (1996), Hendricks (1996), Angelidis and Degiannakis (2005), Chong (2004) and Gramlich (2002). The article by Kimball (2000)

provides an excellent perspective as to why corporations may, in fact, be prone to miscalculate risk.

As described in the introduction to this paper, increasing globalization, the increased use of derivatives, and a number of blockbuster business failures all contributed to a heightened sensitivity to risk. Platt (2007), for example, provides an excellent discussion of the increased use of value at risk resulting from globalization. Beyond these key environmental changes, the usage of value at risk (VAR) as a management tool increased significantly in the second half of the 1990s as the Securities and Exchange Commission required that publicly held corporations quantify and disclose their market risk associated with volatility in foreign currency exchange rates, interest rates, commodity prices, and additional risk factors using VAR or comparable methods. (See Thiem and Ruiz-Zaiko, 1998) Another factor which promoted the usage of VAR was the Basle II Capital Accord (1997) which required that bank regulators set capital requirements (for individual banks) based on the bank's value at risk. (See Sacks, 1997)

Despite the widespread usage of the value at risk methodology, the potential shortcomings of this approach to measuring downside risk are fairly well known. One of these shortcomings is the possibility that the assumption the variable (or variables) in question is normally distributed is incorrect. Articles that explore the implications of nonnormal distributions, including fat tails and how to employ VAR in these cases (sometimes referred to as "extreme value theory"), include Neftci (2000), Hull and White (1998), Bekiros (2008), Novak, Dalla, and Giraitis (2007), Yamai and Yoshiba (2005), Ferreira (2005), Castellano and Giacometti (2001), Taylor (2000), Mittnik and Paolella (2000), Kaut, Vladimirou, Wallace, and Zenios (2007), and Ghaoui, Oks, and Oustry (2003).

Another potential vulnerability of the VAR approach is that the ability to forecast volatility deteriorates as the time horizon (or "holding period") lengthens. Relevant articles include Christoffersen and Diebold (2000), Fernandez (2005), and Chiu, Lee, and Hung (2005). Jorion (1996) discusses how VAR analyses may be subject to "estimation error" and how VAR forecasts can be improved.

The article by Artzner, Delbaen, Eber and Heath (1999) describes a modification of the basic value at risk methodology referred to as "conditional value at risk" (CVAR) which evaluates the risk the corporation faces given (i.e., assuming) the loss will exceed the VAR. In other words, CVAR attempts to provide information on exactly how big the loss is likely to be, assuming the loss will exceed the VAR at a particular confidence level. Basak and Shapiro (2002) and Alexander and Baptista (2004) pursue the "conditional value at risk" concept.

Despite the potential weaknesses of the VAR approach to measuring risk, a reasonably accurate, albeit imperfect, measure of risk is preferable to ignorance or avoidant behavior. The article by Jorion (2002) presents evidence the "VAR disclosures [by commercial banks] are informative in that they predict the variability of trading revenues."

In the last several years, most textbooks on risk management (or derivatives) have added chapters on value at risk. Excellent examples include Hull (2009) and Chance and Brooks (2007). The international finance text by Madura (2008) includes a good discussion of how value at risk can be employed in the specific context of managing transaction exposure due to fluctuating exchange rates.

OVERVIEW OF METHODOLOGY

The transaction exposure (transaction risk) of conducting business in a particular foreign currency is a function of the standard deviation in the daily percentage changes of the particular exchange rate and the desired confidence level. More specifically, the risk associated with doing business in "currency Y" is, at the 95-percent confidence level, given by:

Maximum one-day loss = $E(e_t) - (1.65 \times \sigma_y)$ Equation 1

where $E(e_t)$ = the expected percentage change in the exchange rate

σ_y = the standard deviation in the daily percentage change of the
        exchange rate

Obviously, if the expected percentage change in the exchange rate is zero, the maximum one-day loss at the 95-percent confidence level is simply $(1.65 \times \sigma_y)$. Or, in other words, the likelihood of the corporation experiencing a loss greater than $(1.65 \times \sigma_y)$ is less than 5 percent.

Based on accepted portfolio theory, the standard deviation in the daily percentage changes of a two-currency portfolio can be measured as follows:

$$\sigma_P = \sqrt{W_X^2 \sigma_X^2 + W_Y^2 \sigma_Y^2 + 2W_X W_Y \sigma_X \sigma_Y CORR_{XY}}$$ Equation 2

where:
σ_p = the standard deviation of the two-currency portfolio
W_X = proportion of the total portfolio in currency X
W_Y = proportion of the total portfolio in currency Y
σ_X = the standard deviation in the daily percentage changes in currency X
σ_Y = the standard deviation in the daily percentage changes in currency Y
$CORR_{XY}$ = the correlation coefficient of the daily percentage changes between
        currencies X and Y

The risk associated with carrying net positions in this two-currency portfolio is, at the 95-percent confidence level, given by:

Max. one-day loss of the currency portfolio = $E(e_t) - (1.65 \times \sigma_p)$ Equation 3

where $E(e_t)$ = the expected percentage change in exchange rate

σ_p = the standard deviation in the daily percentage change of the
        currency portfolio

If the expected percentage change in the exchange rate is zero, the maximum one-day loss at the 95-percent confidence level is simply $(1.65 \times \sigma_p)$. Or, in other words, the likelihood of the corporation experiencing a loss greater than $(1.65 \times \sigma_p)$ on the entire portfolio is less than 5 percent.

This paper measures the "value at risk" (VAR) for a hypothetical multinational corporation transacting business in five specific foreign currencies for two recent time periods using the variance-covariance approach (also called the delta normal approach). The five currencies

evaluated include: the Swiss franc, the British pound, the Euro, the Canadian dollar, and the Japanese yen (i.e., all vis-à-vis the U.S. dollar). The two time periods are i) from February 12, 2007 through March 30, 2007, and ii) from September 3, 2007 through October 12, 2007. Each time period includes thirty consecutive observations on the relevant spot exchange rates.

However, while previous articles about value at risk by the authors of this paper have assumed that the "expected percentage change in the exchange rate" is zero, i.e., the exchange rate is not expected to change over the relevant time period [See Khazeh and Winder (1) and Khazeh and Winder (2)], this paper assumes an adaptive expectations model whereby the MNC expects the exchange rate to change by the same percentage as the average for the most recent 15-day period. In effect, these VAR calculations include a forecasted change in the exchange rate based on the most recent 15-day period. The results of these calculations are then compared to the authors' earlier results (i.e., which assumed the expected percentage change in the exchange rate is zero).

EMPIRICAL RESULTS AND DISCUSSION

The results for each of the five individual currencies (i.e., their dollar exchange rates), for each of the two time periods, are shown below in Exhibits 1 through 10. For each Exhibit, the first (top) histogram indicates the value at risk assuming no expected percentage change in the exchange rate (i.e., $E(e_t)$ from Equation 1 is assumed to be zero). The second (lower) histogram indicates the value at risk assuming a percentage change in the exchange rate equal to the average percentage change for the prior fifteen trading days (i.e., a fifteen-day moving average). Because these latter VAR calculations include a forecasted exchange rate change equal to the average percentage change over the prior 15-day period, the value at risk is calculated for only the last 15 days of each of the two 30-day periods.

As can be seen in the Exhibits, the VAR calculations which include a forecasted change in the exchange rate based on a 15-day moving average (i.e., the lower histograms) indicate <u>less</u> value at risk for each currency and for each time period.[3] For example, Exhibit 1 (representing the U.S. dollar/British pound exchange rate for the Feb.-March, 2007 time period) shows that assuming no expected change in the exchange rate the VAR for the first day was slightly more than .4 percent (i.e., .4 percent of the MNCs net cash flow denominated in British pounds). By comparison, assuming the U.S. dollar/British pound exchange rate would change by the same percentage as the average for the previous 15 trading days, the VAR was just slightly more than .1 percent. For the fifteenth day, the same comparison was a VAR of slightly more than .6 percent and a VAR of a little more than .3 percent.

The reason why the VAR is reduced when the calculation includes a nonzero expected percentage change in the exchange rate is, of course, that the U.S dollar depreciated against each of the five foreign currencies during the Feb.-March, 2007 time period. In the context of Equation 1, $E(e_t)$ was therefore assumed to be a positive number (based on the average percentage change in the dollar/pound exchange rate over the prior 15-day period). Conceptually, if the risk associated

---

[3] It should be noted that the comparisons shown in Exhibits 1 through 10 implicitly assume that the MNC has net cash <u>receivables</u> (i.e. inflows) denominated is each of the foreign currencies. While this assumption is plausible (for example, a U.S.-based MNC might sell a product is various foreign markets, thereby resulting is receivables denominated in each respective foreign currency), it is also possible that an MNC could have net cash <u>payables</u> in a particular foreign currency. In this latter case, the value at risk calculations which include a nonzero exchange rate change would be greater than under the zero percentage change assumption during a time when the U.S. dollar is expected to depreciate.

with the dollar/pound exchange rate is .6 percent at a particular confidence level, but the dollar is expected to depreciate by .2 percent (or, alternatively, the value of the foreign currency is expected to rise by .2 percent), the VAR would be reduced to just .4 percent of the net cash flow.

Exhibit 2 indicates a similar phenomenon with respect to the Japanese yen for the Feb./March, 2007 period, except that the VAR is greater due to the greater volatility in the underlying U.S. dollar/Japanese yen exchange rate. Still, because the dollar was generally depreciating vis-à-vis the yen, when a depreciation of the U.S. dollar is built into the calculation, the VAR is reduced. As a specific example, for the first day, the value at risk assuming no change in the exchange rate was approximately 1.4 percent while the value at risk assuming a change in the exchange rate (equal to the average percentage change over the prior fifteen days) was approximately .7 percent of the net cash flow. The results for the additional three currencies (shown in Exhibits 3-5) are consistent with the findings for the British pound and the Japanese yen. In general, including a nonzero change in the exchange rate reduces the VAR by roughly one-half.

Overall, the findings for the Sept.-Oct. 2007 time period are similar (see Exhibits 6-10). While the value at risk is greatest for net cash flows denominated in Japanese yen, the inclusion of a nonzero change in the exchange rates reduces the value at risk by roughly one-half.

CONCEPTUAL AND PRACTICAL CONSIDERATIONS FOR THE FUTURE

These findings raise both conceptual and practical considerations about using the increasingly popular value at risk methodology for assessing transaction exposure. As noted above, the inclusion of a nonzero expected percentage change in the exchange rate in the VAR calculations of transaction exposure will always reduce the value at risk on net receivables (both in percent as well as the actual dollar value) if the U.S. dollar is expected to depreciate vis-à-vis the foreign currency. An appreciation of the U.S. dollar, of course, will have the opposite effect.

Conceptually, the percentage change in the exchange rate, $E(e_t)$, is not viewed as probabilistic in the context of the model. Rather, it is assumed to be known with certainty. Nonetheless, how much confidence an MNC can have in such a forecast is unclear. Ultimately, if the MNC chooses to build into the VAR calculation a nonzero percentage change in the exchange rate, the accuracy of the VAR estimate will depend, in part, on the accuracy of the exchange rate forecast. In this event, estimating value at risk is to some extent an exercise is forecasting changes in exchange rates. The adaptive expectations approach utilized in this study may, or may not, be desirable in this regard.

As a practical matter, the best option may be for the MNC to assume that the relevant exchange rate(s) will not change (i.e., assume that $E(e_t)$ is zero) over the relevant time period. This may be desirable, in particular, for very short holding periods (such as one day) or in cases where the change in the exchange rate is likely to be small in relation to the variability of the exchange rate (i.e., σ_y).[4]

As Hull (2009) describes, "It is customary…to assume that the expected change in a market variable over the time period considered is zero. This is not strictly true, but it is a reasonable assumption. The expected change in the price of a market variable over a short time period is

---

[4] The standard deviation for a longer holding period of N days will approximately equal the standard deviation for one day multiplied by the square root of N. For example, the standard deviation for a holding period of 25 trading days will be approximately five time the standard deviation for a holding period of one day. For more discussion see Hull (2009), p. 456.

generally small when compared with the standard deviation of the change." (p. 456) Chance and Brooks (2007) similarly observe "… it is fairly common to assume a zero expected value. This is because one day is a common holding period over which to calculate a VAR and the expected daily return is very small. A typical VAR calculation is much more highly influenced by the volatility than by the expected return." (p. 531)

Having made this point, it is true, nonetheless, that the inclusion of a nonzero expected change in the exchange rate significantly impacted the values at risk for these particular currencies and for these specific time periods. It should also be noted that the specific examples provided by Hull (2009) and by Chance and Brooks (2007) refer to using value at risk methodology to determine the maximum downside risk associated with equity prices, not foreign currencies. It is unclear whether their views can be generalized to a broader array of financial assets.

For the future, it may be valuable to examine additional time periods to evaluate the impact of including a nonzero change in the exchange rate. If it can be established that the two time periods evaluated in this paper were atypical, and that for most periods the volatility (i.e., the standard deviation) in the exchange rate does, in fact, dominate the expected change, the assumption of no change in the exchange rate gains credibility. It may also be worthwhile to evaluate longer time periods (e.g., one week or one month) to determine the sensitivity of the results to the length of the holding period.

Exhibit 1--Spring 2007 Comparisons for the British Pound (for Net Receivables)

Maximum 1-day loss based on % change with no expected currency change

Maximum 1-day loss based on % change with expected currency change
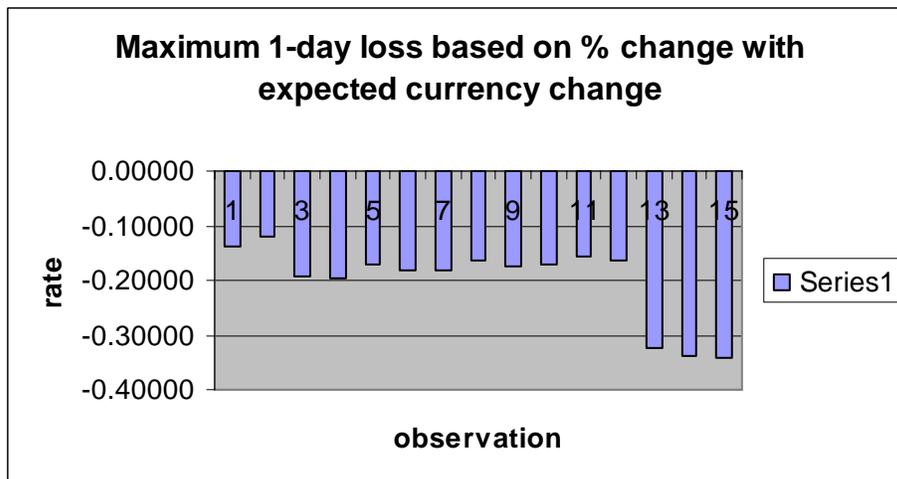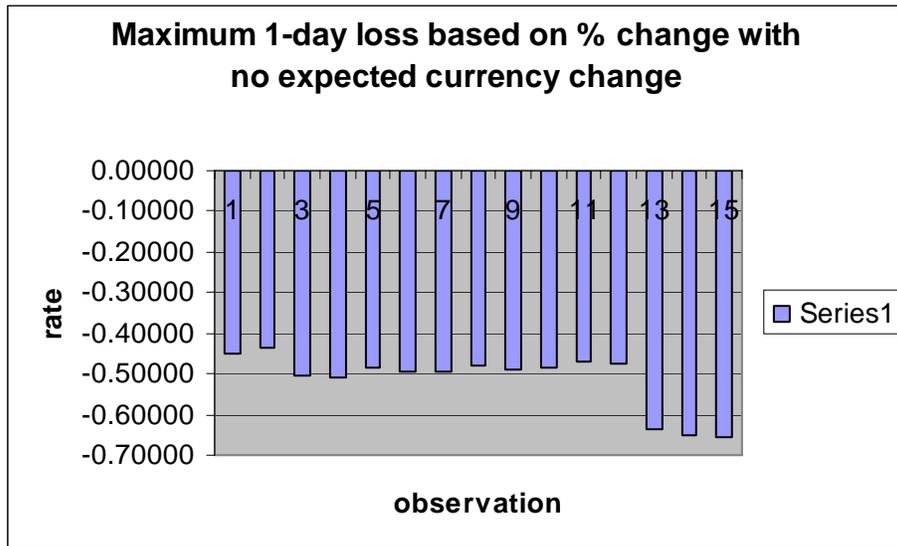
Exhibit 2--Spring 2007 Comparisons for the Japanese Yen (for Net Receivables)

Maximum 1-day loss based on % change with no expected currency change

Maximum 1-day loss based on % change with expected currency change
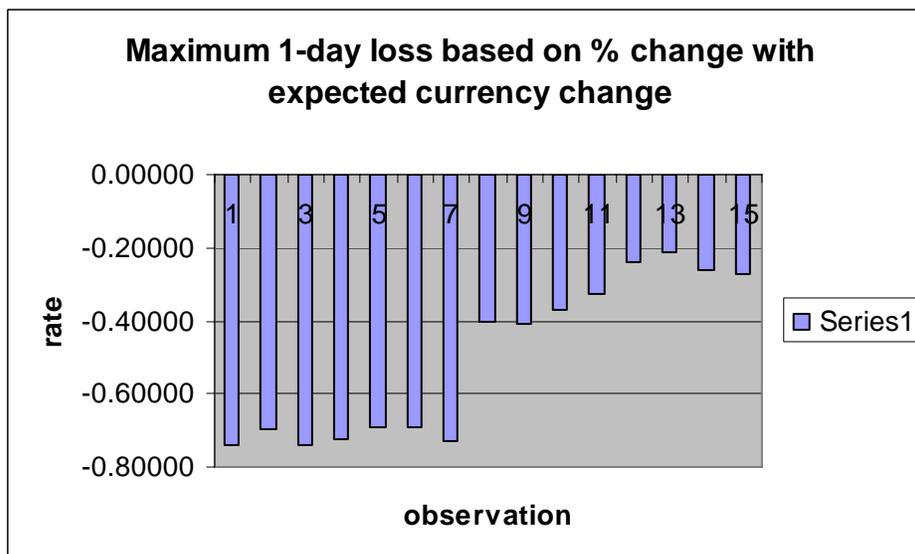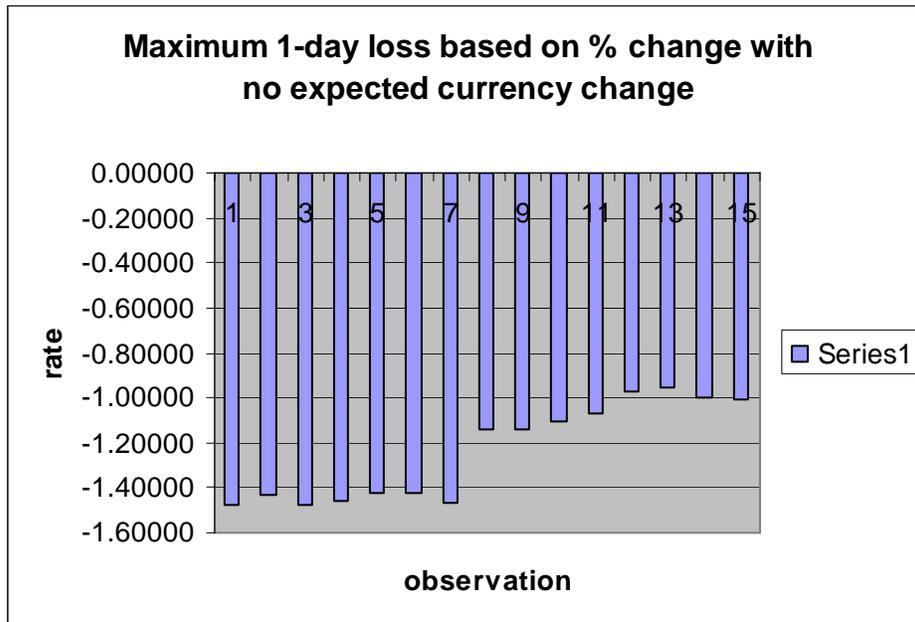
Exhibit 3--Spring 2007 Comparisons for the Swiss Franc (for Net Receivables)
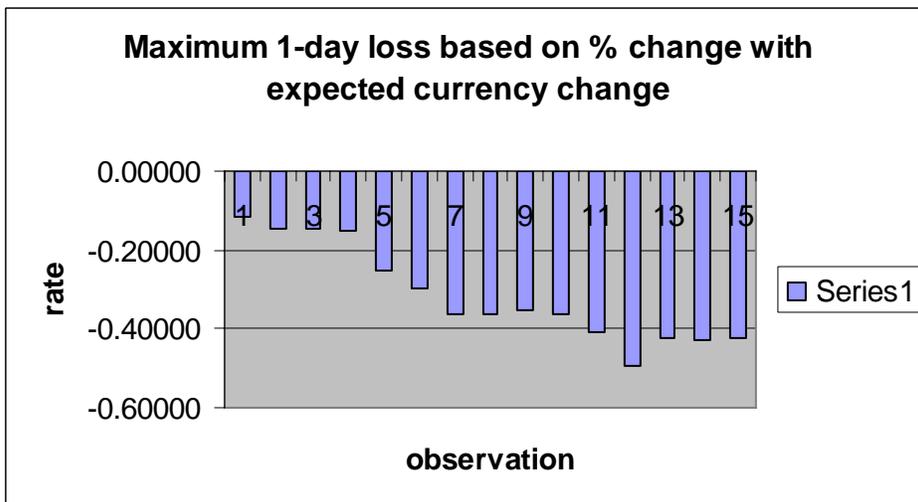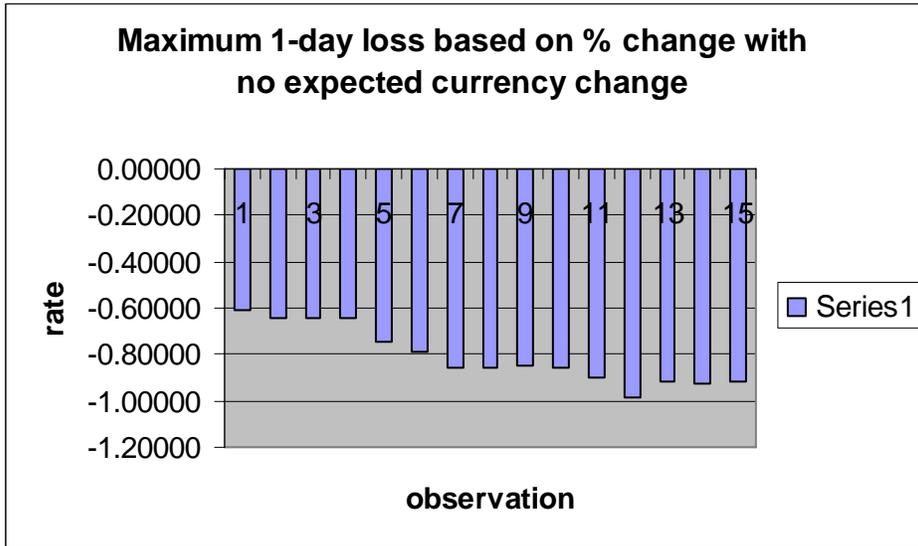
Exhibit 4--Spring 2007 Comparisons for the Euro (for Net Receivables)

**Maximum 1-day loss based on % change
with no expected currency change**

**Maximum 1-day loss based on % change
with expected currency change**
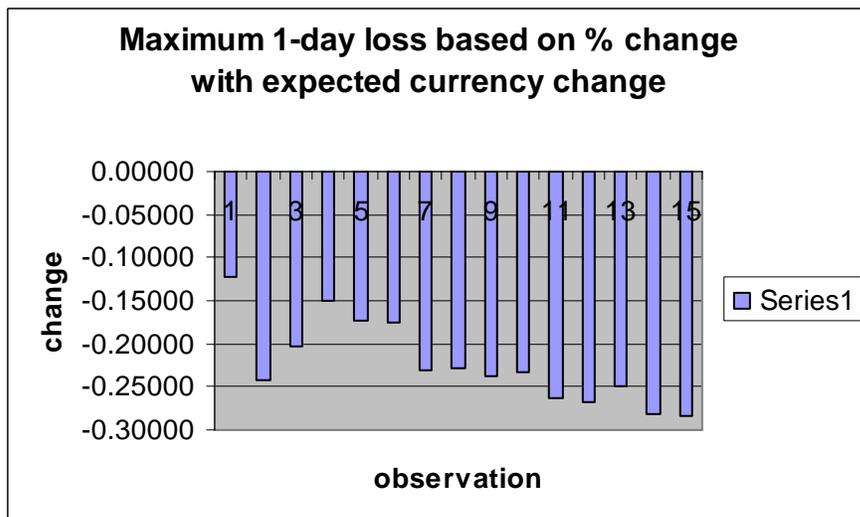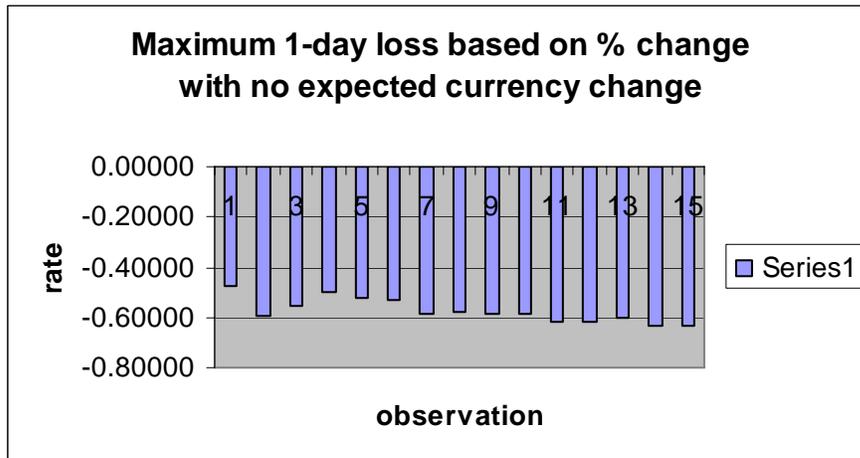
Exhibit 5--Spring 2007 Comparison for the Canadian Dollar (for Net Receivables)

Maximum 1-day loss based on % change with no expected currency change

Maximum 1-day loss based on % change with expected currency change
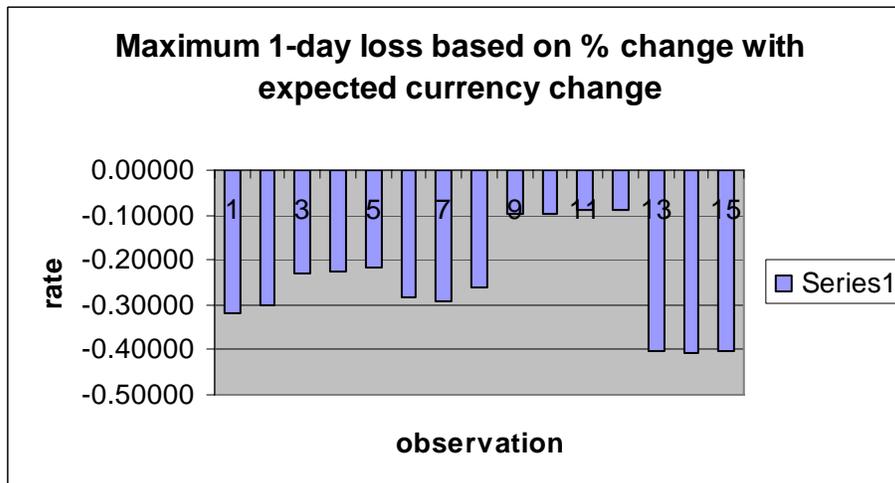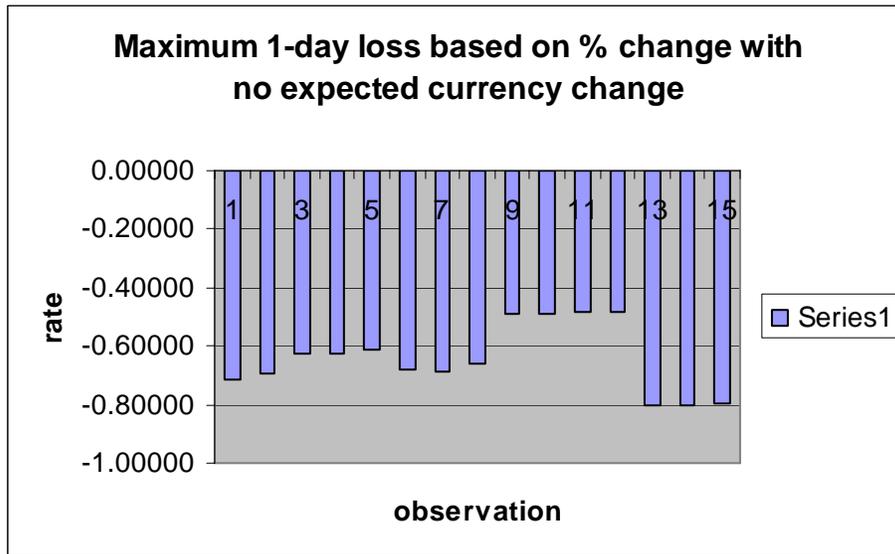
Exhibit 6--Fall 2007 Comparisons for the British Pound (for Net Receivables)

Maximum 1-day loss based on % change with no expected currency change

Maximum 1-day loss based on % change with expected currency change
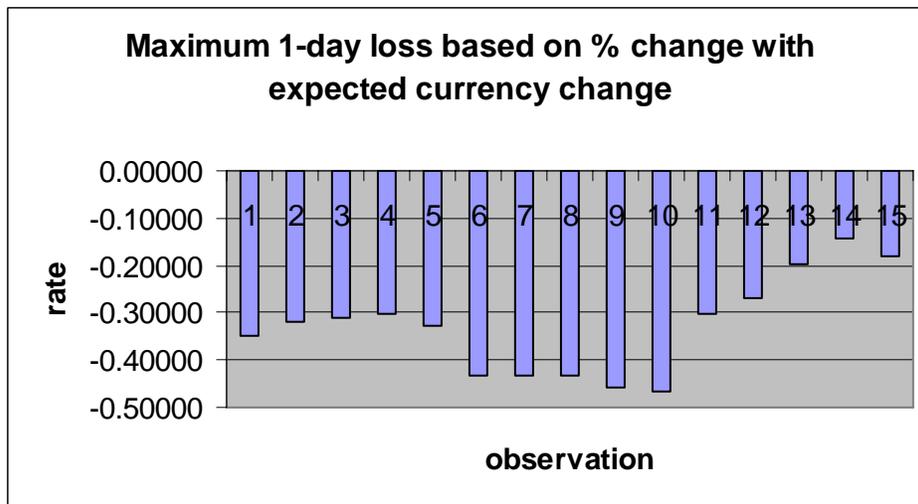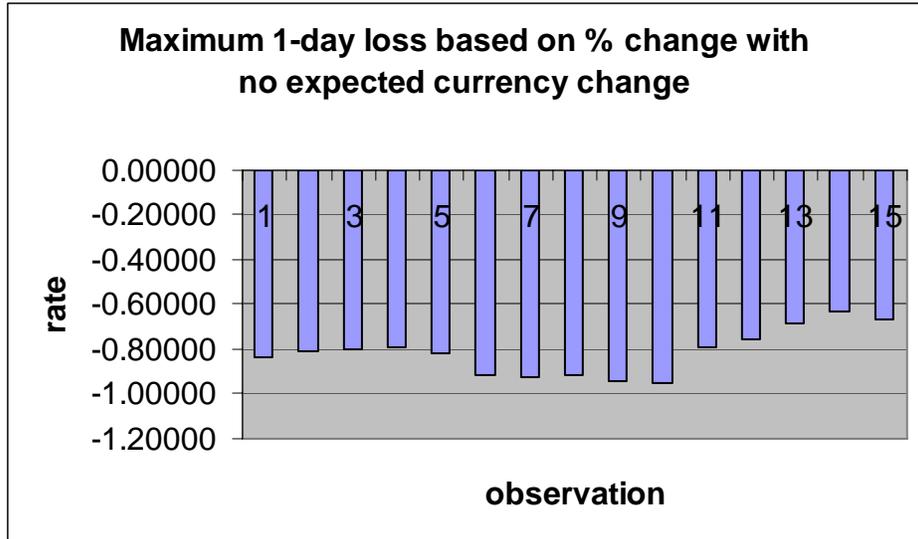
Exhibit 7--Fall 2007 Comparisons for the Japanese Yen (for Net Receivables)

Maximum 1-day loss based on % change with no expected currency change

Maximum 1-day loss based on % change with expected currency change
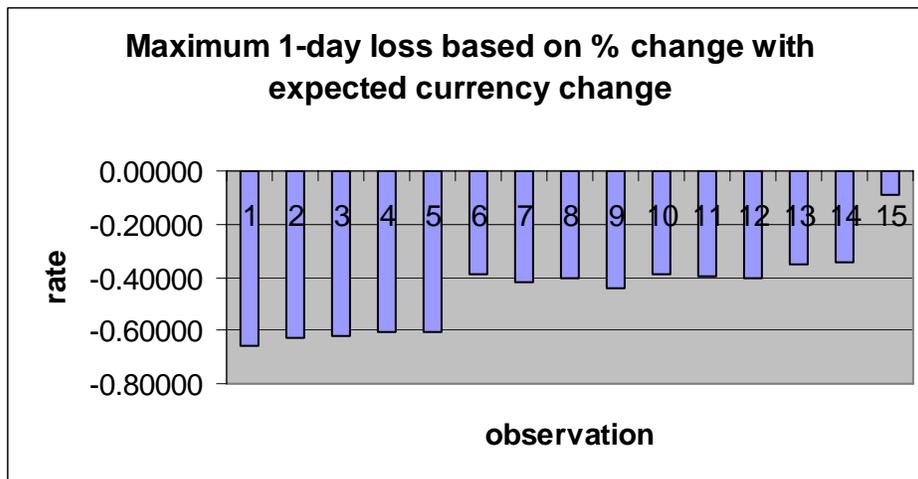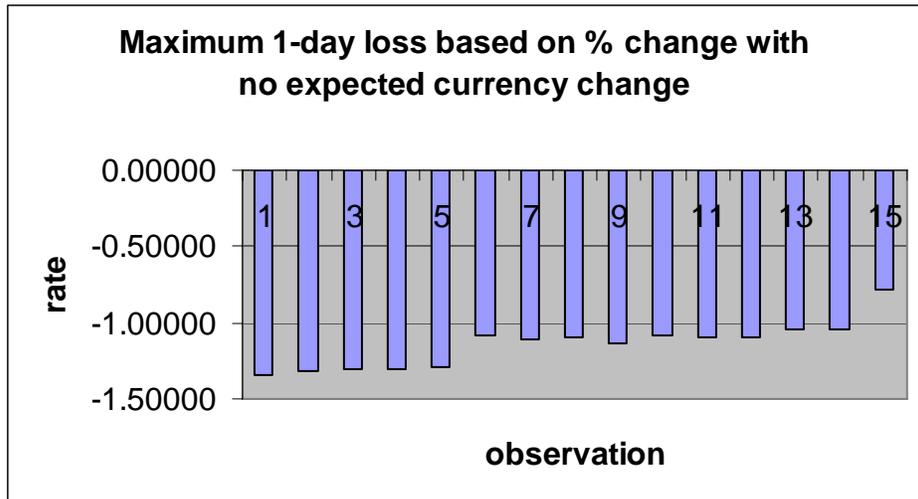
Exhibit 8--Fall 2007 Comparisons for the Swiss Franc (for Net Receivables)

Maximum 1-day loss based on % change with no expected currency change

Maximum 1-day loss based on % change with expected currency change
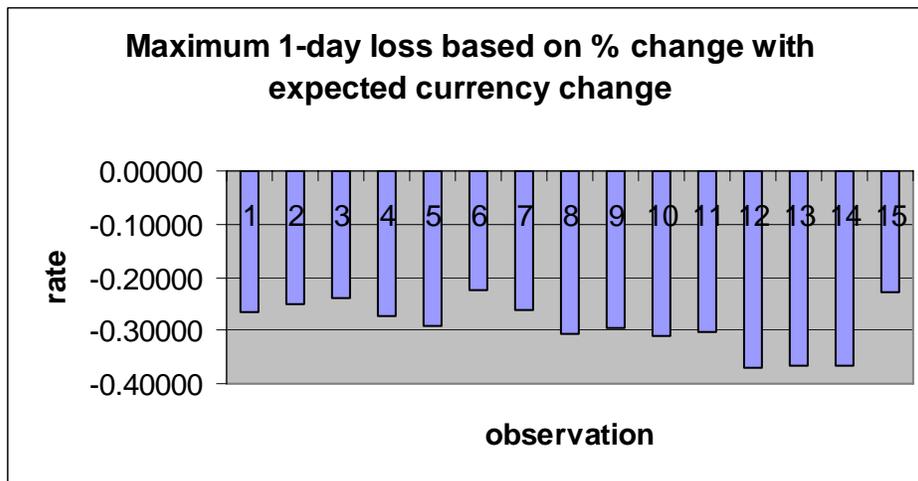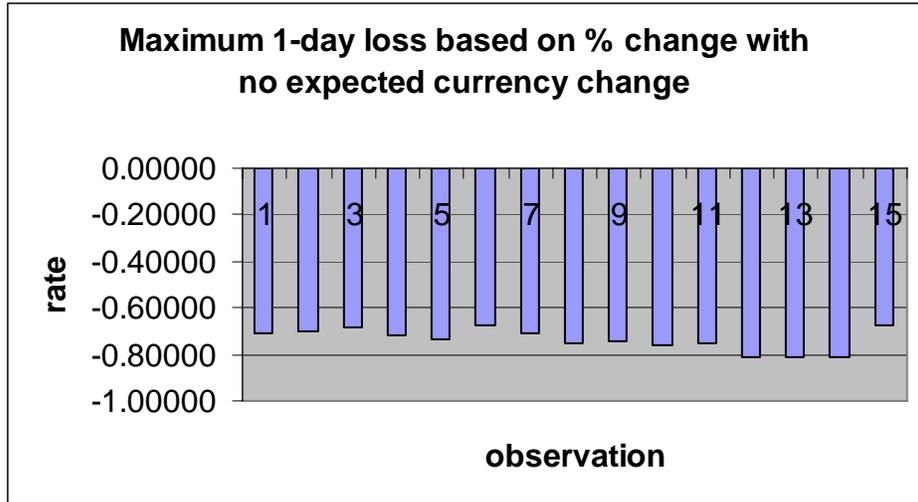
Exhibit 9--Fall 2007 Comparisons for the Euro (for Net Receivables)

Maximum 1-day loss based on % change with no expected currency change

Maximum 1-day loss based on % change with expected currency change
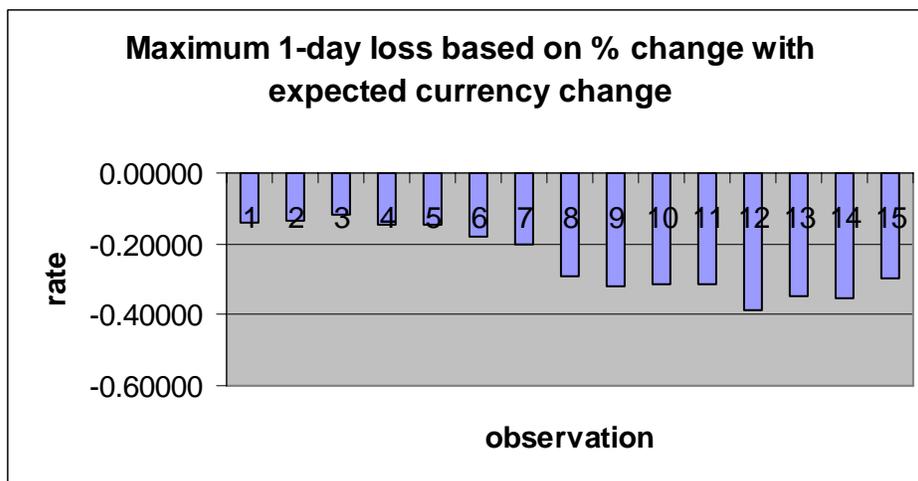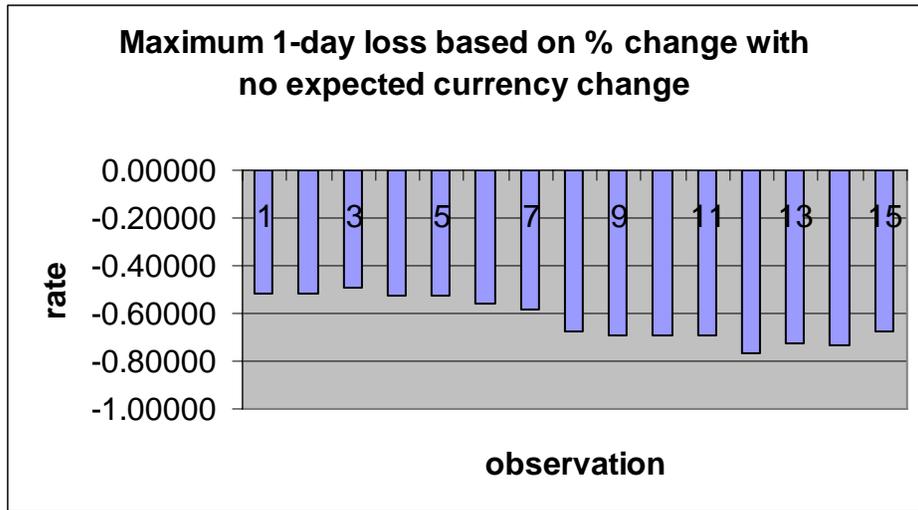
Exhibit 10--Fall 2007 Comparisons for the Canadian Dollar (for Net Receivables)

Maximum 1-day loss based on % change with no expected currency change

Maximum 1-day loss based on % change with expected currency change
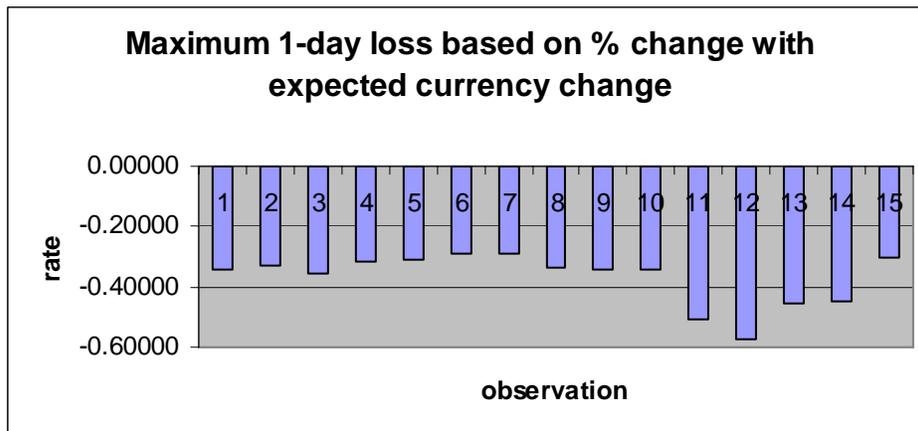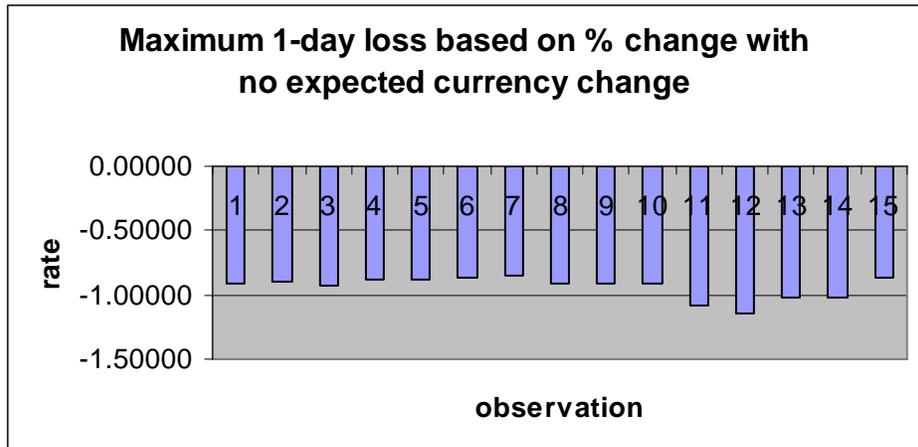
REFERENCES

Alexander, G. and Baptista, A., "A Comparison of VAR and CVAR Constraints on Portfolio Selection with the Mean-Variance Model," *Management Science*, 2004, 50(9), 1261-1273.

Al Janabi, M. A. M. "Foreign Exchange Trading Risk Management with Value at Risk: Case Analysis of the Moroccan Market." *The Journal of Risk Finance*, 2006, 7(3), 273-291.

Angelidis, T. and Degiannakis, S. "Modelling Risk for Long and Short Trading Positions." *The Journal of Risk Finance*, 2005, 6(3), 226-238.

Artzner, A., Delbean, F., Eber, J., and Heath, D., "Coherent Measures of Risk," *Mathematical Finance*, 1999, 9(3), 203-228.

Basak, S. and Shapiro, A., "Value-at-Risk-Based Risk Management: Optimal Policies and Asset Prices," *The Review of Financial Studies*, 2001, 14(2), 371-405.

Bekiros, S. D. and Georgoutsos, D. A. "Extreme Returns and the Contagion Effect between the Foreign Exchange and Stock Market: Evidence from Cyprus." *Applied Financial Economics*, 2008, 18(3), 239-254.

Carrada-Bravo, F., Hosseini, H. K. and Fernandez, L. "Currency Risk Management: Simulating the Canadian Dollar." *International Journal of Managerial Finance*, 2006, 2(1), 77-89.

Castellano, R.and Giacometti, R. "Performance of a Hedged Stochastic Portfolio in the Presence of Extreme Events." *Computational Economics*, 2001, 17(2-3), 239-252.

Chance, D. and Brooks, R., An Introduction to Derivatives and Risk Management, Seventh Edition, 2007, South-Western Cengage Learning, Mason, OH.

Chiu, C. L., Lee, M. C. and Hung, J. C. "Estimation of Value at Risk Under Jump Dynamics and Asymmetric Information." Applied financial Economics, 2005, 15(15(, 1095-1106.

Chong, J. "Value at Risk from Econometric Models and Implied from Currency Options." *Journal of Forecasting*, 2004, 23(8), 603-620.

Christoffersen, P. F. and Diebold, F. X. "How Relevant is Volatility Forecasting for Financial Risk?" *The Review of Economics and Statistics*, 2000, 82(1), 12-22.

Fernandez, V. P., "The International CAPM and a Wavelet-Based Decomposition of Value at Risk." *Studies in Nonlinear Dynamics and Econometrics*, 2005, 4(1), 1-35.

Ferreira, M. "Evaluating Interest Rate Covariance Models within a Value at Risk Framework." Journal of Financial Econometrics, 2005, 3(1), 126-168.

Ghaoui, L. Oks, M. and Oustry, F. "Worst Case Value at Risk and Robust Portfolio Optimization: A Conic Programming Approach." *Operations Research*, 2003, 51(4), 543-556.

Glasserman, P. Heidelberger, P. and Shahabuddin, P. "Variance Reduction Techniques for Estimating Value at Risk." *Management Science*, 2000, 46(10), 1349-1364.

Gramlich, D. "Cross Risks in International Finance." *Journal of Financial Management and Analysis*, 2002, 15(2), 1-8.

Hendricks, D. "Evaluation of Value at Risk Models Using Historic Data." *Economic Policy Review-Federal Reserve Bank of New York*, 1996, 2(1), 39-69.

Hull, J. and White, A. 'Value at Risk when Daily Changes in Market Variables are Not Normally Distributed." *Journal of Derivatives*, 1998, 5(3), 9-19.

Hull, J., Options, Futures, and Other Derivatives, Seventh Edition, 2009, Pearson Prentice Hall, Upper Saddle River, NJ.

Jorion, P. "How Informative Are Value at Risk Disclosures?" *The Accounting Review*, 2002, 77(4), 911-931.

Jorion, P., "Measuring the Risk in Value at Risk," *Financial Analysts Journal*, 1996, 52(6), 47-56.

Kaut, M., Vladimirou, H., Wallace, W. and Zenios, S. "Stability Analysis of Portfolio Management with Conditional Value at Risk." *Quantitative Finance*, 2007, 7(4), 397-409.

Khazeh, K., and Winder, R., "Measuring Transaction Exposure Using Value at Risk: A Comparison of Two Different Time Periods," presented at the Annual Meeting of the Association for Global Business, Newport Beach, California, November 20-22, 2008.

Khazeh, K. and Winder, R., "Transaction Exposure and Value at Risk: A Practical Application for MNCs," presented at the Annual Meeting of the Southeast Institute for Operations Research and Management Sciences, Myrtle Beach, South Carolina, October 3-4, 2008.

Kimball, R., "Failures in Risk Management," *New England Economic Review*, 2000, Jan/Feb, 3-12.

Linsmeier, T., and Pearson, N., "Value at Risk," *Financial Analysts Journal*, 2000, 56(2), 47-67.

Madura, J. International Financial Management. Thomson-Southwestern Publishers, 2008.

Mittnik, S. and Paolella, m. 'Conditional Density and Value at Risk Prediction of Asian Currency Exchange Rates." *Journal of Forecasting*, 2000, 19(4), 313-333.

Neftci, S. N. "Value at Risk Calculations, Extreme Events, and Tail Estimation." *Journal of Derivatives*, 2000, 7(3), 23-37.

Novak, S. Y., Dalla, V. and Giraitis, L. "Evaluating Currency Risk in Emerging Markets." *Acta Applicandae Mathematicae*, 2007, 97(1), 163-173.

Platt, G. "Increased Volatility in Exchange Rates Spurs Adoption of Best Practices in Currency-Risk Management." *Global Finance*, 2007, 21(5), 72-75.

Sacks, J. "Managing Market Risk: Science versus Art of Science and Art." *The Bankers Magazine*, 1997, 180(3), 27-31.

Stambauch, F. "Risk and Value at Risk." *European Management Journal*, 1996, 14(6), 612-621.

Tardivo, G. "Value at Risk: the New Benchmark for Managing Market risk." *Journal of Financial Management and Analysis*, 2002, 15(1), 16-26.

Taylor, J. W. "A Quantile Regression Neural Network Approach to Estimating the Conditional Density of Multiperiod Returns." *Journal of Forecasting*, 2000, 19(4), 299-311.

Thiem, L. and Ruiz-Zaiko, L. "Complying with the SEC's Market Value Risk Disclosures." *TMA Journal*, 1998, 18(3), 34-38.

Yamai, Y. and Yoshiba, T. "Value at Risk versus Expected Shortfall: a Practical Perspective." *Journal of Banking and Finance*, 2005, 29(4), 997.

How Does the Conversion Privilege Effect a Bond's Risk Premium?

Wesley M. Jones, Jr. The Citadel wes.jones@citadel.edu
George S. Lowry, Randolph-Macon College glowry@rmc.edu

Abstract

Corporate bond indentures often contain various provisions and covenants that are designed to benefit one party or the other to the bond agreement. This study will examine the effect of a bond having a conversion provision in its indenture on the offering yield that the issuer pays on the bond in the primary market. The results of this study can have a practical application to bond issuers in that if the study reveals that no offering yield reduction results from the presence of a conversion privilege, then the issuer may decide to omit the option to the bondholder. Thus reducing ownership dilution that results from the exercise of the "de facto" call options on the company's stock that result from the bond's conversion privilege

Introduction

Corporate bond indentures often contain various provisions and covenants that are designed to benefit one party or the other to the bond agreement. Indenture provisions such as the call provision, which allows the issuer to redeem the bond early in the event of a lower interest environment, have been associated with lower bond offering prices and higher offering yields. [See for example: Allen, Lamy and Thompson (1987), and Jones (2001)].

Most indenture provisions, however, are designed to make the bond more attractive to the investor and thus enhance the price and lower the offering yield. For example, the imposition of restrictions on the issuer subsequent to the bond being issued are placed so that investors will perceive the contract as less risky and be willing to pay a higher price for the bond at issue. This

lowers the relative interest rate that the issuer will be required to agree to over the life of the bond.[See for example: Jones (1998)].

Another provision that is sometimes included in the bond's indenture is the conversion privilege.   The conversion privilege gives the bond's holder the option to convert the bond into a specified number of shares of the company's stock.   This acts essentially as a call option to the bondholder on the company's stock and allows the bondholder to participate in share price appreciation resulting from the company's investments if they so desire.

For example: A bond is sold in the primary market for it's face value of $1,000.   At the time the bond is issued, the issuing company's stock is trading for a price of $35 per share.   The bond contains a conversion privilege that allows the bond holder to convert the bond to 25 shares of stock (the conversion ratio).   Since the conversion ratio of the conversion privilege remains constant, the bondholder now has a call option on the company's stock at a strike price of $40 per share ($1,000/$25 = $40) and the option is currently out of the money (strike price > market price). Most convertible bonds are issued with the conversion option "out of the money."   However, if the bondholder believes that price appreciation in the company's stock is likely to occur, then the value of the conversion option will increase the value of the bond, and make them more likely to pay a higher offering price for the bond.   This will lower the offering yield that the issuer will be required to pay.

The Model

To examine the effect of a bond having a conversion provision in its indenture on the offering yield that the issuer pays on the bond in the primary market the following model is specified.

$$OTY = \beta_0 + \sum \beta_i EV_i + \beta_1 Conv$$

where OTY is the off treasury yield (the difference between the issue's offering yield, and the yield on three month treasury securities on the same date) in basis points. Measuring "off treasury" yield controls for the general level of interest rates and recognizes that potential investors retain the option of "parking" their money in short term risk free assets in the event that other investment opportunities are perceived as less than optimal. The EV_i represent a vector of other explanatory variables that are included either as the result of theory or prior empirical work. These explanatory variables include call protection, term to maturity, issue size, issue rating, whether the issue is dually or split rated, and the volatility of the stock market in the period preceding the issue[1]:

CALL is a dichotomous grouping variable that is set to one if the issue is callable prior to maturity and zero otherwise. The call grouping variable is included in the analysis because the ability to call an issue early represents an option to the issuing firm that has a positive value which will accrue from some other party, in this case, the purchaser of the bond. In addition, the ability to call the issue early raises the possibility that under conditions of falling market rates, the very condition under which the holder of the bond will want to keep it, the bond issue may be prematurely recalled forcing the holder to reinvest at a lower rate (reinvestment rate risk). These arguments suggest that the relationship between the call grouping variable and a bond's excess yield should be positive.

---

[1]See Allen, Lamy and Thompson (1990), Altinkilic and Hansen (2000), Billingsley, Lamy, Marr and Thompson (1985), Blackwell, Marr, and Spivey (1990), Chatfield and Moyer (1986), Ederington (1986), Jewell and Livingston (1998), Liu and Moore (1987), Livingston et al. (1995) Logue and Rogalski (1979) Sorensen (1979), Rogowski and Sorensen (1985), and Livingston and Miller (2000).

TERM is the natural log of the number of years to maturity of the issue. This variable is included as a proxy for the interest rate risk of the issue. Because Macaulay's duration typically increases with maturity at a decreasing rate it is assumed that interest rate risk rises with time to maturity. Therefore, it is expected that longer term issues will have a higher required yield than shorter term issues to compensate for the additional interest rate risk.

SIZE is the natural log of the proceeds of the issue. This variable is included as a proxy for the liquidity risk of the issue. Fisher (1959) suggests that the amount of debt issued will have an impact on the liquidity risk of the issue. This impact can be either positive or negative. Larger issues may be traded more frequently thus reducing the liquidity risk of the issue or a large issue may have a negative price impact increasing liquidity risk.

Default risk is proxied by the issue's Standard and Poor's rating. While each issue in the sample has a rating from both Moody's and Standard and Poor's, previous work by Jones (1998) suggests that the market places greater weight on the rating of Standard and Poor's, therefore, the S&P rating is used to categorized issues with respect to default risk. The issues are placed into one of five default risk groups. The five groups are: Prime (AAA and AA+), Very High Grade (AA to A+), Upper Medium Grade (A and A-), Lower Medium Grade (BBB+ to BBB-) and Speculative (BB+ and lower). Five dummy variables are assigned a value of 1 or 0 depending upon in which category the issue's S & P rating falls. Alternatively, default risk is proxied by assigning a numerical equivalent to each of the rating categories (i.e. AAA = 1, AA = 2,... and so on to CCC = 7).

SPLIT is dummy variable set equal to one if the issue is rated differently by Moody's and Standard and Poor's and zero otherwise. Billingsley et. al. (1985) examined 258 bond issues floated between January 1977 and June 1983, 12.9% of which were split rated. Their study found

that investor's perceive split rated issues as more risky than non split rated issues. It is therefore expected that split rated issues will have a higher yield than non split rated issues [See also Ederington (1986), Liu and Moore (1987) and Jones (1998)].

MKTVOL is a continuous variable whose value equals the natural log of the variance of returns on the Dow Jones Composite Average over the 30 days prior to the bond's issue date. This variable is included to account for investor's preferred investment habitat and innate desire to avoid risk (See Mishkin 1995 pp. 159.). Investors have the ability to change their preferred maturity structure, and as longer term maturity investments such as stocks become more volatile, it is expected that relatively shorter term investments such as bonds will become more attractive. Hence, as the stock market's volatility increases, investors should be willing to pay more for bonds in general, and bond prices should rise causing yields to fall. It is expected that the coefficient of MKTVOL will be negative.

CONV is a binary indicator variable that is set to one if the issue is convertible to stock at the discretion of the holder. This is the variable of interest, and it is expected that convertible feature will be associated with higher bond prices and lower required yields as described above.

The Data

The data for the study is a sample of 3600+ bond issues dated from December of 1982 until June of 1993 approximately 10% of which contain a conversion privilege. Other bond characteristics and issuer characteristics that have been shown from theory or prior empirical work to influence a bond's offering yield will be controlled for to try to isolate the effect of the conversion privilege on the bond's offering yield. This dataset was derived from data originally created by Dr. T. Opler at The Ohio State University and expanded by the authors to include many of the additional explanatory variables. The primary source of the additional information was

various editions of *__Moody's Industrial Manual__*.

Further description of the data, the results of the statistical analysis, and the author's conclusions will be presented at the conference.

.

References

Allen, D. S., R. E. Lamy, and G. R. Thompson. "The Shelf Registration of Debt and Self Selection Bias." *The Journal of Finance*. 45(1). March 1990. pp. 275-287.

Jones, W. M. "The Effect of Underwriter Prestige on Offering Yield." *Southwest Business and Economics Journal*. 9. 2000. pp. 23-30.

Jones, W. M. "The Effect of Protective Covenants on Offering Yield on Corporate Debt." *Proceedings*, Southeastern Chapter of the Institute for Operations Research and the Management Sciences, October 1998. pp 196-198.

PUBLISHING RESEARCH OF HIGH QUALITY IN JOURNALS OF INFORMATION SYSTEMS: TECHNIQUES AND TIPS

James Lawler, Pace University, Seidenberg School, New York City, New York, 212-346-1013

Educators in information systems are challenged frequently by the difficulty that students may have in completing a bona fide research study. Students may not be creative or critical enough in forming a foundation for a research study. They may be dependent on merely periodical practitioner research as a foundation for study. They may lack a disciplined method for researching a Big Idea, or ideas of originality in information systems, which might be contributory to the field if not publishable in higher tier conference proceedings and journals. The tutorial is proposed as an aid to students and to educators instructing in the practice and the theory of research and is based on a Research Project Seminar begun by the presenter for graduate students, but relevant to undergraduate students, at a leading northeast school of computer science and information systems.

The focus of the tutorial is to furnish an easy-to-follow method for guiding students in doing research in the field of information systems. The tutorial begins with an exploration of ideas for formulating a research study in information systems. The tutorial highlights elements of importance in the abstract, background, introduction, focus of study, methodology – instrument of survey, analysis and discussion of data, implications, limitations and opportunities, conclusion, and references of a study – the essential skeletal structure of a study. It highlights the importance of readability of a research study. The relevancy of contemporary practitioner research and prior scholarly research sources in a descriptive, exploratory or predictive study is a further focus of the presentation. The tutorial concludes with methods for profiling conferences and journals and for publishing papers of improved research in an evolving mix and sequence of Tier III to Tier I conference proceedings and journals.

The benefits of the tutorial are for graduate students and undergraduate students considering the design of a bona fide research study that can contribute effectively to the field of information systems. The tutorial furnishes a disciplined but evolving method for increasing the confidence of students in initiating a research study that is potentially publishable, from research abstract and research-in-progress study to full research study, in high Tier conference proceedings and peer reviewed journals. The integration of foundational models of prior research of scholars in the field of information systems may benefit researcher students. The benefits of the tutorial are also for instructors educating students on the practice and the theory of research and helping as mentors in the preparation of a publishable research study. Throughout the tutorial, the presenter, as an associate editor and a frequent reviewer of papers for a number of leading publications in information systems, will share insight for students submitting potentially publishable research to Tier III to Tier I proceedings and journals of information systems. In summary, this tutorial will be beneficial to both students and instructors in formulating a methodology for plausibly publishing research of quality and of significance of solutions in the study of information systems and technologies – the WOW!

COMPUTING SERVICES IN THE CLOUD: A TUTORIAL

Harry Katzan, Jr.
Savannah State University

ABSTRACT

Cloud computing is a modality for providing computer facilities via the Internet. The cloud-computing concept incorporates single-function applications, such as those available as office suites, and the execution of comprehensive enterprise applications pieced together from components residing in varying Internet locations. The application software with cloud computing is useful for connecting people and organizations in various combinations across the Web and supports mobile computing. This paper gives a tutorial on cloud computing.

FORWARD

The discipline of service science serves as the basis of modern computer and Internet technology encompassing the subjects of Web services, service-oriented architecture, and, most recently, cloud computing. Most aspects of modern information systems are derived from service science, as well as are the pragmatic sides of business and economic theory. This paper seeks to investigate the underlying principles that govern the exchangeable value of cloud services. Throughout, we will attempt to show the real value of service, the different parts of which a cloud service is constructed, and the forces that govern the dynamics of service value.

One of the defining characteristics of cloud computing is the transfer of control from the client domain to the cloud service provider. Accordingly, it is particularly important that client requirements are delineated and analyzed, because without a clear understanding of exactly what client needs are in cloud computing, what constitutes a cloud service, what differentiates one form of cloud computing from another, and how cloud services operate and interoperate, continuous improvement will be a never-ending process of trial and error.

CLOUD COMPUTING CONCEPTS

Cloud computing is a means of accessing computer facilities via the Internet, where the adjective "cloud" reflects the diagrammatic use of a cloud as a metaphor for the Internet. Most of us have been using cloud-computing facilities in one form or another for years through ordinary email and the World Wide Web. Recently, the term has come to reflect the use of software and the running of computer applications via the Internet where the computer infrastructure and software are not "on premises." Cloud computing, as a form of service provisioning, has given rise to several related concepts, such as mesh computing, cloud platforms, and software plus service.

A proper, but not necessarily definitive, conceptualization of cloud computing is to use office-class applications via your web browser over the Internet instead of having those applications reside on your "on premises" computer. In this instance, the service provider supplies the network access, security, application software, and data storage from a data center located somewhere on the Internet and implemented as a form of server farm with the requisite infrastructure. A service would have ubiquitous access through a web browser. In general, the cloud computing concept is not limited to single-function applications, such as those available with typical office suites, but could include comprehensive enterprise applications pieced together from components residing in varying Internet locations.

1

Every year, businesses spend millions of dollars on their IT infrastructure consisting of hardware, system software, applications, networks, people, and other organizational assets. With "on demand" computing, they can plug into the wall, figuratively speaking, and only pay for the IT services they use. The general concept is called *utility computing* that is accessed as most public utilities. When appropriate, a service utility is a viable option for obtaining computing services, the essence of which is in the packaging of computer services as a metered facility without up-front costs for IT infrastructure. In the current view of things, a services utility is network based and is dependant upon the Internet as a transport mechanism. In recent years, computing has become the operational medium for business, government, education, and a part of everyday life for most people, and as with electric utilities, computing utilities have evolved from being a luxury to an everyday necessity.

CLOUD SERVICE CHARACTERISTICS

Cloud service utilities are characterized by four key factors: necessity, reliability, usability, and scalability. *Necessity* refers to the idea that a preponderance of users depend on the utility to satisfy everyday needs. *Reliability* refers to the expectation that the utility will be available when the user requires it. *Usability* refers to the requirement that the utility is easy and convenient to use – regardless of the complexity of the underlying infrastructure. *Scalability* refers to the fact that the utility has sufficient capacity to allow the users to experience the benefits of an expandable utility that provides economy of scale. Certainly, modern Internet facilities for search operations that engage thousands of servers satisfy these characteristics.

The notion of "paying for what one uses" is a compelling argument for using the cloud for special or all computing needs. The proof of the pudding may be in the details. The key question is whether the service should be based on a metered model or a subscription model. With the *metered model*, the usage is easily measured, monitored, and verified and lends itself to managerial control on the part of the user. In addition, metering can be applied to differing levels of service. With the *subscription model*, usage is difficult to control and monitor and its adoption is favored by managers more concerned with convenience than with resource control.

The difference between application services and multi-tenant services may very well be the deciding factor in determining whether metered or subscriber service is the way to go. With *multi-tenant service*, several clients may share the same software with separate data – as in the case of office processing. With *application service*, the service provider supplies one instance of the software per client, thereby lending itself to a form of metered service. In the latter case, the notion of a client should be regarded as an environment comprised of several users.

HOSTING AND VIRTUALIZATION

A common example of utility computing is *hosting* wherein an application service provides "off premises" computer services on a subscription or pay-as-you-go basis. The practice is prevalent among relatively small software developers that require expensive computer facilities. A service provider usually supplies requisite services on a time-sharing basis through communications facilities, and the service provided is the access to and utilization of a computing platform comprised of a computer system, an operating system, and necessary utility facilities. This is the origin of the *Platform as a Service* (PaaS) concept, often sustained through virtualization.

Virtualization refers to the provisioning of a "not real but virtual" computing environment created through a software facility known as a *hypervisor* with the capability of managing several diverse computing platforms, executing concurrently, so that the client is given the operational advantage and illusion of having a unique copy of the selected platform. The hypervisor controls the underlying

computer hardware and software and passes control to a specific client instance on a demand basis. [Kat86]

BUSINESS ASPECTS OF CLOUD SERVICES

The long tail [Cho06] is a conceptualization of the unique business opportunities available through Internet access, exemplified by online book sellers and software services. A brick-and-mortar bookseller has a limited amount of self space and typically stocks only the most popular books. Online booksellers do not have the same limitation and are able to take advantage of the long tail, as suggested by Figure 1, to provide opportunities not available otherwise. The long-tail phenomenon also applies to line-of-business software, as depicted in Figure 2, and consumer-oriented services to provide a level of economy of scale not otherwise available with "on premises" software and the requisite computing platforms. The long-tail perspective provides a basis for the monetization of cloud computing. The defining characteristic of cloud computing is that services are accessible through a web browser. In general, the cloud computing concept is not limited to single-function applications, such as those available as office suites, but could include comprehensive enterprise applications pieced together from components residing in varying Internet locations. Because the application software with cloud computing is not executed on a local computer, it is useful for connecting people and organizations in various combinations across the Web and supporting mobile computing. Cloud computing should not be confused with outsourcing. With outsourcing, an existing function is moved out of the department, enterprise, or geographic jurisdiction. With cloud computing service, the home of an application originates in the cloud.
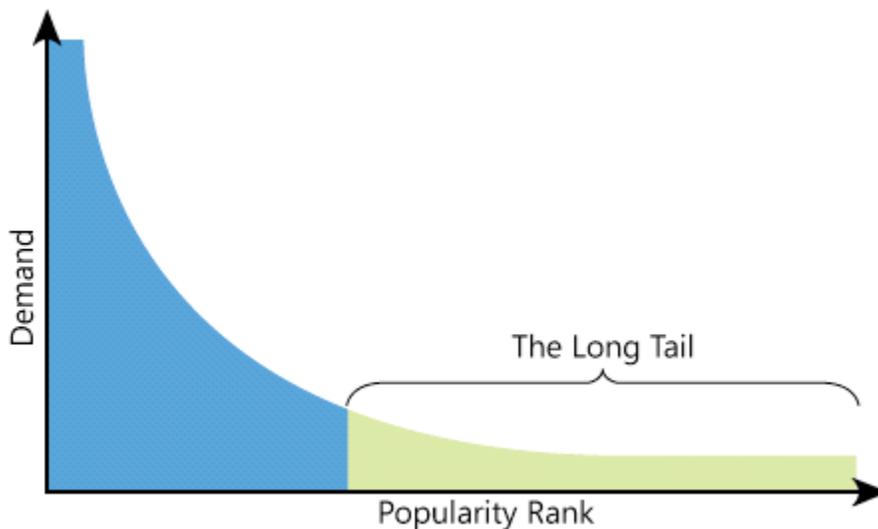
Figure 1. The Long-tail concept. [Cho06, p. 8]
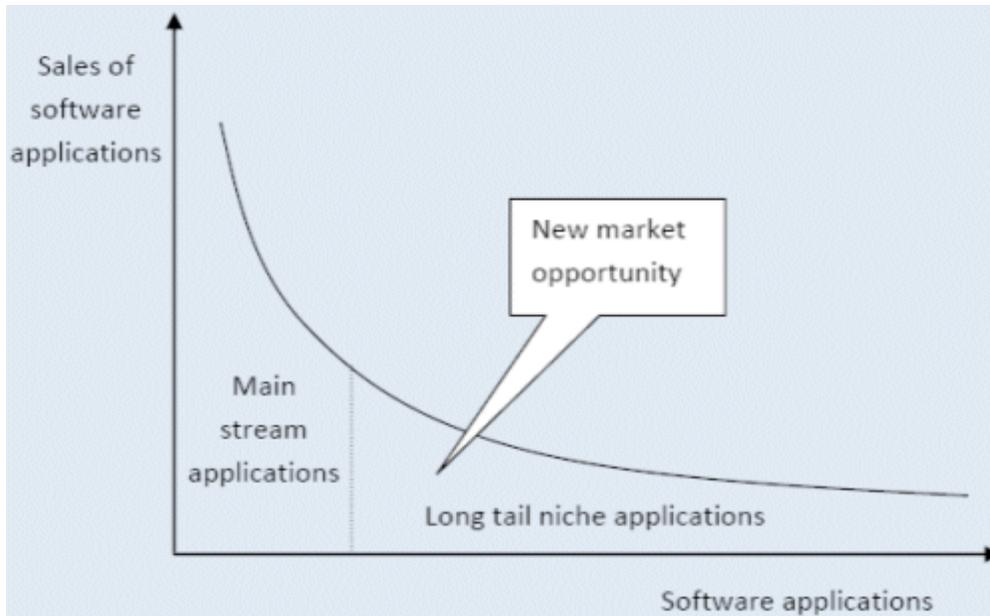
Figure 2 Long-tail software opportunities. [Cho08, p. 2]

It is difficult to state the difference between cloud computing and utility computing, because they both appear to refer to the same phenomena. Digging a little deeper, however, it would appear that utility computing is more of a business concept – perhaps a business model – providing "pay for what you get" services, where the operational framework could be traditional batch processing, local networks, enterprise networks, or the Internet. In fact, utility computing has the flavor of a "spin off" of a non-core service to another organizational entity – either internally or externally. In general, utility computing could use the Internet, but that is not a defining characteristic.

Cloud computing, on the other hand, is by definition an Internet-based facility – hence the "cloud" metaphor referring to the usual depiction of the Internet. With the Internet providing the accessibility component, service clients do not typically own the hardware and software infrastructure. So the chief advantage of cloud computing from the client's perspective is the availability of software, storage, and computing resources without up-front infrastructure costs.

CLOUD TERMINOLOGY

As with other forms of service, cloud computing has its own terminology, reflecting the underlying concepts and components, such as the following: [Wik08]

> *Cloud application* – the software service being offered.
> *Cloud client* – the service participant using the cloud functionality.
> *Cloud platform* – the computer infrastructure that supports the cloud computing service.
> *Cloud service* – the application facilities provided by the cloud environment.
> *Cloud storage* – the online storage for files and databases supported by the cloud platform.
> *Cloud architecture* – the overall design of the cloud computing environment.
> *Cloud provider* – the enterprise that owns and operates the cloud computing service.

Collectively, the cloud concept engenders two related topics: Software as a Service (SaaS) and Platform as a Service (PaaS). With SaaS, the burden of software installation, maintenance, and support is practically eliminated from the client domain. From the vendor's viewpoint, SaaS establishes an ongoing revenue stream for the software developer. PaaS provisioning reflects a business model wherein one

4

enterprise supplies PaaS hosting to one or more SaaS enterprises. In the provisioning package, the PaaS provider would supply advanced security measures and other necessary infrastructure facilities never actually seen, per se, by the cloud client. In this scenario, the SaaS enterprise is then solely responsible for cloud software development.

BUSINESS AND CONSUMER SERVICES

Chong and Carraro [Cho06] define software as a service (SaaS) as software deployed as a hosted service and accessed over the Internet. The key features of SaaS are where the programs reside and how they are accessed. The two kinds of software in this category are business software and consumer software. Business software provides business services and emphasizes business solutions, such as CRM, SCM, ERP, and human resources. Consumer software provides publicly oriented personal solutions, such as office applications and are often provided at no cost – that is, in their cloud versions.

With business services, the most important consideration is whether the process is executed in-house or as a cloud service. When the process is handled in-house, total control over the operation is obtained along with limited opportunity for achieving economy-of-scale. As processes are distributed outward on the cloud, control is decreased but opportunities for achieving economy-of-scale are increased. The considerations are different with consumer services. Pure service, as with office applications, provides practically no control over the application to the client and a reasonably high-level of economy-of-scale to the provider. In many cases, consumer services are advertising-supported and are complimentary to the client through advertising. In addition to the metered and subscription models, the advertising-supported model is another means of monetizing cloud computing.

Business applications that reside "on premises" are governed by the traditional considerations of application acquisition and deployment. If an application resides on and is deployed from the cloud, then two options exist:

> (1) Build the software yourself (or have it built for you) and run it on the cloud as a hosted service – perhaps using a cloud platform.

> (2) Obtain the application software from an independent software vendor (ISV) and run it on the cloud in a standard or modified mode.

In the former case, all users access the same version of the software. In the latter case, a client gets a customized version achieved with a separate code base, or its equivalent, configuration options, or operational metadata. The subject of business services is covered in more detail in a subsequent section.

The primary advantage of a cloud consumer service is that it is typically free to the client, as well as being accessible from any location via the Internet, and it yields advertising-supported revenue for the provider. Consumer services have a near-zero marginal cost of distribution to clients, because of the long tail, and requires only a fraction of the number of clients to respond to advertising. This is the well-known *Freemium Business Model* [And04], characterized as follows: In the free sample product model, you give away 1% of your product to sell the additional 99%, whereas in the freemium model, you give away 99% to sell 1%. Because of the scale of the Internet with millions of users, you can reach a large market, so that the 1% is a huge amount.

Software plus Service (S+S) refers to a user-centric approach to service deployment by combining "on premises" computing (fat client) with enhanced services on the cloud. The enhanced services combine advanced functionality with the capability to scale up to meet peek computing demands for both business and consumer services. A related feature of S+S involves the distribution of service pack software

updates for both system and application software and the provisioning of automatic software downloading.

Clearly, the business model for the deployment of both SaaS and S+S changes with the adoption of cloud computing. The ownership of software shifts from the client to the provider, along with the responsibility for the technology infrastructure and its management. [Cho06] The marketing targets for SaaS and S+S clients are service consumers and small to medium-sized business, and economy of scale is achieved through specialization and the development of cloud platforms.

<div align="center">CLOUD SERVICE ARCHITECTURE</div>

A comprehensive SaaS application structure includes a continuum of architectural levels, based on the capability of handling multiple clients and software configurability. Four levels are identified. The number of levels in any specific operational environment is based on the cloud platform and its characteristics.

> **Level One.** At the first level, the users within a client domain address a single instance of an application running on a server. Each client/instance is totally independent of other client/instances running on the same server. This is the traditional hosted service operating in the cloud. Each software instance is individually customized for each client.

> **Level Two.** At the second level, the server hosts a separate instance of the software for each client, but the instance is a configurable version of the same code base, reducing maintenance costs and contributing to increased economy-of-scale.

> **Level Three.** At the third architectural level, the vendor runs a sole instance that is shared by multiple clients. The feature set for each client is determined by configurable metadata, and authorization/security policies insure the separation of user data.

> **Level Four.** At the fourth level, the same "level three" instances are run on a server farm with fabric for lead balancing.

The choice among architectural levels is determined by the provider/client's business, architectural, and operational models.

<div align="center">CLOUD PLATFORMS</div>

A *cloud platform* is an application service provider that runs in the cloud. More specifically, a cloud platform provides services to applications in the same manner that "software as a service" programs provide services to clients using the cloud as a transport medium. A cloud platform resides in a cloud data center and exists as a powerful computing facility, a storage system, an advanced operating system, support software, and the necessary fabric to sustain a server farm and scale up to support millions of Internet clients. A cloud platform is as much about operating in the cloud, as it is about developing applications for the cloud.

A cloud platform provides the facility for an application developer to create applications that run in the cloud or use cloud platform services that are available from the cloud. Chappell [Cha08a, Cha08b] lists three kinds of cloud services: SaaS user services, on-premises application development services (attached services), and cloud application development services. An *SaaS application* runs entirely in the cloud and is accessible through the Internet from an on-premises browser. *Attached services* provide functionality through the cloud to support service-oriented architecture (SOA) type component development that runs

<div align="center">6</div>

on-premises. *Cloud application development services* support the development of applications that typically interact while running in the cloud and on-premises.

A cloud platform can be conceptualized as being comprised of three complementary groups of services: foundations, infrastructure services, and application services. The *foundation* refers to the operating system, storage system, file system, and database system. *Infrastructure services* include authorization/authentication/security facilities, integration between infrastructure and application services, and online storage facilities. *Application services* refer to ordinary business services that expose "functional" services as SOA components.

Cloud platforms are a lot like enterprise-level platforms, except that they are designed to scale up to support Internet-level operations.

APPLICATION SERVICES

"*Venus* is for application services and *Mars* is for infrastructure services." Application services are designed to be used by people, and infrastructure services are designed to be used by applications. [Cha08, p. 11] The basic idea of cloud platforms is that SaaS applications will be created by developers to provide services used by people, and SaaS applications will use infrastructure services.

Software plus service (S+S) is an in-between point in the cloud service continuum, falling between the pure-play user-centric set of services and the large-scale enterprise application systems in which on-premises and cloud software interact to support comprehensive business services. In the S+S hierarchy, the cloud platform should consist of building block, attached, and finished services to complement application services, mentioned previously, and to support a flexible set of operational scenarios that include PCs, the Web, mobile devices, on-premises servers, and cloud-based services. [Fol08]

CLOUD COMPUTING REQUIREMENTS

In addition to the prototypical definitions, given earlier, cloud computing has been characterized in some creative ways, somewhat as follows: (1) It is a host in the cloud; (2) It is a hub in the tub; [Apparently, use of the word "tub" refers to the Internet.] (3) It is a means of monetizing Internet services; and (4) It is a complimentary means of achieving workflow and online collaboration. [Referring to the *Freemium Business Model*.] The list could go on-and-on. This section gives a set of basic client requirements for cloud computing from an "end user" perspective. The ideas are summarized in Table 1.

Class I. Single Tenant Model

The functionality inherent in this class is to host a software application and deploy it as a single instance for each user. The application software would use the computational and operating system facilities in the cloud, as well as services provided through the cloud, such as database management and communications support. This is a single identity environment, wherein each user supplies authentication and authorization information to the application via the operating system. If another user requires access to the same application, then a separate instance is deployed within the cloud environment. The cloud client is the individual user. In the latter case, variations in the application software are achieved through configuration options and metadata. Storage for user data is in the cloud using the fabric of the cloud service center. ISV monetization for standard applications is provided as metered, subscription, or advertising-supported services, and extra functions can be supported on a "fee for use" basis.

7

Class II. Client Based Model

The functionality inherent in this class is to host a software application and deploy it as a single instance for each client. The distinction is that a client may have several users accessing the same application, most probably at the same time, such that data can be exchanged between users. The model is commonly referred to as the "multiple tenant" model. Software is configured on a client basis and security is supplied by the cloud operating system   Storage for user data is provided in the cloud, logically segmented by client. Individual users may require extra cloud functionality that are supplied on a subscription or metered bases. Multi tenant operations require exceedingly complex cloud operating system features that are beyond the scope and intention of this paper.

Class III. Attached Service Model

In this model, software applications are hosted "on premises," and extra functions are available as "attached services" from the cloud. This is a form of service-oriented architecture, wherein the extra functions are executed in the cloud.

Class IV. Cloud Application Platform

In this model, a cloud application platform is available on the cloud and can viewed as an "operating system in the cloud," comprised of foundation services, infrastructure services, and application services. [Cha08a] The cloud platform should contain computational, traditional operating system, storage, identity, packaged applications, and custom software applications.

Class V. Mesh Computing

A final class is termed a *mesh,* intended to connect a user's PC, mobile device, and other cloud services via the Internet. The mesh software functions as a control hub providing unified services on a demand basis.

Clearly, the above list is a start in the delineation of end-user requirements for a cloud computing environment.

Class	Name	Basis	Computation	Monetization
I	Single instance	Single tenant	Cloud	A, B, C
II	Client based	Multiple tenant	Cloud	A, B
III	Attached services	Services	On premise	A
IV	Cloud platform	Services	Cloud	A, B
V	Mesh	Connection/hub	Cloud	C

(Legend: A-Metered, B-Subscription, C-Advertising-supported)

Table 1. Characterization of Cloud Computing Requirements.

FURTHER RESEARCH

Cloud computing has evolved into a huge research topic with each major player in the IT provisioning group supplying its own version of exactly what the subject matter should incorporate. The above materials are an attempt at finding a middle ground and providing a basis for further research. Two very

8

important areas have not been covered: authorization/authentication/security and cloud databases. Both are significant for exchanging data between applications within the cloud.

REFERENCES

[And04]   Anderson, C., "The Long Tail," *Wired Blog Network*, 2004.

[Cha08a] Chappell, D., "A Short Introduction to Cloud Platforms, " *Microsoft Corporation*, August 2008.

[Cha08b] Chappell, D., "Introducing the Azure Services Platform, " *Microsoft Corporation*, October 2008.

[Cho06]   Chong, F. and G. Carraro, "Architecture Strategies for Catching the Long Tail," *Microsoft Corporation*, April 2006.

[Cho08]   Chong, F., "Application Marketplaces and the Money Trail," *Microsoft Corporation,* March 2008.

[Fol08] Foley, M., *Microsoft 2.0*, Indianapolis: Wiley Publishing, Inc., 2008.

[Kat86]   Katzan, H., *Operating Systems: A Pragmatic Approach (2e)*. Hoboken, NJ: John Wiley and Sons, 1986.

[Kat08]   Katzan, H., *Service Science: Concepts, Technology, Management,* New York: iUniverse, Inc., 2008.

[Mil08]   Miller, M., *Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online,* Indianapolis: Que Publishing, 2008.

[Rap04]   Rappa, M., "The utility business model and the future of computing services," *IBM Systems Journal,* Volume 43, Number 1, (2004).

[Wik08]   Wikipedia, "Software as a Service," www.wikipedia.com, 2008.

Decision Support System for Advising Students

Ramesh M. Choudhari
Department of Mathematics and Computer Science,
South Carolina State University, Orangeburg, SC 29117

ABSTRACT

The purpose of this paper is to explain design and implementation of the decision support system for student advisement. The advisement process plays an essential role in student's academic life. The goal of the decision support system is to help advisors as well as students to plan their degree programs. The system facilitates the process of advisement by providing quick and easy access to valuable information, and giving important feedback on several issues involved in student advisement, which otherwise could have taken considerable time. The student advisement system certainly simplifies the task of advisement, improves the quality of student advisement and gives a viable option to students. The system is invaluable tool for advisors and students.

INTRODUCTION

The academic advisement is an important major function of any academic institution. The proper advisement for students enhances chances of succeeding in an institution. Academic advising is a decision making process through which a student advised by an advisor, maximizes the educational experience through interaction specifically pertinent to both curricular and career planning. The quality of advisement can play a critical role in students academic planning and decision making. The advisement is a rather complex process and involves activities from bookkeeping to discussing different issues with students. An advisor needs to have all the pertinent information to give a good advice to a student. Many times access to information becomes a major handicap to give constructive advice and in this respect, decision support system can be invaluable tool. The goal of the decision support system is to help advisors as well as students to plan their degree programs. In addition to that, the system also gives information on various topics such as different programs available in departments, their requirements, facilities available, courses available, and as well as how to use the system itself. The system also assists in making changes to the existing plan, to help in registration process and to check graduation status. Several tests are performed to evaluate the system response to user requests. It is observed that the system response is consistent with the human response in the same situation. The student advisement system certainly simplifies the task of advisement and improves the quality of student advisement. The system is going to offer students an important viable option in advisement which was not available before [4][5][9][11][18][25][26][27][28][29][31][35].

DECISION SUPPORT SYTSEMS

There is no agreement on the definition of Decision Support Systems. We are going to use the practical definition of DSS. A DSS is an interactive, flexible and adaptable computer based system that uses data, knowledge, and reasoning to aid management of a specific problem [36].

COMPONENTS OF DSS

The Decision Support System is composed of the following components:

1. Data Base Module – Software system to manage internal and external databases used for computations to make decisions.

2. Model Module – Software system that uses conceptual model to make analytical computations.

3. User Interface Module – Software system responsible for user communications.

4. Knowledge Base Module – Software system that manages problem specific knowledge [2][3][20][25][36].

METHODOLOGY

The development of the decision support system is divided into two parts. In the first part, the system is designed and in the second part, it is implemented on a computer. The first part consists of construction of an abstract model for advisement, development of necessary data structures to hold information and development of algorithms to process information. The second part consists of programming to realize the system on a computer system. The system is implemented on the main frame. The knowledge is represented in form of sets of rules. The set of rules is implemented using If-Then-Else statements [13][14][15].

ABSTRACT MODEL

The core concept in the system is the curriculum model. There are four major components in any degree program: general education, major, minor, and electives. Each course in the curriculum has specified require grade for graduation. The successful completion of a degree program essentially depends on completing the necessary number of hours and courses with appropriate grades described in the curriculum for the degree program. The courses required for a given degree program are arranged in proper order from first semester to the last semester as illustrated in figure 1. This becomes our curriculum model for the system [11][14][29][31][35].

The curriculum model is abstracted in the form of data structure called curriculum-page for a department as well as for a student in the department. The departmental curriculum-page contains all the courses required for the degree program and the required grades. The student's curriculum-page contains all the courses required for the degree program and slots open for grades and elective courses. The curriculum-page is a kind of loose adoption of frames. The loose in a sense that procedures and functions acting on it are loose i.e. not attached to the structure. As most of the information about curriculum for a given class is known and is well defined, the static structure is used to implement the curriculum-page.

Another important concept in the system is the degree plan. The degree plan is essentially a list of courses a student needs to take from the first semester to the last semester in a given period of time. The printed form of the degree plan is illustrated in figure 1. The degree plan is the basic concept, as any changes student wish to make to his degree program for any reason, the system will generate appropriate a new degree program for him. When a student enters the school, the system makes a degree plan for him according to his specifications. Subsequently, he can make changes to his original plan and system will generate new degree plan for him. In addition to making degree plan, the system can make projection on

his existing plan, make changes to have additional major, make changes to have alternate major, and help him for registration and to evaluate his graduation status.

Curriculum Leading to the Degree of Bachelor of Science in Computer Science

Freshman

	First Semester				Second Semester		
	Course	Hours	Grade		Course	Hours	Grade
Educ	101	2	P	Educ	101	3	C
Engl	101	3	C	Engl	102	3	C
BSc	101	3	D	M	106	3	C
Econ	101	3	D	BSc	102	3	D
MS	101	2	D	Econ	102	3	D
M	105	3	C	MS	102	2	C

Sophomore

M	203	3	C	M	204	3	C
M	209	3	C	M	208	3	C
CS	201	3	C	CS	202	3	C
Huma	201	4	D	Huma	202	4	D
M	212	1	C	MS	202	2	D
MS	201	2	D	SP	103	3	C

Junior

P	201	4	C	Psy	201	3	D
Huma	301	3	D	P	202	4	C
CS	301	3	C	CS	304	3	C
CS	307	3	C	CS	308	3	C
M	307	3	C	M	213	3	C

Senior

CS	401	3	C	CS	409	3	C
CS	402	3	C	CS	403	3	C
Approv		3	C	Approv		3	C
Approv		3	C	Free		3	C
Free		3	C	Free		3	C

Figure 1. Abstract Model

The ultimate goal of a student is to graduate from the school with a diploma. From student point of view, the graduation is the final goal to be achieved. The system can assist a student to evaluate his current degree plan and inform him status of graduation. If he is unable to graduate with the existing conditions, the system will offer him suggestions to remedy the situation and a possible way to graduation [11][14][15][29][31][35][37].

THE SYSTEM DESCRIPTION

The aim of this project was to construct a decision support system for student advisement. The goal of the system is to help advisors as well as students to plan his or her degree program. In addition to that, the system also gives information on various topics such as different programs available in departments, their requirements, facilities available, courses available, and as simple as how to use the system itself. The system also assists in making changes to the existing plan, to help in registration and to check graduation status. The system consists of three major components: user interface, knowledge representation, and database [13][15][16][20][36].

User Interface

Most of the systems constructed and will be constructed in future are going to interact extensively with end-users. So, user interfaces are utmost important for productive use of any system. To make working environment comfortable, convenient, and pleasant is the primary task of any designer. The user acceptance is greatly depends on user-interface of the system.

User interfaces are constructed using menus and Q&A system. Each module invokes its own user interface to communicate with users. The information collected from user is interpreted by the module and the necessary actions are taken. Thus each module interprets and controls part of the system and so act as shell or subshell for the system [36].

Knowledge Representation

The knowledge-base is essentially information (knowledge) from the college-handbook, faculty-handbook, and advisor's personal experiences over several years in academics. The knowledge-base is implemented as rules. Rules are organized as sets of rules. The related rules are put into a set. The sets of rules are implemented as procedures [32].

Data Bases

A lot of information is required to make decisions involved in student advisement. The system derives information from its databases. The major data-bases used in the system are as follows:
Course_Base : All the courses available in the college.
Student_Base : All the students enrolled in the college.
Help_Base   : All the information about college and the system itself to be used by help module [19].

SYSTEM ARCHITECTURE

The system model is essentially composed of three modules: User Interface Module, Processing Module, and Output Module.

User Interface Module

The user interface module consists of user input module and output module. The user input module contains keyboard event handlers to collect information from the users regarding his/her degree plan.
The output module is responsible for tasks such as displaying responses to user requests, error messages, as well as saving the results created by the processing module in an output file.

Model Processing Module

The processing module consists of several subprocessors, each one responsible for processing specific tasks, such as checking validity of grades specific to a program, and the inference processor to make necessary symbolic computations to apply advisement rules to draws conclusions regarding advisement.

Data Base Module

The function of this module is to manage the various databases used in the system. The relational data base model is used to do so.

Knowledge Base Module

This module is responsible for managing the knowledge base of handbooks. The knowledge base is dynamically created and used in inference module at the time of execution [2][3][20][26][33][36].
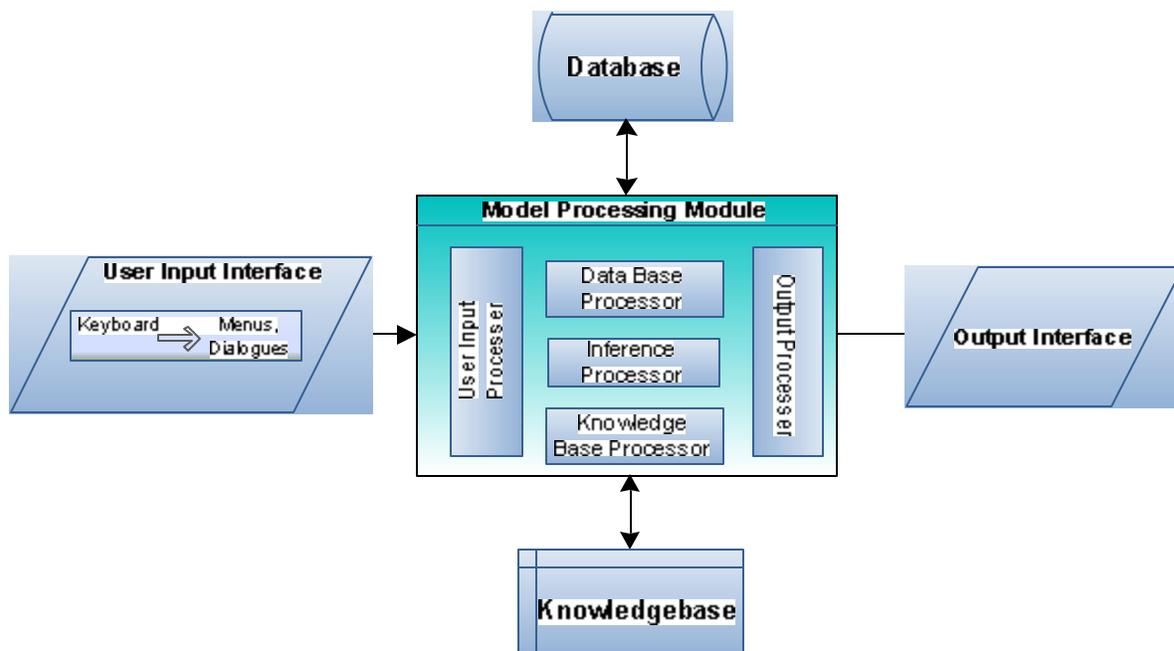
Figure 2. System Architecture

IMPLEMENTATION

A prototype of the system is implemented on main frame. The heart of the system is the processing module that is implemented by the main processor. The processor consists of several subprocessors that are responsible for specific tasks such as processing user inputs, processing data. The inference subprocessor performs the necessary computations by applying data validation rules. The inference subprocessor is implemented using forward if-else chaining.

Output module is implemented by the display procedures. It displays the output of the system and the appropriate error messages [24][25][32][36][37][38].

TESTING

The test results are in the form of outputs from the system which is implemented. Several tests were performed to evaluate the system response to the users' requests. One of the test results are illustrated in the figure 3 and the figure 4. This test consists of processing the request for graduation. The current status of the student's present curriculum is shown in the figure 3. The student logs in and selects the option for graduation. The user session is shown in the figure 4. The student is Computer Science major and mathematics minor. He has completed most of the curriculum. He has to take CS401, CS411, CS403 and he got D in CS307 which he needs to repeat as grade of C is required. The system requests and collects the specifications from the user for graduation. The system response is shown in the figure 4. The system suggested repeating CS307 and complete CS401, CS411, CS403. Thus the response is consistent with the human response.

Freshman

First Semester				Second Semester		
Course	Hours	Grade		Course	Hours	Grade
Educ 101	2	P		CS 105	3	B
Engl 101	3	B		Engl 102	3	B
BSc 101	3	B		M 106	3	B
Econ 101	3	B		BSc 102	3	B
MS 101	2	B		Econ 102	3	B
M 105	3	B		MS 102	2	B

Sophomore

M 203	3	B		M 204	3	B
M 209	3	C		M 208	3	B
CS 201	3	A		CS 202	3	B
Huma 201	4	C		Huma 202	4	C
M 212	1	C		MS 202	2	B
MS 201	2	B		SP 103	3	B

Junior

P 201	4	C		Psy 201	3	C
Huma 301	3	C		P 202	4	C
CS 301	3	C		CS 304	3	C
CS 307	3	D*		CS 308	3	C
M 307	3	B		M 213	3	B

Senior

CS 401	3	*		CS 409	3	C
CS 402	3	C		CS 403	3	*
CS 411	3	*		Econ 205	3	B
CS 417	3	B		BA 205	3	B
ACC 201	3	B		ACC 202	3	C

Figure 3. Student's Current Curriculum

Sample Test Output

```
*********************************************
*      Welcome to the Student Advisement System      *
*                                                     *
*      The following options are available:           *
*      1 : Administration                             *
*      2 : Advisement                                 *
*      3 : Help                                       *
*      4 : Exit                                       *
*********************************************
```

Make your choice
2

Give your student id:
90002156

The following options are available:
1 : Help
2 : Advisor
3 : Exit

Make your choice
2

The following plans are available:
1 : Requirements
2 : Degree plans
3 : Review plan
4 : Change of plan
5 : Registration
6 : Graduation
7 : Exit

Make your choice
6

This institution consists of the following divisions:
1 : Arts
2 : Sciences
3 : Engineering
4 : Business
5 : Exit

Make your choice
2

Division of sciences consists of the following departments:

1 : Department of Biology
2 : Department of Chemistry
3 : Department of Computer Science
4 : Department of Mathematics
5 : Department of Physics
6 : Department of Statistics
7 : Exit

Make your choice
3

Degrees offered by this department are:
 1 : Bachelor of Science
 2 : Master of Science
 3 : None of above

Make your choice
1

The Following degree options are available:
 1 : Professional
 2 : Teaching
 3 : None of above

Make your choice
1

The following minors are available:
1 : Math
2 : BA
3 : English
6 : Exit

Make your choice
1
From which semester you wish to start a plan?
1 : Fall-Freshman
2 : Spring-Freshman
3 : Fall-Sophomore
4 : Spring-Sophomore
5 : Fall-Junior
6 : Spring-Junior
7 ; Fall-Senior
8 : Spring-Senior
9 : Summer
10 : Exit

Make your choice
8

Do you wish to graduate this semester?

1 : Yes
2 : No

Make your choice
1

You need to repeat the following courses
1 : CS307 File Processing   3

You need to complete the following courses
1 : CS401   Operating Systems   3
2 : CS411   Data Base Systems   3
3 : CS403   Numerical Analysis   3

You have not completed all the requirements

The following plans are available:
1 : Requirements
2 : Degree plans
3 : Review plan
4: Change of plan
5 : Registration
6 : Graduation
7 : Exit

Make your choice
7

The following options are available:
1 : Help
2 : Advisor
3 : Exit

Make your choice
3

Figure 4. Test Output

CONCLUSIONS

The DSS for student advisement is a valuable tool for advisors as well as for students for students academic planning and decision making. It certainly simplifies the advisement process. It is undoubtedly very useful for advisors and students to make important decisions in a student's academic life. It can provide quick and easy access to an important information and also can provide important feedback on different issues which otherwise could have taken a considerable time. The system is by no means to replace advisors but it can certainly provide an option to students.

REFERENCES

[1]   Allison, G. T., *The essence of Decision*. Boston: Little, Brown, 1971.

[2]   Alter, S. L., *Decision Support Systems: current Practice and Continuing Challenges*. Addison Wesley Publishing Company, 1980.

[3]   Ariav, G., Ginzberg, M. J., "DSS Design: A Systematic View of Decision Support." Communications of the ACM, Vol. 28, No. 10 (October 1985).

[4]   Association of American Colleges. Liberal Learning and the Arts and Sciences Majors Washington, DC, 1992.

[5]   American Psychological Association. "Is Psychology for them?: A Guide to Undergraduate Advising." Washington, DC, 1988.

[6]   Barr, A. and Feigenbaum, E. A. (eds.). *The Handbook of Artificial Intelligence, Vol. I.* Reading, Mass: Addison-Wesley Publishing Co.,1989.

[7]   Barr, A. and Feigenbaum, E. A. (eds.). *The Handbook of Artificial Intelligence, Vol. II.* Reading, Mass: Addison-Wesley Publishing Co.,1989.

[8]   Barr, A., Cohen, P. R., and Feigenbaum, E. A. *The Handbook of Artificial Intelligence, Vol. IV*. Reading, Mass: Addison-Wesley Publishing Co.,1989.

[9]   Bergquist, W. H. *Designing undergraduate education*. 1st Edition. San Francisco, Jossey-Bass Publishers, 1981.

[10]   Budd, Timothy. *An Introduction to Object-Oriented Programming*. 3rd Edition. Addison Wesley Publishing, 2001.

[11]   Carnegie Foundation for Advancement of Teaching. *Mission of college curriculum: a contemporary review with suggestions: a commentary of the carnegie Foundation for Advancement of Teaching*. 1st Edition. San Francisco, Jossey-Bass Publishers, 1977.

[12]   Choudhari, Ramesh. "Expert System for student Advisement." Annual Meeting of sedsi, Charleston South Carolina, 2009.

[13]   Choudhari, Ramesh. "Expert system for student advisement." Ph.D dissertation, School of Engineering, Kennedy Western University. Boise, Idaho:1994.

[14]   Choudhari, Ramesh. "Conceptual Model for online student advisement." Southeast The Institute for Management Sciences, Annual Meeting. Myrtle Beach, SC, October 1994.

[15]   Choudhari, Ramesh. "Automatic Student Advisement System." South Carolina Academy of Science, Annual Meeting. Aiken, SC, April 1994.0

[16]   Coad Peter and Yourdon Edward. *Object Oriented Analysis*. Prentice Hall, 1990.

[17]   Cohen, P. R., and Feigenbaum, E. A. *The Handbook of Artificial Intelligence Vol. III*. Reading, Mass: Addison-Wesley Publishing Co.,1989.

[18]   Conrad, C. *The undergraduate curriculum: a guide to innovation and reform*. Westview Press, 1978.

[19]   Date, C. J., "An Introduction to Database Systems." Reading, Mass.: Addison-Wesley, 1990.

[20]   Davis, M. W. "Anatomy of Decision Support." Datamation, July 15th, 1984.

[21]   Dersham, Herbert and Jipping, Michael. *Programming Languages: Structures of Models*. 2nd Edition. PWS Publishing Company, Inc., 1995.

[22]   Digital Equipment Corporation, VAX Pascal Reference Manual. Boston, Mass. 1990.

[23]   Feingenbaum, E. A. and Feldman, J. (eds.) *Computers and Thought*. New York: McGraw-Hill, 1963.

[24]   Jalote, Pankaj. *An Integrated Approach to Software Engineering*. 3rd Edition. Springer, 2005.

[25]   Keen, P. G. W., Gambino, T. J., "Building Decision Support Systems." *The Mythical man-month* Revisited in Bennet, J. L. "Building Decision Support Systems." Reading, Mass.: Addison-Wesley Publishing Company, 1983.

[26] Kenn, P. G. W., Scott Morton, M., "Decision Support Systems:-An Organizational Perspective." Reading, Mass.: Addison-Wesley Publishing Company, 1978.

[27] Kramer, H. C., Advising by faculty. National Education Association. Washington, DC .1977.

[28] Lawrence Erlbaum Associates. *Handbook on student development: advising, career development, and field placement.* Hillsdale, N. J., 1987.

[29] Levine, A. *Handbook on undergraduate curriculum.* 1st Edition. San Francisco: Jossey-Bass Publishers, 1978.

[30] McGregor, John D. and Sykes, David A. *Object-Oriented Software Development, Engineering Software for Reuse.* International Thomson Computer Press, A Division of International Thomson Publishing Inc., 1992.

[31] Mcneil, J. D. *Curriculum: a comprehensive introduction.* 4th Edition. Glenview, III: Scott Foresman/Little, Brown Higher Education, 1990.

[32] Minsky, Marvin "A framework for representing knowledge." in Winston, P. (ed.) *The Psychology of Computer Vision.* New York: McGraw-Hill, 1975.

[33] Moore, J. H. and Chang, M. G. "Design of Decision Support Systems." *DATA BASE*, Vol. 12:1, No. 2 (1980), pp. 15-28.

[34] Nilson, N. J., *Principles of Artificial Intelligence*. Tioga 1980.

[35] Title III, Institutional Aid Programs, The Faculty advising Handbook. The Counseling and self-Development Center, S.C. State College.1983.

[36] Turban, Efraim. *Decision Support and expert Systems. Management Support Systems.* Macmillan Publishing Company, New York, 1993.

[37] Waterman, D. A. "Generalization learning techniques for automating the learning of heuristic." Artificial Intelligence, Vol. 1 and 2 (1970):121-170.

[38] Waterman, D. A., and Hayes-Roth, F. (eds.) *Pattern-Directed Inference Systems.* New York: Academic Press, 1978.

[39] Winston, P. H., "Artificial Intelligence." Reading, Mass: Addison-Wesley, 1979.

The Use of an Integrative Project in a Computer Applications in Business Course

Chuck Leska
Department of Computer Science
Randolph-Macon College
Ashland, VA 23005
cleska@rmc.edu
(804) 752-3158

ABSTRACT

To provide an academic richness to a course that focuses on the use of application software it is essential to not only learn how to use the tool but to provide a context for its use. A further necessary condition is developing the ability to recognize those problems that the tool can be used to effectively solved. The paper argues that to enhance the academic integrity of such a course requires an emphasis in modeling with the tool and developing problem solving skills that provide an opportunity to integrate the skills learned. In this paper an integrative project/case study is proposed as an approach for achieving this goal. Further this paper discusses factors that mitigate against its successful use.

INTRODUCTION – THE COURSE

In this section a general overview of the Computer Applications in Business course is presented. The catalog description for the course is: This course introduces software applications that are utilized in the business environment. There is a strong emphasis on effectively using these applications as problem solving tools. The course includes an extensive introduction to the use of spreadsheets in business processes. Additionally topics and applications selected from database design and use, presentational software, web page construction, effective use of the Internet, and a general introduction to the computer and computing.

Over the last seven years the department has used applications from the Microsoft Office Suite in the delivery of this course (Excel, Access, and PowerPoint) and FrontPage. In the instantiation of the course by this instructor the two primary emphases are on the use of spreadsheets and relational databases in the business environment.

The topics covered in the spreadsheet emphasis include the typical elementary topics, for example, absolute and relative referencing, formatting, the standard functions, creating a formula, creating graphs/charts, and decision making with =if(), =sumif(), =vlookup(), and =hlookup() functions. Other topics regularly included are the use of goal seek, solver, scenarios, data tables, using multiple worksheets and workbooks, pivot tables and charts, importing data, protection mechanisms, data validation, combo box control, command buttons, and an introduction to the use of Visual Basic scripts for applications.

In the database emphasis, a typical collection of topics include intuitive relational database design methodology, data redundancy, data integrity, creating effective relationship tables, the use of primary keys, importing and exporting data, the use of validation and formatting, referential integrity, querying, creating and modifying forms, and password protecting.

Next, a brief description of how the Excel material is presented to the students is outlined. For virtually every topic there is a brief mini-lecture in which the particular topic is discussed in the context of a simple model. For example, if the =sum() function were being introduced the model might be of the monthly sales of a company's sales force. The scenario might request that the total sales, the total return on sales, and total net sales be computed. The students would be asked to make the preliminary calculations and then the use of the =sum() function would be illustrated. There typically would be a classroom exercise or two (depending on the complexity of the topic) and weekly homework exercises again presented as simple scenarios that the students would be required to complete. The classroom exercises allow the students to use the concept when assistance is readily available. If there are a number of questions or students get stuck on some point additional instruction is provided. Since the object of these exercises is to assist in the mastery of the material, students are permitted to help each other. There are frequent quizzes, worth a significantly larger portion of the course grade than the homework, to discourage students from simply copying.

OBSTACLES TO STUDENT MASTERY

A primary goal of the course is to prepare students to effectively utilize the skills and concepts developed in the course. Given a problem the expectation is that students can apply their modeling and design skills, recognize the potential tools for implementing the model and select the best ones, and to ultimately develop their problem solving skills. Two core impediments to achieving these objectives face an instructor – the nature of the audience and the support for these goals provided by textbooks.

The Audience: The design of the course emphasizes business applications. But, since the course satisfies the general education **computing** requirement at my institution, it is not unusual that 50% of class to have majors outside of business.

Students have demonstrated that they have difficulty in transferring the skills they learn solving one problem to analogous problems especially when presented as word problems or scenarios. This obstacle is typically tackled by practice with classroom and homework exercises, and, ultimately on quizzes and exams. Of course, time is a limiting factor in developing these skills during quizzes and exams. Still, the essential challenge is to have a venue for problems which require a number of functions, formula, and problem solving techniques where students are asked to organize the solution into a sequence of steps. Problems such as these develop the students' problem solving abilities and assist them in making the tool set they are learning their own.

Our approach in the past has been in two phases: first, a problem or a set of problems that have limited scope and that use a particular concept, function or technique. The second phase explores its use in a modestly larger setting where it a key component of a larger solution algorithm. The former is typical of a classroom exercise, a homework exercise or a quiz question. The latter type problem is more likely to appear as part of a homework problem following a phase one problem after a collection of such items are covered and to a limited extent on an exam problem. Quite frankly neither of these phases is sufficient due to scope of such an exercise and time constraints.

Textbooks: Virtually all of the texts I have reviewed for the course do not truly emphasize problem solving. In many cases in the tutorials and exercises the authors actually spell out the calculation to use and even where to place that calculation as well as the nature of the presentation of the data. In

fairness to these texts their primary focus is on accessing the features, the parameters available for the features, and the correct use of the features introduced in the chapter and giving the students practice in the use of the features. The O'Leary text [3] is an example of this type of text.

In my department the instructors use these textbooks to minimize the amount of time that needs to be spent working through all the details of the software menu system and the less frequently used parameters available in functions. The textbook's chapter tutorials do a very thorough job of that, and, in addition, provide broader coverage of the available features than a problem solving approach could ever hope to achieve.

A text such as Miller's[2], which contains a set of case studies appropriate for use in a course such as ours, does not provide the elementary topics needed for beginners to develop a facility and confidence with the application software. The book would be an excellent one for a follow up course for honing students design and problem solving skills with the software.

The text by Krishan [1] has a most promising title which includes the phrase "A Problem Solving Approach". The text does an interesting job of integrating the access and skills. In a number of sections the approach has a "just in time" feature to developing the instruction of how to access and use the features of Excel within the discussion of a problem. I found the presentation to be very accessible and does in fact cover most of the Excel topics but some not at the depth I would like. The text does provide some problems that require students to exercise their problem solving skills.

AN APPROACH TO INTEGRATION: PROJECTS/CASE STUDIES

As indicated in the paper title, the approach used was to exercise student problem solving skills and to assist them in integrating the tools, concepts and techniques covered in the Excel and Access portions of the course. The vehicle used was a fairly comprehensive project/case study.

There are two Excel projects and two Database projects which are briefly outlined below.

For both Excel projects students are advised that wherever possible entries should be calculated from other entries on the worksheets (rather than simply entering constants which are computed by hand or calculator).

A brief overview of the projects is provided below.

Excel project one: This project is an extension of a problem instructors have frequently utilized in the course. The basic scenario: Georgia Oceanside Vacations, located on the Georgia coast, is a popular area for family vacations from May through mid October. The property is run and managed by Bill and Agnes Downes. Reservations can be made for up to a year in advance. Agnes manages the reservations for Georgia Oceanside Vacations.

Agnes has decided that she is going to use an Excel workbook to maintain the reservations. Bill and Agnes are determined to integrate all their bookkeeping activities into the workbook. All their budgetary activities will reside on one of the worksheets in the workbook.

This case requires the student to compute current income based upon current rental information, to perform an income projection for the remainder of the season based upon historical rental data, to perform a cost analysis, and to make a projection of income and expenses for next year. The project has a requirement that a "what if" analysis must be included using the appropriate tools to develop the overall problem analysis.

The first two tasks have a model provided; the students are required to develop a model for the final two tasks.

Excel project two: The Mercury Energy Corporation is a small company that supplies products that are well known for their energy efficiency. The company chief executive officer Bill Kratzer wants to use Excel to maintain records of the company's benefits package and assist him in better understanding the financial impact of the package. Mr. Kratzer has requested that you develop this Excel workbook.

The benefits package has three major features: a medical plan, a dental plan, and a retirement plan. Each employee is free to allocate its benefits package allocation in any way they desire with the caveat that an employee must allocate at least 3% to the retirement plan. The students are to manage data on both the overall plan cost and the individual employee allocations. The selection of the employee's allocation requires a user-friendly interface. The project also requires a projection of the next year's company budget given percent increases in the plan costs and salary.

Tables containing medical plans and dental plans and an employee listing with salary and dependents are provided. All the remaining models are left for the students.

Database project one: An agent who represents a number of artists wishes to maintain a database which among other entities will contain the artifacts produced by these artists. The artifacts are shown at various venues and many are for sale. The agent has kept careful records of those patrons who have purchased artifacts or expressed interest in so doing.

It is essential that the agent be able to track the artifacts currently for sale and artifacts of artists the agent has sold (for possible purchase from owner for resale to interested patron). Each artifact that is for sale will have a price, a description of the artifact and possibly be on display at some venue.

The project provides the design of the three primary tables, Artists, Patrons and Venues. An Excel workbook containing three worksheets contains the data for these tables.

The requirements include the design of the relationship tables; the students are provided with the expected contents for a number of reports and queries they need to process. In designing the relationship table the students are cautioned to pay careful attention to redundancy. To protect the user from improper data entry data validation and formatting features are to be used wherever appropriate. Referential integrity is expected to be enforced.

Database project two: Lake Winona College is a private college that is required to maintain data on its internship program. Due to the complexity of the data, the numerous information requests and reports, internal and external, that the college is required to respond, the college has decided it is time to design a database and to enter the necessary data to meet these needs.

Amongst the data the college is required to track are the students participating in internships, the semester they participated, the internship course number, the participating companies, their location and other relevant information, the faculty sponsors, the company's internship supervisor, and more.

The first phase of the project requires the students to use the problem description to decide on the identity and design of the primary entity tables including the identification of the primary key and the attributes.

For the second phase all students are provided with a standard design of the primary entities by the instructor. They are required to design the relationship tables given a collection of queries and reports that need to be produced. In addition, data for the primary tables is provided for importing. As part of the case study requirements all listed reports and queries must be produced. The remainder of the case requirements are the same as provided above for the first database case study.

OBSERVATIONS, ADJUSTMENTS, AND WHAT NEXT

Assigning the case study where students have a number of weeks to complete their work caused me to be concerned about the independence of their work. To address this concern I took the following precautions. First, I assigned different case studies to students that I had observed working together on lab and tutorial exercises. Since the primary function of lab and tutorial activities is to learn Excel's functionality and how to use it in solving problems, this cooperation is permitted and, in fact, often encouraged. Second, as part of the grade for the case, study students were told there would be a question or two on a subsequent quiz or the final (in actuality it was the final) which required the students to discuss how they approached solving a specific part of the case study or asked them to solve a problem very similar to a component of the project.

It turned out that in examining the results of the case study there was no evidence that information or approaches were shared. The presentation and the approaches used were in most cases quite dissimilar. Within the projects the students were provided with opportunities to approach a sub-problem in a variety of ways. During the assessment of the projects it became clear that they did not think through the consequences of their choices in completing that portion of the project or did not connect their choice with the rest of the project. In general, the quality of solutions on the project matched performance on the students' other assessed work in class.

I decided to wait to distribute the case study until the class had covered all the material needed to successfully complete all aspects of its requirements. Since the work required to do well on the case study was quite extensive by the time the student solutions were completed there was insufficient time left in the semester to complete the database case study. In the next iteration of the course I plan to distribute the case study to the students during the second week of classes with a due date of one week after the completion the Excel portion of the course.

Grades	Distribution Course Grades	Distribution Case Study Grades	Distribution Final Exam Problem
A	3	2	3
B	7	7	5
C	7	6	7
D	5	6	5
F	2	3	4

Table 1: Comparative grade distribution

The results on the case study related question on the final examination indicated that the students had learned the material at least to the level they had in other graded activities in the course. The results contained in Table 1 do not, in and of themselves, guarantee that their work was done independently. But based upon the questions I was asked and the end results I believe that the project was reasonably successful; that is, the students, even those whose grades were not stellar, showed a level of mastery of the requisite Excel material and problem solving skills. And, they were able to successfully use these skills in the project which was the primary goal of the exercise.

SELECTED REFERENCES

[1] Kirshan, S.I., Computing with Excel and VBA, A Problem Solving Approach, Jones and Bartlett, 2009.

[2] Miller, M. Lisa, MIS CASES Decision Making with Application Software, Prentice-Hall, 2003.

[3] O'Leary, L. & O'Leary T., Microsoft Office 2007 Excel, Introductory Edition, McGraw-Hill, 2007.

WEB-BASED AND FACE-TO-FACE STUDENT SATISFACTIONS WITH COURSE WEBSITE

Qidong Cao, Winthrop University, Rock Hill, SC 29733, caoq@winthrop.edu
Thomas E. Griffin, Nova Southeastern University, Fort Lauderdale, FL 33062, tegriffi@nova.edu
Xue Bai, Virginia State University, Petersburg, VA 23806, xueb@vsu.edu

ABSTRACT

While a vast body of literature has been devoted to comparison of the online and traditional face-to-face courses, little research of student satisfaction with respect to course Websites differentiated between the online and face-to-face students. Our effort was aimed at identifying important predictors of the satisfaction of online students and face-to-face students. This study conducted Fisher's z transformation and test to compare correlation coefficients of each of Website features and the student satisfaction between two groups of student. Williams' T-test was performed to compare correlation coefficients, with the student satisfaction, of different Website features within one group, online or face-to-face students. The results showed that online students and face-to-face students had different focuses on Website features.

INTRODUCTION

A vast body of research was devoted to Web-based online classes. McGorry [19] identified six factors that affected student satisfaction with Web-based classes: flexibility, responsiveness and student support, student learning, interaction, technology, and technical support. Technical problems were found having negative impact on students' course performance [1] [4] [24]. Instructors' performance, such as timely feedback and interaction with students, was found more important than technology and significantly related to student satisfaction with course Websites [11] [18] [22] [28]. Thurmond et al. [28] conducted a hierarchical regression analysis and found that student satisfaction was related to quality of online classroom activities, rather than student characteristics such as computer skills, knowledge of electronic communications, and number of Web courses taken. There is also an increasing use of course Websites in traditional face-to-face classes. Ballard et al. [3] found that the majority of students "chose course information rather than online communication as the most helpful feature of course Websites." Students found that course Websites enhance the understanding of course content [5].

The existing studies compared student satisfaction with courses in face-to-face and Web-based settings, rather than student satisfaction with course Websites. Some researchers found no significant difference between the online and the face-to-face students in terms of students' course performance, quality of course work, and satisfaction with effectiveness of course delivery [1] [4] [24] [27] [29] [30] [32]. However, some studies found that the face-to-face classes had significantly higher mean scores for courses content, delivery [21], interaction, and support [15]. Summers et al. [26] found that the online students were significantly less satisfied with the course in terms of class discussion, quality of questions and problems, and evaluation and grading, while no significant difference existed in grades of the online and the face-to-face students. There were no consistent conclusions found in studies.

This study conducted Fisher's z transformation and test [25] to compare between two groups of student the correlation coefficients of each of Website features and the student satisfaction with course Websites. Williams' T-test [31] was performed to compare correlation coefficients, with the student satisfaction, of different Website features within online or face-to-face students. The results, from comparisons between two samples and comparisons within the same sample, showed that online students and face-to-face students had different focuses on Website features.

DATA AND METHODOLOGY

Data were supplied by a sample of 102 traditional face-to-face students and a sample of 231 Web-based distance learning students from public and private higher education institutes in North America. The samples contained business students working on degree programs in various fields. The survey form (Appendix) included nine questions and employed a five-point Likert scale ranging from Strongly Disagree (1 point) to Strongly Agree (5 points). The last question in the survey form assessed the dependent variable "student satisfaction with the course Website". To reveal relationship between Website features and student satisfaction with course Websites, the Pearson correlation coefficients were computed. The differences were further investigated by using Williams' T-test [25] and Fisher's z-transformation and test [7]. Steiger [25] examined methods of comparing correlation coefficients from the same sample (Pearson and Filton's Z-test, Hotelling's T-test, Williams' T-test, and Dunn and Clark's Z*-test). It was found that Williams' T-test was perhaps the best all-around choice when the null hypothesis of interest was $\rho_{jk} = \rho_{jh}$. The formulas from Williams' T-test [31] are shown as follows:

$$T = (r_{jk} - r_{jh}) \sqrt{\frac{(n-1)(1+r_{kh})}{2(\frac{n-1}{n-3})|R| + \bar{r}^2(1-r_{kh})^3}} \tag{1}$$

where $|R| = (1 - r_{jk}^2 - r_{jh}^2 - r_{kh}^2) + (2r_{jk}r_{jh}r_{kh})$ and $\bar{r} = \frac{1}{2}(r_{jk} + r_{jh})$. T has a t distribution with df = n-3.

Fisher's z-test has gained popularity for providing a methodology of comparing two correlation coefficients. Successful applications have been seen in many research areas such as business, education, psychology, biology, and medical science. The z-test for comparison of correlation coefficients form two independent samples has formulas as follows [7]:

$$Z = \frac{z_1 - z_2}{\sqrt{\frac{1}{n_1 - 3} + \frac{1}{n_2 - 3}}} \tag{2}$$

where

$$z_1 = .5 \log_e (\frac{1 + r_1}{1 - r_1}) \tag{3}$$

$$z_2 = .5 \log_e (\frac{1 + r_2}{1 - r_2}) \tag{4}$$

In order to control the experimentwise Type I error rate in the multiple-comparison tests, a variable reduction technique was utilized. The principal component analysis with orthogonal rotation reduced eight independent variables into a smaller number of principal components (the underlying dimensions) while those components still accounted for most of the variance in those eight observed variables. The multiple-comparison tests were applied to a smaller number of components. The orthogonal rotation resulted in uncorrelated principal components and made easier interpretation of those factors. The number of components in this study was determined by a combination of four approaches – the eigenvalue-one

2

criterion [16], the scree test [6], the proportion of variance accounted for [17], and the interpretability criterion [6].

RESULTS

In Stage 1, the principal component analysis was performed on the first eight survey items. The number of components initially extracted by the principal component analysis was equal to the number of the variables (8) being analyzed. A combination of four approaches (the eigenvalue-one criterion, the scree test, the proportion of variance accounted for, and the interpretability criterion) was used in determining the number of components that should be retained. The first three components have eigenvalues greater than one, and three components may be retained according to the eigenvalue-one criterion [16]. Cattell [6] suggested finding the place in the "scree test" where the curve made an "elbow". In Figure 1, the smooth decrease of eigenvalues appears to level off to the right of the fourth variable and, therefore, four components may be retained by the scree test. The approach of "proportion of variance accounted for" retains a component if it accounts for a specified percentage of total variance in the variables being analyzed. The critical values usually used in practice were 10% for individual components and 70%-80% for the combined components [13]. The first four components account for approximately 81% of the total variance while three components each account for more than 10% with the fourth one slightly below 10% (9.4%). It again suggests that four components may be retained. The most important criterion is perhaps the interpretability criterion. The result of orthogonal rotation in the following paragraph suggests that four components can be retained. Combining all four approaches, this study identified four components.

The orthogonal rotation results in uncorrelated principal components that are easier to interpret. Table 1 shows the loadings on components and communalities of observed variables from the orthogonal rotation. For description of variables 1 through 8 in Table 1, readers are referred to Appendix. The loadings are equivalent to bivariate correlation between the observed variables and the components, and communality refers to the amount of variance in an observed variable that is accounted for by the retained components [13]. Nunnally [20] recommended: "A common rule of thumb for assessing construct validity is that individual items should have a factor loading of at least 0.6 on their hypothesized construct (for convergent validity) and less than 0.3 loading on all other constructs (for discriminant validity)." According to Nunnally, items 1 and 2 loaded on component 4. In the survey form (Appendix), questions 1 and 2 appeared to deal with "useful course information", and therefore component 4 was labeled the "Course Information" component. Items 3 and 4 loaded on component 2. Questions 3 and 4 appeared to deal with "System Responsiveness", and component 2 was labeled the "Response" component. Questions 5 and 6 loaded on component 3. Questions 5 and 6 appeared to deal with "timely and quality learner-instructor interaction", and component 3 was labeled the "Interaction" component. Questions 7 and 8 loaded on component 1. Questions 7 and 8 appeared to deal with "easiness of learning and using course Web-sites", and component 1 was labeled the "Ease" component. Thus, the clear-cut four-component structure shown in Table 1 was easily interpretable. In addition, communality refers to the amount of variance in an item that is accounted for by the retained components. The four components accounted for 81% (6.5/8) of the total variance in the eight variables being originally analyzed.

In Stage 2, the reliability of constructs was assessed by calculating Cronbach's α. The reliability reflected how well the observed scores collected by the survey instrument were related to the true scores of constructs [14]. Cronbach's α reliability estimates were 0.74, 0.77, 0.75, and 0.79 for the Course Information, Response, Interaction, and Ease of Use scales, respectively. Reliability estimates all exceeded the minimum value of 0.70 recommended by Nunnally [20].
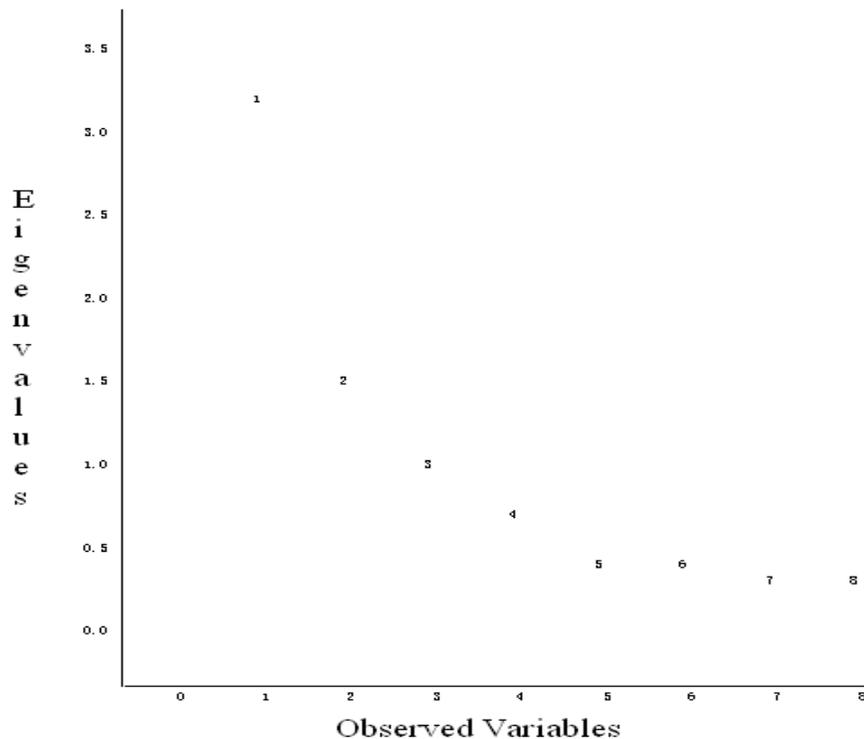
Figure 1 Scree Plot of Eigenvalues

Variable	1	2	3	4	5	6	7	8	Variance Explained by Each Component
Component 1	.20	.25	.13	.02	.14	.15	**.86**	**.87**	1.66
Component 2	.06	.08	**.90**	**.89**	.11	.00	.06	.10	1.64
Component 3	.18	.24	.01	.10	**.87**	**.85**	.13	.16	1.62
Component 4	**.86**	**.80**	-.02	.15	.16	.24	.25	.18	1.58
Communality	.81	.77	.83	.82	.81	.80	.82	.83	6.50

Table 1 Loadings and Final Communality Estimates from Orthogonal Rotation

In Stage 3, the scores of four components were calculated by averaging scores of survey items for each component, and the bivariate correlation coefficients between each of the components and the student satisfaction were then computed and used to assess the marginal importance of each component in terms of improving the student satisfaction with course Websites. The sample means of component scores were shown in Table 2. The correlation coefficients and their p-values (H_0: $\rho=0$) were shown in Table 3 for face-to-face students and Web-based online students, respectively. All components were significantly correlated with the student satisfaction for both student groups except for statistical insignificance of component "Response" for online students (p=.6877). Next, Fisher's z-test was performed to compare correlation coefficients from two student groups, and the p-values of tests are shown in the bottom of Table 3. Components "system responsiveness" and "ease of use" had a significantly higher correlation with the student satisfaction for face-to-face students than that for online students. Lastly, Williams' T-test was used to compare correlation coefficients from the same sample. Tables 4 and 5 show T values and p-values of Williams' T-test for the face-to-face students and online students, respectively. For face-to-face students, component "ease of use" had a significantly higher correlation with the student satisfaction than any other components, and component "timely and quality learner-instructor interaction" had a significantly higher correlation with the student satisfaction than component "system

4

responsiveness". For online students, components of "course information" and "timely and quality learner-instructor interaction" had a significantly higher correlation with the student satisfaction than components of "ease of use" and "system responsiveness" while component "ease of use" had a significantly higher correlation with the student satisfaction than component "system responsiveness".

	Course Info	Response	Interaction	Ease
F2F	3.52	3.52	3.37	3.65
Web-Based	3.73	3.27	3.66	4.16

Table 2 Sample Means of Component Scores

	Course Info	Response	Interaction	Ease
F2F	.550 p<.0001*	.442 p<.0001*	.647 p<.0001*	.755 p<.0001*
Web-Based	.609 p<.0001*	.027 p=.6877	.514 p<.0001*	.323 p<.0001*
p-value	0.4576	0.0002*	0.0941	<0.0001*

Table 3 F2F vs. Web-Based: Comparison of Correlation Coefficients

	Course Info	Response	Interaction	Ease
Response	1.318 .191	-		
Interaction	-1.435 .154	-2.985 .004*	-	
Ease	-3.505 .001*	-4.538 <.001*	-2.103 .038*	-

Table 4 Williams' T-test for F2F Students: T value and p value (H0: T = 0, Ha: T ≠ 0)

	Course Info	Response	Interaction	Ease
Response	7.542 <.001*	-		
Interaction	1.714 .088	-5.856 <.001*	-	
Ease	4.977 <.001*	-3.442 .001*	2.569 .011*	-

Table 5 Williams' T-test for Web-Based Students: T value and p value (H0: T = 0, Ha: T ≠ 0)

DISCUSSION AND SUMMARY

The results of Fisher's z-test showed that components "system responsiveness" and "ease of use" had a significantly higher correlation with the student satisfaction for the face-to-face students than that for Web-based online students. The results of William's T-test showed that component "ease of use" was the most important course Web-site feature for the face-to-face students but it was less important for the online students. For both the face-to-face and online students, components "course information" and "timely and quality learner-instructor interaction" were found important while component "system responsiveness" the least important.

The findings can be explained by an extended version [12] of the technology acceptance model (TAM). TAM tried to reveal causal relationships between factors (perceived usefulness and perceived ease of use) and the information system usage [9] [10]. When TAM was applied to Web-based online learning, acceptance of Web-based online learning system was found multidimensional and TAM should be

5

extended to incorporate a wide variety of variables [8] [23]. Gefen et al. [12] have revealed that the perceived ease of use directly influenced IT acceptance only if the task was intrinsic to the IT. Tasks that were intrinsic to the IT were defined as tasks where the IT itself provided the end product or service while tasks that were extrinsic to the IT were defined as tasks in which the IT was only the means [12]. This theory explained the finding in this study that component "ease of use" was a more important factor to student satisfaction for the face-to-face students than for the Web-based online students. For the face-to-face students, tasks of using course Websites were intrinsic to course Websites because the course Websites provided the end services such as downloading course related information, interacting with instructors, and so forth. For the Web-based online students, tasks of using course Websites were extrinsic to course Websites because the service for which the course Websites were ultimately being used by students was taking a course. For the Web-based online students, many tasks of using course Websites, such as downloading course related information, interacting with instructors and etc., were only the means of taking a course.

The findings can also be explained by the theory of learning curves. "Learning-by-doing" is a central concept of the learning curve theory. According to the theory of learning curves, individuals or teams improved performance as a task was repeated [2]. The frequency and length of time of using course Websites by the Web-based online students were considerably higher than by the face-to-face students. Furthermore, the course Websites for the Web-based online students had more consistent user interfaces because those course Websites were usually created by using commercial systems and maintained by dedicated system administrators while course Websites for the face-to-face students were mostly created and maintained by individual instructors. Thus, it was reasonable to assume that the surveyed online students had reached the later stage of the learning curve and completed learning how to use the course Websites. Thus, component "ease of use" was a less important factor for the Web-based online students than for the face-to-face students.

Under the constraints of limited budget and time, educational administrators, instructors, and system developers need to know which Website features are more important with respect to student satisfaction. The findings of this study have extended knowledge beyond the simple statistics, as that has been done in previous studies, of responses to the items in the questionnaire. Multiple comparisons of correlation coefficients showed significant difference of the same correlation coefficient from two student groups and different patterns of significance for two student groups. Therefore, for course Websites used by different student groups, educational administrators, instructors, and system developers might apply constrained resources on improvement of the more important Website features to efficiently increase student satisfaction.

REFERENCES

[1] Allen, M., Bourhis, J., Burrell, N. and Malbry, E. "Comparing Student Satisfaction with Distance Education to Traditional Classrooms in Higher Education: A Meta-Analysis." *The American Journal of Distance Education*, 2002, 16(2), 83-97.
[2] Argote, L. *Organizational learning: creating, retaining, and transferring knowledge*. New York, NY: Springer, 1999.
[3] Ballard, S., Stapleton, J. and Carroll, E. "Students' Perceptions of Course Websites Used in Face-to-Face Instruction." *Journal of Interactive Learning Research*, 2004, 15(3), 197-211.
[4] Buckley, K. M. "Evaluation of Classroom-Based, Web-Enhanced, and Web-Based Distance Learning Nutrition Course for Undergraduate Nursing." *Journal of Nursing Education*, 2003, 42(8), 367-370.
[5] Buzzetto-More, N. A. "Student Descriptions of Various E-Learning Components." *Interdisciplinary Journal of E-Learning and Learning Objects*, 2008, 4(1), 113-135.

[6] Cattell, R. B. "The Scree for Criterion and the Interpretability Criterion." *Multivariate Behavioral Research*, 1966, 1(2), 245-276.

[7] Chalmer, B. J. *Understanding Statistics*. New York, NY: Marcel Dekker, 1987.

[8] Chang, K. M. and Cheung, W. "Determinants of the intention to use internet/www at work: a confirmatory study." *Information & Management*, 2001, 39(11), 1-14.

[9] Davis, F. D. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly* 13(3), 319-340.

[10] Davis, F. D., Bagozzi, R. P. and Warshaw, P. R. "User acceptance of computer technology: a comparison of two theoretical models." *Management Science*, 1989, 35(8), 982-1003.

[11] DeBourgh, G. A. "Predictors of Student Satisfaction in Distance-Delivered Graduate Nursing Courses." *Journal of Professional Nursing*, 2003, 19(3), 149-163.

[12] Gefen, D. and Straub, D. W. "The Relative Importance of Perceived Ease of Use in IS Adoption: A Study of E-Commerce Adoption." *Journal of the Association for Information Systems*, 2000, 1(8), 1-30.

[13] Hatcher, L. *A Step-by-Step Approach to Using the SAS System for Factor Analysis and Structural Equation Modeling*. Cary, NC: SAS Institute Inc., 1997.

[14] Hayes, B. E. *Measuring Customer Satisfaction Development and Use Questionnaire*. Milwaukee, WI: ASQC Quality Press, 1991.

[15] Johnson, S. D., Aragon, S. R., Shaik, N. and Palma-Rivas, N. "Comparative Analysis of Learner Satisfaction and Learning Outcomes in Online and Face-to-Face Learning Environments." *Journal of Interactive Learning Research*, 2000, 11(1), 29-49.

[16] Kaiser, H. F. "The Application of Electronic Computers to Factor Analysis." *Educational and Psychological Measurement*, 1960, 20(1), 141-151.

[17] Kim, J. O. and Mueller, C. W. *Factor Analysis: Statistical Methods and Practical Issues*. Sage, CA: Beverly Hills, 1978.

[18] Mayzer, R. and DeJong, C. "Student Satisfaction with Distance Education in a Criminal Justice Graduate Courses." *Journal of Criminal Justice Education*, 2003, 14(1), 37-52.

[19] McGorry, S. Y. "Measuring Quality in Online Programs." *Internet and Higher Education*, 2003, 6(2), 159-177.

[20] Nunnally, J. C. *Psychometric Theory*. New York, NY: McGraw-Hill, 1978.

[21] Roach, V. and Lemasters, L. "Satisfaction with Online Learning: A Comparative Descriptive Study." *Journal of Interactive Online Learning*, 2006, 5(3), 317-332.

[22] Roblyer, M. D. and Wiencke, W. R. "Design and Use of a Rubric to Assess and Encourage Interactive Qualities in Distance Courses." *American Journal of Distance Education*, 2003, 17(2), 77-98.

[23] Saadé, R. and Bahli, B. "The Impact of Cognitive Absorption on Perceived Usefulness and Perceived Ease of Use in On-Line Learning: an Extension of the Technology Acceptance Model." *Information & Management*, 2005, 42(2), 317-327.

[24] Schoech, D. and Helton, D. "Qualitative and Quantitative Analysis of a Course Taught via Classroom and Internet Chatroom." *Qualitative Social Work*, 2002, 1(1), 111-130.

[25] Steiger, J. H. "Test for Comparing Elements of a Correlation Matrix." *Psychological Bulletin*, 1980, 87(2), 245-251.

[26] Summers, J. J., Waigandt, A. and Whittaker, T. A. "A Comparison of Student Achievement and Satisfaction in an Online Versus a Traditional Face-to-Face Statistics Class." *Innovative Higher Education*, 2005, 29(3), 233-250.

[27] Swan, K. "Virtual Interaction: Design Factors Affecting Student Satisfaction and Perceived Learning in Asynchronous Online Courses." *Distance Education*, 2001, 22(2), 306-331.

[28] Thurmond, V., Wamback, K., Connors, H. R. and Frey, B. B. "Evaluation of Student Satisfaction: Determining the Impact of a Web-Based Environment by Controlling for Student Characteristics." *The American Journal of Distance Education*, 2002, 16(3), 169-189.

[29] Unal, Z. "A Comparative Study on Learning Outcomes of Web Based vs. Classroom Based Instruction." *Journal of College Teaching & Learning*, 2005, 2(3), 1-6.

7

[30] Warren, L. L. and Holloman, H. L. "Online Instruction: Are the Outcomes the Same?" *Journal of Instructional Psychology*, 2005, 32(2), 148-151.

[31] Williams, E. J. "The Comparison of Regression Variables." *Journal of the Royal Statistical Society, Series B*, 1959, 21(2), 396-399.

[32] Wright, V. H., Marsh, G. E., and Miller, M. T. "A Critical Comparison of Graduate Student Satisfaction in Asynchronous and Synchronous Course Instruction." *Planning and Changing*, 2000, 31(1/2), 107-118.

Appendix: Survey Form

To better serve you, we would like to know your opinion of the quality of my course Website. Please indicate the extent to which you agree or disagree with the following statements. Circle the appropriate number using the scale below.

1 – I strongly disagree with this statement (SD).
2 – I disagree with this statement (D).
3 – I neither agree nor disagree with this statement (N).
4 – I agree with this statement (A).
5 – I strongly agree with this statement (SA).

	SD	D	N	A	SA
1. The information on the course Website contained what I needed to improve my course performance.	1	2	3	4	5
2. The information contained on the course Website was sufficiently detailed to help me understand the course subjects.	1	2	3	4	5
3. I waited a short period of time to get help when I had a problem to use the course Website.	1	2	3	4	5
4. I waited a short period of time before a requested Web page showed up.	1	2	3	4	5
5. The instructor was quick to respond when I sent him/her message through the course Website.	1	2	3	4	5
6. The quality of assistance the instructor gave me in the "Chat room" was high.	1	2	3	4	5
7. I was able to learn how to use the course Website in a short amount of time.	1	2	3	4	5
8. The course Website was easy to use.	1	2	3	4	5
9. I am very satisfied with the course Website.	1	2	3	4	5

DEVELOPMENT AND IMPLEMENTATION OF A DECISION SUPPORT TOOL TO ASSIST PHARMACISTS TO DETERMINE PRECISE DOSING AND INTERVALS OF AN AMINOGLYCOSIDE (ANTIBIOTIC)

Robert D. Spillman, Radford University, rspillma@radford.edu
Jason Welch, Radford University, jchadwic@gmail.com
Brandon K. Shaver, Radford University, brandon.shaver@gmail.com

ABSTRACT

The focus of this paper is to describe the development and implementation of a decision support tool to assist pharmacists in the management of dosing and intervals of an aminoglycoside. The development effort successfully created an end solution needed by pharmacists in a timely manner and provided the required portability of an application of this type. The project was completed in a community hospital located in southwest Virginia.

INTRODUCTION

An aminoglycoside is a molecule composed of a sugar group and an amino group, and several aminoglycosides function as antibiotics. Some of the common aminoglycoside antibiotics include Gentamicin, Amikacin, Tobramycin, Vancomycin, and Neomycin. It is critical that these antibiotics be carefully dosed based on numerous patient parameters to avoid damage to the kidneys, and to a lesser extent the auditory system. Precise dosing of an aminoglycoside can be a rather painstaking process since there are numerous difficult calculations that must be performed and the process is prone to error. Our goal in the creation of the this decision support tool was to automate much of this process and free the clinician up to do what they do best and leave the binary decisions and labor intensive calculations to the computer.

Pulaski Community Hospital located in southwest Virginia typically uses two different aminoglycosides in the course of disease treatment for patients. The first, Gentamicin, was being dosed using an excel spreadsheet that was deployed on a single aging laptop that sat in an office in the corner of the department. The second, Vancomycin, was dosed using a nomogram that was used to determine approximate dosing values based on only two parameters. Both of these drugs require careful monitoring for peak and trough concentrations of the drug within the body so as to adhere to the pulse dosing methodology in which the body is allowed to enjoy a drug free period after reaching the maximum therapeutic levels.

PURPOSE

The purpose of this project was twofold, first was to create an end to end solution in which the clinical pharmacist would be able to enter in a number of patient parameters into the program and receive back a number of calculated values as well as the recommended dose in milligrams as well as the dosing interval in hours. Our second aim was to make the program small enough to be sent as an email attachment, as straightforward to use as possible, not require an internet connection to operate, and able to run on modest hardware on any platform. To facilitate our goals toward those points we chose to write the program in JAVA, since it is a ubiquitous language and an executable jar file could be created that would run in any operating environment that would support the JAVA virtual machine.

NEED

The need for an application such as this stemmed from the fact that not all the computers that were available to the pharmacists had the Microsoft Office suite installed on them, thus restricting them to a single computer within their department. Additionally, pharmacists are on call at night after pharmacy hours, and many of the staffing pharmacists live in rural areas where they do not have access to internet connection which would allow them to avail themselves to an online calculator. Finally, our program would be able to utilize the comprehensive formulas, and return results that are accurate to two decimal places.

PROJECT DEVELOPMENT

Our first step toward facilitating our initial goal was to make sure we fully understood the problem, and that began with understanding exactly what information the program would need as input in order to perform the necessary calculations. After examining the existing spreadsheet, interviewing several of the staffing pharmacists, and experimenting with several online calculators, we narrowed it down to eight essential pieces of information.

1. Gender
2. Height
3. Weight
4. Age
5. Serum Creatinine
6. Desired Peak
7. Desired Trough
8. Infusion Time

The first four fields are self explanatory, but we will briefly describe what the last four refer to. Serum creatinine is a measure of the quantity of a waste product called creatinine which is present in the human body. The desired peak and trough are numbers that represent what maximum and minimum levels that the clinician is aiming for in terms of the concentration of the drug in the body. These ideal levels vary from drug to drug, and can vary for a single drug based on the organism that is being targeted and various complicating factors involved with the patient such as renal failure, congestive heart Failure (CHF), hypotension, etc. The infusion time refers to how long it will take the drug to infuse into the patient, i.e. 30 minutes for Gentamicin, or 2 hours for Vancomycin.

Once these parameters have been passed to the program, along with information as to which of the two supported drugs a dosing regimen is being sought for, we can begin the calculations. The first calculation was one of the easiest and most straight forward. The patient's weight is still collected in pounds, and our

first task was to transform this value into kilograms since all calculations that follow require the weight to be in that form.

$$\text{Weight in Kilograms} = \text{Weight in Pounds} / 2.2$$

Two additional weights are also required for further calculations, and these are the ideal body weight, and the adjusted body weight.

$$\text{Ideal Body Weight (Males)} = 50\text{kg} + 2.3 * \text{each inch over 5 feet}$$

$$\text{Ideal Body Weight (Females)} = 45.5\text{kg} + 2.3 * \text{each inch over 5 feet}$$

$$\text{Adjusted Body Weight} = \text{Ideal Body Weight} + 0.4(\text{Actual Body Weight} - \text{Ideal Body Weight})$$

The adjusted body weight is used in some of the calculations if the actual body weight is greater than 25% of the calculated ideal body weight.

Estimating the creatinine clearance is the next step, and as indicated earlier, the creatinine clearance is a measure of how quickly the body is able to clear creatinine from the blood. This formula is called the Cockcroft and Gault equation, and has a rule built into it that states if the patient is over 65 years of age, and their creatinine clearance is less than 1, the value of 1 is used in the serum creatinine field for the purposes of calculation.

$$\text{Creatinine Clearance} = [(\,140 - \text{age}\,) * \text{Ideal Body Weight}\,] / (\,\text{Serum Creatinine} * 72\,)$$

$$\text{Note: If the patient is female, the calculated value is further multiplied by 0.85}$$

Once the creatinine clearance has been obtained, it is then possible to calculate the estimated kel, or elimination constant, also sometimes referred to the coefficient of elimination. This equation allows the clinician to estimate the elimination rate of the drug by the body.

$$\text{Gentamicin Kel} = (0.00285 * \text{Creatinine Clearance}) + 0.015$$

$$\text{Vancomycin Kel} = (0.00083 * \text{Creatinine Clearance}) + 0.0044$$

The next calculation needed is the estimated half life of the drug; this value represents the estimated value in hours at which the drug levels will drop by half within the body.

$$\text{Half Life} = 0.693 / \text{Elimination Constant}$$

The last sub result we needed to obtain to perform the final calculations was the estimated volume of distribution. This is the calculation that is sensitive to the patient's obesity status; we also included an option to force the calculation to be performed using the patient's actual body weight when dosing Vancomycin since there are certain situations in which the clinician may choose to only use actual body weight for that drug. The normal acceptable range for the volume of distribution for Gentamicin is 0.25 to 0.3 Liters per Kilogram, and 0.6 to 0.7 for Vancomycin. Based on standard practice for the pharmacists at Pulaski Community Hospital, 0.3 and 0.7 respectively were chosen and hard coded into the system.

The final three equations are the most difficult, require the most calculator manipulations, and are the main reasons that this process was ripe for automation. The dosing interval is a calculated value in hours that represents how long the patient should go between doses.

$$\text{Dosing Interval} = \text{Ln}\,(\,\text{Desired Peak} / \text{Desired Trough}\,) / \text{Elimination Constant} + \text{Time of Infusion}$$

Calculating the desired dose, the second of the two actionable calculated values, is also a very complex formula to solve.

$$\text{Dose} = [\text{Elimination Constant} * \text{Volume of Distribution} * \text{Time of Infusion} * \text{Desired Peak} * (1 - e^{-\text{elimination constant} * \text{dosing interval}})] / (1 - e^{-\text{elimination constant} * \text{time of infusion}})$$

Having finally reached our answer, there is a final step to perform where we can essentially check our work. We have two final formulas which allow us to predict the peak and trough; these two calculated values should always match the desired peak and trough values entered by the clinician during the data entry phase of using our application.

$$\text{Calculated Peak} = [\text{Dose} * (1 - e^{-\text{elimination constant} * \text{time of infusion}})] / [\text{Elimination Constant} * \text{Volume of Distribution} * \text{Time of Infusion} * (1 - e^{-\text{elimination constant} * \text{dosing interval}})]$$

$$\text{Calculated Trough} = \text{Calculated Peak} * e^{-\text{elimination constant}(\text{dosing interval} - \text{time of infusion})}$$

Once we had completed the work of entering our formulas into our JAVA application, we began the process of testing our results. A number of previous dosage calculations were made available to us, in which we compared the results of the spreadsheet and nomogram, as well as online calculators, to results that our application provided. After a few refinements, our application calculated exact matching answers to industry standard calculators available on the internet, as well as falling closely to the values that the pharmacists were obtaining using their old system in the hospital.

Graphical User Interface Development

Upon completing numerous tests to verify the validity of the calculations, the dosing calculator required a facelift to increase its usability and overall appearance. The current state of the dosing calculator is a basic command prompt in which the user is prompted with a series of input questions and enters a response for each. An additional goal for this project was to design a graphical user interface (GUI) that would be easy to use as well as provide a familiar screen layout pharmacists are used to seeing on the office computers.

Java provides the ability to design a graphical user interface utilizing the Swing library which allows a sophisticated set of GUI components to be implemented. Our interface design makes consistent use of text boxes and radio buttons placed within panels that hold a group of components together. The group of panels is placed in a frame which holds the entire interface intact. Interface design standards were followed by ensuring that text boxes were aligned and did not vary in size to create a non-interrupted navigation of screen components. An example of the design follows:

The results of the calculations are presented to the user in a new window. First, the input variables are displayed to the user as a confirmation that the correct numbers were submitted. This is followed by an identification of the specific drug the dosage is being sought after. Thirdly, the results reveal whether the dosage is calculated using the ideal or adjusted body weight. Lastly, the calculations are presented to the user based upon their body weight which has been converted to kilograms. An example of the output follows:

```
Message                                              ✕

  (i)   You entered this information:

        Male
        Gentamicin
        Weight: 165.0 lbs
        Height: 69.0
        Age: 22.0
        Serum Cr: 1.0
        Trough: 2.0
        Peak: 12.0
        Infusion time in hours: 1.0

        GENTAMICIN DOSING

        Dosing Using Ideal Body Weight
        Dosing weight is: 70.7 kg
        Creatinine clearance is: 115.87
        Ke is: 0.35
        Half-Life is: 2.01
        Volume of Distribution based on 0.3L/kg = 21.21

        Dosing Interval is: 6.19
        Desired Dose is: 265.46

        Calculated Peak is: 12.0
        Calculated Trough is: 2.0


                        OK
```

SUMMARY

Upon setting out to develop an application intended to ease the workload of pharmacists in a hospital environment, we have accomplished our desired goals for the project. We created a program that empowered a user to receive calculations based on specific information entered about a patient with minimal effort as opposed to working out complex math calculations with far less advanced technology. Specifically, this decision support tool provides aminoglycoside dosing recommendations within industry standards while at the same time minimizing adverse risks to patients. Our dosing calculator also proved to be extremely lightweight and portable while being completely functional on any computer system capable of running a JAVA virtual machine. Efforts to increase the usability with a graphical user interface have diminished any confusion or hardship the previous command prompt may have caused. With the dosing calculator already placed in a live hospital environment, pharmacists are nothing less than grateful that the old, paper weight of a laptop can be retired from that office corner.

The Implementation of Electronic Health Records

ABSTRACT

A 2000 Institute of Medicine Report estimated that as many as 98,000 U.S. patients die from preventable medical errors as a result of lack of access to complete medical information (Institute of Medicine, 2003). The development of an electronic health record system has been supported by the federal government as an opportunity to reduce medical errors by providing complete, accurate and timely information to health care providers. This paper will discuss the advantages and disadvantages of an electronic health record system and the barriers to implementing a system. Three case studies will be discussed to support salient points.

INTRODUCTION

Despite the fact that the United States' health care expenditures comprise 16% of the gross domestic product and expected to reach nearly 20% of the gross domestic product, U. S. citizens fail to consistently receive high quality health care (National Health, 2006). A 2000 Institute of Medicine Report estimated that as many as 98,000 U. S. patients die annually from preventable medical errors—many due to lack of access to complete medical information (Institute of Medicine, 2003). Medical informatics science, developed in the 1950s, is concerned with developing and evaluating information technology to advance health care focuses on the storage, retrieval, and use of biomedical information for problem resolutions (Vreeman, Taggard, Rhine, & Worrell, 2006; Austin& Boxerman, 2007). The use of electronic health records (EHR) or electronic medical records (EMR) may be considered a fundamental application of medical informatics, although there appears to be varying definitions of these systems (Jha, Ferris, Donelan, DesRoches,Shields, Rosenbaum&Blumenthal, 2006).

EMRs are electronic documentation of providers' notes, electronic viewing of test results and electronic prescribing. They are not a single computer application; rather a set of systems that are integrated that require investments in money, training, change and time. EHRs are more complex because it points to where other patient information can be found. An EMR provides information to the physicians regarding care recommendations and can also receive data from remote sites (Thielst, 2007). Because both systems have similar challenges during their implementation in an organization, the acronym EMR will be used interchangeably for both systems. Research indicates that the use of information technology and particularly the use of EHRs and EMRs may provide a platform to improve the quality of health care while controlling health care costs (Caldwell, Beattie, Cox, Denby,Ede-Golightly, & Linton, 2007). This type of management system focuses on both the efficiency and effectiveness needed to control health care costs.

In 2004, President Bush indicated that there should be widespread national adoption of EMR by 2014…that every U.S. resident should have an EHR/EMR (GAO Report, 2007). Bush established the National Health Information Technology Coordinator with a 10 year goal of creating an interoperable health information infrastructure that would ensure that most Americans would have electronic health records that are accessible by the health care delivery system (Valerius, 2007). The Health Resources and Services Administration (HSRA) have a $27 million grants budget that will be allocated to community health centers nationally to implement HER systems (Shields, 2007). The Certification Commission for Healthcare Technology was formed in 2004 by three leading healthcare industry associations to develop a certification program and establish criteria for EMR systems (Reber&Ladd, 2007). Funds have been awarded to them by the federal government to achieve these goals and is anticipated that a certification program for EMR will be established this year. Also, the Health Information Technology Initiative, which began in 2005, is a partnership between the federal government, several academic institutions and a non for profit organization. Their goal is to collect baseline data on the use of EMR systems in physician practices and hospitals (Physician Quality, 2005). This paper will discuss the evolvement of the use of EMRs/EHRS in the U.S. health care system, its impact on the different health care

delivery systems, the cost of using an EMR system, the advantages and disadvantages of implementing an EMR system, and the legal and ethical issues of an EMR system.

HISTORY OF THE ELECTRONIC MEDICAL RECORD

In 1991 and 1997, the Institute of Medicine issued reports that focused on the impact of computer-based patients' records as important technology for improving health care (Vreeman et al, 2006). The IOM has been urging the health care industry to adopt the EMR but initially costs were too expensive and the health community did not embrace the recommendation. As software costs have declined, more health care providers have adopted the use of the EMR system. In 2003, the Department of Health and Human Services began to promote the use of health information technology including the use of the EMR. The IOM was asked to identify essential elements for the establishment of an electronic health record. The IOM broadly defined the definition of an EMR to include:
1) the collection of longitudinal data on a persons health;
2) immediate electronic access to this information;
3) establishment of a system that provides decision support to ensure the the quality, safety and efficiency of patient care (IOM, 2003).

Benefits to the Implementation of the EMR

Several studies have been performed to assess the impact of the EMR on health care delivery. Administrators of several health care delivery systems reported many benefits to the implementation of an EMR. Many administrators cited the capability of more comprehensive reporting that integrated both clinical and administrative data. It also provided an opportunity to analyze and review patient outcomes because of the standardization of the clinical assessments. Also noted was the development of electronic automated reports that improved the discharge of a patient. The reports also provided an opportunity for the administrator to assess the workload of a department. The EMR also improved operational efficiency. The EMR had excellent capabilities to process and store data. Administrators also reported that the computerized documentation took 30% les time than the previous handwritten notes (Shields, 2007).

Several studies indicated there was an improvement in interdepartmental communication. The EMR provided aggregate data in the patient records to other departments and the information about the patient was legible. The EMR allowed accessibility by many departments regarding integrated care. The actual design and implementation of an EMR system developed a more interdisciplinary approach to patient care (Ventures&Shah, 2007; Whitman&David, 2007). The implementation of an EMR system led to improved data accuracy because it reduced the need to replicate data. The EMR system also provided a platform for routine data quality assessments which was important to maintain the accuracy of the EMR data. The EMR system provides an opportunity for future research. The data captured in the database could be used to analyze outcomes and develop baseline data for future research.

Barriers to Implementation

The major issue with EMR implementation was the cost of the implementation of the system. Software purchases, hardware, network upgrades, training and computer personnel must be considered in the purchase of the system. Estimates vary from $15,000-$30,000 per physician which can be amortized over a period of 5 years (Adler, 2004). Estimates should also include annual costs of $5,000-$15,000 over the first 5 years. According to Lowes (2007), Barbara Drury, President of Pricare, a healthcare IT consulting firm, recently compared several bids of five EHR vendors to upgrade physician practices computer system to include the HER/EMR components. The vendor quotes varied from $58,000 to $13,000 for similar practices. These quotes also do not include any hardware upgrades for their systems. Therefore, it is very important for a provider to understand what they are receiving from a vendor and comparison shop for the most appropriate system for the best price.

According to Valerius (2007), migrating from a hard copy system to an electronic system, requires several components including: a physician order communication/results retrieval, electronic document/control management, point of care charting, electronic physician order entry and prescribing, clinical decision support system, provider patient portals, personal health records, and population health. When an organization implements an electronic system, there are changes in the workflow because much of the process was manual. Training was required for both health care professionals and staff to fully utilize the system.

When purchasing an EMR system, it was found that there were equipment or software inadequacies which created a processing of the data much slower. If the system failed, it created frustration from health care professionals and administrators.   Both of these problems emphasized the need for adequate training for both the providers and staff. Much of the initial training required overtime for the staff. Most of the training lasted approximately 4 months. Continued training was also required for maintenance of the system (Valerius, 2007).

CASE STUDIES

Financial Analysis of EMR - A Case Study

The EMRs have long been promoted as a means to reduce costs, improve patient customer service, and improve outcomes (Schmidt&Wofford, 2002). However, many organizations are reluctant to invest millions of dollars in a system if the returns on the investment are not realized within a certain timeframe. Virginia Mason Medical Center, an acute care hospital, with 400 employed physicians, initiated a cost benefit study in 2000 to assess the effectiveness of an EMR implementation. They organized an advisory team, consisting of physicians and staff, to perform a cost benefit analysis. The team found that a major cost of the EMR implementation is the reduction in physician productivity during the new system transition. They also reported that the anticipated benefits would far outweigh the cost of implementing and maintaining the EMR. The following cost analysis of the EMR benefits are as follows:

1) there would be approximately $9 million in labor costs reduction: by reducing the laboratory and radiology paper entry system, there would be an elimination of clinic, hospital and ancillary staff to transcribe and manually enter orders.   By physicians entering their prescriptions into the system, would provide guidelines for the most cost effective medications for the patient, and reduce the opportunity for prescription errors.

2) there would be approximately $8 million in enhanced charge capture due to an increase in collections because of efficiency of the EMR system.

3) Overall, there was an annual benefit of nearly $18 million dollars as a result of the EMR system (Schmitt&Wofford, 2002).

Health Care Professionals and Staffs' Attitude toward EMR Adoption: A Case Study

Many health care professionals and staff were hesitant to utilize the EMR system because they would need to require new skills and had limited time for training which would result in some inefficiency in their practices as they adopt the EMR system (Millstein, 2007). Health care professionals and staff were also concerned with the financial investment into this system. There were also issues regarding the confidentiality protection of the patients' information that is stored electronically. Which individuals have access to the information and what type of information should be maintained in an EMR system.

Silver Cross hospital, a 306 bed hospital, located in Illinois that had 450 doctors with privileges at their hospital, understood these issues and developed a strategy to successfully implement an EMR system (EHR:Myth, 2007).   The main reason they were successful because they provided opportunities for providers to actively participate in the implementation plan. They selected the system that would be used; they formed task forces to discuss the implementation and shared the cost of the system purchase with the providers. They treated the providers as business partners. The entire process was transparent which enabled the providers and their staff to voice their concerns. They also designed trainings for both the providers and the staff to ensure they would be comfortable with the EMR system.   As a result of this approach, the hospital reached an 80% penetration usage rate with the providers that worked with the hospitals.

Cost Benefit Analysis of EMR System

Savings from using an EMR can include: reduced medical transcription costs, paper chart related costs and improved staff efficiency.   Annual estimates of transcription costs of $3600-12,000 per year will be reduced by 50-100%. Printing, storage and paper supplied will also be dramatically reduced by using an EMR system. Improvements in diagnostic coding as a result in the EMR system increased physician revenue by $26 per patient visit (Adler, 2007).   (Wang et al, 2007) performed a cost benefit analysis from using the EMR model as compared to the traditional paper based system. Their results indicated that transcription costs were reduced by 28%, adverse drug events were reduced by 34%, and radiology ordering would be reduced by 14%

Ambulatory EMR Use - A Physician's Adoption of an EMR System – A case study

The physician's priority is for an EMR system to capture a clinical encounter in real-time to increase the quality and accuracy of documentation which reduces malpractice risk. Physicians also would like a database for knowledge management of clinical care (Brown, 2007; Burt, Hing&Woodwell, 2005).   A typical physician patient encounter would consist of accessing the electronic system together in an exam room. All demographic, insurance, lab reports, etc would be visible to both the patient and the physician. As a result of this system, a physician would save approximately $30,000 annually because there would be no need for medical transcriptions. Also, revenues increased because there was a reduction in billing errors and the collection rate increased dramatically. The efficiency that resulted in the implementation of the system resulted in employee satisfaction because they worked effectively. The success of the EMR is based on continued training of all staff. As a result of the success of the EMR program, he has acquired three additional practices over the past 7 years and all of the patient data was transferred from paper charts to EMRs .

An Acute Care Hospital System Adoption of an EMR System – Case Study

In 2006, the American Hospital Association surveyed more than 1500 community hospitals which represents 31% of all community hospitals nationally. Results indicated that nearly 70% of hospitals had full or partial HER records. Approximately 50% shared electronic patient data with others in 2005 and 2006 (Shields, 2007)). Large urban hospitals used more health IT. Hospitals' spending on IT is increasing annually and therefore, cost is often cited as a barrier to adoption.

JKL Healthcare System is a not for profit organization that operates three acute care hospitals with five satellite ambulatory locations, a research component, a network of 50 local physician offices and a home care services company.   In 2001, they decided to implement an EMR and physician order entry system. Their goal was to implement the system quickly to ensure physicians did not redirect prospective patients to competitors.

A challenge was to train over 1500 employees and 450 physicians on this system to avoid any adverse patient outcomes and to improve quality of care. In order for it to be cost effective, the compliance would need to be 100% by all physicians. The anticipated cost of the system was $35 million. (Obrien, 2007).   Nine months after the system's implementation, the physicians surveyed indicated they would not want to return to a paper system. Nearly 90% of the physicians surveyed that the system, made it easier for them to work. Nearly all medication errors caused by illegibility and transcription were eliminated. Patient satisfaction for overall care also increased as a result of the system.

Staff felt their jobs became more efficient because many staff could be reviewing the same information from different systems. Because JKL Healthcare was one of the first to successfully implement an EMR system, it will serve as a consultation site for other healthcare systems (Obrien, 2007).

CURRENT STATUS OF EMR/HER IMPLEMENTATION

The Centers for Disease Control center for health statistics has issued a new health report regarding the use of EMRs in the medical community. In 2005, nearly 25% of physicians reported using a EHR in their office based practice which is a 31% increase from the 18.2% reported in 2001 (www.cdc.gov/od/oc/mediapressrel/a060721.htm). In 2006, the first national survey of federally funded community health centers (n=725) indicate that 26% reported using some EHR capabilities. CHCs that serve the most indigent and uninsured were least likely to utilize Emirs (Shields, 2007). Approximately 91% of the respondents indicated that the major barrier to EMR adoption was lack of capital to invent in a system. Approximately 81% indicated that the second major barrier to adoption was the inability to integrate an EMR system with their current billing system. Approximately 76% indicated that a third barrier to adoption was the loss of productivity during the transition between the different systems (Shields, 2007). Because community health centers budgets are heavily financed by public funds, EMRs systems are also part of the funding. Unfortunately, many CHCs have budget deficits.

In November 2007, the Certification Commission for Healthcare Information Technology announced that six EMR products designed for use in acute care hospitals which represent 25% of the vendor marketplace have received CCHIT status. The certification indicates that these products have demonstrated compliance with CCHIT published criteria which focus on improving patient care. Additional certification for physician office systems, nursing homes, and specialized health care settings will also be developed which will assist with the President's goal of most Americans having an EMR by 2014 (Reber, &Ladd, 2007). The Doctor's Office Quality Information Technology project, which has enrolled more than 4,000 providers nationally, is designed to promote the adoption of EMRs (Doctor's Quality, 2005).

The federal government announced on October 30th, 2007 that they will pay higher Medicare reimbursement rates to those providers who utilize an EHR/EMR system. Providers applauded the effort indicating the increase in financial incentives would help to offset the costs of the new systems (Havenstein, 2007). Although critics indicate that the new reimbursement will only add thousands of dollars annually per practice which is not enough money to offset the expense of the EHR/EMR system adoptions.

LEGAL AND ETHICAL ISSUES OF AN EMR SYSTEM

Computerized information systems in healthcare that is seen in finance, manufacturing and retail have not achieved the same penetration. EHR/EMRs have captured the attention of politicians, insurance companies and practitioners as a way to improve patient safety because patient information will be more complete and standardized which will enhance the decision making process of a practitioner (Murer, 2007). Major barriers to EHR/EMR implementation have been discussed including training and financial impact of an organization as the system becomes integrated with daily operations. However, legal and ethical issues are also a concern. As with any technological development, regulations often lag behind its' implementation. A major

legal barrier is the sharing of the patient information electronically with other providers. Does this violate any HIPAA regulations pertaining to privacy and confidentiality? Does the patient have to consent this sharing of information each time their information is electronically shared with other providers (Christman, 2007).   Recent surveys have indicated that nearly 50 percent of U.S. adults polled indicated they had concerns about privacy and security of their information but felt that a computerized system like EHRs would outweigh the risks. The remaining 50 percent of those polled indicated that the HER/EMR systems do not outweigh the risks of privacy and security (Swartz, 2005).

The issue of provider and organizational liabilities has also been discussed. As part of an EMR/HER system, a provider may electronically prescribe medication to a patient. Are there any violations under state and federal fraud laws regarding electronic prescriptions of drugs? The Centers for Medicare and Medicaid Services issued regulations in 2005 which established legal exceptions and safe harbors for related to the use of e-prescribing and EHR/EMR technology. If these exceptions are more widely publicized, this may increase the usage of EHR/EMR adoptions (Murer, 2007; Diamond, 2005).

CONCLUSION

The implementation of an EMR system can greatly improve quality of patient care for several reasons. Access to medical information has improved which impacts turnaround times for follow up appointments, billing information, and conducting quality management reviews. Providers have immediate access to patient information. The system has also increased the efficiency of operations and reduced the costs of medical delivery (Austin &Boxerman, 2007; Millstein, 2007).   These benefits can be found in any health care organization. However, in order to ensure the EMR is a success in a health care organization, the participants need to understand these benefits.

Research has indicated that there are several factors involved in the successful implementation of an EMR. The most important factor is involving the users of the EMR in the process. The users understand what their needs are for the EMR and the vendors can develop a system that will accommodate those needs. The users need to understand the increase in the quality of patient care as a result of reduced errors of patient information, increasing integrated patient management by having the EMR system available to different providers, improved patient and physician satisfaction as a result of the EMR (Scmitt&Wofford, 2002). Although the cost of an EMR can be daunting for organizations, the cost benefit analyses indicate that it would be a positive step to improving patient care in a cost effective environment. Considering the increasing percentage of health care expenditures of the U.S. gross domestic product, national adoption of an EMR/EHR system should be embraced by all health care organizations.

References

More physicians using electronic medical records. *Indian Journal of Medical Science,* (60), 7: 308. Retrieved November 10, 2007 from www.cdc.gov/od/oc/media/.

Abrahamson, C. (2007). From pong to PHRs: Advances in electronic recordkeeping. *Nursing Management,* 38(8), 20-21.

Adler, K. & Edsall, R. (2007). Electronic health records: The 2007 FPM User-satisfaction survey. *Family Practice Management*,11(10), 43-46.

Adler, K. (2004). Why it's time to purchase an electronic health record system. *Family Practice Medicine*,11(10),43-46.

Austin, C.& Boxerman, S. (2007). *Information Systems for Healthcare Management.* Chicago: Health Administration Press.

Brown, V. (2007). Planning makes perfect. *Health Management Technology*, 28(5), 12-17.

Burt, C., Hing, E., & Woodwell, D. (2005). Electronic medical record use: By office-based physicians, United States, 2005. National Center for Health Statistics. Retrieved November 7, 2007 from http//cdc.gov/nchs/pubs/pubd/hestats/electronic/electronic.htm.

Cauldwell, M., Beattie, C., Cox, B., Denby, W., Ede-Golightly, J., & Linton, F. (2007). The impact of electronic patient records on workflow in general practice. *Health Informatics Journal*, 13(6), 155-163.

Certification commission announces first EHR products certified for hospitals. Retrieved November 10, 2007 from http://www.cchit.org.

Christman, K. (2007). Will electronic medical records doom your practice? *Journal of American Physicians and Surgeons*, 11(3), 67-69.

Diamond, M. (2005). Early adopters and lemmings: Look before you leap into electronic records. *Physician Executive*, 31(4), 18-22.

EHR: Myth or Realty, November 2, 2007. Webinar. Retrieved November 10, 2007 from www.healthdatamanagement.com.

GAO report: Bush administration lacks strategy for EHRs. Retrieved November 10, 2007 from http://www.ihealthbeat.org.

Havenstein, J. (2007). Feds prescribe more money for E-health push. Computerworld,41(46),18.

Institute of Medicine, Committee on Data Standards for Patient Safety, Board on Health Care Services. Key capabilities of an electronic health record System, National Academy Press: Washington, DC: 2003.

Jha, A., Ferris, Donelan, K., DesRoches, C., Shields, A., Rosenbaum, S., & Blumenthal, D.(2006). How common are electronic health records in the United States? A Summary of the evidence. *Health Affairs,* 25(5), 496-507.

Lowes, R. (2007). Avoiding EHR sticker shock. *Medical Economics*, 84(20): 41-45.

Millstein, A. (2007). Health information technology is a vehicle, not a destination: A conversation with David J. Brailer. *Health Affairs,* 25(1), 236-242.

Murer, C. (2007). EHRs: Issues preventing widespread adoption. Retrieved November 10, 2007 from
http://www.rehabpub.com/issues/articles/2007-06_09.asp?mode=print

Murray, P. (2007). One patient, one record unrealistic and unsustainable. Computer Weekly, September 4, 2007,44.

Natiional health expenditure projections 2000-2016.
Retrieved November 22, 2007 from
http://www.cms.gov/NationalHealthExpendData/downloads/proj2006.pdf.

O'Brien, M. (2007). Implementation of the EPIC electronic medical record physician order-entry system. *Journal of Healthcare Management*, 51(5), 338-343.

Pawlson, G. (2007). Health information technology: Does it facilitate or hinder rapid learning? *Health Affairs*, January 26 2007,178-180.

Physician quality reporting initiative, 2005. Retrieved November 10, 2007, from http://www.cms.hhs.gov/pqri.

Reber, C. & Ladd, S (2007). Certification commission announces first HER Products certified for hospitals. News Release, November 5, 2007. Retrieved November 10, 2007 from http://www.cchit.org/about/faq/general.asp.

Scmitt, K. & Wofford, D. (2002). Financial analysis projects clear returns from electronic medical records. Healthcare Financial Management, 56(1), 52-54.

Shaw, N. (2007). Banking and the electronic health record: what lessons can be learned? Informatics in Primary Care,14,81-83.

Shields, A., Shin, P., Leu, M., Levy, D., Betancourt, R., Hawkins, D., & Proser, M. Adoption of health information technology in community health centers: Results of a national survey. *Health Affairs*, 26(3),1373-1383.

Swartz, N. (2005). Electronic medical records' risks feared. Information Management Journal, 39(3), 9.

Thielst, C., (2007). The new frontier of electronic, personal, and virtual health records. *Journal of Healthcare Management*, 52(2), 75-78.

Valerius, J. (2007). The electronic health record: What every information Manager should know. *The Information Management Journal*,   4(1), 56-59.

Ventres, W.& Shah, A. (2007). How do EHRs affect the physician-patient relationship*? American Family Physician*, 75(9), 1385-1390.

Vreeman, D., Taggard, S., Rhine, M., & Worrell, T., (2007). evidence for electronic health record systems in physical therapy.   *Physical Therapy*, 86(3), 434:446.

Wang, S., Middleton, B, Prosser, L;, Bardon, C., Spurr, C., Carchidi, P., Kittler, A,Goldszer, R., Fairchild, D., Sussman, A., Kuperman, G., & Bates, D (2003). A cost-benefit analysis of electronic medical records in primary care. *The American Journal of Medicine*, 114, 397-403.

Whitman, J.C.& David, S. (2007). Effectively integrating your EMR initiative.*The Physician Executive*, 33(5), 56-59.

Modeling Access Rights Using the CRUD Security Cube: An Extension Incorporating Time

Michael R. Collins, Ph.D., mcollins@highpoint.edu
Department of Management
Phillips School of Business
High Point University
High Point, NC 27262

Dale L. Lunsford, Ph.D., *Dale.Lunsford@usm.edu*
Department of Business Economics and Decision Sciences
The University of Southern Mississippi
730 East Beach Blvd.
Long Beach, MS 39560

Modeling Access Rights Using the CRUD Security Cube: An Extension Incorporating Time

ABSTRACT

This paper builds on the CRUD Security Cube (Lunsford & Collins, 2008) research by incorporating time as an important variable in the process. In this paper we identify why accounting for time is important and how time can be incorporated and accounted for within the CRUD security cube approach to securing and providing appropriate permissions to objects.

INTRODUCTION

Defining access rights is a challenge in many settings. Since a database often serves as the foundation for information systems, proper specifications at the database level can ensure proper access rights exist within the system. How do organizations set and maintain user and group access rights to information systems in general and within databases specifically? Turnover, promotions, job and task shifts are just a few of the situations that arise in maintaining an up-to-date set of security and access rights for users and groups within organizations today. This paper describes a database implementation of access rights using the CRUD Security Cube (Lunsford & Collins, 2008) and incorporates the time dimension into the CRUD proposed security cube model.

Access Rights

Although the nature of an access right varies from system to system, most contemporary systems provide some mechanism for managing access to resources. Access rights, also known as permissions or privileges, define the types of access a user or group has to a securable object. In many systems, access rights apply to either users or groups. In Unix systems, access rights apply to an object's owner, a group, and the world (December, 2008). In Windows systems using the NT File System (NTFS), access rights apply to users and groups (Melber, 2006). The target resources for access rights include directories and files, devices, executables, as well as other objects (Changing Access Security on Securable Objects, 2008). Common access types include full control, modify, read & execute, read, and write under NTFS (Melber, 2006; Eckel, 2007) and read, write, and execute under Unix (December, 2008). NTFS offers advanced mechanisms for access rights, including inheritance and the ability to deny access (Melber, 2006; Mullins, 2006; Eckel, 2007). Additionally, under NTFS the specification of access rights is either explicit or inherited. Finally, NTFS provides the ability to deny a user or group any particular access type.

THE CRUD SECURITY CUBE

The traditional CRUD matrix provides a method for identifying the types of access system processes have to data objects. The CRUD Security Cube adds a user/group dimension to the CRUD matrix (Lunsford & Collins, 2008). This dimension documents

the access rights for users or groups to processes and data. Analysts may use the CRUD Security Cube to specify security for information systems, including any setting where the user employs specific programs to access data objects.

In this paper, we propose an extension of the existing proposed security cube to include an incorporation of time as a valid and important dimension through which organizations would want to control users or group's access and privileges to processes and data objects.

A Time Dimension Example

The CRUD matrix assists database administrators in mapping out usage access for databases within an organization. Working from the CRUD Security Cube extension, this paper proposes the incorporation of time within the security cube. Using time as a fourth dimension, while hard to draw, is very important conceptually. Most organizations have constraints and policies in place that require strict attention to what processes and objects are available to what users and groups and to what extent those privileges are granted. The question we ask in this paper is do those privileges remain the same for all points in time? Stated another way, would a particular user or group have access to (create, read, update, or delete) a process or data object at one point in time and not have access to that same object or process at a different time? With many organizations controlling when access is granted is as important as the granting of the access itself. Many situations call for the granting, ungranting, and granting again of access to a process or object.

Using time as another dimension to the proposed CRUD security cube this need to restrict and allow access across time can be accomplished. Presented in Figure 1 is the original security cube as proposed in (Lunsford & Collins, 2008).

FIGURE 1: CRUD SECURITY CUBE
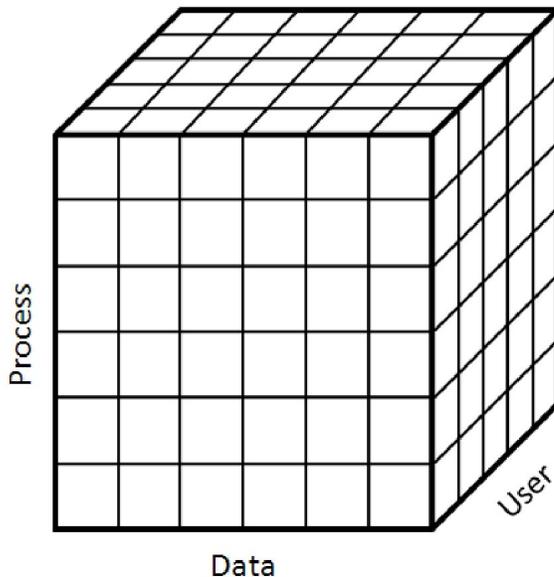
Incorporating the Time Dimension

Adding time to the CRUD security cube would in effect potentially add a very large number of cubes to represent the point in time the access is granted or removed from a user or a process. This unit of time could be months, weeks, days, hours, minutes, or even seconds depending on the needs of the organization. Imagine if you will a "long row" of cube after cube after cube with each cube representing the setting for the CRUD security cube at a particular point in time.

This incorporation of the time dimension could be implemented in a database by adding a time parameter and having the security management program scan the security table for restrictions or grant requests based on points in time. This security management program would scan the security table several times a second for changes to the security settings.

FIGURE 2: GROUPS, PROCESSES, AND DATA OBJECTS

Groups	Processes	Data
Group One	Maintain Inventory	Customer Information
Group Two	Invoice Customer	Vendor Information
Group Three	Pay Vendor	Product Information

Figure 3 depicts the CRUD Security Cube with the time dimension.

FIGURE 3: CRUD SECURITY CUBE WITH TIME DIMENSION
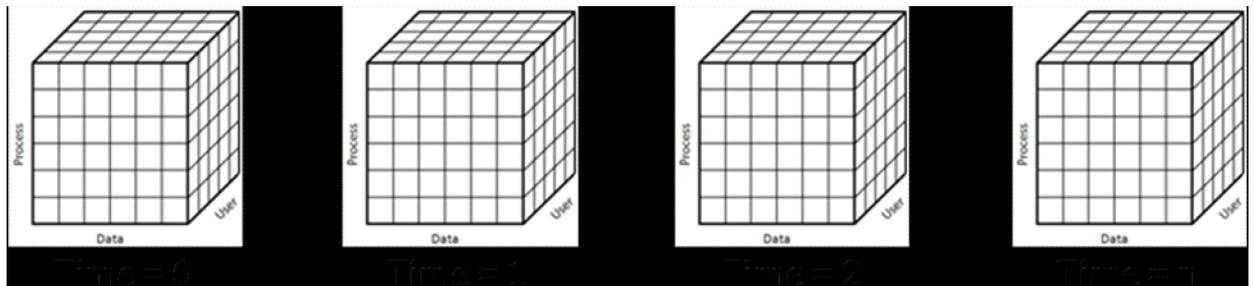
As you can see from the cube representation in Figure 3, the cube allows a database

administrator to break down individual access rights by group, within a process, for specific data over time. This information can then be entered into a database and updated as needed. Once the database is updated with the information a program can be written to pull the data and settings from the database and update the security and access rights for groups and users automatically. A snapshot of the system access table would look similar to Figure 4.

FIGURE 4: MICROSOFT ACCESS IMPLEMENTATION

Using this system access table presented in Figure 4, the groups or users documented access and security privileges could be extracted and updated in a separate database using Oracle, SQLSever, MySQL, or just about any other SQL-based DBMS on the market today.

In addition to enabling the specification of a time-based access constraint, the addition of the time dimension also enables the security manager or auditor to view a historical record of the access privileges at any point in time. This could prove valuable when investigating suspected inappropriate access to information or programs.

Extensions to this research

Extensions to this research could include additional proof-of-case scenarios that show the versatility of this approach to apply to any type of information system access rights' settings. In this paper we have shown a proof-of-concept example of how the CRUD security cube, incorporating a time component, could be implemented within a database management systems environment. The approach proposed in this paper could be used to automate the

setting of security and accessibility settings for objects with respect to data within individual processes and with respect to groups or individuals of an organization over any period of time.

REFERENCES

[1] *Changing Access Security on Securable Objects.* (2008, February 14). Retrieved February 26, 2008, from MSDN: http://msdn2.microsoft.com/en-us/library/aa384905(VS.85).aspx

[2] December, J. (2008, January 21). *Permissions.* Retrieved February 22, 2008, from December.com: http://www.december.com/unix/tutor/permissions.html

[3] Eckel, E. (2007, January 22). *How do I... Secure Windows XP NTFS files and shares?* Retrieved February 7, 2008, from TechRepublic.com: http://articles.techrepublic.com.com/5100-10877_11-6152061.html

[4] Lunsford, D. L., & Collins, M. R. (2008). The CRUD Security Matrix: A Technique for Documenting Access Rights. *7th Annual Security Conference.* Las Vegas, NV.

[5] Melber, D. (2006, May 3). *Understanding Windows NTFS Permissions.* Retrieved January 25, 2008, from WindowsSecurity.com: http://www.windowsecurity.com/articles/Understanding-Windows-NTFS-Permissions.html

[6] Mullins, M. (2006, June 15). *Windows 101: Know the basics about NTFS permissions.* Retrieved June 19, 2006, from TechRepublic.com: http://techrepublic.com.com/5102-1009-6084446.html

ISSUES REGARDING SOCIAL MEDIA AND COMPANY USAGE

Leanne C. McGrath, University of South Carolina Aiken, 471 University Parkway, Aiken, SC 29801

ABSTRACT

Many employees use social media to communicate daily with others inside the company and with those outside the company. Their usage has raised many concerns for the employer.   This paper discusses this growing trend and its benefits and risks to the company.

INTRODUCTION

Social media are fast becoming a part of the corporate landscape, literally transforming the traditional business world.   These media include six major areas, namely social networking, blogs, podcasts, message boards, wikis, and online videos (Barnes & Mattson, 2008). Broad spectrums of industries from banking to manufacturing to high tech are creating internal networks, protected by firewalls, to connect employees and to allow them to create their own profiles. This networking fosters collaboration across divisions and leads to increased innovation (Brandel, 2008). Additionally, use of external social media is also accelerating, especially for marketing and sales purposes. Examples of common sites for this activity include MySpace, Face Book, and LinkedIn.

This paper addresses social media in general, identifies the benefits and risks of their use, and discusses some issues that companies may find helpful to minimize their legal exposure in allowing social media utilization in the workplace.

BACKGROUND

Social media are increasingly becoming at the heart of employee communication in this growing age of technology. According to one study, 60% of Americans interact through social media and of these, a whopping 93% want companies to be visible on social media sites. Also of this 60% of social media users, a majority (59%) already interact with companies regularly through social media. Furthermore, 85% of these users think that companies should utilize social media for interaction with customers. And interestingly 56% of users perceive that they are getting better customer service and have a stronger connection through this social media interaction with companies. Also, men are almost twice as likely to interact frequently through social media to companies than women are (Larrumbide, 2008).

Barnes and Mattson (2008) performed the first longitudinal study about corporate use of social media. Their population was the fastest growing INC 500 companies in the United States private sector. Results indicated that 77% of the INC 500 companies utilized at least some type of social media tool. The most popular form was social networking at 49% usage in 2008, up from 27% in 2007. When asked in 2007 about the importance of social media to their business and marketing strategy, 26% responded "very important." One year later that figure had risen to 44%, a healthy 18% increase (Barnes & Mattson, 2008).

The business model for social networks is different from the traditional business model where customers and suppliers are two separate agents. Because of the very nature of a social network, users perform both roles, that of supplier and that of consumer of content. For free social network sites, revenue is usually generated through advertisements (Jesdanun, 2008). Member subscriptions are another source to provide some sites with revenue. Some suggest that as a social network grows larger and larger, it may attract spammers and other less desirable intruders (Lundquist, 2008). Nonetheless, the social network business model is thriving.

In today's turbulent environment, corporations are searching for ways to use social networking to enhance business operations. Internal social networking has been expanded to foster collaboration and communication among company employees. For example, Hot Topic, a 690 store retail chain, is launching an internal social site for employees to use to share ideas and data (Swartz, 2008).

Social networking by companies in Europe has been documented also. Specifically, 65% of employees in Europe report that their everyday work life includes social networking. In contrast to the United States, more large companies than small and medium enterprises (SMEs) in Europe use social media tools. Large companies focus on internal social networks while SMEs use more external social networking tools. In general, two-thirds of employees in Europe feel that their companies are more transparent and more open because of the adoption of social networks. By country, Germany has the highest adoption rate and Great Britain the lowest (Taylor, 2008).

BENEFITS

The benefits of social networking are just beginning to be recognized with more to emerge as new applications are found. Companies constantly look for improvements in their business operations, and social networks have gained their attention especially as the economy began to falter more drastically over the last years. Internal social networks surfaced as a way to increase communication and to improve productivity particularly as travel amongst employees for collaboration became increasingly cost prohibitive. Thus, utilizing social networks has the potential to be a cost saver rather than a time waster (Lundquist, 2008).

Greater innovation was also fostered by collaboration across divisions within a company. Employees began to use social networks to discuss business issues, and they generated solutions that had a business impact. Deloitte, IBM, and Best Buy are three companies that have successfully used internal social networks to enhance and transform their respective businesses (Brandel, 2008).

Healthcare professionals are now adopting social networks to disseminate and manage medical knowledge. For example, the social network site, Sermo, is used to bring doctors together to discuss patient cases peer to peer and to share universally their collective medical knowledge. Sermo is considered a dedicated site for healthcare professionals. To be listed as a member, the physician must be matched for identity against a list from the respective state licensing board. This validation is, of course, done rather instantly because of the online availability of this licensing information (Luo, 2007).

Small businesses benefit from using social networks in several ways. They can ask questions, seek advice, and gain valuable business contacts. For example, an online lingerie company visited a social network site to locate a reputable search engine optimization firm. Almost two dozen suggestions came within 24 hours. Specifically, the small business owner benefited by others sharing their experiences with optimization companies. Forming social networks provides an instant peer group for small businesses that traditionally do not have such support (Schwartz, 2008).

Other benefits of social networks include recruitment and career networking. The first area is on the employer side and the second more on the employee side. Thus, both contribute in a positive way (Sachoff, 2007).

In Europe, 74% of employees feel that social networks have benefits. The eight items that were reported as benefits include the following: 1) knowledge base of employee increased (38%); 2) availability of problem solutions (38%); 3) capture collective knowledge over the supply chain (36%); 4) increase of internal collaboration and stimulation of team building (32%); 5) better creativity (31%); 6) better cross functional team formation and interaction (29%); 7) timely access to all key persons needed (26%); and 8) innovation motivation (24%) (Taylor, 2008). These are clearly benefits that have documentation and so cannot be easily dismissed.

RISKS

The risks of social networks are certainly of concern to and at the same time a challenge for the employer. The main concerns of employers are centered around security, productivity, and bandwidth capacity (Sachoff, 2007).

Security encompasses several areas. Exposure to worms, spyware, and viruses are common malware hazards, especially since social networks have few restrictions regarding links and content. Leaking of corporate secrets and disclosing of personal information are two more risks. And, the potential legal liability of a United States employer for acts like harassment or slander by its employees is another concern that could have costly consequences for the company (Perkins, 2008).

Decline in employee productivity is possible without monitoring and/or company policies to rein in social network usage for personal reasons. In fact, a limit on business use of social networks is prudent to ensure that an employee's time is used efficiently and effectively (Perkins, 2008).

Large files such as pictures, music, or videos can affect bandwidth. If too many are downloaded and stored, the employer's infrastructure can be crippled. So limits on personal downloads should be addressed by the employer (Perkins, 2008). Even further, employees need education about file size to avoid business download problems with bandwidth.

Another emerging area of concern is the online reputation of a company. Postings on social media about product defects or the ranting of a disgruntle customer can negatively affect the company's reputation (Hoffman, 2008). It only takes seconds for a negative blog, a negative podcast, or unfavorable chatter on a social network site to cause substantial damage to the reputation of the company. Continual monitoring and assessment of social media are important to be proactive in managing today's company reputation.

In a European study, 79% of employees linked social networks with a negative. The two main negatives that were identified are as follows: 1) Employee distraction (49%) and 2) Confidential information leaks by the company (45%). Regarding return on investment (ROI) of internal social networks, 24% of employees were not sure this measurement was even possible (Taylor, 2008).

LEGAL CONCERNS

Use of social media can have legal consequences for a company. Corporate blogs can increase or decrease a company's liability depending upon how they are used. The following are a few examples to consider.

Statements that have potential to invade privacy of others need to be avoided. Also, the company should always scan posted statements to eliminate any content that could be considered defamation of character regarding a person or business. Using words like "alleged" or "may" could lessen company risk (Savell, 2007).

Blogs can be seen as advertisements. As such, all laws applicable to advertising, to consumer protection, and to unfair competition rules would then apply. Brand names and trademarks used in social media are other related areas of potential concern (Savell, 2007).

In general, employers are responsible for blogging that employees do within the scope of their job. The company for its protection should establish corporate policies regarding this area. In fact, legal counsel would be prudent to be proactive in reducing liability (Savell, 2007).

Providing external links and allowing third parties to post or comment on a company blog can result in corporate liability. Prudently the company should notify those who post that they, simply by posting, are attesting to their right to the content of the posting they make. This can lessen the company liability but not remove the possibility of being sued for plagiarized content. Also immediate removal of the plagiarized content if posted can give the company some lessening of liability although again not complete protection from responsibility. Statements denying responsibility for content or products on sites to which the company links are essential. Having a "terms of use" section and properly worded disclaimers on social media sites also help minimize legal exposure (Savell, 2007). Finally, given the complex nature of this type of liability, retention of legal counsel may again be prudent.

In view of these legal concerns and more, the web security firm, ScanSafe, reports that one third of companies block employee access to social networking sites. In only one year this figure had risen 17% from the previous year (Sachoff, 2007). In a study by Forrester consulting, it was reported that 58.4% of the interviewed large firms had a policy against social network usage at work (Abeidoh, 2007). These percentages reinforce the increasing concerns of employers in this legal area.

CONCLUSION

Use of social media has benefits and risks for a company. Given this age of technology, a company cannot ignore either. The goal, of course, is to gain the benefits while minimizing the risks. To do this, a company must become thoroughly informed about social media. Then assessment as to whether use of a certain social media outlet will benefit the company can be made. After that decision, company policies and regulations for employee use of social media help to minimize the potential risks. Managing issues relating to social media are in the future of all companies, large and small, if not in the present.

REFERENCES

Abeidoh, Reem (2007) Should Companies Allow Social Network Usage at Work? Retrieved 2/11/09 from http://www.reemabeidoh.com/social-media/should-companies-allow-social-network-usage-at-work

Barnes, Nora G. & Mattson, Eric (2008) Social Media in the Inc. 500: The First Longitudinal Study, Retrieved 2/24/09 from http://www.umassd.edu/cmr/studiesresearch/blogstudy5.pdf

Brandel, Mary (2008) Social Networking Goes Corporate, Computerworld 42(32) pp. 25-27.

Hoffman, Thomas (2008) Online Reputation Management, Computerworld 42(12) pp. 22-26.

Jesdanun, Anick (2008) Enthusiasts Find Big Is Not Always Best With Social Networks, USA Today, April 16, Retrieved 4/20/09 from http://www.usatoday.com/tech/products/2008-04-16-300991490_x.htm

Larrumbide, Andrea (2008) Cone Finds That Americans Expect Companies to Have a Presence in Social Media, Retrieved 2/26/09 from http://coneinc.com/content1182

Lundquist, Eric (2008) New Role for Social Networks, eWeek, 25(9) p. 43.

Luo, John (2007) Social Networking: Now Professionally Ready, Primary Psychiatry, 14(2) pp. 21-24. Retrieved 4/21/09 from http://www.primarypsychiatry.com/aspx/article_pf.aspx?articlid=975.

Perkins, Bart (2008) The Pitfalls of Social Networking, Computerworld, 42(7) p. 44.

Sachoff, Mike (2007) More Companies Blocking Social Networks, Retrieved 2/11/09 from http://www.webpronews.com/topnews/2007/09/28/more-companies-blocking-social-networks

Savell, Lawrence. (2007) Blogger Beware! Computerworld, 41(39) pp. 32-34.

Schwartz, Karen D. (2008) SMBs Feed on Social Networking Input to Grow, eWeek, 25(3) p. 43.

Swartz, Jon Social Networking Sites Help Companies Boost Productivity, Retrieved 2/11/09 from http://abcnews.go.com/Technology/Story?id=59818337&page=1

Taylor, Cherry (2008) Corporate Social Networking in Europe, Independent Market Research, Retrieved 2/11/09 from http://www.att.com/Commun/merger/files/pdf/enterprise_2_0/market_report_executive_summary.pdf

Analyzing Customer Churn in the
Software as a Service (SaaS) Industry

Ben Frank, Radford University
Jeff Pittges, Radford University

Abstract

Predicting customer churn is a classic data mining problem. Telecommunications providers have a long history of analyzing customer usage patterns to predict churn. Many other industries, such as banking, routinely analyze customer behavior to predict customer satisfaction and renewal rates. The Software as a Service (SaaS) model enables software vendors to collect customer usage data that is not available to traditional software vendors. The SaaS market, and cloud computing in general, is growing rapidly yet to our knowledge little work has been done to apply existing methods to analyze customer churn in the SaaS industry. This paper describes a study conducted on behalf of a leading performance and talent management company. Our work uses churn analysis in telecommunications as a baseline to study the SaaS industry. Although there are many similarities between the two industries our study identifies several important differences. The paper presents four experiments and outlines opportunities for future research.

Keywords: Churn analysis, churn prediction, cloud computing, customer attrition, software as a service.

1   Introduction

Software as a Service (SaaS) is a deployment model whereby customers subscribe to a service rather than purchasing a license to own a software product. Subscriptions are sold for a period of time (e.g., monthly or yearly subscription) similar to cell phone service and utilities. The SaaS model offers many advantages to customers. The low cost of a subscription makes high-end products available to companies that could not afford to purchase the product. System administration is managed by the vendor which eliminates expenses and headcount for the customer and reduces time and expenses for training and support. The recurring revenue stream of subscription based services is attractive to vendors, but the vendor's dependence on subscription renewals makes the business far more sensitive to customer satisfaction.

When a customer purchases a traditional software license the product is installed on the customer's servers and the vendor has no visibility into how the customer is using the product. SaaS vendors host their applications by running the software on servers managed by the vendor. This enables vendors to collect valuable data on how customers are using their product including who is using the product, when, for how long, and how often. Many industries, such as telecommunications and banking, already rely on usage patterns to predict customer churn and customer satisfaction. SaaS vendors have the ability to predict similar characteristics of their customers.

Customer churn in service industries has been studied extensively. However, to our knowledge, Software as a Service (SaaS) has not been a specific focus. Although the SaaS industry shares many commonalities with telecommunications and other service industries, there are some key

1

differences worth exploring especially given the rapid growth of the SaaS market and the increasing availability and reliability of cloud computing.

This paper describes a one-semester student project to study customer churn in the SaaS industry. The study was conducted on behalf of a leading performance and talent management company. The paper draws comparisons between the SaaS and telecommunications industries, describes four experiments that apply existing methods to predict churn, and presents opportunities for future research to better understand customer churn in the SaaS industry.

2   Related Work

Customer churn is a classic data mining problem and many approaches have been developed for the telecommunications industry. The following work provides a foundation for our current and future research.

Euler [3] developed a decision tree to identify types of telecommunications customers most likely to churn. Euler utilized the data preprocessing capabilities of the MiningMart KDD system to derive predictive features that were not present in the original data. Derived values were an important component of our final and most successful model. Euler's model also incorporates temporal aspects of customer behavior and we plan to use a similar approach to measure the velocity of several features as we continue our research.

Coussement and Van den Poel used support vector machines to improve the performance of predicting churn for a newspaper subscription service [1]. The results of this work show that interactions between the clients and the provider are an important predictor of churn. Coussement and Van den Poel continued their study of client/provider interactions by adding emotions from client emails to their model [2]. Hadden et al [4] identified predictive features of customer complaints and found that decision trees outperform neural networks and regression in terms of overall accuracy.

3   Project Goals and Hypotheses

The project was conceived with two primary stakeholders, a student and the vendor. The student had completed a course on data warehousing, data mining, and reporting [5] and wanted to learn more about data mining. The vendor wanted to predict customer satisfaction and renewal rates.

The study was designed as an exploratory project to understand the vendor's data and to evaluate existing methods for analyzing customer churn. The primary objective was to identify the most important features of usage data that predict customer satisfaction.

The project was guided by the following hypotheses:
1. Deployment (percentage of employees with accounts) is a significant measure of customer satisfaction.
2. Deployment rate (how quickly user accounts are created) will help account managers measure satisfaction and identify stalled engagements.
3. Adoption rate (deployment and usage) is a significant measure of customer satisfaction.
4. Usage across levels of the organization (e.g., executives, middle managers, and independent contributors) should indicate stronger adoption and overall satisfaction.

2

This study was conducted in collaboration with a leading provider of performance and talent management services. The vendor offers several modules from which a customer may choose. To properly use these services a customer must purchase a license for every employee to access the applications hosted by the vendor. Customers typically purchase all licenses (one per employee) when the contract is signed, but each module is deployed in phases, one department at a time. This practice allows the vendor to monitor product adoption by observing two variables for each customer: the total number of licenses purchased and the number of user accounts that the customer has created for their employees.

Our first hypothesis is that the rate of deployment, how quickly the customer creates accounts for their employees, should provide a strong indication of the customer's satisfaction level. Furthermore, a decrease in deployment rate may indicate that the customer is becoming dissatisfied with the product. Establishing a baseline for deployment rate with key milestones based on the percentage of users would enable account managers to measure satisfaction, identify stalled accounts, and take action proactively.

The last two hypotheses pertain to the overall satisfaction of the customer. It is not uncommon for executives to purchase a productivity tool only to find that the employees are not using the product. The adoption rate measures how much the product is being used. However, usage must be based on the percentage of users who have accounts (i.e., deployment). The final hypothesis takes into consideration the diversity of the user population by grouping users by rank. High usage across all levels of an organization should indicate high overall satisfaction. Furthermore, identifying groups with low usage enables the vendor and the customer to address issues with a particular group.

4   Comparing Data from SaaS and Telecommunications Providers

The vendor provided aggregate, anonymized usage data collected over a multi-year span. The data includes the 8 attributes described in Table 1. These 8 attributes are collected daily for individual users (employees) from over 600 customers. The percentage of valid users is calculated by dividing the number of valid users by the total number of licenses (max_seats). The data is loosely described in accordance with our confidentiality agreement with the vendor.

Attributes	Description
all_users	The total number of times a module was accessed
cust_date	Date the customer was acquired
dist_users	The number of distinct users to access a module
logins	Number of times the customer logged in
max_seats	Total number of licenses purchased by the customer
mkt_segment	Customer's market segment
module	Name of the module used
valid_users	Total number of valid users for a customer

Table 1: Usage data attributes.

There are many similarities between the telecommunications industry and the SaaS industry. As shown in Table 2, both industries are capable of tracking usage with respect to the number of times their product is used and the length of time their products are used. Telecommunications providers record the details of each call while SaaS vendors record the details of each session. A session begins when a user logs into the system (login) and the session ends when the customer

3

logs off or when the session times out due to inactivity. Therefore, while most callers are active during a call, except for hold time, software users may not be active during an entire session. When a session times out the timeout period should be subtracted from the length of the session to more accurately measure the time the user was actively using the system.

Telecom	SaaS
Number of calls	Number of logins (sessions)
Length of call	Length of session
Call targets	Modules used

Table 2: Comparison of Telecom data with SaaS data.

Telecommunications providers often track who their customers are calling (e.g., ISPs, toll free numbers). SaaS vendors typically offer a suite of products and they track which modules are being used. Telecommunications providers offer a wide variety of applications whereas SaaS vendors typically offer a related suite of products. Hence, SaaS vendors typically have more focused offerings which has advantages for identifying product adoption.

Market segments apply to both industries. However, much of the research on customer churn in telecommunications has studied business-to-consumer (B2C) relationships whereas the SaaS vendor in our study only sells to businesses (B2B). Therefore, while the customer attributes may be similar, our study uses data aggregated over all of a customer's employees. Furthermore, we are able to group a customer's employees by rank and other properties which may lead to important insights.

5   Experiments

Four experiments were conducted to understand the vendor's data. Each experiment built models with the Weka data mining suite [6]. The models were built with data from over 600 customers known to be satisfied or unsatisfied. Approximately 60 percent of the customers in the training set were preclassified as satisfied.

5.1   Experiment One: Clustering

The first experiment attempted to further classify customers beyond satisfied and unsatisfied using the K-means algorithm to cluster customers into 2, 3, and 5 groups. All three iterations produced a single cluster that contained over 70 percent of the customers.

We chose to cluster the customers into two groups expecting the K-means algorithm to separate the customers into satisfied and unsatisfied, but this was not the case. Unsatisfied customers were almost evenly distributed between the two clusters. We tried three clusters expecting a group form between the original two clusters but the single large cluster was mostly unchanged. The model with five clusters also failed to break up the large group and none of the three models produced a cluster that could be interpreted in any meaningful way.

5.2   Experiment Two: oneR

The remaining experiments built decisions trees to identify the most relevant attributes for predicting customer satisfaction. A third of the customers in the training set were randomly chosen to build each tree and the remaining two-thirds were used to test the models.

4

Experiment 3	Experiment 4
cust_date	percent_valid_users
max_seats	dist_users
dist_users	percent_valid_users
valid_users	all_users
max_seats	module
all_users	logins
logins	dist_users
max_seats	all_users
	percent_valid_users

Figure 1: Decision tree attributes

In the second experiment, the oneR algorithm identified the number of valid users as the most important attribute for predicting customer satisfaction. This is consistent with our expectations that product adoption and retention depend on customer deployment. However, we also hoped to find a distinct number of users, a threshold, that would partition the majority of customers into satisfied and unsatisfied. The vendor could use this threshold as a target for all of their customers. Unfortunately, multiple sections of satisfied and unsatisfied customers were scattered throughout the range of valid users.

5.3 Experiment Three: J48

For the third and fourth experiments we created J48 decision trees. The first tree was built with all eight attributes. The final pruned tree had 8 levels with 23 leaves and a size of 45. The attributes at each level of the tree from the root down are shown under Experiment 3 in Figure 1. Neither of the top two attributes, customer acquisition date (cust_date) and the maximum number of users (max_seats) are actionable, as the data is historical and the vendor does not want to focus solely on large accounts.

5.4 Experiment Four: J48

The first J48 decision tree identified acquisition date and maximum seats as the most important predictors of customer satisfaction but neither attribute is actionable. In the fourth experiment we derived more meaningful values based on the acquisition date and the maximum number of seats purchased by the customer.

Customer acquisition date is a single, fixed point in time that does not account for the length of time the customer uses the product. The customer acquisition date was transformed to the number of months the customer has licensed one or more modules. By measuring the length of

5

the engagement we hoped to identify a significant milestone for product adoption. This would produce a valuable target for the vendor.

The maximum number of seats is also a fixed number biased towards larger customers. By combining the maximum number of seats with the number of valid users we derived the percentage of valid users which better reflects adoption across the entire company regardless of size.

The modified data set produced a tree with 9 levels, 39 leaves, and a tree size of 69. The attributes at each level of the tree from the root down are shown under Experiment 4 in Figure 1. The second J48 decision tree correctly classified 96 percent of the customers in the test data set. No conclusive threshold emerged for the length of engagement, but the results indicate that a series of milestones over time may produce an adoption rate baseline consistent with our third hypothesis.

The top three attributes in the second J48 tree are the percentage of valid users, the number of distinct users, and the total number of times the system has been accessed. The percentage of valid users measures the degree to which management has adopted the product. The number of employees using the system (dist_users) and the number of times the system has been used (all_users) measure the degree to which the employees have adopted the product. Finding these three attributes at the top of the tree is consistent with our first and third hypotheses.

Everyone involved in the study expected market segment to have a high impact on customer satisfaction. Our hypothesis was that software applications would appeal to customers in some markets more than others. The fact that market segment was pruned from the final tree is likely an indication that software has become an integral part of doing business.

6   Future Research

There are many opportunities to further analyze usage data from software vendors employing the SaaS model. We plan to build on our fourth experiment by deriving additional variables and incorporating time, similar to Euler [3]. For example, computing the percentage of valid users who have used the system (dist_users / valid_users) should provide a more precise measure of employee adoption. As we create additional derived values it may be worthwhile to experiment further with clustering. We also want to build a oneR model using the derived data from the fourth experiment as we are more likely to find a threshold using the percentage of valid users in place of the number of valid users.

Time is an important factor for measuring rates of deployment and adoption. Tracking the number of valid users who use the system over time, both fixed (monthly) and sliding (last 30 days) intervals, will enable us to identify trends. Developing a temporal model to identify adoption milestones, such as percentage of valid users and percentage of distinct logins, and the time periods that indicate satisfaction or dissatisfaction, would enable the vendor to manage product deployment more proactively.

As discussed in Section 2, Coussement and Van Den Poel found client/provider interactions to be an important predictor of customer satisfaction [1, 2]. Incorporating complaints data into our models should increase reliability in accordance with the findings of Hadden et al [4]. As suggested in [4], time is also important for measuring the frequency of complaints.

Segmenting employees also appears promising. As described in our fourth hypothesis, tracking usage by rank should provide further insight into overall satisfaction. What is the ideal mix of usage across the levels of an organization? Do renewal rates depend more on management usage

6

or employee usage? Customers should also be segmented into additional classes of satisfaction. The ability to estimate a customer satisfaction score would be even more valuable as this would allow vendors to determine a customer's direction and velocity along the satisfaction scale. Not only would this help the vendor identify customers at risk of churning, it would also help vendors identify factors that lead to dissatisfaction.

7   Conclusion

Both stakeholders, the vendor and the student, benefited from the project. The study provided support for our first three hypotheses: the rate of deployment and adoption are significant predictors of customer satisfaction. Time constraints prevented us from testing our fourth hypothesis pertaining to adoption across levels of an organization, but we intended to address employee segments in our future research.

Our experiments produced several surprises. The results of clustering customers into 2, 3, and 5 groups were particularly disappointing as none of the clusters could be interpreted in a meaningful way. Clustering with derived values may produce more interesting results. The oneR model confirmed our hypothesis that the number of valid users is an important predictor of satisfaction, but the oneR model failed to produce a single threshold for the vendor to target. We are hopeful that the percentage of valid users may produce a threshold.

Although there are many similarities between the telecommunications and SaaS industries, our study identified several important differences such as telecommunication's focus on consumers versus the business-to-business relationships typical in the SaaS market. Further study is likely to identify additional differences that may be exploited to develop better models for predicting customer churn in the SaaS industry.

Through the process of analyzing the problem, developing a plan of attack, and deciphering the results, the student gained valuable experience with data mining and learned the importance of data preparation and the challenges of working with real data. We will continue to involve students in this research to create excitement among the next generation of data miners.

Acknowledgements

References

[1] Kristof Coussement and Dirk Van den Poel. Churn prediction in subscription services: An application of support vector machines while comparing two parameter-selection techniques. *Expert Systems with Applications*, 34:313 – 327, 2008.

[2] Kristof Coussement and Dirk Van den Poel. Improving customer attrition prediction by integrating emotions from client/company interaction emails and evaluating multiple classifiers. *Expert Systems with Applications*, 36:6127 – 6134, April 2009.

[3] Timm Euler. Churn prediction in telecommunications using miningmart. *Proceedings of the Workshop on Data Mining and Business (DMBiz) at the 9th European Conference on Principles and Practice in Knowledge Discovery in Databases (PKDD)*, 2005.

7

[4] John Hadden, Ashutosh Tiwari, Rajkumar Roy, and Dymtr Ruta. Churn prediction using complaints data. *Proceedings of World Academy of Science, Engineering and Technology*, 13, May 2006.

[5] Jeff Pittges. An undergraduate course in data warehousing. *Proceedings of the 44th Annual Meeting of the Southeast INFORMS*, October 2008.

[6] Weka data mining software. `http://www.cs.waikato.ac.nz/ml/weka/`.

[7] Yaya Xie, Xiu Li, E. W. T. Ngai, and Weiyun Ying. Customer churn prediction using improved balanced random forests. *Expert Systems with Applications*, 36:5445 – 5449, April 2009.

[8] Yu Zhao, Bing Li, Xiu Li, Wenhuang Liu, and Shouju Ren. Customer churn prediction using improved one-class support vector machines. In *Advanced Data Mining and Applications*, pages 301 – 306. Springer Berlin / Heidelberg, 2005.

8

CLOUD COMPUTING DATA ARCHITECTURE

Harry Katzan, Jr.
Savannah State University

ABSTRACT

Cloud computing is an application architecture for accessing and hosting computing service over the Internet. Access is achieved with a web browser and service is supplied by software running on a cloud platform. Client benefits include lower up-front infrastructure cost and reduced time to deployment. Provider benefits are provided through the monetization of client tenancy, achieved through prudent service provisioning and operational efficiency. The paper addresses the securitization of client data in a cloud computing domain.

CLASSIC CLOUD COMPUTING MODEL

The essence of *cloud computing* is software deployed as a hosted service and accessed over the Internet. The two kinds of software in this category are business software and consumer software. Business software provides business services and emphasizes business solutions, such as CRM, SCM, ERP, and human resources. Consumer software is characterized by publicly oriented personal solutions, such as office and social applications. Software application, known as *Software as a Service* (SaaS), normally operate on a cloud platform.

A *cloud platform* resides in a cloud data center and exists as a powerful computing facility, a storage system, an advanced operating system, support software, and the necessary fabric to sustain a server farm and scale up to support millions of Internet clients. A cloud platform is as much about operating in the cloud, as it is about developing applications for the cloud. A cloud platform is usually employed to do the following: develop and run client applications, develop SaaS applications, and run SaaS applications.

The objective of cloud software vendors is to increase revenue by giving the client more money to spend on cloud software service by reducing operational costs and then to use economy of scale to equitably provide requisite computing services. If the software is built to scale well, the operating cost for each client will be less as additional clients are added.

Accordingly, a successful SaaS vendor will use multi-tenancy theory to develop effective software.

BUSINESS AND CONSUMER SERVICES

With business services, the most important consideration is whether the process is executed in-house or as a cloud service. When the process is handled in-house, total control over the operation is obtained along with limited opportunity for achieving economy-of-scale. As processes are distributed outward on the cloud, control is decreased but opportunities for achieving economy-of-scale are increased. The considerations are different with consumer services. Pure service, as with office applications, provides practically no control over the application to the client and a reasonably high-level of economy-of-scale to the provider. In many cases, consumer services are advertising supported and are complimentary to the client through advertising. Business applications that reside "on premises" are governed by the traditional considerations of application acquisition and deployment. If an application resides on and is deployed from the cloud, then a client gets a customized version achieved with a separate code base, or its

1

operational equivalent achieve through configuration options. The subject of business services is covered under "multi-tenancy."

The primary advantage of a cloud consumer service is that it is typically free to the client, as well as being accessible from any location via the Internet, and it yields advertising-supported revenue for the provider. Consumer services have a near-zero marginal cost of distribution to clients, because of the long tail, and require only a fraction of the number of clients to respond to advertising. This is the well-known *Freemium Business Model* [And04], characterized as follows: In the free sample product model, you give away 1% of your product to sell the additional 99%, whereas in the freemium model, you give away 99% to sell 1%. Because of the scale of the Internet with millions of users, you can reach a large market, so that the 1% is a huge amount. Consumer services would normally employ multi-tenancy.

CLOUD SERVICE ARCHITECTURE

A comprehensive SaaS application structure includes a continuum of architectural levels, based on the capability of handling multiple clients and software configurability. Four levels are identified. The number of levels in any specific operational environment is based on the cloud platform and its characteristics.

> **Level One.** At the first level, the users within a client domain address a single instance of an application running on a server. Each client/instance is totally independent of other client/instances running on the same server. This is the traditional hosted service operating in the cloud. Each software instance is individually customized for each client. This is the *single-tenant model*.

> **Level Two.** At the second architectural level, the vendor runs a sole instance that is shared by multiple clients. The feature set for each client is determined by configurable metadata, and authorization/security policies insure the separation of user data. This is the *multi-tenant model*.

The choice among architectural levels is determined by the provider/client's business, architectural, and operational models.

MULTI-TENANT ARCHITECTURE

From an architectural point of view, there are three features that identify an effective multi-tenant application: scalability, efficiency, and configurability. With a level one architecture, it is not possible to produce a distinctly customized version of the application software for each client, and at the same time, yield the economy of scale needed for successful monetization. This might be possible with single-client on-premises software, but with hundreds or millions of clients, producing and maintaining custom code is not feasible. Accordingly, even when a single-tenant environment is involved, metadata driven software is required.

With multi-tenancy, a single code instance services all clients with authorization and security policies in place to isolate client data. Instance options provide unique applicability, as required. This requires a trade-off between features and tenancy.

Business Model

The business model for cloud computing reflects how service providers can increase revenue and how clients can reduce operational costs of services over on-premises facilities. There are two areas that can

2

be addressed: the application architecture and the operational structure. From a monetization viewpoint, there are two options for application architecture: common features and unique features. For operational structure, the options are single-tenant and multi-tenant. The various options are regarded as service drivers and are summarized in Figure 1.

Figure 1. Service Drivers for Cloud Service Monetization.

The salient features of the cloud computing business model are summarized as follows:

- The ownership of the software is transferred to the cloud service provider.
- The responsibility for hardware, application software, storage facilities, and professional services resides with the provider.
- Systems software is available from a trusted vendor for supporting cloud services.
- Data centers are available for sustaining the operational structure and supporting the requisite fabric needed to utilize service farms.

Accordingly, the business model provides the economy of scale needed to target the long tail by providers and reducing up-front and operational costs for the client.

The SaaS provider with cloud computing will characteristically experience high up-front costs for infrastructure and software development. The SaaS client will have to give up a certain level of control to benefit from the economy-of-scale supplied by the provider. There are lingering questions over "who owns the software," "who owns the data," and information security.

Business Perspective

An element of software is essentially a collection of features – functions that perform a computational task. The set of features in a product or service support the selling aspects of that item. The cost of providing software services in a cloud environment are substantial and involve design, implementation, testing, marketing, and support activities. In short, complex software has a higher cost over simple software. When cloud software is architected for multi-tenancy to achieve sharing and economy-of-scale for the client, the costs are dramatically higher. Cloud software provisioning is a trade-off between

3

features and tenancy. Each of the items, i.e., features and tenancy, is actually a continuum, even though it is customarily treated as "lower" and "higher" to simplify the analysis and understanding. The scenario is inherent in the graphs in Figure 2.

Cost per tenant is the cost of delivering an element of software to one client and covers any requisite expenses needed for the associated service. Multi-tenant architecture maximizes sharing between users and increases the total revenue and economy of scale for the client; however, it increases development costs.

Cost per feature is the cost of implementing a specific functionality. Simpler features cost less to develop and maintain. Adding multi-tenancy increases the cost of a feature. The tenancy/feature conundrum is summarized as follows: "… multi-tenancy incurs a higher cost per feature, but lower cost per tenant while isolation has lower cost per feature but higher cost per tenant." [Car08b, p.1] Figure 5 summarizes in graphical form the advantages of each approach over time. As the tenant base grows (t3 in the diagram), multi-tenancy has good monetization for the provider.
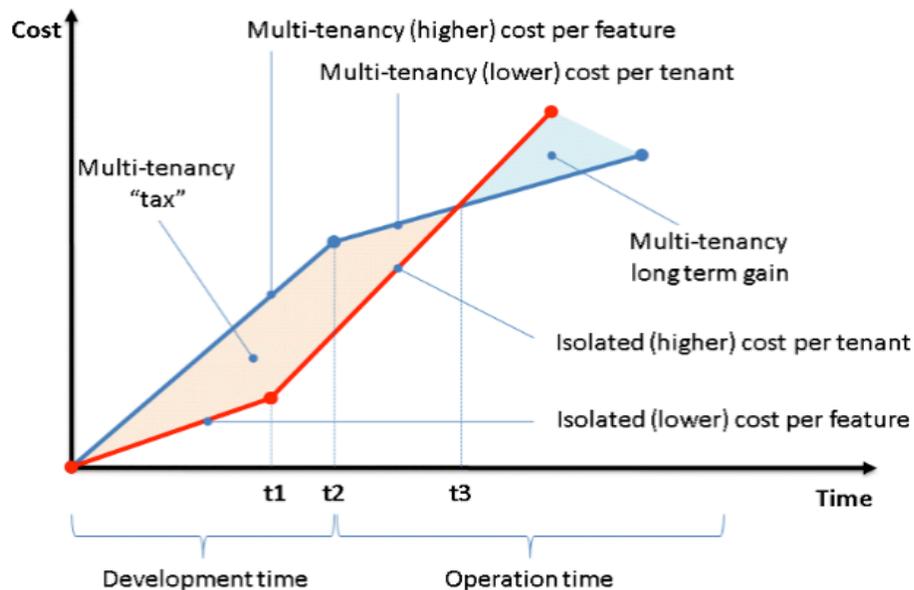
Figure 2. Cost per Feature vs. Cost per Tenant. [Car08b, p.2]

A promising approach to achieving economy-of-scale is to use virtualization at the cloud platform operating system level instead of designing an application for multi-tenancy.

MULTI-TENANT DATA ARCHITECTURE

Clearly, multi-tenant data architecture requires a correspondingly complex data model, ranging from data isolation to shared schemas as features range from common to unique and tenancy ranges from single to multiple, respectively. A continuum from isolated to shared is conceptualized, and three levels are identified: separate database per tenant, shared database and separate schema per tenant, and shared database and shared schemas per tenant.

4

Separate Database per Tenant

This option is suggested by Figure 3. In this case, computing resources and application code are shared among tenants, and each tenant has its own unique database. This instance supports single- and multi-tenant architecture. While this option more easily satisfies client needs, database maintenance cost are high and database server requirements are high, thereby limiting the number of tenants that can be supported by a specific computing system. This is a unique solution for clients with special security requirements, and are willing to pay for them.

Database Scalability

With cloud business applications, the game changes form mission criticality to Internet scaling to support millions of users. Two approaches can be envisioned: scaling the application, scaling the database, or both. In this paper, we are going to discuss data scaling.

Two approaches are: replication and partitioning. *Replication* refers to copying parts of the data to other tables or other databases and keeping the parts in synch. The basic idea is that the master copy is written to and replicated automatically to secondary databases for reference efficiency. *Partitioning* refers to moving "chunks" of data on a horizontal (row-based) basis to outlying tables or databases to increase efficiency, security, and manageability.
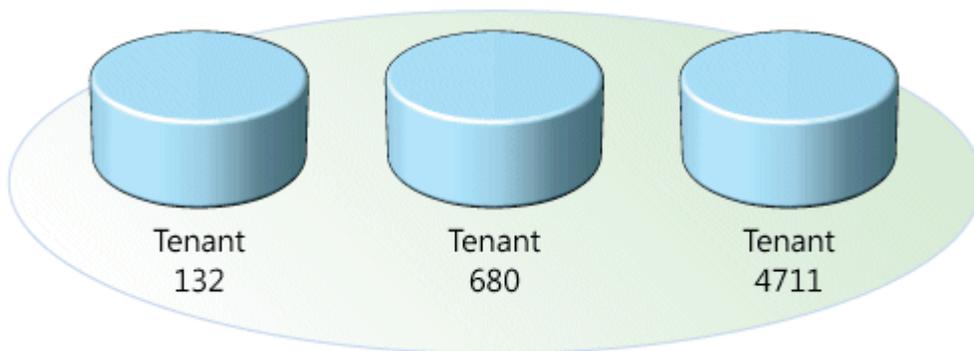
Figure 3. Separate Database per Tenant. [Cho06b, p. 2]

Shared Database, Separate Schemas

The option stores the data from multiple tenants in the same database with each client having its own set of tables and schema, as suggested by Figure 4. This approach requires a more complex software development, but provided added economy of scale for the client and the capability of servicing more clients.
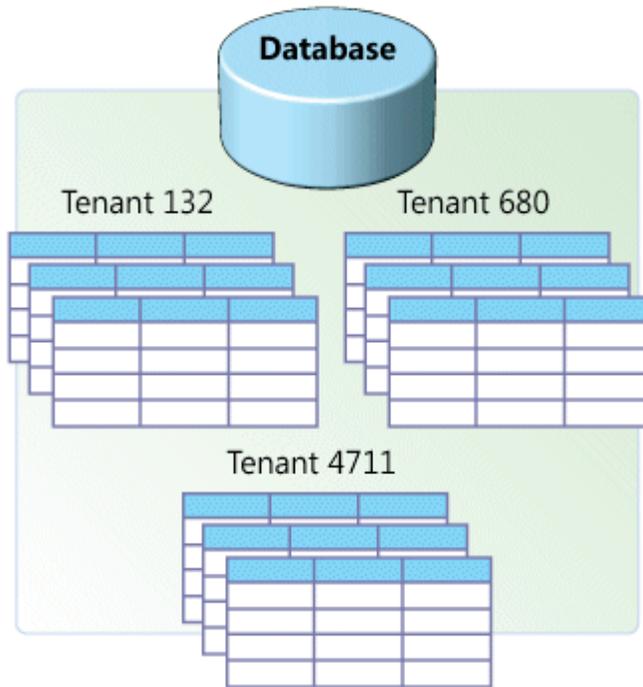
Figure 4. **Shared Database, Separate Schemas. [Cho06b, p. 3]**

Shared Database, Shared Schema

With this option, as suggested by Figure 5, tenant share the database and the tables are "logically" partitioned by tenant ID. This approach requires the most complex software but has the lowest hardware and software infrastructure costs. The number of database servers is lowest since tables are shared and database maintenance is reduced over the other options.

TenantID		ProductID	Date
4	4711	324965	2006-02-21
1	132	115468	2006-04-08
6	680	654109	2006-03-27
4	4711	324956	2006-02-23

Firgure 5. Shared Database, Shared Schema. [Cho06b, p. 4]

SUMMARY AND FURTHER RESEARCH

Cloud computing has evolved into a huge research topic with each major player in the IT service business supplying its own version of exactly what the subject matter should incorporate. The above materials are

an attempt at finding a middle ground and providing a basis for further research in the area of small systems. Two very important areas have not been covered: security and data architecture. Both are significant for exchanging data between applications within the cloud.

REFERENCES

[And04] Anderson, C., "The Long Tail," *Wired Blog Network*, 2004.

[Car08a] Carraro, G., "I don't believe we are still talking about whether SaaS == multi-tenancy … ," *Microsoft Corporation*, blogs.msdn.com/gianpaolo/archive, (2008).

[Car08b] Carraro, G., "Monetization: the next frontier of SaaS/S+S architecture," *Microsoft Corporation*, blogs.msdn.com/gianpaolo/archive, (2008).

[Cha08] Chappell, D., "A Short Introduction to Cloud Platforms, " *Microsoft Corporation*, August 2008.

[Cho06a] Chong, F. and G. Carraro, "Architecture Strategies for Catching the Long Tail," *Microsoft Corporation*, April 2006.

[Cho06b] Chong, F., Carraro, G. and R. Wolter "Multi-Tenant Data Architecture" *Microsoft Corporation*, June 2006.

[Cho08] Chong, F., "Application Marketplaces and the Money Trail," *Microsoft Corporation,* March 2008.

[Kat08a] Katzan, H., *Service Science: Concepts, Technology, Management,* New York: iUniverse, Inc., 2008.

[Kat08b] Katzan, H., "Cloud Computing, I-Service, and IT Service Provisioning," *Journal of Service Science*, Volume 1, Number 2, (2008).

[Mil08] Miller, M., *Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online,* Indianapolis: Que Publishing, 2008.

[Rap04] Rappa, M., "The utility business model and the future of computing services," *IBM Systems Journal,* Volume 43, Number 1, (2004).

CLOUD COMPUTING MESH MODEL FOR DECISION SUPPORT SYSTEMS

Harry Katzan, Jr.
Savannah State University

ABSTRACT

This paper introduces the use of service science to enhance decision-making capability by providing service transparency to information from diverse knowledge sources in a complex operating environment. The concept of a *live collector* that runs in the cloud is developed. The collector gives information visibility, context mediation, and presentation facilities on a dynamic basis by employing the principles of cloud computing. The subject of cloud computing is introduced in the paper, and a case study from decision support is presented.

INTRODUCTION

Much of modern business is dependent upon information that is locked in on-premises information systems. Clearly, the price for maintaining and accessing this information is high and incorporates infrastructure, hardware, software, development, and professional services including the in-house costs of utilization and deployment. Information systems of this sort have evolved such that the aforementioned information can be encapsulated, exposed as components, and accessible as services over the Internet. In many cases, the components are usable in systems development for the development of other on-premises software applications. [Kat08b, pp. 119ff] The concept is well established and known as *Service-Oriented Architecture* (SOA). [Erl08] The drawback of most, but certainly not all, SOA applications is that the up-front costs are high, time consuming, and yield only a marginal contribution to business agility. Many business operations require that information from several on-premises systems be visible for consistent and effective decision-making. The provisioning of information from several systems to facilitate decision making is the subject of this paper.

CLOUD COMPUTING CONCEPTS

Cloud computing is a collection of technologies for accessing computer facilities via the Internet. From a user perspective, ubiquitous access is provided to software and information through the use of a web browser. The adjective "cloud" reflects the diagrammatic use of a cloud as a metaphor for the Internet and suggests that the same services are available in several forms, such as conventional web access, mobile platforms, and mesh computing.

From a provider perspective, cloud computing refers to software deployed as a hosted service and accessed over the Internet. There are two aspects to service provisioning: infrastructure services and application services. Both use a *cloud platform*, which is essentially an operating system that runs in the cloud. [Cha08a, Cha08b] *Infrastructure services* include authorization/authentication/security facilities, integration between infrastructure and application services, and online storage facilities. *Application services* refer to ordinary business services that expose "functional" services as SOA components. Cloud platforms are a lot like enterprise-level platforms, except that they are designed to scale up to Internet-level operations supporting millions of clients.

Cloud computing clients are grouped into three categories: traditional business users, independent software vendors (ISVs), and consumers. *Traditional business users* run their applications in the cloud to avoid up-front deployment costs and to minimize development and deployment time. *ISVs* develop multi-

1

tenant applications that can address a wider marketplace for services and provide economy of scale for the client. *Cloud consumer services* are typically free to the client, as well as being accessible from any location via the Internet, and yield advertising-supported revenue for the provider. Consumer services have a near-zero marginal cost of distribution to clients.

APPLICATION ARCHITECTURE

For the purposes of this paper, two forms of cloud application architecture are established: the multi-tenant model and the visibility model. The *multi-tenant model* runs on a cloud platform and uses a common data model for all tenants. This model provides economy of scale for clients based on long tail monetization. [Kat08b] This model, popular with ISVs, probably will use the virtualization feature of cloud operating systems to achieve multi-tenancy, and requires that all clients run the same basic business application. [Kat86, Cha08b]

The *visibility model* reflects proprietary software that runs on a cloud platform. It uses a single tenant model and demands a separate data model. Each tenant may have several users, each associated with the same client. Internet access is required for on-premises and other cloud applications. This model may involve the use of specially written computer programs to support particular business applications, such as decision support.

SYSTEM DESIGN

Achieving service visibility from different information systems requires a software application that is hosted on a cloud platform and adopts the visibility model. We are going to call this application the *live collector* that creates an operational scenario on a dynamic basis. The collector is script-driven and creates an instance for each client. It is important that the application runs as a client, where the client can sustain several users. An application instance is synthesized for each user. Figure 1 gives a structural and process design diagram of the live collector with functional sub-components, as required. The main components are the script-driven instance generator, the accesser to on-premises data objects, the aggregator that derives a composite picture of the application domain, the presenter that derives the requisite presentation facility, and a storage manager for handling the data-centric aspects of cloud computing. The systems environment is conceptualized in Figure 2. The design is actually a *mesh model* intended to connect a user's PC, mobile device, and other cloud services via the Internet. The mesh software functions as a control hub providing unified services on a demand basis.

Instance Generator

The *live collector* is composed of software components that can be assembled dynamically to instantiate a specific application instance. The *instance generator* is a script-driven functionality that generates an operational instance. This operational instance, when executed, will access components from on-premises information systems with the accesser component and then synthesize a composite data structure, relying on the context mediator when needed. The composite data structure will feed the presenter component that generates and updates the display. The aggregator will employ a pulsar module that can dynamically refresh the display from on-premises components. The storage manager, also script-driven, will store operational information in a cloud database. Since the instance runs in the cloud, it can be accessed from any location and with fixed and mobile facilities.

Accesser

The primary function of the *accesser* component is to locate needed information on on-premises information systems. To achieve data location, the accesser will employ Web Services technology, which includes a registry of system components. [Cer02] The locater looks up needed components in the

2

registry and returns their Internet-accessible reference locations. The accesser can return that information to the aggregator for subsequent composition and display,

Aggregator

The *aggregator* is a software component that resides in the live collector with the sole objective of combining information as prescribed in the script. The aggregator is conceptualized as a rule-based software component that would necessarily employ the services of a "context mediator" to resolve semantic differences in otherwise incompatible entities, as described in the following quotation. "Context mediation is a field of research that is concerned with the interchange of information across different environments, which provides a vehicle to bridge semantic gaps among disparate entities." [Buc04] To insure the timeliness of information, the aggregator should exercise a pulsar component that would refresh information on a periodic basis.
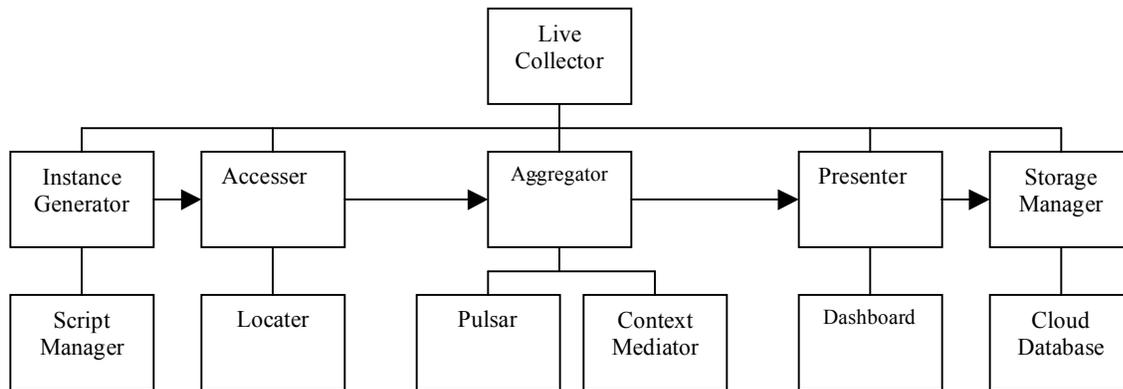
Figure1. Design of the Live Collector.
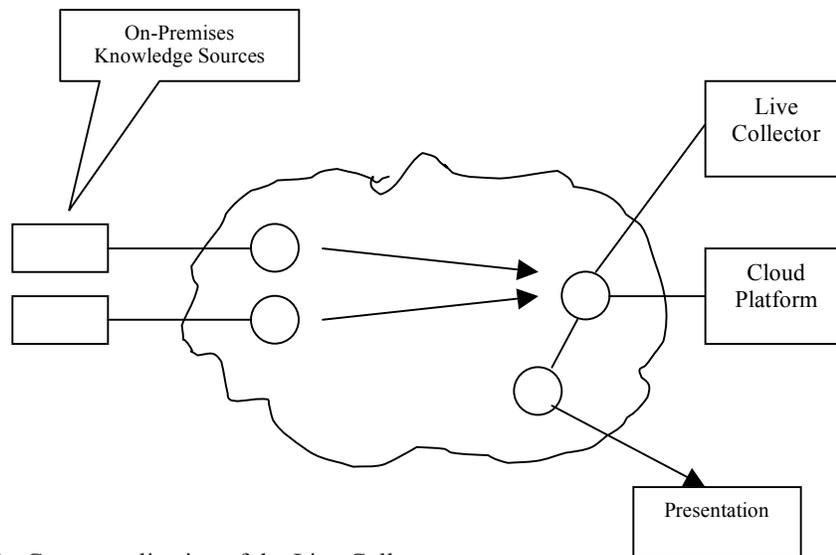
Figure 2. Conceptualization of the Live Collector.

Presenter

The *presenter* is an open-ended display component – sometimes regarded as a "dashboard" – designed to match informational requirements with display technology. Presenter output is expected to be archived for subsequent reference and to protect against repudiation.

3

Cloud Storage Manager

The *cloud storage manager* is a front-end to a cloud database component designed to handle cases of multi-tenant data structures with multiple users. A key issue with cloud storage management is "Who owns the data?" It is generally felt that ownership considerations can be resolved with effective service-level agreements.

Workflow

As implied in Figure 1, the workflow for service visibility is the following: instance generation, access, synthesis, presentation, and storage. Since instance execution is script driven, the flow can be adjusted on a dynamic basis, perhaps with the use of intelligent agents. [Rus03]

BUSINESS PERSPECTIVE

It would seem that there is something in cloud computing for everyone. For the IT manager, it means reduced upfront costs for hardware and software. For the business manager, it means shorter development time and increased business agility. For the business analyst, it means the ability to effectively work from a remote location. For the executive, it means obtaining information on a client, business partner, or competitor from diverse systems and then combining that information in a form useful for decision making, such that the information is timely, accurate, and complete. Often, an enterprise will have several lines of business with clients that address one or more of those lines. In these cases, it is more than useful for an executive to have a composite position for decisions that affect that client.

In the next section, we give a case study involving data from different knowledge sources that are combined to form a composite picture of a situation. It demonstrates that the cloud is a practical technology for quantitative as well as qualitative data.

CASE STUDY FROM CONSENSUS THEORY

The effectiveness of unstructured decisions made under uncertainty directly involves two important concepts: the representation of the problem domain and the completeness of the solution space. A *category* is a means of representing the problem domain so that relevant structural information may be assessed and decisions can be made. A *frame of discernment* ([Sha76], [Kat92], [Kat06], [Kat08c]) is a set of mutually exclusive and collectively exhaustive possibilities for the solution space.

Category

A category is a means of structuring a problem domain with objective of engaging in a predictive modality in which one or more future events may be identified and analyzed. Let C_i be one of the categories used to stratify the problem domain such that the collection

$$C = \{C_1, C_2, \ldots, C_n\}$$

represents a complete conceptualization of the dynamics under investigation and *n* is the number of categories.

Associated with each category is a set of probabilities representing an assessment of a future outcome based on its underlying categorical imperative. Thus, a category is a mechanism for isolating a single view of the problem under consideration. The ontological definition of a *category,* as a conceptual entity with no attributes in common with other categories, is adopted in this paper.

Frame of Discernment

A frame of discernment is a means of representing the possibilities under consideration, as in the following examples:

E = {McCain, Obama}
M = {Up, Unchanged, Down}

Clearly, the elements in a frame of discernment are, in fact, propositions that can be interpreted as events or states. Thus, if component s_i of system S over domain V were associated with the symbol "**McCain**," then that state is equivalent to the proposition, "The true value of V for component s_i is **McCain**," or in ordinary language, "s_i prefers **McCain**."

Accordingly, the set S of propositions S_i,

$$S = \{S_1, S_2, \ldots, S_n\}$$

commonly represent the collection of states of a system under analysis. Clearly, at an agreed upon point in time, one proposition is true and the others are false.

Uncertainty

Prior to the agreed point in time (τ), we obviously do not know the state of the system under analysis or its components with any degree of certainty. The expectation that a part of the system will be in a particular state at time τ is denoted by a real number $p(S_i)$ associated with each of the propositions in the frame S = $\{S_i\}$, i=1,2,…,n, such that

$$0 \leq p(S_i) \leq 1$$

and

$$\sum_{i=1}^{n} p(S_i) = 1$$

This is simply the addition rule for mutually exclusive events.

Consensus Theory

Consensus theory is a methodology for combining evidence based on Dempster-Shafer theory ([Sha76], [Kat92], [Kat06], [Kat08c]) and the mathematical combination of evidence ([Dem67]). Dempster-Shafer theory has commanded a considerable amount of attention in the scientific and business communities, because it allows a knowledge source to assign a numerical measure to a proposition from a problem space, and provides a method for the measures accorded to independent knowledge sources to be combined. Dempster-Shafer theory is attractive because conflicting, as well as confirmatory, evidence from multiple sources may be assimilated.

The basis of Dempster-Shafer theory is the frame of discernment (Θ), introduced previously. Accordingly, a knowledge source may assign a numerical measure to a distinct element of Θ, which is equivalent to assigning a measure of belief to the corresponding proposition. In most cases, the numerical measure will be a basic probability assignment. A measure of belief may also be assigned to a subset of Θ or to Θ itself.

Support Functions

Consider a frame of discernment Θ and its power set denoted by 2^{Θ}. For example, given the frame:

$$\Theta = \{a, b, c\}$$

The power set is delineated as follows:

$$2^{\Theta} = \quad \{\{a, b, c\},$$
$$\{a, b\}, \{a, c\}, \{b, c\},$$
$$\{a\}, \{b\}, \{c\}\}$$

5

In Dempster-Shafer theory, a knowledge source apportions a unit of belief to an element of 2^Θ. This belief can be regarded as a mass committed to a proposition and represents a judgment as to the strength of the evidence supporting that proposition. When viewed in this manner, evidence focuses on the set corresponding to a proposition; this set is called a *focal set*.

The support for a focal set is a function *m* that maps an element of 2^Θ, denoted by *A*, onto the interval [0,1]. Given a frame of discernment Θ and function *m*: $2^\Theta \rightarrow [0,1]$, a support function is defined as follows:

$m(\phi) = 0$, where ϕ is the null set
$0 \leq m(A) \leq 1$, and

$$\sum_{A \subset 2^\Theta} m(A) = 1$$

The support function *m* is called a *basic probability assignment*, which is assigned by the knowledge engineer or domain specialist.

A support function is called a *simple support function* if it reflects, at most, one focal set not equal to Θ. A simple support function assigns a measure of belief to the focal set *A*, as follows:

$m(A)>0$
$m(\Theta)=1-m(A)$
$m(B)=0$, for all $B \subset 2^\Theta$ and $B \neq A$

The simple support function for a focal set *A* assigns a portion of the total belief exactly to *A* and not to its subsets or supersets. The remainder of the belief is assigned to Θ, and this is where Shafer's work departs from conventional Bayesian analysis. Because certainty function must add up to 1, $m(\Theta)=1-m(A)$.

It is possible that a body of knowledge or evidence supports more than one proposition, as in the following case. If

$\Theta = \{a, b, c, d\}$
$A = \{a, b\}$

and

$B = \{a, c, d\}$

then the evidence supports two focal sets, which in the example, are *A* and *B*. If $m(A)=0.5$ and $m(B)=0.3$, then $m(\Theta)=0.2$. A support function with more than one focal set is called a *separable support function*. Separable support functions are normally generated when simple support functions are combined.

The notion of combining simple support functions is a practical approach to the assessment of evidence. An analyst obtains information from a knowledge source, and it leads to an immediate conclusion – not with certainty, but with a certain level of belief. This is a normal straightforward means of handling human affairs and is precisely what people do. Then when additional information comes in, the prior evidence and the new information are combined to obtain a composite picture of the situation.

Combination of Evidence

A method of combining evidence is known as Dempster's rule of combination ([Dem67]). Evidence would normally be combined when it is obtained from two different observations, each over the same frame of discernment. The combination rule computes a new support function reflecting the consensus of the combined evidence.

If m_1 and m_2 denote two support functions, then their combination is denoted by $m_1 \oplus m_2$ and is called their *orthogonal sum*. The combination $m_1 \oplus m_2$ is computed from m_1 and m_2 by considering all products of the form $m_1(X) \bullet m_2(Y)$, where X and Y range over the elements of Θ; $m_1(X) \bullet m_2(Y)$ is the set intersection of X and Y combined with the product of the corresponding probabilities.

For example, consider the frame of discernment

Θ = {healthy, tests, sick}

and views A and B, based on two different observation over the same frame:

X = {{healthy},0.6},{{tests},0.3},{{sick},0.1}}
Y = {{healthy},0.4},{{tests},0.4},{{sick},0.2}}

The entries are combined as follows using Dempster's rule of combination:

$m_1 \oplus m_2(\{healthy\}) = 0.24$
$m_1 \oplus m_2(\{tests\}) = 0.12$
$m_1 \oplus m_2(\{sick\}) = 0.02$
$m_1 \oplus m_2(\{\emptyset\}) = 0.62$

Thus, for $A_i \cap B_j = A$ and $m_1 \oplus m_2 = m$, the combination rule is defined mathematically as:

$$m(A) = \sum_{A_i \cap B_j = A} m_1(A_i) \bullet m_2(B_j) / (1 - \sum_{A_i \cap B_j = \emptyset} m_1(A_i) \bullet m_2(B_j))$$

The denominator reflects a normalization process to insure that the pooled values sum to 1. So, in this instance, the normalization process yields the combination

X$\oplus$Y = {{healthy},0.63},{{tests},0.32},{{sick},0.05}}

after normalization by dividing the combined assessment by (1-0.62) or 0.38. Because the problem is well-structured, the representation can be simplified as

X$\oplus$Y = {0.63,0.32,0.05}

For views A={$A_1,A_2,\dots,A_n$} and B={$B_1,B_2,\dots,B_n$}, the combination rule can be simplified as

A$\oplus$B={$A_1 \times B_1/k, A_2 \times B_2/k, \dots, A_n \times B_n/k$}   **[1]**

$$\text{where } k = \sum_{i=1}^{n} A_i \times B_i$$

We will refer to equation **[1]** as the *simplification rule*.

An example of the preceding concepts is demonstrated trough the elicitation of expert opinion.

Elicitation of Expert Opinion

Typically, experts do not agree, especially when system failure is concerned. Typical examples might be the crash of an expensive fighter aircraft or the collapse of a building. Consider a situation wherein the frame of discernment is {A,B,C} reflecting that the failure could be caused by Component A, Component B, or Component C. Expert #1 believes the failure is due to Component A with probability 0.75, Component B with probability 0.15, or

7

Component C with probability 0.10. Expert #2 believes the failure is due to Component A with probability 0.30, Component B with probability 0.20, or Component C with probability 0.50. The support function are:

Expert #1 = {{{A},0.75}, {{B},0.15}, {{C},0.10}} = {0.75, 0.15, 0.10}
Expert #2 = {{{A},0.30}, {{B},0.20}, {{C},0.50}} = {0.30, 0.20, 0.50}

Table 1 summarizes the application of the simplification rule to this problem. The opinion of the experts is summarized and reflects the differing opinions.

Support Function	Probability Assignment	Entropy
Expert #1 (=X)	{0.75, 0.15, 0.10}	1.05
Expert #2 (=Y)	{0.30, 0.20, 0.50}	1.49
X×Y	{0.738, 0.098, 0.164}	1.08

Table 1. Elicitation of Expert Opinion.

The strong opinion of Expert #1 in favor of Component A, reflected in the low entropy, has a major influence on the consensus.[1]

SUMMARY

The basis for service visibility across differing domains is service science, cloud computing, Web Services, and Service-Oriented Architecture. Cloud computing is a collection of technologies for accessing computer facilities via the Internet. The two aspects of cloud service provisioning are infrastructure services and application services. Cloud computing clients are grouped into three categories: traditional business users, independent software vendors (ISVs), and consumers. The two forms of cloud application architecture are the multi-tenant model and the visibility model. A live collector is a software application used to achieve service visibility across lines of business. The main components of a live collector are the instance generator, the accesser, the aggregator, the presenter, and the storage manager. The collector through mesh technology is useful for combining information from disparate knowledge sources.

REFERENCES

[Buc04]   Buchner, A., *Context Mediation among Knowledge Discovery Components*, www.dissertation.com, (from the abstract), (2004).
[Cer02]   Cerami, E., *Web Services Essentials*, Sebastopol, CA: O'Reilly Media, Inc., (2002).
[Cha08a] Chappell, D., "A Short Introduction to Cloud Platforms, " *Microsoft Corporation*, (August 2008).
[Cha08b] Chappell, D., "Introducing the Azure Services Platform, " *Microsoft Corporation*, (October 2008).
[Dem67]   Dempster, A.P., Upper and Lower Probabilities Induced by a Multivalued Mapping, *The Annals of Statistics* 28:325-339, (1967).
[Erl08]   Erl, T., *SOA: Principles of Service Design*, Upper Saddle River, NJ: Prentice-Hall Inc., (2008).
[Kat86]   Katzan, H., *Operating Systems: A Pragmatic Approach (2e)*. Hoboken, NJ: John Wiley and Sons, 1986.

[1] Entropy for n elements is computed as:

$$H(x) = \sum_{i=1}^{n} x_i h(x_i) = \sum_{i=1}^{n} x_i \log(1/x_i) = -\sum_{i=1}^{n} x_i \log(x_i)$$

[Kat92]   Katzan, H., *Managing Uncertainty: A Pragmatic Approach*, New York: Van Nostrand Reinhold Co., (1992).

[Kat06]   Katzan, H., Consensus, *Proceedings of the Decision Science Institute National Conference*, San Antonio TX. (November 2006).

[Kat08a]   Katzan, H., Cloud Computing, I-Service, and IT Service Provisioning, *Journal of Service Science*, Volume 1, Number 2, (2008).

[Kat08b]   Katzan, H., *Foundations of Service Science: A Pragmatic Approach*, New York: iUniverse, Inc., (2008).

[Kat08c]   Katzan, H., Categorical Analytics Based on Consensus Theory, *Journal of Business and Economics Research*, Volume 6, Number 8, (2008).

[Kno08]   Knorr, E and G. Gruman, "What cloud computing really means," *InfoWorld*, April 07, 2008, www.infoworld.com, (2008).

[Mar08]   Martin, R and J. Hoover , "Guide to Cloud Computing," *Information Week*, June 21, (2008), www.informationweek.com, (2008).

[Mil08]   Miller, M., *Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online,* Indianapolis: Que Publishing, (2008).

[Rus03]   Russell, S. and P. Norvig, *Artificial Intelligence: A Modern Approach* (2ed), Upper Saddle River, NJ: Prentice-Hall Inc, (2003).

[Sha76]   Shafer, G., *A Mathematical Theory of Evidence*, Princeton, NJ: Princeton University Press, (1976).

[The67]   Theil, H., *Economics and Information Theory*, New York: American Elsevier Publishing Company, Inc., (1967).

9

THE RELATIONSHIP OF PERFORMANCE AND PERSONAL
FACTORS IN JOB CRAFTING

Paul Lyons, College of Business, Frostburg State University, 301-687-4179

INTRODUCTION

This study is about the concept of job crafting. Job crafting represents individual work and job change that is not revealed to management and does not include management in decision making. Fundamentally, employees are choosing to engage in a form of shadow job-redesign that may or may not run counter to what management desires.

The purposes of this study focus on two distinct yet related areas: the relationship of reported job crafting behavior to supervisor assessment of individual performance, and the exploration of individual factors that may drive individual interest towards engaging in job crafting behavior. There has been little research completed on job crafting, in general, and virtually no research on the relationship between the concept and job performance.

The research questions that this study addresses are: (a) is there a relationship between job performance (success on the job) and one's self-report of engaging in job crafting behavior; (b) what are some of the features of job crafting activity in a sample of employees; (c) what forms does job crafting take in the particular context studied; and (d) what behavioral stimuli or drivers may serve to motivate or propel the behavior? With regard to this last item, the work of Wrzesniewski and Dutton (2001) suggests that three variables: belonging, self-esteem, and perceived control, help to explain the motives of individuals engaged in actual job crafting behavior. In this study these three variables serve as a starting place to examine some of the possible antecedents of job crafting.

There are practical implications of this research as it may influence both future research and management practice. First, it is helpful to reinforce, empirically, that job crafting does take place on the job, and that it may be related to overall job performance. Second, it is desirable to ascertain indications of the quantity and characteristics of the behavior as this information would likely add credibility to the concept and support theory-building.

BACKGROUND AND PREVIOUS RESEARCH

The Concept of Job Crafting. In their work, Wrzesniewski & Dutton (2001, p. 179) define job crafting as,. . . the physical and cognitive changes individuals make in the task or relational boundaries of their work. There is the aspect of modifying the cognitive, relationship 'doing' part of a job purely for affecting performance and results. There is also the aspect that relates to one's identity with the job, that is, the relationship of one's self with the job. Part of a person's social identity is shaped by their work and this relationship has been widely demonstrated in the literature (for example, Brief & Nord, 1990; Ashforth & Kreiner, 1999).

For purposes of this exploratory study, job crafting has occurred when an individual initiates a change in the task or relational features of their work that is intended to be relatively permanent that is, on-going, and that serves some personal interest or need that may or may not benefit others or the organization. It is thought and action-based.

Job crafting represents another dimension of work (behavior) and by implication, relates to motivation, job involvement, work identity, job satisfaction, extra-role behavior, personal autonomy and related constructs. Job crafting provides an outlet for individual creativity and
may be categorized as a form of extra-role behavior on the job, that is, activity that extends beyond the formal requirements of work.

In terms of extra-role behavior, the research that does exist regarding the concept of job crafting reinforces the organizational citizenship behavior [OCB] conceptualization as many job crafting episodes reported in the literature to date are in the service of others or the organization.
The most material difference between OCB and job crafting is that OCB is aimed primarily at individual behavior that is enacted in the service of others and/or the organization, while job crafting is aimed at personal needs. Further, OCB is often episodic in nature and usually is not made part of an individual's continuing job role. These features create real differences in the two concepts.

The existing literature gives very little specific information with regards to the frequency and amount of job crafting behavior that might take place in a work setting. In reflection of the work of Wrzesniewski & Dutton (2001) and others, this paper takes the position that many, if not most, employees do at some time, engage in what is defined here as job crafting behavior. It seems reasonable to proceed with the notion that some baseline frequency marker should be explored. To this end the following hypothesis is expressed:

Hypothesis 1 – in the sample selected for study, approximately 40 per cent of the employees will report having engaged in some form of job crafting behavior in the past 12 months.

Personal Interest, Motivation, and Antecedents. In their analysis of research that describes changes in work, Wrzesniewski & Dutton (2001) conclude that three needs probably supply the motivation for such changes. First, is the basic need for control or mastery. The idea is that some people desire to make part of their work their own, that is, they wish to have more personal control over the work. Second, in order to enhance their self-esteem, some people desire to create a positive view or sense of self in their work. In terms of social identity theory as explained by Ashforth & Mael, (1989), people want positive images of work in their own eyes and in the eyes of others, hence they make changes in the work that they believe make the work more attractive. Finally, changes in jobs are made to establish linkages or connections with others to address needs of belonging or connectedness.

There is research related to the foregoing ideas. The socioanalytic theory of Hogan and Warrenfeltz (2003) supports these (need-based) assertions as they have argued that people have innate biological needs for (a) status, power, and control of resources; (b) acceptance and approval; and (c) order and predictability. Frese & Fay (2001) report that people will take initiative at work if they believe it will result in having more control. And Parker (1998) has argued that acquiring new skills and mastering new responsibilities help to enable personal autonomy.

The work of Schmitt, Cortina, Ingerick, & Wiechmann, (2003), which offers a more trait-based view of motivation in the work environment, supports the assertions as well by concluding that extroversion, tenacity, and self-regulatory characteristics, among others, are predictors of motivation. Adjunct to these interpretations and depending on intention and/or outcomes of job crafting, the result of the behavior could mirror organizational citizenship behavior [OCB] as exemplified in the work of Podsakoff, MacKenzie, Paine & Bachrach, (2000). In addition, behavior that leads to some work/job modifications may help an individual to accept other, or cope better with less desirable aspects of their work activities that are not readily open to job crafting.

There are two additional concepts that relate to the matter of antecedents or motives for the engagement in job crafting behavior and they are proactive behavior and personal initiative. These concepts have received much recent attention in the literature. In terms of definition and classification, it may be possible to include within one or both of these concepts the behavior we have labeled, job crafting. Crant (2000) has suggested that proactive behavior may have broad impact in an organization and thus may be regarded as a high leverage concept as contrasted with just another fad of management. At the individual level, proactive behavior in an organization is usually a form of self-initiated, future-oriented action that is attempting to create improvements in current conditions or oneself (see, Crant, 2000; Unsworth & Parker, 2003). It is about change, at the least.

The second related concept is what Frese, Kring, Soose, & Zempel (1996) have labeled personal initiative. This is defined as behavior that is basically self-starting (that is, it is not an explicit requirement of the job; it is doing a thing without being told to do it); persistent (overcoming some obstacles to create change), and proactive. In the collective, Frese and Fay (2001) refer to this group of actions as "active performance concepts" because the concepts suggest that workers develop their own goals, and take actions that go beyond the tasks assigned to them by management.

For our purposes in this paper, the position is taken that in the context of a job, the behavior of job crafting is a more specific term that either of the above two concepts although job crafting behavior is certainly proactive in nature and it includes the individual exercising personal initiative. In concluding this section on the motivation and antecedents of job crafting behavior, the following three related yet distinct hypotheses are offered. Job crafting behavior will be positively and significantly related to:

Hypothesis 2 A – need for belonging,
Hypothesis 2 B – need for control, and
Hypothesis 2 C – need for self-esteem.

Performance and Job Crafting. The work of Wrzesniewski & Dutton (2001) did not directly address the matter of the relationship of engaging in job crafting behavior and job performance and this relationship requires some attention. If positive outcomes are achieved as a result of job crafting, then the encouragement and/or reinforcement of job crafting could be desirable. There is some research supportive of this idea. For example, Conti & Warner (2002) propose a model that encourages work that maximizes the use of the worker's judgment, knowledge, creativity, intelligence and initiative so that customer's needs are best served. Some of the studies of the concept of empowerment of employees such as those of Wellins, Byham & Wilson, (1991); and Pearson (1992); are supportive of these ideas. There is also the issue of direction of relationship, that is, does job crafting positively influence performance, or vice-versa. In this exploratory study only the basic relationship is examined.

If changes in jobs were not aligned with organizational objectives or were hostile to organizational objectives and manager needs, then the job crafting activity could become a problem for the organization, work groups, and other employees. Wrzesniewski and Dutton (2001) repeatedly state that job crafting is not necessarily performed in the service of the goals of the organization. Yet, many of the examples of job crafting they cite make it clear that positive changes in performance and other benefits to the organization accrue. The exploratory study of Lyons (2006b) reinforces these findings. In that study, most job crafting episodes reported were in the service of job or organization goals and values. These findings in the collective seem to suggest that the performance of the individual engaged in job crafting is satisfactory, at the least.

In this study the measure of employee performance used to examine relationships with job crafting behavior is a supervisor rating of employee performance. While there is a relatively broad literature that addresses the weakness of supervisor ratings of employee performance (see, for example, Fried, Tiegs, &

Bellamy, 1992), the fact remains that first and second-level supervisors and managers are the most common source of performance information regarding employees. The evaluation of employee performance and subsequent efforts in providing feedback, mentoring, and training are among the most important tasks of supervisors and managers. Recent meta-analytic research by Viswesvaran, Schmidt, and Ones (2005), in which more than 300 studies of rating scales of performance covering a period of 25 years were examined, concluded that after controlling for various error sources there may be a general performance factor.

The foregoing discussions of prior research that demonstrates positive outcomes from job crafting and the use of supervisor ratings of employee performance suggests the hypothesis to examine which is: Hypothesis 3 – Job crafting behavior will be positively and significantly related with supervisor ratings of employee performance.

Context and Opportunity. We then have the issues of job context and opportunity to engage in the job crafting behavior. Some types of jobs, some job venues, and some organizations, other things being equal (e.g., interpersonal dynamics), will offer opportunities, invitations, and incentives to employees to modify their jobs. For example, the very nature of the job and the level and amount of direction and/or supervision received may influence the likelihood of job crafting activity taking place as employees perceive opportunities to make changes on their own. Some work (job, task) environments are much more open and loose than other environments with reference to such things as: work pace, processes and procedures, authority structure, centralization of decision making, and monitoring of performance. In the present study, for example, the work environment of the study participants probably encourages self-initiated changes in jobs. The details of the environment are discussed later in this paper.

SUMMARY OF BACKGROUND AND PREVIOUS RESEARCH

Earlier sections of this paper have revealed that there has not been a lot of empirical research directed at the crafting of jobs or work by employees. Of the research that does exist, much of it is of the observational - anecdotal variety where individuals in different organizations in a variety of jobs were observed as they went about their normal job duties (see, for example, Benner, et al., 1996). Other research has relied on interviews of employees where specific questions were asked about job duties, changes in duties, and special initiatives to change work practices. This research is represented in the work of Cohen & Sutton, (1998); Fine (1996); Fletcher (1996); and Jacques (1993). These observations help to establish the need for the present study.

These studies have clearly demonstrated that job crafting as defined in this study does, indeed, take place and it usually takes place without the knowledge of managers or others. What has not been given much attention in the literature is the extent to which job crafting takes place in terms of frequency, type, magnitude of changes in work, and the like. Empirical research regarding the antecedents and/or individual personality characteristics relating to job crafting is practically non-existent. Further, research (Ilgen & Hollenbeck, 1992; Staw & Boettger, 1990) that has examined employee-initiated job crafting normally assumes that only employees in jobs that offer them substantial autonomy will be able to make job modifications. These findings and conclusions support the need for the present, exploratory study. In the sections of the paper that follow, the details of the research are presented. The hypotheses under consideration are summarized here.

Hypothesis 1 – in the sample selected for study, approximately 40 per cent of the employees will report having engaged in some form of job crafting behavior.
Job crafting behavior will be positively and significantly related to:
Hypothesis 2 A – need for belonging,
Hypothesis 2 B – need for control, and

Hypothesis 2 C – need for self-esteem.
Hypothesis 3 – Job crafting behavior will be positively and significantly related with supervisor ratings of employee performance.

METHOD

Interviews of job holders will ascertain: (a) if they engage in job crafting behavior that is self-initiated and not related to any direction from management, (b) how frequently such behavior occurs, (c) what forms the actual behavior takes; and (d) how participants perceive their opportunities to engage in such behavior. Interviews of job holder's supervisors will provide performance ratings of each job holder.

Participants. The participants in this study are 94 sales representatives of a large, consumer products firm. These participants are outside sales representatives who work in various districts in a nine-state area in the Northeast and Middle Atlantic sections of the U.S. Most of their time is spent making sales calls on business, government, and other organizations. For the most part, they work with little direct contact with other organization employees. The original sample size of participants was 102, however, owing to illness and other factors, complete data was available for 94 members of the group. The original sample is the entire population of sales representatives in the nine-state area.

These particular employees were selected for this study for several reasons: (a) they all do the same, general type of work, (b) they work for the same firm and are subject to the same job requirements, conditions, organizational policies and requirements, and (c) they were available as they are participants in a larger, longitudinal study about motivation and performance.

Details of the group: Men 76 (81%), Women 18 (19%); Racial composition: Asian 3 (3 %), African American 9 (10%), White 82 (87%); average age of the entire group was 33 years, and average number of years working with the organization was 6.3 years. All of the participants held a college degree with 11 of the group of 94 with a community college degree; the majority had a B.A. or B.S. degree. Also participating in this study were the seven district sales managers who had oversight responsibility for the sales persons, among other duties.

Procedure. Each member of the study group was interviewed, individually, using a structured interview format. None of the interviews lasted more than 65 minutes. Each member interviewed agreed to participate in the study and completed (executed) a consent form to that effect. All of the interviews took place in early 2006. Interviews took place a few weeks after the participants had completed several tests and scales, including the measures used in this study. The same, trained interviewer conducted all of the interview sessions. A set of questions was used in a sequence of events methodological approach. The interviewer was trained to take notes of the interviews. Tape recording of interviews was completed as well. The notes of the interviewer were copied; the tape recorded interviews were transcribed.

Each one of the study participants was asked to tell a brief story of a time, within the past year, when: (a) They initiated and made some adjustment, change, modification in their work activity that was not part of any formal specification or prescription of how their work should be done nor part of any training or consequences resulting from training; or from any direct supervision received regarding work performance. The change could be of any type, size, scope, and so forth, however, in their minds the change must represent a substantial influence on their work activities; and (b) Assuming the positing of substantial influence (above), what form did the change take, that is, what actually took place in the change? What was done and why was it done? and (c) When having made such a change, how much effort went into the change; how long did it take; what was the level of interest in doing this; in personal terms: how do they evaluate or rate the interest they had in making the change; and how did they perceive the value or importance of the change in adjusting their work? (d) Finally, whether any changes were

made or not, how did they view or perceive their opportunity, their "chance" to make any changes at all in the work. Did they perceive some freedom or autonomy to engage in job change activity? Participants were asked and encouraged to report all such episodes that may have taken place in the past 12 months.

A team of two human resources professionals (team) that did not include the interviewer, reviewed all of the transcribed content and written notes of the interviewer and identified each job crafting episode reported by each participant. A total of 23 participants (24%) did not offer a single job crafting episode. The team segregated all interview material into job crafting episodes and applied ratings on several domains to each episode. This process yielded the information that follows.

1. Individual, discrete episodes of job crafting with a particular focus or content that
    participants said were self-motivated and not stimulated by management.
2. A quantity of job crafting episodes.
3. A rating of the magnitude and/or complexity, or "reach" of the specific change. The
    rating would be low = 1, moderate = 3, or high = 5.
4. A rating of the employee's interest in making the specific change with ratings of low =
    1, moderate = 3, or high =5.
5. An estimate of how many hours it took to fully execute and evaluate or assess the
    efficacy of the change with ratings of 1 = less than 10 hours, 3 = 11 to 20 hours,
    and 5 = more than 20 hours.
6. A rating of the employee's perception of the importance or significance of the particular
    change (episode) in relation to their work activities with ratings of low = 1,
    moderate = 3, or high = 5.

 Other than the rating area that contributed to an individual score for each study participant that engaged in job crafting, the remaining variable to receive attention in the job crafting component of the results was that of opportunity to engage in personally-initiated changes in the job. The stimulus questions asked of the study participants were: Do you believe or perceive that you have had the opportunity to make some modifications in the work that you do? That is, if you decided that you could make improvements in what you do with regard to things like product knowledge, service to your customers, and such things, do you feel that you have the latitude to make changes in what you do, on your own, without anyone else's knowledge or approval? The participants supplied a rating for their perceived opportunity to change one's job represented as: no opportunity = 0, slight opportunity = 1, moderate
opportunity = 2, and great opportunity to shape the job= 3.

In our sample, an employee who reports no job crafting episodes has a total score of 0, while an employee who reports three different job crafting episodes may attain a score of from 3 to 15 points. In addition, the team was required to achieve agreement on all classifications and ratings. The team also classified each job crafting episode by general content area. This task required considerable time and effort. The original coding of value/importance (6, above) of episodes by the team had an interrater reliability of .77. All other reliability measures for the different codings averaged .81.

Using a modified Q-Sort methodology (Brown, 1993), a different group of three individuals trained in Q-Sort methodology sorted the episodes by content type of each job crafting episode reported. This was a most important task as it identifies the specific content of the changes enacted by the participants, as well as their goals. This effort yielded interrater reliability of .89 per the original content classifications established (see paragraph above). No third-party effort was made to determine the effectiveness of the reported job crafting efforts for purposes of this study.

In addition to the information gathered regarding actual job crafting activity, the study participants also completed three measures that are intended to represent components of the possible motivational foundation for the job crafting behavior. Details of the three measures follow.

       Belonging. Used in the study was a slightly adapted version of Anderman's (2002) Belonging Scale. With this scale, Anderman found that perceived belonging was significantly and positively correlated with self-esteem and overall performance. The scale has good reliability and with application of factor analysis the factor had an eigenvalue of 2.71 and explained 45.2 per cent of the variance. Cronbach's alpha at .78. One of the scale items reads: I feel like I am part of this organization.

       Control. This measure contained 22 Likert-scale items that provide an overall index of how much control the worker experienced over the work environment (Dwyer & Ganster, 1991). Example: On the job, I believe I have much discretion over the use of my time. The scale covers a variety of work domains including control over the variety of tasks performed, the order of task performance, pacing, and the procedures and policies. A factor analysis of the items for a sample of 191 white-collar workers yielded a single factor. The scale used in that study yielded an internal reliability of .87.

       Self-esteem. A self-report questionnaire measure was used (Winstok & Enosh, 2004), a measure of global self-esteem. The instrument contains eight items of the semantic differential form (Osgood, 1964). The scale consists of: strong-weak, smart-stupid, brave-coward, happy-sad, positive-negative, good-bad, winner-loser, and friendly-unfriendly. Reliability was tested with internal consistency analysis and reliability of the measures was found to be acceptable. Cronbach's alpha was .80.

Finally, the district supervisors provided for each sales person a rating of from 1 (low) to 7 (high) that was to represent job performance. The supervisors and the company did not normally use a single, overall rating for employee performance hence the supervisors were instructed to consider the most recently recorded performance ratings of employees and to select a rating from 1 to 7 that would most closely represent the performance ratings received by the employee as part of the regular employee evaluation system. As a result we have a performance measure ranging from 1 - 7 for each employee in the sample. Validity for this reductionistic approach is assumed as the supervisors have access to much contextual and performance information for each employee and have a strong basis for judgment.

RESULTS

A total of 138 separate and distinct job crafting episodes was identified for the sample of 94 outside salesperson study participants. This total represents an average of 1.47 episodes per person and the finding is consistent with other research (Lyons, 2006a). Of the episodes reported and classified, 23 participants (24 per cent of total) reported no episodes, 28 (30 per cent) reported one episode, 27 (29 per cent) reported two episodes, and 16 (17 per cent) of participants reported three or more episodes. This latter group accounts for 56 job crafting episodes or an average of 3.5 episodes, each. As mentioned above, participants were asked to recall episodes that had taken place over the past 12 months. In sum, 71 (76 per cent) of the participants report one or more job crafting episodes judged by them as substantive and worthy of being identified. Interviewers corroborate the participants' assertions. This finding provides both rational and face validity for the behavior. Inter-rater reliability for interviewer and for classifier judgments of the episodes were at least .77. The self-reporting of the episodes supports Hypothesis 1 as a majority (76 per cent) of study participants did report the initiation of at least one job crafting episode.

As mentioned above in the Methods section, three individuals then used the Q-sort method to place the episodes into categories. The task was performed twice to be sure that the consensus votes for category placement was accurate and complete. There were 138 distinct episodes to categorize and the episodes were finally classified into five groups. Titles for the groupings represent a consensus of the interviewers, the author of the study, and individuals who performed the final sort of the data. Identification of each

category group, the number of episodes per category, and an example of episode content is offered in Table 1.

```
------------------------------------------------
                  Table 1 about here
------------------------------------------------
```

A review of the content across categories reveals that nearly all of the episodes focus on one of the following areas: (a) improving or increasing sales, (b) setting the stage for relationship building and future sales, and (c) gaining customer confidence and appreciation. In addition, there was some evidence of building personal relationships with those purchasers or potential purchasers with whom the study participants had built a relationship based on factors other than business matters (for example, vacation plans, sports, the war in Iraq).

Responses to the stimulus questions concerning perceived opportunity to engage in personally-initiated changes in the job yielded results as: 20 (21 per cent) reported that they had virtually no such opportunity to modify their work. These subjects were all of the group (n=23) that chose not to report any episodes; 18 (19 per cent) reported that they perceived they had a slight opportunity to make changes; 37 (40 per cent) reported that they had moderate opportunity to make changes in their work; and 19 (20 per cent) said they perceived great opportunity to modify their work. Several subjects in this latter group said that they believed they had a responsibility to make positive changes in what they did on the job in order to improve sales (hence, their commissions) and build stronger relationships with their customers. Details are offered in Table 2.

```
------------------------------------------
                Table 2 about here
------------------------------------------
```

Relationships Among Variables. Intercorrelations were calculated among the variables: the job crafting score (see above in Methods section – it is the rating by the employee of the importance or significance of the actual change they made in their work, summed over n episodes they report), and belonging, control, self-esteem, and performance. Performance was a rating supplied by the salesperson's immediate supervisor. These relationships are shown in Table 3.

```
--------------------------------------------
                Table 3 about here
--------------------------------------------
```

Job crafting score represents the value place on an episode by the study participant and confirmed by the raters. These values are summed over the independent episodes offered by the individual participant and thus, reveal a score. As Table 3 demonstrates, the scores correlates significantly and positively with all four of the variables, in particular with the more personal, potentially motivating variables (need for: belonging, control, and self-esteem) and to a lesser extent with performance. All correlations are significant at the .05 level. This is both interesting and encouraging. The results support hypotheses 2A, 2B, and 2C as well as hypothesis 3. Also of interest is that without exception, although statistically significant, the performance measure correlates lower with all variables than does any of the other variable inter-correlations.

Regression analysis with job crafting episode score regressed on the four variables (belonging, control, self-esteem, performance) yielded an R^2 (adjusted) of 80.8 percent. ANOVA results in an F of 112.68 and a p. of .001. These results are encouraging and they reflect and reinforce the high, positive inter-correlations among the variables. No moderator analysis was performed as part of this study although such analysis is to be considered for future research on the job crafting concept.

DISCUSSION

In some studies of the extra-role behavior of employees (Wright, et al., 1993) it is suggested that such behavior may not be desirable, in general. There is very little evidence to suggest that job crafting behavior is undesirable. In this study we find a positive, significant correlation with supervisor rating of performance and incidence of job crafting behavior. That is, an independent measure of performance on the job is positively correlated with employee self-reports of engaging in job crafting behavior.

As mentioned earlier, the sample (n= 94) consisted of outside sales persons employed by the same firm with all sample members holding the same position of sales representative. These study participants probably had considerable control over their tasks, duties, and time.

Several limitations characterize the study. The sample size is not large, the data reported concerning job crafting behavior was entirely of the self-report type and there was no easy means to verify the reported behavior unless a particular change in job has been documented or carefully observed in practice. The focus, save the supervisor rating of performance, is on the individual's perspective and not on the perceptions of others (external) or on other, more objective evidence although independent interviewer and raters sought to objectify and validate self-reports using agreed-to criteria. And, while study participants were asked to recall job crafting events of the past 12 months, it is likely that many potential events were lost to memory or could not be readily recalled, hence the self-report approach likely contains some recency errors and memory loss/distortion.

Importantly, there is the validity question regarding the job crafting behavior. That is, how do we know that employee efforts are self-initiated changes in jobs that are initiated to suit personal needs and not necessarily the needs of the organization? The self-report information of job crafting events was tested in the interview using questioning and criteria (see Methods, above) to determine if employee supervisors, trainers, or others had suggested or demanded the changes that were made. In this study, only those changes that were not stimulated by others could be included. Participants were repeatedly reminded of this in the interviews. The examples of job crafting activities supplied by the study participants were not part of any organization plan, procedure, or program. To some extent then, face and rational validity is established. Yet, conclusive validity evidence is not established.

CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Earlier research did much to identify the *what* of job crafting behavior while this study is more focused on *what, how much, why,* as well as the relationship of the behavior to performance, overall, on the job. The information in the present study helps to establish some bounds for further study of the concept of job crafting, given the context in which the study was completed. Other organizational contexts may yield different results.

Heretofore, the frequency of the behavior has not been explored with much precision as nearly all previous research used very small samples and much of the research was of the anecdotal and observational variety. In the present study, given the limitations reported earlier, we have more information that helps to give additional definition to the behavior as presented in the seminal work of Wrzesniewski & Dutton (2001). The frequency aspect is likely tied to the context of the work as well as to the closeness of supervision, and specific job requirements and procedures. Future research should take these factors into account as variables such as these may serve as controls.

Implicit in this study was the assumption that outside sales representatives were employees with moderate to great opportunity for job crafting owing to the fact that they received very little direct supervision or direction once they received their initial training and moved beyond their probationary employment period with the organization. Yet, only 20 per cent of the sample reported that they had a substantial opportunity to make changes in their work. Another 40 per cent said they had no or slight opportunity to

make changes. In future research it may be desirable to use different means to assess opportunity as the gradations used in this study may be too coarse to render meaningful distinctions.

The present study does not establish cause-effect linkages, as it has not ascertained whether or not study participants have increased their sense of control, belonging, or self-esteem. Hence, there is the issue of these variables serving as outcomes as well as stimulants of behavior. Future research will need to carefully examine changes in self-perceptions related to both propensity to engage in job crafting behavior as well as the actual behavior as enacted. More study needs to be done to better isolate performance and the creative behavior labeled job crafting.

Implications for Employers and Management. In the present study and in virtually all of the studies reported in Wrzesniewski and Dutton (2001), organization-serving episodes of job crafting were reported. One should not rule out the idea that the low social desirability of reporting purely self-serving, detrimental-to-organization episodes were simply left out. Fulfilling one's own needs may or may not prove beneficial for the organization.

Contrast these considerations with management encouragement of employee self-initiative on behalf of organization needs and goals. For example, Conti & Warner (2002) propose a model that encourages work that maximizes the use of the worker's judgment, knowledge, creativity, intelligence and initiative so that customer's needs are best served. Some of the studies of the concept of empowerment of employees such as those of Wellins, et al., (1991); and Pearson (1992); are also supportive of these ideas.

Depending on intention and/or outcomes of job crafting, the result of the behavior could represent organizational citizenship as exemplified in the work of Podsakoff, et al. (2000). It is possible for one to make the case that job crafting that leads to positive outcomes for the organization is simply a form of OCB. However, the many positive outcomes reported could be linked to the self-report nature of the study design.

One aspect of job crafting that did not receive attention in this study but that is of importance is the potential influence of job crafting on the actual work or working conditions of others. An employee may not have sufficient grasp of how the outcomes of their efforts influence others in the firm, and customers. Managers may have knowledge of such effects and may find that a particular job crafting effort results in more harm than good. Of course, the opposite situation may hold and the change results in more good than the instigator had imagined. In a team-work context, job crafting behavior may tacitly result in some advantage (efficiency, effectiveness) for job crafters.

Managers and other employees may regard job crafting as a clandestine, end-run around the existing management system. Some managers may react negatively to such initiatives, regardless of outcomes if the activity is perceived as a challenge to authority, and is not perceived as a type of continuous improvement or personal initiative. Most experienced managers have probably engaged in job crafting of sorts themselves. It is not likely a foreign concept for many of them.

In closing, this study provides information about job crafting that heretofore has largely been absent from the literature. Greater definition and bounds have been given to the concept of job crafting to include its occurrence, frequency, forms it takes, and perceived opportunity to engage in job crafting. Important relationships regarding potential antecedents and outcomes of the behavior, namely, the needs for control, belonging, self-esteem, and individual job performance are illuminated. Other research has pointed to the existence of such relationships but has not provided much information to clarify them. Much more work remains. Larger samples sizes are required for future research and refinements in methods to obtain information and data are needed. Future research should include multiple job classes or types over a variety of organizational (work) contexts to identify further the extent of job crafting behavior and the

forms it takes.

REFERENCES

Anderman, E.M. " School effects on psychological outcomes during adolescence." *Journal of Educational Psychology*, 2002, 99(4): 795-809.

Ashforth, B.E. & Kriener, G.E. " How can you do it?: Dirty work and the challenge of constructing a positive identity" *Academy of Management Review*, 1999, 24: 413-434.

Ashforth, B.E. & Mael, F. "Social identity theory and the organization." *Academy of Management Review*, 1989, 14: 20-29.

Benner, P, Tanner, C.A., & Chesla, C.A. *Expertise in Nursing Practice*, New York: Springer, 1996.

Brief, A.P.,& Nord, W.R. *Meanings of Occupational Work: A Collection of Essays,* Lexington Ma., Lexington Books, 1990.

Brown, S.R. " A primer on Q-methodology." *Operant Subjectivity*, 1993, 15: 91-138.

Cohen, R.C., & Sutton, R.I. "Clients as a source of enjoyment on the job", in Wagner, III, J.A. (Ed.), *Advances in Qualitative Organizational Research.* Greenwich, CT., JAI Press, 1998.

Conti, R.F. & Warner, M. " A customer-driven model of job design:Towards a general theory." *New Technology, Work & Employment*, 2002, 17: 2-19.

Crant, J.M. "Proactive behavior in organizations." *Journal of Management,* 2002, 26: 435-462.

Dwyer, D.H. and Ganster, D.C. " The effects of job demands and control on employee attendance and satisfaction." *Journal of Organizational Behavior,* 1991, 12: 595-608.

Fine, G.A. "Justifying work: Occupational rhetorics as resources in restaurant kitchens." *Administrative Science Quarterly*, 1996, 41: 90-115.

Fletcher, J.K. "Relational practice: A feminist reconstruction of work." *Journal of Management Inquiry*, 1998, 7: 163-186.

Frese, M. & Fay, D. "Personal initiative: An active performance concept for work in the 21st Century." *Research in Organizational Behavior.* 2001, 23: 133- 187.

Frese, M., Kring, W., Soose, A., & Zempel, J. " Personal initiative at work: Differences between East and West Germany,." *Academy of Management Journal,* 1996, 39: 37-63.

Fried, Y., Tiegs, R.B., & Bellamy, A. R. "Personal and interpersonal predictors of supervisors' avoidance of evaluating subordinates." *Journal of Applied Psychology*, 1992, 77: 462-468.

Hogan, R. & Warrenfeltz, R. " Educating the modern manager." *Academy of Management Journal,* 2003, 46: 74-84.

Ilgen, D.R. & Hollenbeck, J.R. "The structure of work: Job design and roles", in Dunnette, M. & Hough, L. (Eds.), *Handbook of Industrial & Organizational Psychology,* Palo Alto, Ca., Consulting Psychologists Press, pp. 165-207, 1992.

Jacques, R. "Untheorized dimensions of caring work: Caring as a structural practice and caring as a way of seeing." *Nursing Administration Quarterly*, 1993, 17(2): 1-10.

Lyons, P. " Individual competitiveness and spontaneous changes in jobs." *Advances in Competitiveness Research*, 2006a, 14(1): 90-98.

Lyons, P. " Competitiveness and spontaneous changes in jobs revisited," *Competition Forum*, 2006b, 4(1): 31-37.

Osgood, C.E. " Semantic differential technique in the comparative study of cultures." *American Anthropologist*, 1964, 66(3): 171-200.

Parker, S.K. " Role breadth self-efficacy: Relationship with work enrichment and other organizational practices." *Journal of Applied Psychology,*1998, 83: 835-852.

Pearson, C.A.L. "Autonomous workgroups: An evaluation at an industrial site." *Human Relations*, 1992, 45: 905-936.

Podsakoff, P.M., MacKenzie, S.B., Paine, J.B., & Bachrach, D.G. " Organizational citizenship behaviors: A critical review of the theoretical and empirical literature and suggestions for future research." *Journal of Management*, 2000, 26: 513-563.

 Schmitt, N., Cortina, J.M., Ingerick, M.J., & Wiechmann, D. "Personnel selection and employee performance", In *Handbook of Psychology,* Borman, W.C. Ilgen, D.R. & Klimoski, R.J. (Eds.), New York, Wiley, pp. 2003, 77-106, 2003.

Staw, B.M. & Boettger, R.D. " Task revision; A form of work performance." *Academy of Management Journal*, 1990, 33: 534-559.

Unsworth, K.L. & Parker, S. K. "Proactivity and innovation: Promoting a new workforce for the new workplace", In Holman, D.,Wall, T.D., Clegg, C.W., Sparrow, P.& Howard A. (Eds.), *The New Workplace: A Guide to the Human Impact of Modern Working Practices,* Chichester, England: Wiley, pp. 175- 196, 2003.

Viswesveran, C., Schmidt, F.L., & Ones, D.S. " Is there a general factor in ratings of job performance? A meta-analytic framework for disentangling substantive and error influences." *Journal of Applied Psychology*, 2005, 90: 108-131.

Wellins, R.S, Byham, W.C. & Wilson, J.M. *Empowered Teams*, San Francisco, Jossey-Bass, 1991.

Winstok, Z. & Enosh, G. "Towards re-conceptualization of global self-image: Preliminary findings of the validity and reliability of a structured scale." *Individual Differences Research*, 2004, 2(1): 63-80.

Wright, P. M., George, J.M., Farnsworth, S.R. & McMahan, G.C. " Productivity and extra-role behavior: The effects of goals and incentives on spontaneous helping." *Journal of Applied Psychology*, 1993, 78(3): 374-381.

Wrzesniewski, A. & Dutton, J.E. " Crafting a job: Revisioning employees as active crafters of their work." *Academy of Management Review*, 2001, 26(2): 179-201.

Table 1

Categorizations of Job Crafting Episodes

_____

Category of Job Crafting	Number per Category	Percent of Total	Examples of Behaviors
Personal Skill Development	38	28	Developing job aids or prompts to enhance listening skills
Task Function	33	24	Developing special customer surveys
Advancing Relationships	25	18	Communicate on-site w/staff (other than purchaser
Tactics Choices	25	18	Using empirically-grounded effective sales techniques
Maintaining Relationships	17	12	Guarantee at least some contact with actual purchaser
	138	100%	

Table 2

Perceived Opportunity to Shape One's Job

Perceived Opportunity to Shape Job	Number of Subjects	Percent of Total
No Such Opportunity	20	21
Slight Opportunity	18	19
Moderate Opportunity	37	40
Great Opportunity	19	20
	------	------
	94	100 %

Table 3

Intercorrelations Among Variables and Descriptive Statistics

						Descriptive Statistics	
VARIABLES	1	2	3	4	5	Mean	SD
1. Job Crafting Episodes Value	1.00	.36*	.45	.61	.31	5.91	3.39
2. Belonging		1.00	.38	.31	.33	15.89	5.84
3. Control			1.00	.34	.26	93.16	38.40
4. Self-Esteem				1.00	.36	33.36	13.35
5. Performance [Supervisor Rating]					1.00	5.06	1.38

 * all correlations significant at .05

Employee Satisfaction with Performance Evaluations

Courtni Day, Horry Electric Cooperative, Inc.,
courtni.day@horryelectric.com

Nicholas W. Twigg, Coastal Carolina University,
ntwigg@coastal.edu

ABSTRACT

There are some organizations that have a formal evaluation process and some that do not. This study was done on a southern not-for-profit electric utility company that does not have a formal evaluation process. The employees of this organization were surveyed to determine their satisfaction level with the current process and whether or not there is a need for a more formal and feedback driven evaluation process. The scales used include: leadership style, organizational support, trust, commitment, job satisfaction, and satisfaction with the performance appraisal system. A model of the satisfaction with the process is tested. Implications for managers, limitations, and future research are discussed.

INTRODUCTION

Performance appraisals have been shown to be an effective tool to increase trust (Nyhan, 2000; Hubbell & Chory-Assad, 2005), commitment (Meyer, Paunonen, Gellatly, Goffin, & Jackson, 1989; Buck & Watson, 2002), and job satisfaction (Harris, Winskowski, & Engdahl, 2007; Lau, Wong, & Eggleton, 2008) in the workplace. Workers perceived support from supervisors has been shown to be positively related to leadership (Podsakoff, Mackenzie, & Bommer, 1996; Rhoades & Eisenberger, 2002; Matzler, Kepler, Schwarz, Deutinger, & Harms, 2008), trust (Eisenberger, Cummings, Armeli, & Lynch, 1997), commitment (Eisenberger et al.,

1997; Rhoades, Eisenberger, & Armeli, 2001; Rhoades & Eisenberger, 2002), and job satisfaction (Rhoades et al., 2001). This study looks at a model of satisfaction with a performance appraisal system. It is theorized that leadership style will have a positive effect on perceived support, trust, commitment, and job satisfaction which in turn will effect the satisfaction of the process of performance evaluations.

Some organizations have formal evaluations and others do not. An organization that currently does not have a formal evaluation process was chosen as the sample for this study. At the present time there is no real evaluation process in the sample. Once every year all the employees meet with their supervisors and are given their annual increase in salary with very little comments and/or feedback on their performance or the reasoning behind their raise. This process is not beneficial to the organization or the employees because there is no tool to help employee development and growth. However, the company hired a consultant firm to design a more formal evaluation process. A focus group met with a representative from the consultant firm to determine the key competencies that should be included in the new evaluation process and these were presented to upper management and staff for approval. After these were approved, the consultant firm created and evaluation software program for the company. A presentation was given to every employee informing them of the new evaluation process being developed and employees who would be completing evaluations were trained on the software. The presentation was on the importance of an evaluation process, the benefits, common fears, and an explanation of how the competencies being evaluated came from a focus group of fellow peers and staff members. All supervisors who were completing evaluations did a preliminary evaluation of their subordinates, which were then submitted to upper management for review and approval. This process was done to help determine inconsistencies and as mock trial for the real

evaluations. There were inconsistencies among the evaluations and upper management could not come to agreement on correcting them so the new process was suspended.

The current evaluation process at this organization is lacking because the employees are not receiving any constructive feedback or praise, therefore they have no solid proof of where they stand, their strengths, or their weaknesses. Due to this concern, the employees were surveyed to determine their satisfaction level with the current process and whether or not there is a need for a more formal and feedback driven evaluation process (see Appendix). The purpose of this study is to determine how satisfied employees are with their current evaluation process.

LITERATURE REVIEW

Leadership

There are five components of leadership (Bass, 1985). Three are seen as transformational and include: charismatic leadership, individualized consideration, and intellectual stimulation. The other two are transactional and include: contingent reward and management-by-exception (Bass, 1985; Bycio, Allen, & Hackett, 1995; Podsakoff et al., 1996; MacKenzie, Podsakoff, & Rich, 2001). Transformational leadership inspires employees to perform based on their values and goals, where as transactional leadership involves performing based on reward and punishment (Bycio et al., 1995; Podsakoff et al, 1996; MacKenzie et al., 2001; Matzler et al., 2008). Transformational leaders tend to be more proactive and transactional leaders tend to be more reactive (MacKenzie et al., 2001). The effectiveness of a leaders has a positive relationship with transformational leadership, where as it has a negative relation to management-by-exception (manager only gets involved when there is a problem) (Bycio et al., 1995). Transformational leadership augments transactional leadership in terms of employee performance and satisfaction

and it is charismatic leadership (level of faith, respect, and inspiration employees have in their leaders) that is responsible for the augmentation (Bycio et al., 1995; Podsakoff et al., 1996; MacKenzie et al., 2001).

Trust and role-ambiguity are influenced by both transactional and transformational leadership (MacKenzie et al., 2001). The transactional leadership behavior, contingent reward, has a positive impact on citizenship behaviors like helping behavior and sportsmanship and on the other hand, decreases role ambiguity (MacKenzie et al., 2001). Contingent reward and punishment can be beneficial when it is administered correctly because is helps to reduce role ambiguity, therefore this should be a leader behavior in addition to transformational leadership behaviors (MacKenzie et al., 2001). Leaders who go overboard with intellectual stimulation tend to reduce role ambiguity, satisfaction, and perceived trust, which in turn will decrease citizenship behavior and role conflict (Podsakoff et al., 1996; MacKenzie et al., 2001). Leaders who offer individualized support to their employees will increase trust, perceived support, performance, satisfaction, role clarity, citizenship behaviors, and civic virtue (Podsakoff et al., 1996). Articulating a vision has a positive relationship with employee satisfaction, commitment, role clarity, and sportsmanship, however, it has no relation to trust and helping behaviors (Podsakoff et al., 1996).

There are many transformational leadership behaviors including: evaluation and problem-solving, offering appropriate feedback, articulating a vision, good communications skills, impression management or being a good role model, empowering employees, individualized support, high performance expectations, and intellectual stimulation (Bycio et al., 1995; Podsakoff et al., 1996; MacKenzie et al., 2001; Matzler et al., 2008). A strong positive relationship exists between performance and transformational leadership (Bycio et al., 1995;

Podsakoff et al., 1996; MacKenzie et al., 2001; Matzler et al., 2008). Transformational leaders inspire employees to perform above what is required of them and reduce stress and/or burnout (Bycio et al., 1995; Podsakoff et al., 1996; MacKenzie et al., 2001; Matzler et al., 2008). If management desires innovation, a transformational leadership style is appropriate because it intrinsically motivates employees, increases perceived support, and increases employee performance (Matzler et al., 2008). There is a positive relationship between transformational leadership and organizational commitment (Bycio et al., 1995). Having a transformational leader will influence an employee's affective commitment, therefore decreasing turnover intent (Bycio et al., 1995). However, of the three types of organizational commitment, affective commitment has the strongest relationship with transformational leadership over continuance and normative commitment (Bycio et al., 1995).

Perceived Organizational Support

Perceived organizational support has been studied by many (Rhoades et al., 2001; Eisenberger et al., 1997; Rhoades & Eisenberger, 2002). Employees who perceive organizational support are normally satisfied with their job, have a positive attitude and/or mood, and have less stress symptoms (Rhoades & Eisenberger, 2002). Job satisfaction and perceived organizational support are related, but employees can distinguish between them (Eisenberger et al., 1997). The distinction between the two is because organizational support concerns the intent of the organization and job satisfaction concerns the different aspects of the job (Eisenberger et al., 1997).

There is a social exchange (reciprocated treatment) and psychological contract between organizations and employees (Rhoades et al., 2001; Eisenberger et al., 1997). Job experiences that employees feel are high discretion conditions (controlled by the organization) and are

favorable are more positively related to perceived organizational support than experiences that are low discretion conditions (organization has little control) (Eisenberger et al., 1997). When favorable treatment exists, trusts in and perceived support by the organization is positively impacted (Eisenberger et al., 1997). If employees feel the organization does not support them, there is an increase withdrawal behavior (Rhoades et al., 2001).

Fairness or procedural justice has the strongest relationship with perceived organizational support (Rhoades & Eisenberger, 2002). Employees may view fairness as a voluntary or discretionary act that is controlled by the organization (Rhoades et al., 2001). Procedural, distributive, and interactional justice are equally related to perceived organizational support and when employees see all three types of justice as being fair they feel the organization values their contributions and cares for them. (Rhoades & Eisenberger, 2002).

Perceived organizational support is important to employee commitment (Rhoades et al., 2001). Perceived organizational support is associated with and is a mediator of the relationship between affective commitment and the following favorable work conditions: rewards, managerial support, and fairness. (Rhoades et al., 2001; Rhoades & Eisenberger, 2002). Organizational support leads to affective commitment (Rhoades et al., 2001). Employees determine organizational support and commitment to the organization based on the accumulation of different work experiences that are seen as being under the voluntary control of the organization (Rhoades et al., 2001). When employees perceive organizational support they believe the organization values their contribution and cares about them there is an increase in affective commitment and performance, therefore decreasing voluntary turnover. (Rhoades et al., 2001; Eisenberger et al., 1997; Rhoades & Eisenberger, 2002). Managerial support is also

positively related to perceived organizational support because supervisors are viewed as being representatives of the organization (Rhoades & Eisenberger, 2002).

Trust

Trust in organizations helps to facilitate relationships, commitment to the organization, employee motivation, and cooperation within the organization (Hubbell & Chory-Assad, 2005). In addition trust helps to increase the length of time an employee will stay with a company because they are more committed and motivated (Hubbell & Chory-Assad, 2005). There are two types of trust, managerial and organizational trust (Hubbell & Chory-Assad, 2005; Perry & Mankin, 2007; & Tan & Lim, 2009). Procedural justice has been found to be related to trust (Hubbell & Chory-Assad, 2005). It has also been found that trust acts as a predictor of job satisfaction and when there is little trust, employees report less satisfaction (Hubbell & Chory-Assad, 2005). Procedural justice is the strongest predictor of both forms managerial and organizational trust (Hubbell & Chory-Assad, 2005). Interaction during an evaluation does not predict trust in managers, but the fairness of the procedures of the evaluation is a predictor of trust (Hubbell & Chory-Assad, 2005). However, past studies have found a relationship between interaction during evaluations and building trust in managers (Hubbell & Chory-Assad, 2005).

Trust also includes empowering employees, offering feedback, and collective decision making (Nyhan, 2000). In order for managerial trust to exist there must be confidence on a mutual level between supervisors and their subordinates that the other is fair and ethical (Nyhan, 2000). A manager's style and personal values effect trust by employees (Perry & Mankin, 2007). Styles which enhance the perception of empathy, fairness, honesty, and mutual values have a positive impact on the level of trust (Perry & Mankin, 2007). Managerial trust and organizational trust are not significantly related suggesting that trust in ones manager can be independent of

trust in the organization (Perry & Mankin, 2007). Although both types of trust were found to be independent on each other, job satisfaction tended to be higher when employees have trust in both their managers and the organization (Perry & Mankin, 2007).

Trust in one's fellow co-workers has an impact in trusting the organization and such trust leads to organizational commitment and higher levels of performance (Tan & Lim, 2009). When a person trusts a fellow employee of equal standing they are willing to be vulnerable to that employee's behaviors and actions for which they can not control (Tan & Lim, 2009). Trust in the organization is defined in the same manner that trust in co-workers is and is the willingness to trust the organization's behaviors and actions for which they can not control (Tan & Lim, 2009). Trust has three elements: ability (competence, know how, and skill), benevolence (good intentions and positive orientation), and integrity (values are deemed acceptable) (Tan & Lim, 2009). Only benevolence and integrity are found to be significantly related to trust in co-workers (Tan & Lim, 2009). This may not always be the case in some situations. One possible case could be in a team setting where there is no form of structured control and the success of the team is based on the knowledge and ability of its team members (Tan & Lim, 2009).

Commitment

Employees who are committed to an organization identify with the organization, feel they are involved with the organization, and have a felt sense of loyalty to the organization (Dale & Fox, 2008). Organizational commitment increases both motivation and performance (Buck & Watson, 2002; Dale & Fox, 2008; Giffords, 2003; Meyer, Paunonen, Gellatly, Goffin, & Jackson, 1989). When commitment exists there is a reduction in withdrawal behaviors such as absenteeism, tardiness, and voluntary turnover (Buck & Watson, 2002; Dale & Fox, 2008; Giffords, 2003; Meyer et al., 1989). Human resource management practices affect an employee's

level of organizational commitment and voluntary turnover (Buck & Watson, 2002). Commitment to the organization and/or profession is impacted by organizational auspice meaning public, non-for-profit, and proprietary organizations (Giffords, 2003). Employees who work for public companies have reported less commitment to their organization and profession than employees who work for non-for-profit and proprietary institutions (Giffords, 2003).

There are three forms of organizational commitment: affective commitment (emotional attachment with organization), continuance commitment (perceived cost of leaving or having to stay with an organization), and normative commitment (obligation to stay with an organization) (Buck & Watson, 2002; Dale & Fox, 2008; Giffords, 2003; Meyer et al., 1989). There is more value in commitment that is due to identifying with the organization and being involved than there is in commitment that is due to the perceived cost of going elsewhere (Meyer et al., 1989). Job performance and affective commitment are positively related, but job performance and continuance commitment has a negative relationship, therefore it is the type of commitment that determines the value of that commitment to the organization (Meyer et al., 1989). When people are committed based on continuance commitment there is a reduction in turnover, yet performance may suffer because if they are only staying due to the cost of leaving they will only be motivated to perform at the standard that is required and no more (Meyer et al., 1989). Although more difficult, it is important and in the best interest of the organization to focus on the development of affective commitment because employees will be motivated to both stay with the organization and work toward making it a success (Meyer et al., 1989). Some job conditions that help to foster affective commitment in employees include: knowledge of expectations, challenging work, role clarity, and input into to decision (Meyer et al., 1989).

Leader style and organizational commitment are related (Dale & Fox, 2008). Leadership style impacts voluntary turnover and the level of stress in employees, therefore managers should be aware that their behavior and/or style have an impact on the level of organizational commitment (Dale & Fox, 2008). Leadership style can increase or decrease work stress, which has a negative impact on organizational commitment (Dale & Fox, 2008). In order to decrease employee stress leaders should provide structure, let employees know where they fit in the scheme of things, and define the standard and expectations clearly (Dale & Fox, 2008). Organizational commitment is positively affected when employees perceive leader consideration (favorable social interaction and good two-way communication) (Dale & Fox, 2008). The favorable actions of supervisors may be perceived as those of the organization because supervisors are viewed as representatives of the organization and may foster commitment to the organization, especially when supervisor actions are perceived as being similar to the values of the employees (Dale & Fox, 2008).

Job Satisfaction

There have been many studies done on job satisfaction (Harris et al., 2007; Lau et al., 2008; Perry & Mankin, 2007; Witt & Wilson, 2001). One common theme among the study of job satisfaction is how perceived fairness and/or equity effect job satisfaction (Lau et al., 2008; Witt & Wilson, 2001). Among the things that effect job satisfaction is the perceived fairness of performance appraisals (Lau et al., 2008). When the effects of distributive fairness (rewards and compensation), trust in manager, and organizational commitment are taken together they provide good explanations for perceived procedural fairness (Lau et al., 2008). However, non-outcome-based effects thru trust in manager and organizational commitment were much stronger than outcome-based (distributive fairness) effects (Lau et al., 2008).

Equity (equality and perceived fairness) is a determinant of extra-role behaviors (employees who help co-workers, are accepting of change and inconvenience, have positive attitudes, and are committed to the organization and its resources), but only when employees are satisfied in their jobs (Witt & Wilson, 2001). Job satisfaction moderates the relationship between equity and extra-role behavior (Witt & Wilson, 2001). Employees who have the perception of equity and are satisfied with their job are more likely to act in a manner that demonstrates extra-role behavior (Witt & Wilson, 2001).

Social support, a form of organizational support, can increase satisfaction at work by helping worker's emotional state and consequently improving their social behavior (Harris et al., 2007). Types of social support are career mentoring, coaching, collegial support, and task support (Harris et al., 2007). Career mentoring and task support are predictors of job satisfaction, while coaching and collegial support are not (Harris et al., 2007). A form of career mentoring is the use of performance evaluations and when employees feel they are successful in their jobs based on the feedback they receive they tend to have increased job satisfaction (Harris et al., 2007).

Figure 1 is a hypothesized model that shows the relationships previously discussed. Satisfaction with the process of evaluations are hypothesized to be directly a function of trust, commitment, and overall job satisfaction. Trust, commitment and perceived support are hypothesized to be a direct result of a transformational leadership style. While this may seem to be a comprehensive model it has a distinctly exchange based perspective. Having an exclusively exchange based perspective leaves out other constructs which may be germain, such as social identity or affective dimensions.

FIGURE 1

Hypothesized Model
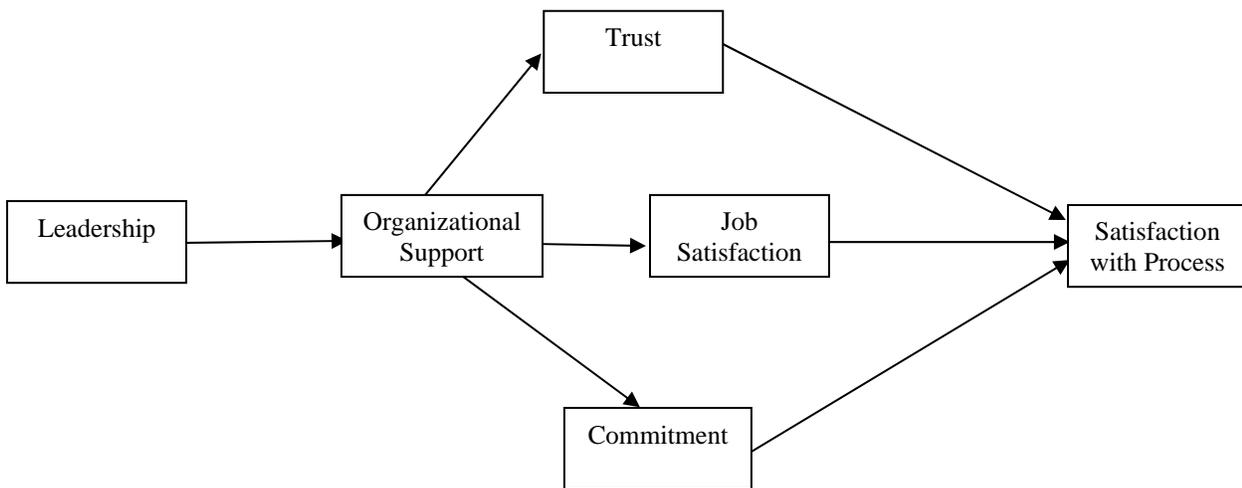
METHODS

Sample

Surveys were completed by 101 of 157 full time employees of a southern non-for-profit electric utility provider for a 64% response rate. The employees departments include Upper Management and/or Staff, Cashiers, Customer Service, Billing, Accounting, Energy Management/Marketing, Human Resource, Warehouse, Metering, Construction, System Control, Servicemen, Information System, Investigation, and Engineering. The population was selected because every full time employee in the sample was included in the new evaluation process.

Procedure

The survey instrument was passed out to the respondents to complete and turn in the same working day. When the surveys were complete the respondents were told to bring them to a

central location and turn them into the surveyor. They put the completed surveys into an envelope so that their answers would remain anonymous. When they turned in the survey, they were given a HECK Coupon that was provided by the company for their efforts. This was a tool to motivate the respondent's participation. They earn Heck Coupons through out the year and can turn them in at the end of the year for a prize; the more they have the better the prize.

Variables

Demographic information was collected which included gender, status, and tenure. *Performance appraisal system* was measured using items that were developed to fit the sample. There were 7 items used to measure the *Performance appraisal system*. The items include "A performance appraisal system that offers more feedback on my performance would be better than the annual reviews I have received in the past." and "I would like a more structured performance appraisal system than what I have had in the past." 10 items were adapted from Churchill Ford, and Walker (1974) to measure *Job satisfaction*. Respondents were asked to indicate their level of satisfaction with items that included "Frequency of evaluations," "Connection between pay and performance," and "Influence over decisions that affect you." *Trust* was measured by 4 items, adapted from Nyhan (2000). Items consisted of "I have confidence that my supervisor is technically competent at the critical elements of his/her job." and "I feel I can tell my supervisor anything about my job." There were four items used to measure *Commitment,* adapted and modified from Nyhan (2000) and included "I feel like "part of the family" at HEC." and "I would be very happy to spend the rest of my career with HEC." *Organizational support* was measured by 9 items adapted and modified from Eisenberger, Huntington, Hutchison, and Sowa (1986). Items consisted of "HEC strongly considers my goals and values." and "HEC cares about my opinions." *Transformational leadership and Transactional leadership behaviors,* four

transformational and three transactional items were adapted from Bass, Avolio, and Jung (1995). The items included "My supervisor displays a sense of power and confidence." And "My supervisor provides me with assistance in exchange for my efforts."

RESULTS

An analysis of the measurement model was conducted after replacing the missing data. The analysis was done using principal component analysis and confirmatory factor analysis. A sample of the results of the factor loadings are shown in Table 1. The results suggest that there is adequate differentiation in the factor loadings because none of the variables measured the same construct. Structural Equation Modeling (SEM), AMOS 7.0 (Arbuckle, 2006) was used to evaluate the hypothesized and alternative models.

TABLE 1

Factor Analysis of the Study Items

	OS	TL/TA	PAS	JS	T	C
OS7	.95					
OS4	.83					
OS6	.80					
OS8	.77					
OS10	.73					
OS2	.73					
OS9	.68					
OS3	.67					
OS5	.66					
OS1	.47					
TA3		-.81				
TA1		-.41				
TA2		-.80				
TL3		-.74				
TL1		-.73				
TL2		-.39				
TL4		-.51				
PAS2			.92			

PAS3	.89			
PAS1	.84			
PAS5	.84			
PAS4	.75			
PAS6	.70			
PAS7	.68			
JS1		.75		
JS2		.24		
JS4		.72		
JS3		.65		
JS7		.52		
JS5		.48		
JS6		.17		
JS10		.12		
JS8		.21		
JS9		.27		
T2			-.78	
T1			-.78	
T3			-.77	
T4			-.67	
C3				.63
C2				.20
C4				.61
C1				.39

Extraction Method: Maximum Likelihood, with an Oblimin with Kaiser Normalization.

TABLE 2

Confirmatory Factor Analysis of the Measurement Model

Factors	χ^2	df	$\Delta\chi^2$	RMSEA	IFI	TLI	CFI
1.	1219.93	252		.20	.49	.38	.48
3.	864.9	322	335.03*	.13	.72	.66	.71
5.	555.2	246	309.7*	.11	.84	.80	.83
6.	418.9	243	136.3*	.08	.91	.88	.91

Using SEM (Bryne, 2001) several alternative models were ran and evaluated. First, a single factor model was run to see if there was any common method bias (Padsakoff & Organ, 1986). The single factor model showed little common method bias among the variables

(RSMEA, .20). Next, a 3 factor model was ran by using leadership as the first factor, combining the organizational support, trust, and commitment intermediate variables as the second factor (L, OS, T, C), and job satisfaction, the outcome variable, as the third factor (JS). There was significant improvement compared to the single factor model (RMSEA, .13, significant to <.001). A five factor model was developed by separating out the intermediate variables, PS, T, and C, and further significant improvement was seen (RMSEA, .11). Finally, the full six factor model was developed and resulted with an even more significant improvement of a .08 RMSEA. This model was found to be satisfactory based on the criteria from Bryne (2001).

The means, standard deviations, correlation, and Cronbach alpha matrix of study variables are presented in Table 3 and the internal validity of the study variables (Cronbach Alpha) is displayed on the diagonal in the table. Of the 101 respondents 46% were female and the other 54% were male. The majority of the sample were employees who only receive evaluations (72%), while the remaining were in some type of supervisory position and both receive and administer evaluations. The majority of the sample had been with the company for only 1-5 years (46%), the next group was 10-15 years (20%), the next two groups 5-10 and over 15 years (16%), and the lowest tenure group worked there less than a year (2%). In the demographic variables there is a slight correlation among tenure and status. A relationship between the length of time a person has worked for a company and their status in not surprising and was not considered a major concern. Transformational leadership and transactional leadership are significantly correlated and is consistent with the theoretical development of this model because as was stated earlier transformational leadership augments transactional leadership. Trust is significantly correlated with leadership and there is also significant

correlation between organizational support and commitment. The correlations suggest the hypothesized model is justified.

TABLE 3

Means, Standard Deviations, Correlations, and Alpha's of Study Variables

	Mean	s.d.	Gender	Status	Tenure	PAS	JS	T	C	OS	TL	TA
Gender												
Status	1.28	.45	.01									
Tenure	3.04	1.19	-.10	.35**								
PAS	2.57	.93	-.26**	-.18	-.19	.94						
JS	2.05	.56	-.11	-.15	.12	-.09	.85					
T	1.58	.77	-.07	-.12	.08	.02	.44**	.90				
C	1.88	.77	-.18	-.2.*	.02	.27**	.47**	.33**	.82			
OS	2.19	.81	-.20*	-.24*	.06	.21*	.60**	.47**	.76**	.96		
TL	1.85	.79	.04	-.17	.09	-.03	.49**	.74**	.38**	.52**	.91	
TA	1.85	.83	.03	-.13	.07	-.01	.44**	.72**	.37**	.50**	.89**	.89

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed). The Cronbach alpha for each scale is shown on the diagonal.

A number of hierarchical regressions were then run to help identify structural equation models. The results of the hierarchical regression suggest that the hypothesized model fits to the data set (Table 4). For the Structural Equation Model results of the hypothesized and alternative models see Table 5. The structural equation hypothesized model showed adequate fit to the data (χ^2=272.2, df =163). The standardized beta weights for the hypothesized model are shown in Figure 2. Alternative models were then tested to determine if there is a better model that fits the data. The first alternative model tested organizational support and as a partial mediator and showed significant improvement in the model fit to the data (χ^2=231.8, df =161). Therefore, another alternative was ran to test job satisfaction as a partial mediator and no significant improvement was shown in the model fit to the data (χ^2=230.6, df =160). The results of the

structural equation model show that alternative 1 is the best model fit to the data. The

standardized beta weights for alternative 1 model are shown in Figure 3.

TABLE 4

Hierarchal Regression of Study Variables against Transformational Leadership Style

Step 1		Beta				
	(Constant)	3.90				
	Gender	.05	.09	.10	.10	.11
	Status	-.24**	-.08	-.08	-.06	-.05
	Tenure	.17	.05	.05	.03	.02
	PAS AVE	-.03	.01	-.01	-.02	-.03
Step 2	JSAVE	.20	.57***	.51***	.26***	.20**
Step 3	CAVE	-.07		.10	.03	-.07
Step 4	TAVE	.58			.60***	.58***
Step 5	OSAVE	.19				.19*

*** $p< .01$; ** $p< .05$; *** $p< .10$

TABLE 5

Structural Equation Models

Model	χ^2	df	$\Delta\chi^2$	RMSEA	IFI	TLI	CFI
Hypothesized	272.2	163		.082	.94	.92	.93
Alt1 - Best	231.8	161	40.4**	.066	.96	.94	.96
Alt. 2	230.6	160	1.2	.067	.96	.94	.96

Alternative 1 tested organizational support as a partial mediator
Alternative 2 tested job satisfaction as a partial mediator

FIGURE 2

Structure Equation results of the Hypothesized model
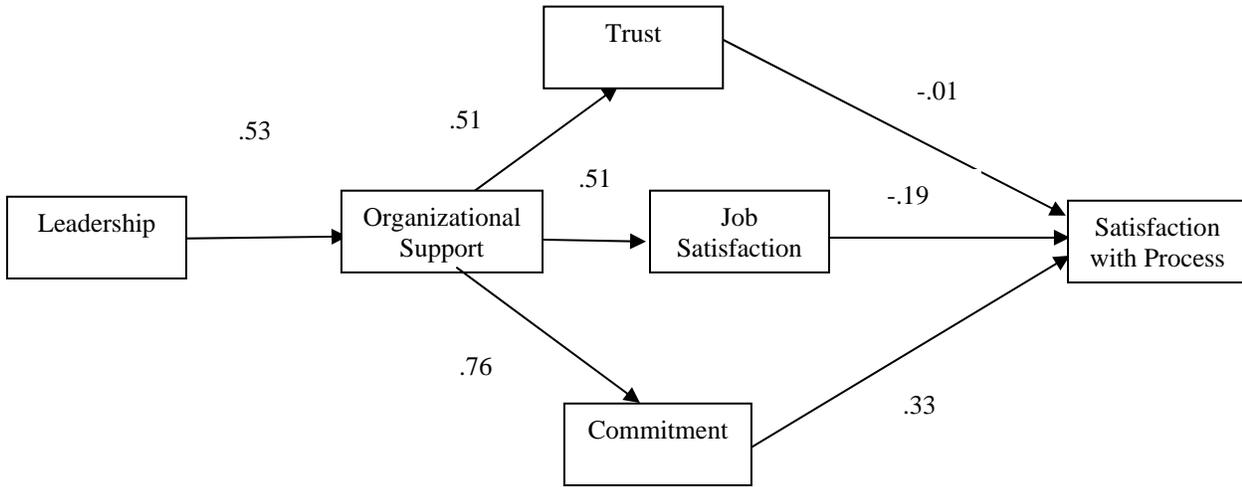
FIGURE 3

Structural equation results of the Alternative 1 – Best Model
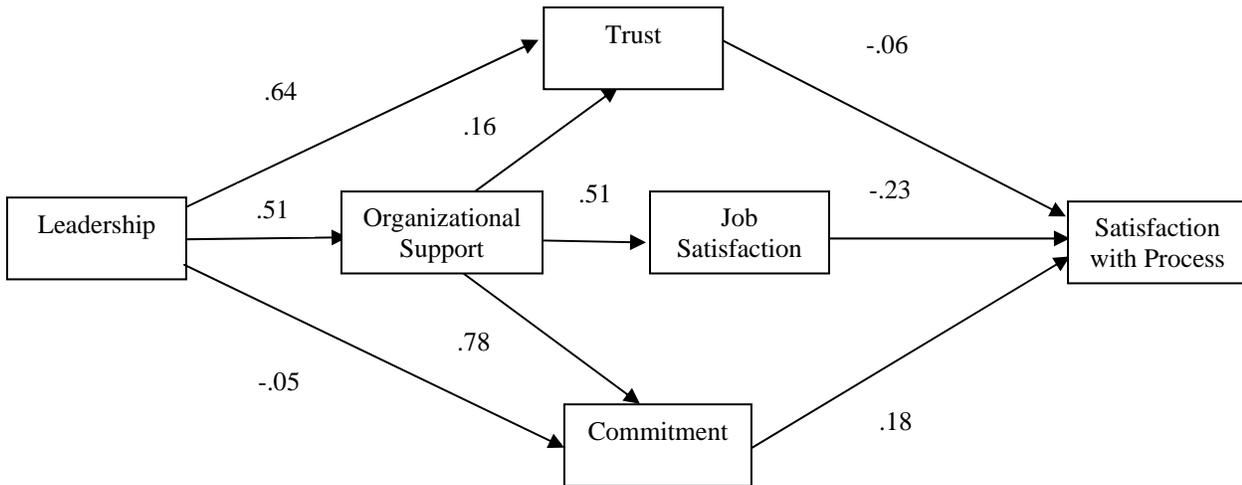
MANAGERIAL IMPLICATION AND LIMITATIONS

The results of this study show that the employees of this particular electric utility company are not currently satisfied with the current evaluation process. They want a process that is more formal and feedback driven. A more structured and formal process would help to increase job satisfaction, trust, commitment, and perceived organizational support. It would also help employees to better understand what is expected of them and be able to develop and grow based on the feedback they are given. An evaluation process that expresses expectations and is fair would help to increase role clarity, job satisfaction, and commitment to the company. Evaluation processes are perceived as discretionary acts of the company and one that offers good feedback, development and growth opportunities, and is fair would help to increase trust and perceived organizational support. Leadership style also impacts satisfaction with the evaluation process, perceived organizational support, trust, commitment, and job satisfaction. A manager should strive to lead with a transformational style in order to increase employee performance and satisfaction.

Although support was found for the hypothesized model, there are some limitations. First, the study is based on survey administered at one company and generalization to others is unknown. Second, the *Performance appraisal system* scale has not been previously used and was developed to fit the sample in this particular study. Although this scale is not a documented scale, for this data the internal consistency (measured by Cronbach's alpha) is good (.94). Finally, the data are cross sectional (a single snap shot in time); therefore one has to be careful in interpreting any causality.

REFERENCES

Arbuckle, J.L. (2006). *Amos 7.0 User's Guide.* Spring House, PA: Amos Development Company.

Bass, B. M. (1985). *Leadership and Performance Beyond Expectations.* New York: The Free Press.

Bass, B.M., Avolio, B.J., & Jung, D.I. (1995). *MLQ Multifactor Leadership Questionnaire: Technical Report.* Redwood City, CA: Mind Garden.

Buck, J.M., and Watson, J.L. (2002) "Retaining Staff Employees: The Relationship between Human Resources Management Strategies and Organizational Commitment." Innovative Higher Education, 26(3): 175-193.

Bycio, P., Allen, J.S., and Hackett, R. (1995) "Further Assessment of Bass's (1985) Conceptualization of Transactional and Transformational Leadership." Journal of Applied Psychology, 80(4): 468-478.

Byrne, B. M. (2001). *Structural Equation modeling with AMOS: Basic concepts, applications, and programming.* Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Churchill, G., Ford, N.M., and Walker, O.C. (1974) "Measuring the Job Satisfaction of Industrial Salesman." Journal of Marketing Research 11: 254-260. Sited from Bearden W.O., Netemeyer, R.G., and Mobley, M.F. (1993) *Handbook of Marketing Sales.* Newbury Park, CA: Sage Publications.

Dale, K., and Fox, M. (2008) "Leadership Style and organizational Commitment: Mediating Effect of Role Stress." Journal of managerial Issues, XX (1): 109-130.

Eisenberger, R., Cummings, J., Armeli, S., and Lynch, P. (1997) "Perceived Organizational Support, Discretionary Treatment, and Job Satisfaction." Journal of Applied Psychology, 82(5): 812-820.

Eisenberger, R., Huntington, R., Hutchison, S., and Sowa, D. (1986). "Perceived Organizational Support." Journal of Applied Psychology 71(3): 500-507.

Giffords, E.D. "An Examination of Organizational and Professional Commitment Among Public, Not-for-Profit, and Proprietary Social Service Employees." (2003) Administration in Social Work, 27(3): 5-23.

Harris, J.I., Winskowski, A.M., and Engdahl, B.E. (2007) "Types of Social Support in the Prediction of Job Satisfaction." The Career Development Quarterly, 56: 150-156.

Hubbell, A. P. and Chory-Assad, R.M. (2005) "Motivating Factors: Perceptions of Justice and Their Relationship with Managerial and Organizational Trust." Communication Studies, 56(1): 47-70.

Lau, C.M., Wong, K.M., and Eggleton, I.R. (2008) "Fairness of Performance Evaluation Procedures and Job Satisfaction: The Role of Outcome-based and Non-outcome-based Effects." Accounting & Business Research, 38(2): 121-135.

MacKenzie, S.B., Podsakoff, P.M, and Rich, G.A. "Transformational and Transactional Leadership and Salesperson Performance." Journal of Academy of Marketing Science, 29(2): 115-134

Matzler, K., Kepler, J., Schwarz, E., Deutinger, N., and Harms, R. (2008) "The Relationship between Transformational Leadership, Product Innovation, and Performance in SMEs." Journal of Small Business and Entrepreneurship, 21(2): 139-152.

Meyer, J.P., Paunonen, S.V., Gellatly, I.R., Goffin, R.D., and Jackson, D.N. (1989) "Organizational Commitment and Job Performance: It's the Nature of the Commitment That Counts." Journal of Applied Psychology, 74(1): 152-156.

Nyhan, R.C. (2000) "Changing the Paradigm: Trust and Its Role in Public Sector Organizations." American Review of Public Administration, 30(1): 87-109.

Perry, R.W. and Mankin L.D. (2007) "Organizational Trust, Trust in the Chief Executive and Work Satisfaction." Public Personnel Management, 36(2): 165-179.

Podsakoff, P.M., MacKenzie, S.B., and Bommer, W.B. (1996) "Transformational Leader Behaviors and Substitutes for Leadership as Determinants of Employee Satisfaction, Commitment, Trust, and Organizational Citizenship Behaviors." Journal of Management, 22(2): 259-298.

Podsakoff, P.M. and Organ, D.W. (1986). "Self-Reports in Organizational Research: Problems and Prospects." Journal of Management 12: 531-544.

Rhoades, L., and Eisenberger, R. (2002) "Perceived Organizational Support: A Review of the Literature." Journal of Applied Psychology, 87(4): 698-714.

Rhoades, L., Eisenberger, R., and Armeli, S. (2001) "Affective Commitment of the Organization: The Contribution of Perceived Organizational Support." Journal of Applied Psychology, 86(5): 825-836.

Tan, H.H. and Lim, A.K. (2009) "Trust in Coworkers and Trust in Organizations." Journal of Psychology, 143(1): 45-66.

Witt, L.A. and Wilson, J.W. (2001) "Moderating Effect of Job Satisfaction on the Relationship Between Equity and Extra-Role Behaviors." Journal of Social Psychology, 131(2): 247-252.

Appendix 1: Survey Instrument

Coastal Carolina University

Dear Employees,

I am a Coastal Carolina University MBA student conducting a research project on the satisfaction of the annual review process at Horry Electric Cooperative, Inc. related to job satisfaction, trust, commitment, perceived support, and leadership.

Your cooperation is important to the study and is greatly appreciated. The survey will take approximately 5-10 minutes to complete. All responses are anonymous and strictly confidential. You do not need to provide your name. There is no right or wrong answers to these questions. **All individual surveys will be shredded once compiled and only the final research paper and presentation will be presented to the management of Horry Electric Cooperative, Inc.**

Please note once you have completed the survey you will be given a HECK coupon.

Sincerely,
Courtni Day

I have read the above information and by checking this line, I agree to have my answers included in this survey ___.

I do not desire to complete this survey ___.

Demographic information: Please circle the one that applies to you.

What is your gender?	Participation in Performance Evaluations?	How long have you worked for HEC?
		Less than 1year
		1-5years
Male	Received Only	5-10 years
		10-15 years
		More than 15 years
Female	Administered and Received	

Performance Appraisal System: Please indicate the degree of your agreement or disagreement with each of the following statements.

	Strongly Dis-Agree					Strongly Agree
I feel a more structured performance appraisal system would help my future performance.	1	2	3	4	5	6
A performance appraisal system would help me do a better job.	1	2	3	4	5	6
A performance appraisal system would help me to better understand what my company expects of me.	1	2	3	4	5	6
A performance appraisal system that offers more feedback on my performance would be better than the annual reviews I have received in the past.	1	2	3	4	5	6
A performance appraisal system would help me to set goals.	1	2	3	4	5	6
A performance appraisal system would help to better compare my performance to others.	1	2	3	4	5	6
I would like a more structured performance appraisal system than what I have had in the past.	1	2	3	4	5	6

Job satisfaction: Please indicate your level of satisfaction with each of the following statements.

	Very Un-Satisfied	Un-Satisfied	Very Un-Satisfied Satisfied	Satisfied	Slightly Satisfied	Slightly Satisfied
Salary	1	2	3	4	5	6
Benefits	1	2	3	4	5	6
Frequency of evaluations	1	2	3	4	5	6

Connection between pay and performance	1	2	3	4	5	6
Workload	1	2	3	4	5	6
Physical working environment	1	2	3	4	5	6
Opportunity for advancement	1	2	3	4	5	6
Job Security	1	2	3	4	5	6
Influence over decisions that affect you	1	2	3	4	5	6
Your co-workers	1	2	3	4	5	6

Trust: Please indicate the degree of your agreement or disagreement with each of the following statements.

	Strongly Disagree	Dis- agree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
I have confidence that my supervisor is technically competent at the critical elements of his/her job.	1	2	3	4	5	6
When my supervisor tells me something, I can rely on what he/she tells me.	1	2	3	4	5	6
My supervisor will back me up in a pinch.	1	2	3	4	5	6
I feel I can tell my supervisor anything about my job.	1	2	3	4	5	6

Commitment: Please indicate the degree of your agreement or disagreement with each of the following statements.

	Strongly Disagree	Dis- agree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
I feel like "part of the family" at HEC.	1	2	3	4	5	6

I would be very happy to spend the rest
of my career with HEC.   1   2   3   4   5   6

I enjoy discussing HEC with people outside of it.   1   2   3   4   5   6

I really feel as if HEC's problems are my own.   1   2   3   4   5   6

Organizational Support: Please indicate the degree of your agreement or disagreement with each of the following statements.

	Disagree	Slightly agree	Disagree	Strongly Agree	Dis- Agree	Slightly Strongly Agree	Strongly Agree
HEC strongly considers my goals and values.	1	2	3	4	5	6
HEC considers my best interest when it makes decisions that affect me.	1	2	3	4	5	6
Help is available from HEC when I have a problem.	1	2	3	4	5	6
HEC really cares about my well being.	1	2	3	4	5	6
HEC is willing to extend itself in order to help me perform my job to the best of my ability.	1	2	3	4	5	6
HEC cares about my general satisfaction at work.	1	2	3	4	5	6
HEC shows concern for me.	1	2	3	4	5	6
HEC cares about my opinion.	1	2	3	4	5	6
HEC takes pride in my accomplishments at work.	1	2	3	4	5	6
HEC takes pride in my accomplishments outside of work.	1	2	3	4	5	6

Leadership: Please indicate the degree of your agreement or disagreement with each of the following statements.

		Strongly Slightly	Dis- Agree	Slightly Strongly Agree	Strongly Agree

Disagree   agree   Disagree

My Supervisor…

Statement						
Specifies the importance of having a strong sense of purpose.	1	2	3	4	5	6
Goes beyond self-interest for the good of the group.	1	2	3	4	5	6
Articulates a compelling vision of the future.	1	2	3	4	5	6
Displays a sense of power and confidence.	1	2	3	4	5	6
Provides me with assistance in exchange for my efforts.	1	2	3	4	5	6
Discusses in specific terms who is responsible for Meeting performance targets.	1	2	3	4	5	6
Expresses satisfaction when I meet expectations.	1	2	3	4	5	6

Job Satisfaction and Organizational Commitment: A Study in the Public Sector

Edward Jernigan, The Belk College of Business, UNC Charlotte
Joyce M. Beggs, The Belk College of Business, UNC Charlotte

ABSTRACT

This paper reports the results of a study that examined differences in organizational commitment type and job satisfaction for a sample of 154 public sector employees consisting of firefighters (N = 52), police officers (N = 57), and utility district employees (N = 45). The study was conducted in a large southeastern metropolitan area. Firefighters were significantly more satisfied with their jobs than were both police officers and utility district employees. Significant differences were found for moral and alienative commitment forms. Firefighters expressed significantly higher moral commitment and significantly lower alienative commitment than did the police officers and utility district employees. There were no significant differences between police officers and utility district employees. The three groups did not differ significantly on calculative commitment.

INTRODUCTION

Lee and Olshfski (2002) argue that commitment to the organization (job) reinforces the role that an individual has taken in the community and serves as a source of motivation. Given the importance of police, fire, and utility district workers to a community, maintaining a stable workforce with a positive attitude toward their work would be in the public interest. In more pragmatic terms, having public employees who are committed to their organizations and satisfied with their jobs could result in reduced turnover, lower absenteeism, greater productivity, and ultimately lower costs to the public. The purpose of this study was to test for differences in levels of job satisfaction and three types of organizational commitment for a sample of police officers, firefighters, and public utility district employees in a large southeastern city.

JOB SATISFACTION

Job satisfaction represents an expression of one's overall sense of satisfaction – or dissatisfaction – with a job. Job satisfaction is one of the most studied variables in the behavioral management literature. Job satisfaction has been defined as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences (Locke, 1976, p. 1300)." Job satisfaction is a global attitude that individuals maintain about their jobs based on perceptions of their jobs (Reilly, Chatham, & Caldwell, 1991). Studying job satisfaction aids in the understanding of those perceptions and their ultimate consequences. These investigations may help managers understand how employees form the attitudes that affect their job satisfaction (DeBats, 1982; Smith, Kendall, & Hulin, 1969; Weiss, Dawis, England, & Lofquist, 1967).

Much attention has been given to the relationship between organizational commitment and job satisfaction, and findings from this study may be useful in developing a deeper understanding of public sector employees. There have been several studies that questioned the causal ordering of organizational commitment and job satisfaction (e.g., Bateman & Strasser, 1984; Williams & Hazer, 1986; Curry, Wakefield, Price, & Mueller, 1986; Glisson & Durick, 1988; Huang & Hsiao, 2007). In a meta-analysis, Tett and Meyer (1993) reported that satisfaction and commitment contribute uniquely to turnover. Kacmar, Carlson, and Brymer (1999) found that the relationship between job satisfaction and organizational commitment was positive and

statistically significant. However, Kacmar et al. (1999) reported that the links for affiliation, exchange, and identification commitment with job satisfaction were not significant. Whereas, Huang and Hsiao (2007) suggested that a reciprocal model explained the relationship. In an examination of performance of virtual workers, Golden and Veiga (2008) found that high quality superior subordinate relationships lead to higher levels of commitment and job satisfaction and performance for those who worked extensively in a virtual mode. In another study of the relationship between job attitudes and performance, Riketta (2008) confirmed the existence of a small but significant effect for attitudes (such as job satisfaction) on performance. Previous research reported a positive relationship between substitutes for leadership and job satisfaction (e.g., Pool, 1997; Jernigan, 1990).

ORGANIZATIONAL COMMITMENT

While researchers have varied in their emphasis, most suggest that commitment represents both an attitude that describes an individual's linkage to the organization and a set of behaviors by which individuals manifest that link. Researchers have examined a wide range of issues important to the understanding of organizational commitment such as job satisfaction and causality (Bateman & Strasser, 1984; Vandenberg & Lance, 1992), intention to leave the organization (Lee & Mitchell, 1991; Jaros, Jermier, Koehler & Sincich, 1993; Cohen, 1993), the influence of personal characteristics on dimensions of organizational commitment (Abdulla & Shaw, 1999), intrinsic motivation and affective commitment (Eby, Freeman, Rush & Lance, 1999), bases and foci of commitment (Clugston, Howell & Dorfman, 2000), and the dimensionality of commitment (Penley & Gould, 1988; Allen & Meyer, 1990; Meyer, Allen & Smith, 1993; Jaros, et. al., 1993).

Emphasis on outsourcing, downsizing, and rightsizing strategies to adapt to more competitive environments caused some researchers to question the value of organizational commitment as a theoretical construct (see Baruch, 1998). From a strategic point-of-view, the value of these strategies for managers is decreased operating costs and/or increased productivity. These strategies are used not only in private enterprise but are also used by public sector administrators to stretch budgets to cover services. Baruch (1998) argues the cost to the organization of such actions can include a decline in employee organizational commitment. The genesis of Baruch's position is a belief that the traditional employment relationship, particularly in the United States, no longer exists. Because employees believe their employer is no longer committed to them, they have no reason to be committed to the organization.

Mowday (1998) countered that organizational commitment remains an important and desirable attitude for organizations. Mowday contends the evidence shows high commitment human resource practices produce high levels of affective commitment and subsequent organizational performance (p. 7). Mowday's position is partially supported by Whitner (2001) whose results suggest high commitment human resource practices affect the relationship between perceived organizational support and organizational commitment or trust in management. On an intuitive basis, there is some logic to Baruch's argument. However, Baruch does not take into account the possibility that changes in the traditional employment relationship may alter the nature of the individual's commitment to the organization rather than leading to the absence of organizational commitment.

The multidimensionality of organizational commitment is widely accepted and well established (e.g., Etzioni, 1961; Kanter, 1968; Penley & Gould, 1988; Allen & Meyer, 1990; Meyer, Allen & Smith, 1993; Jaros, Jermier, Koehler & Sincich, 1993; Meyer & Allen, 1997). Several studies used the model of commitment developed by Meyer and Allen (1997) that identifies three

components of commitment – affective, continuance, and normative. Affective commitment "…refers to the employee's attachment to, identification with, and involvement in the organization." Continuance commitment "…refers to an awareness of the costs associated with leaving the organization." Normative commitment "…reflects a feeling of obligation to continue employment (p. 11)." According to Meyer and Allen, "Employees with a strong affective commitment continue employment with an organization because they want to do so. Employees whose primary link to the organization is based on continuance commitment remain because they need to do so. Employees with a high level of normative commitment feel they ought to remain with the organization (p. 11)."

The model of commitment developed by Penley and Gould (1988) takes a slightly different approach from the Meyer and Allen model. Based on Etzioni's (1961) multiform conceptualization of organizational involvement, Penley and Gould endorse that an individual's commitment to an organization exists in both affective and instrumental forms. One can be morally committed, calculatively committed, or alienatively committed to an organization. Moral commitment is described as a highly positive affective form characterized by acceptance of and identification with organizational goals. Calculative commitment is an instrumental form essentially focused on one's satisfaction with the exchange relationship. Alienative commitment is described as a highly negative affective form that is a consequence of a lack of control over the internal organizational environment and of a perceived absence of alternatives for organizational commitment. Employees who express alienative commitment continue to engage in work behaviors that indicate a desire to continue their membership in the organization. In essence, they ensure their work performance at least meets minimal standards, and their interaction with managers and co-workers communicates that they do not want to leave.

Conceptually, Penley and Gould's (1988) moral and calculative commitment seem similar to affective and continuance commitment as defined by Meyer and Allen. However, alienative commitment does not appear to be conceptually similar to any of the forms of commitment described by Meyer and Allen (1997). As defined by Penley and Gould, alienative commitment suggests an external locus of control, a sense of powerlessness on the part of the employee, and a lower level of engagement in the work role. These are individuals who stay with an organization because they have to, not because they feel any sense of obligation to the organization. As described by Etzioni (1961) alienative commitment is an attitude reflecting the individuals' perception of sunk costs. Thus, alienative commitment would appear to be distinct from normative commitment as defined by Meyer and Allen.

The Penley and Gould model seems appropriate for a study of public sector employees. Public sector organizations are often stereotyped as highly bureaucratic organizations where promotions and pay raises are usually slow in coming and based on seniority. The highly bureaucratic environment may produce a feeling of powerlessness among individual employees. In addition, the frequent criticism of the public sector by the media, politicians, and community groups could add to a sense of alienation either in terms of sunk costs, or a sense of "separation" from the larger community in the case of police officers. The result is a lower sense of commitment. Powerlessness is important because it may lead to job dissatisfaction, burnout, and lower commitment (Ross & Wright, 1998; Wilson & Laschinger, 1994; Chandler, 1986; Bush, 1988). Penley and Gould's alienative commitment may measure powerlessness as well as sunk costs better than other models of commitment.

This paper focused on a single research question. Do firefighters, police officers, and utility district employees express significantly different job satisfaction, moral, calculative, and alienative organizational commitment?

METHOD

Setting, Sample, and Procedure

This study was conducted in a southeastern metropolitan area. Police officers employed in the investigations bureau and in a patrol district were invited to participate in the study. With the support of supervisors in each division, questionnaires were distributed to 60 police officers in their work setting. With the support of the Fire Department Chief, surveys were distributed directly to a sample of 65 firefighters. With the support of the Director of the metropolitan area utility district, surveys were distributed to a sample of 50 employees. The utility district was the principle supplier of water and sewer service in the metropolitan area and faced competition from several private water and sewer companies in the region. The police and fire departments were the largest in the area and offered the most attractive compensation and benefits packages in the region. The fire department was the only fulltime, non-volunteer department in the county. Prior to distributing surveys, the researcher explained the purpose of the study and assured the confidentiality of the responses. Completed surveys were returned to the researcher in a sealed envelope.

Survey Instrumentation:

Commitment was measured using the Organizational Commitment Scale (OCS) developed by Penley and Gould (1988). The OCS is a 15 item seven-point Likert scale that measures organizational commitment on three dimensions: moral, calculative, and alienative. All three dimensions of commitment are measured using subscales consisting of five items. A sample moral commitment item is: "I feel it is my duty to support this organization." A sample calculative commitment item is: "I will give my best when I know it will be seen by the 'right' people in this organization." A sample alienative commitment item is: "I feel trapped here." Coefficient alphas for the three sub-scales were moral commitment, .81; alienative commitment, .75; and calculative commitment, .66. Penley and Gould (1988) reported coefficient alphas of .80 (moral), .82 (alienative), and .67 (calculative).

The following demographic information was solicited for each participating police officer: current job (patrol officer, investigator, or supervisor), age, number of years in the current job, number of years as a police officer, marital status, work shift (first, second, or third), and education. The following demographic information was collected from each firefighter: current job title (firefighter, engineer, captain), age, number of years in the current job, number of years as a firefighter, marital status, and education. The shift question was eliminated for firefighters because all worked the same schedule. Utility district employees were asked to provide demographic information similar to firefighters except job titles differed.

Job satisfaction was measured using the Index of Job Satisfaction developed by Brayfield and Rothe (Cook, Hepworth, Wall, & Warr, 1981). The index consisted of eighteen items of which half were reverse scored (alpha = .87). Originally formulated with a 5 point agree-disagree scale, the index was modified to a 7-point (very strongly agree to very strongly disagree) scale in order to make it consistent with the other measures employed in this study. Sample items from the index include: "My job is like a hobby to me," "I am often bored with my job (R)," and "I find real enjoyment in my work."

Analysis:

Basic relationships were first examined using correlation analysis. T-tests were used to test for differences in organizational commitment and job satisfaction between police officers, firefighters, and utility district employees. For analysis purposes, the supervisory personnel who responded to the survey were included in the group that they supervised. We felt this approach was justifiable since the supervisors performed "regular" duties in addition to their supervisory responsibilities.

RESULTS

Demographic data are summarized in Tables 1A, 1B, and 1C. The average police officer in this survey was 35 years old, had 11.46 years of experience on the department, had 6 years experience in their current job, 71.9 percent of police officers were married, 61.4 percent worked first shift, and 50.9 percent were college graduates. The average firefighter was 33 years old, had 11.41 years of experience as a firefighter, and 5.8 years of experience in their current job, 74 percent were married, and 28 percent were college graduates. The average utility district employee was 39 years old, had 9 years of experience in the industry, 5 years of experience in their current job, 56 percent were married, and 58 percent were college graduates. The largest percentage of utility district employees worked in the laboratory and system protection (environmental protection) departments.

Correlations for the total sample and each subsample are reported in Table 2, 2A, 2B, and 2C. For the total population, the results indicate a small positive and significant correlation between job satisfaction and moral commitment ($r = .164$, $p = .044$), and between job satisfaction and calculative commitment ($r = .162$, $p = .05$). The correlation between job satisfaction and alienative commitment was not significant. The results also showed a negative correlation for moral and alienative commitment ($r = -.61$, $p = .000$), a positive correlation between moral and calculative commitment ($r = .194$, $p = .018$), and no significant correlation between calculative and alienative commitment. Examination of the correlation results for the subsamples showed no significant correlations between job satisfaction and any commitment type for police officers and firefighters; however, there was a significant correlation between job satisfaction and calculative commitment for the utility district workers ($r = .302$, $p = .055$).

Table 3 reports the mean scores for job satisfaction and each type of commitment for firefighters, police officers, and utility district employees. T-test analysis show that there were significant differences between firefighters and police officers for moral commitment ($t = 5.832$, $p = .000$) and alienative commitment ($t = -5.725$, $p = .000$). Firefighters expressed higher moral commitment than police officers, and police officers expressed higher alienative commitment than firefighters. A similar pattern of results were found where firefighters and utility district employees were compared. Firefighters reported significantly higher moral commitment ($t = 4.797$, $p = .000$) and significantly lower alienative commitment ($t = -4.086$, $p = .000$) than utility workers. No significant differences were found when police officers and utility district employees were compared on moral and alienative commitment. No significant differences for any comparisons of firefighters, police officers, and utility district employees were found for calculative commitment.

Examination of the T-test analysis for job satisfaction show that there were significant differences in reported job satisfaction between firefighters and police officers ($t = -2.718$, $p = .008$) and between firefighters and utility district employees ($t = 2.411$, $p = .018$). In both instances

firefighters reported higher job satisfaction that either police officers or utility district workers. There were no significant results when police officers and utility district workers were compared.

DISCUSSION AND CONCLUSIONS

Both job satisfaction and organizational commitment have many favorable outcomes for all organizations. These include better attendance records, longer job tenure, and higher performance levels. As Dessler (1999) points out, "…there is considerable evidence that committed employees will be more valuable employees than those with weak commitment (p. 58)." This study suggests that there may be vocational differences in job satisfaction and organizational commitment types that are worth examining.

In many respects, the results for the correlation are consistent with what one might expect. For example, people satisfied with their jobs are also more likely to be morally and calculatively committed to their organizations while those who feel alienated (possibly estranged) from the organization are less satisfied with their jobs. In the case of moral commitment, job satisfaction may lead to a greater acceptance of organizational goals and values or possibly a manifestation of organizational fit. The relationship between job satisfaction and calculative commitment may be an indicator of the extent to which one's exchange expectations have been met on psychological contracts.

Why do firefighters express higher moral commitment than their police department and utility district counterparts? Possible answers include the public and professional perception of the firefighting profession and the specific nature of the work of firefighters. Firefighters are generally seen by the public as helpers. The media characterizations of the profession are usually positive. The fire department comes to your house to either save the building or to save your life. However, when the police department comes to your house, there is generally something bad that has happened. The police may be there to take you into custody. In general, firefighters do not have their actions or motives second guessed by the media as the police do. For example, when was the last time a fire department was accused of profiling?

For utility district employees a combination of public perception and sunk costs may provide some explanation. For example, working at the sewer plant may not be the most desirable or most appreciated job in a community. Additionally, many utility district employees' jobs may involve repetitive testing and analysis which could be perceived as boring. Sunk costs may provide an explanation for higher alienative commitment among utility district employees. Many utility district jobs require extensive training and professional certification. Individuals may feel that having made such investments, they are now "stuck" because of "overspecialization," and as a consequence, their skills are not transferable. They stay because they can see no viable alternatives to their current circumstances.

The nature of firefighting work could play a role in firefighters being more morally committed than police officers. Firefighters work in relatively stable teams with 24 hour work schedules. Therefore, members of a firefighting team spend significant amounts of time together and should be more likely to establish strong interpersonal bonds as well as a strong organizational/professional identity. It has long been accepted in the teamwork literature that commitment increases with the level of interaction and involvement. In addition, although not tested in this study, individual expectations about the job and the organization may be better met for firefighters than for police officers. The extent to which one's expectations about the job and the organization are met, the more likely one is to develop a positive organizational commitment (Lee & Mitchell, 1999). Dessler (1999) argues that organizations that have high commitment

screen new employees for attitudes that are consistent with company values. The extensive screening process that is part of the hiring process for fire and police departments may result in a larger percentage of employees who are predisposed to the values of the organization and are consequently more likely to express a higher degree of positive types of organizational commitment.

Why do police officers express higher alienative commitment than their fire department counterparts? Possible answers include the way in which police work is often done. Frequently, one officer works alone in a patrol car or as an investigator while firefighters work together in teams or crews. Another answer may be the higher education requirements for police officers than for firefighters. Most urban police departments now require a minimum of a bachelor's degree, and that requirement may create higher individual expectations in economic and professional terms that may not be met.

Are police officers morally committed to their departments? Our results suggest that they are morally committed, but less than firefighters are. Differences in public perceptions of the two groups, differences in the nature of the work they do, and differences in education levels may explain the variance in moral commitment between the two groups. The results of this study showed significant differences between police officers and firefighters on two of the three forms of commitment examined. The group differences on moral and alienative commitment are relatively small in magnitude. This may mean that while statistically significant and important from a theory perspective; in practical terms, the differences might not be important.

There are several limitations to this study. The study is cross sectional and is subject to all the limitations associated such studies. An examination of organizational commitment over time might yield very different results. The small sample size (52 firefighters, 57 police officers, and 45 utility district employees) limits the study. The police officer sample was drawn from a single investigations bureau and only included officers from one shift in a single patrol district. We surveyed fulltime, professional firefighters, and volunteer firefighters were excluded. We did not survey employees of private utility companies in the region. Finally police officers and firefighters working in suburban communities were not included in this study.

REFERENCES

[1] Abdulla, M. H. A. & Shaw, J. D. (1999). "Personal factors and organizational commitment: Main and interactive effects in the United Arab Emirates", *Journal of Managerial Issues*, 11, 1, pp. 77-93

[2] Allen, N. J. & Meyer, J. P. (1996). "Affective, continuance, and normative commitment to the organization: An examination of construct validity", *Journal of Vocational Behavior*, 49, 3, pp. 252-276.

[3] Allen, N. J. & Meyer, J. P. (1990). "The measurement and antecedents of affective, continuance and normative commitment to the organization", *Journal of Occupational Psychology*, 63, pp. 1-18.

[4] Baruch, Y, (1998). "The rise and fall of organizational commitment", *Human Systems Management*, 17, pp.135-143. Cited in Mowday, R. T. (1998). "Reflections on the study and relevance of organizational commitment", *Human Resource Management Review*, 8, 4, pp. 387-402.

[5] Bateman, T. S. & Strasser S. (1984). "A longitudinal analysis of the antecedents of organizational commitment", *Academy of Management Journal*, 27, 1, pp. 95-112.

[6] Blau, G. (1999). "Testing the longitudinal impact of work variables and performance appraisal satisfaction on subsequent overall job satisfaction", *Human Relations*, 52, 8, pp. 1099-1113.

[7] Bush, J. P. (1988). "Job satisfaction, powerlessness, and locus of control," *Western Journal of Nursing Research*, 10, pp. 718-731.

[8] Chandler, G. E. (1986). The relationship of nursing work environment to empowerment and powerlessness. Unpublished doctoral dissertation. Salt Lake City: University of Utah.

[9] Clugston, M., Howell, J. P. & Dorfman, P. W. (2000). "Does cultural socialization predict multiple bases and foci of commitment?", *Journal of Management*, 26, 1, pp. 5-30.

[10] Cohen, A. (1993). "Organizational commitment and turnover: A meta-analysis", *Academy of Management Journal*, 36, 5, pp. 1140-1157.

[11] Cook, J. D., Hepworth, S. J., Wall, T. D. & Warr, P. B. (1981). The experience of work: A compendium and review of 249 measures and their use. Academic Press, London.

[12] Curry, J., Wakefield, D., Price, J. & Mueller, C. (1986). "On the causal ordering of job satisfaction and organizational commitment", *Academy of Management Journal*, 29, 4, pp. 847-858.

[13] DeBats, K. E. (1982). The continuing personnel challenge. *Personnel Journal*, 34, 332-344.

[14] Dessler, G. (1999). "How to earn your employee's commitment", *Academy of Management Executive*, 13, 2, pp. 58-67.

[15] Eby, L. T., Freeman, D. M., Rush, M. C. & Lance, C. E. (1999). "Motivational bases of affective organizational commitment: A partial test of an integrative theoretical model", *Journal of Occupational and Organizational Psychology*, 72, pp. 463-483.

[16] Etzioni, A. (1961). A comparative analysis of complex organizations. Glencoe, NY: Free Press.

[17] Glisson, C. & Durick, M. (1988). "Predictors of job satisfaction and organizational commitment in human services organizations", *Administrative Science Quarterly*, 33, pp. 61-81.

[18] Golden, T.D. & Veiga, J.F. (2008). The impact of superior-subordinate relationships on the commitment, job satisfaction, and performance of virtual workers. *Leadership Quarterly*, 19(1) 77-88.

[19] Huang, T. C. & Hsiao, W. J. (2007). The causal relationship between job satisfaction and organizational commitment. *Social Behavior and Personality*, 35(9), 1265-1276.

[20] Jaros, S. J., Jermier, J. M., Koehler, J. W. & Sincich, T. (1993). "Effects of continuance, affective and moral commitment on the withdrawal process: An evaluation of eight structural equation models", *Academy of Management Journal*, 36, 5, pp. 951-995.

[21] Jernigan, I. E. (1990). Communication competence and substitutes for leadership: Extension of a construct. *Dissertation Abstracts International*, 50, Z3294.

[22] Kacmar, M. K., Carlson, D. S. & Brymer, R. A. (1999). "Antecedents and consequences of organizational commitment: A comparison of two scales", *Education and Psychological Measurement*, 59, 6, pp. 976-994.

[23] Kanter, R. M. (1968). "Commitment and social organization: A study of commitment mechanisms in utopian communities", *American Sociological Review*, 33, 4, pp. 499-517.

[24] Lee, S. & Olshfski, D. (2002). "Employee commitment and firefighters: It's my job", *Public Administration Review*, 62, SI, pp. 108-114.

[25] Lee, T. W. & Mitchell, T. R. (1991). "The unfolding effects of organizational commitment and anticipated job satisfaction on voluntary employee turnover", *Motivation and Emotion*, 15, 1, pp. 99-121.

[26] Lee, T. W. & Mitchell, T. R. (1999). "The unfolding model of voluntary turnover: A replication and extension", *Academy of Management Journal*, 42, 4, pp. 450-463.

[27] Locke, E. A. (1976). "The nature and causes of job satisfaction", In M. D. Dunnette (ed.), *Handbook of Industrial and Organizational Psychology*. New York: Wiley, pp. 1297 – 1351.

[28] Mathieu, J. E. & Zajac, D. M. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment", *Psychological Bulletin*, 108, 2, pp. 171-194.

[29] McCue, C. P. & Gianakis, G. A. (1997, December). "The relationship between job satisfaction and performance", *Public Productivity & Management Review*, 21(2), pp. 170-192.

[30] Meyer, J. P. & Allen, N. J. (1997). Commitment in the Workplace: Theory, Research and Application. Thousand Oaks, CA: Sage Publications.

[31] Meyer, J. P., Allen, N. J. & Smith, C. A. (1993). "Commitment to organizations and occupations: Extension and test of a three-component conceptualization", *Journal of Applied Psychology,* 78, 4, pp. 538-551.

[32] Mowday, R. T. (1998). "Reflections on the study and relevance of organizational commitment", *Human Resource Management Review*, 8, 4, pp. 387-402.

[33] Mowday, R. T., Steers, R. M. & Porter, L. W. (1979). "The measurement of organizational commitment", *Journal of Organizational Behavior*, 14, pp. 224-247.

[34] Penley, L. E. & Gould, S. (1988). "Etzioni's model of organizational involvement: A perspective for understanding commitment to organizations", *Journal of Organizational Behavior*, 9, pp. 43-59.

[35] Pool, S. W. (1997). The relationship of job satisfaction with substitutes of leadership, leadership behavior and work motivation. *Journal of Psychology*, 131(3), 271 – 284.

[36] Porter, L. W., Steers, R. M., Mowday, R. T. & Boulian, T. V. (1974). "Organizational commitment, job satisfaction and turnover: Psychometric techniques", *Journal of Applied Psychology*, 59, 5, pp. 603-609.

[37] Reilly, C., Chatham, J., & Caldwell, D. J. (1991). People and organizational culture: A profile comparison approach to assessing person-organizational fit. *Academy of Management Journal*, 9, 487-516.

[38] Riketta, M. (2008). The casual relation between job attitudes and performance: A meta-analysis of panel studies. *Journal of Applied Psychology*, 93(2), 472-481.

[39] Ross, C. E. & Wright, M. P. (1998). "Women's work, men's work, and the sense of control", *Work and Occupations*, 25, 3, pp. 333-355.

[40] Smith, P. C., Kendall, L. M., & Hulin, C. L. (1969). *The measure of satisfaction in work and retirement*. Chicago: Rand McNally.

[41] Tett, R. P. & Meyer, J. P. (1993). "Job satisfaction, organizational commitment, turnover intention, and turnover: Path analyses based on meta-analytic findings", *Personnel Psychology*, 46, 2, pp. 259-293.

[42] Vandenberg, R. J. & Lance, C. E. (1992). Examining the causal order of job satisfaction and organizational commitment" *Journal of Management*, 18, 1, pp. 153-167.

[43] Weiss, D. J., Dawis, R. V., England, G. W., & Lofquist, L. H. (1967). *Manual for the Minnesota Satisfaction Questionnaire*. Minneapolis: Minnesota Studies in vocational Rehabilitation, University of Minnesota Industrial Relations Center.

[44] Whitner, E. M. (2001). "Do 'high commitment' human resource practices affect employee commitment? A cross-level analysis using hierarchical linear modeling", *Journal of Management*, 27, 5, pp. 515-535.

[45] Williams, L. J. & Hazer, J. T. (1986). "Antecedents and consequences of satisfaction and commitment in turnover models: A reanalysis using latent variable structural equation methods", *Journal of Applied Psychology*, 71, 2, pp. 219-231.

[46] Wilson, B. & Laschinger, H. K. S. (1994). "Staff nurses' perception of job empowerment and organizational commitment: A test of Kanter's theory of structural power in organizations", *Journal of Nursing Administration*, 24, 4S, pp. 39-47.

Table 1A
Descriptive Statistics: Police Sample

Mean Age	35
Years in Current Job	6.04
Years a Police Officer	11.46
Married	71.9%
Single	22.8%
Divorced	1.8%
Separated	1.8%
Work First Shift	61.4%
Work Second Shift	28.1%
Work Third Shift	7%
High School Graduate	15.8%
Associate Degree	28.1%
Bachelors Degree	50.9%
Masters or Higher	3.5%
Age 25 or Less	7%
Age 26 to 30	14%
Age 31 to 35	33.3%
Age 36 to 40	15.8%
Age 41 or Older	21.1%

Table 1B
Descriptive Statistics: Firefighter Sample

Mean Age	33.5
Years in Current Job	5.83
Years a Firefighter	11.42
Married	74.5%
Single	19.6%
Divorced	2.0%
Separated	3.9%
Firefighter	66.0%
Engineer	28.0%
Captain	6.0%
High School Graduate	48.0%
Associate Degree	24.0%
Bachelors Degree	28.0%
Age 25 or Less	12.5%
Age 26 to 30	10.4%
Age 31 to 35	31.3%
Age 36 to 40	27.1%
Age 41 or Older	18.8%

Table 1C
Descriptive Statistics: Utility Sample

Mean Age	39.3
Years in Current Job	5.15
Years in Industry	9.13
Married	56.3%
Single	16.7%
Divorced	8.3%
Water Treatment Employee	12.5%
Laboratory Employee	35.4%
Wastewater Treatment	22.9%
System Protection	10.4
High School Graduate	14.6%
Associate Degree	14.6%
Bachelors Degree	47.9%
Masters or Higher	10.4%
Age 25 or Less	6.3%
Age 26 to 30	4.2%
Age 31 to 35	20.8%
Age 36 to 40	8.3%
Age 41 or Older	29.2%

Table 2
Correlations (Total Sample)

		Job Satisfaction	Moral Commitment	Alienative Commitment	Calculative Commitment
Job Satisfaction	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	151			
Moral Commitment	Pearson Correlation	.164(*)	1		
	Sig. (2-tailed)	.044			
	N	151	153		
Alienative Commitment	Pearson Correlation	-.042	-.610(**)	1	
	Sig. (2-tailed)	.605	.000		
	N	151	153	153	1
Calculative Commitment	Pearson Correlation	.162(*)	.194(*)	-.104	
	Sig. (2-tailed)	.050	.018	.212	
	N	146	147	147	147

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Table 2A
Correlations (Police Sample)

		Job Satisfaction	Moral Commitment	Alienative Commitment	Calculative Commitment
Job Satisfaction	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	57			
Moral Commitment	Pearson Correlation	.118	1		
	Sig. (2-tailed)	.380			
	N	57	57		
Alienative Commitment	Pearson Correlation	.046	-.650(**)	1	
	Sig. (2-tailed)	.731	.000		
	N	57	57	57	
Calculative Commitment	Pearson Correlation	.081	.309(*)	-.266(*)	1
	Sig. (2-tailed)	.553	.020	.048	
	N	56	56	56	56

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 2B
Correlations (Firefighter Sample)

		Job Satisfaction	Moral Commitment	Alienative Commitment	Calculative Commitment
Job Satisfaction	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	50			
Moral Commitment	Pearson Correlation	-.058	1		
	Sig. (2-tailed)	.687			
	N	50	52		
Alienative Commitment	Pearson Correlation	.104	-.378(**)	1	
	Sig. (2-tailed)	.473	.006		
	N	50	52	52	
Calculative Commitment	Pearson Correlation	.098	.113	.263	1
	Sig. (2-tailed)	.501	.433	.065	
	N	49	50	50	50

** Correlation is significant at the 0.01 level (2-tailed).

Table 2C
Correlations Utility Sample

		Job Satisfaction	Moral Commitment	Alienative Commitment	Calculative Commitment
Job Satisfaction	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	44			
Moral Commitment	Pearson Correlation	.120	1		
	Sig. (2-tailed)	.436			
	N	44	44		
Alienative Commitment	Pearson Correlation	.031	-.446(**)	1	
	Sig. (2-tailed)	.844	.002		
	N	44	44	44	
Calculative Commitment	Pearson Correlation	.302(*)	.134	-.183	1
	Sig. (2-tailed)	.055	.404	.253	
	N	41	41	41	41

** Correlation is significant at the 0.01 level (2-tailed).

Table 3
Job Satisfaction and Commitment Type Comparisons
For Firefighters, Police Officers, and Utility District Employees

Moral Commitment	Number	Mean	T-Test Results
Firefighters	52	4.2846	t = 5.823
Police Officers	57	3.5719	p = .000**
Firefighters	52	4.2846	t = 4.797
Utility Employees	45	3.6455	p = .000**
Police Officers	57	3.5719	t = -.475
Utility Employees	44	3.6455	p = .636
Alienative Commitment			
Firefighters	52	1.7192	t = -5.725
Police Officers	57	2.5404	p = .000**
Firefighters	52	1.7192	t = -4.086
Utility Employees	44	2.3000	p = .000**
Police Officers	57	2.5404	t = 1.403
Utility Employee	44	2.3000	p = .164
Calculative Commitment			
Firefighters	50	3.0480	t = .938
Police Officers	56	2.8893	p = .350
Firefighters	50	3.0480	t = -.083
Utility Employees	41	3.0634	p = .934
Police Officers	57	2.8893	t = -1.071
Utility Employees	44	3.0634	p = .287
Job Satisfaction			
Firefighters	52	2.8511	t = -2.718
Police Officers	57	2.7368	p = .008**
Firefighters	50	2.8511	t = 2.411
Utility Employees	44	2.7260	p = .018**
Police Officers	57	2.7368	t = -.227
Utility Employees	44	2.7260	p = .821

** Correlation is significant at the 0.01 level (2-tailed).

A TRILOGY OF UNFORTUNATE EVENTS IN CHINA:
LESSONS LEARNED IN THE MANAGEMENT OF CRISES

Zhang Long**,** China University of Geosciences (Beijing), zhanglongdragon@hotmail.com
William "Rick" Crandall, University of North Carolina at Pembroke, rick.crandall@uncp.edu
John A. Parnell, University of North Carolina at Pembroke, john.parnell@unjcp.edu

ABSTRACT

An organizational crisis is a low-probability, high impact event that threatens an it survival. This paper addresses three recent organizational crises that have occurred in China—the SK-II cosmetic incident, the Sharon Stone comment on the May 2008 earthquake in China, and the melamine milk contamination crisis—within the crisis management framework developed by Crandall and associates (2009). Lessons learned are presented in light of a landscape survey, strategic planning, management of the crisis, and organizational learning. Directions for future research are discussed.

INTRODUCTION

Crisis management addresses unfortunate events in the life of an organization (Barton, 2008; Coombs, 2006; Mitroff & Anagnos, 2001). Crisis events are typically seen as low-probability, high impact occurrences that can seriously disrupt the normal day-to-day operations of an organization (Coombs, 2007; Pearson & Clair, 1998). Five characteristics of crises are common in the literature: (1) Crisis events have a low probability of occurring and are usually unexpected (Barton, 2008; Pearson & Clair, 1998; Sellnow & Seeger, 2001); (2) crises can have a highly damaging impact on the environment, the organization, and society (Carroll & Buchholtz, 2003; Crandall & Mensah, 2008; Shrivastava, 1995); (3) crises require decisive action (Barton, 2008; Fink, 2000); (4) crises need to be addressed within an expedient time frame (Greening & Johnson, 1996; Coombs, 2007; Marra, 1998); and (5) crises offer learning opportunities for organization to develop (Liu, 2004).

A crisis can occur anywhere, and at any time. During the past two-and-a-half years, a number of organizational crises have occurred in the People's Republic of China, three of which are discussed herein: The September 2006 discovery of contaminants in Proctor & Gamble's cosmetic line-SK-II, the comments by U.S. actress Sharon Stone regarding the May 12, 2008 earthquake in China, and the melamine milk crises that occurred in the summer of 2008. This paper examines these three events using the crisis management framework developed by Crandall, Parnell, & Spillan (2009). This framework takes a comprehensive view of the entire crisis management process by looking at the four stages of landscape survey, strategic planning, crisis management, and organizational learning.

We begin by reviewing the definitions of crisis and crisis management, as offered in the relevant management literature. Next, we overview a recent trilogy of crisis events in China. We then present the crisis management framework that will be used to analyze these three events. Finally, we offer lessons learned by examining the phases of landscape survey, strategic planning, crisis management, and organizational learning.

1

DEFINING CRISIS AND CRISIS MANAGEMENT

In the management literature, the Pearson & Clair definition of a crisis is cited frequently:

> "An organizational crisis is a low-probability, high impact event that threatens the viability of the organization and is characterized by ambiguity of cause, effect, and means of resolution, as well as by a belief that decisions must be made swiftly." (Pearson & Clair, 1998: 60).

This definition highlights the following important points:

- **A crisis is a low-probability event**. Crisis events are usually not perceived to be frequent, and consequently, are not always planned for.

- **A crisis can have a high damage impact**. A crisis can devastate an organization, or at least, leave it in a highly compromised state.

- **A crisis is laden with ambiguity**. The reference to ambiguity means that the causes and effects of the crisis might be unknown, at least initially. Crises can have multiple interrelated factors that can lead to a "trigger event", which initiates the crisis. Ambiguity also implies that the manner of resolving the crisis is often debatable. In other words, several viable options may be available to the crisis management team in its quest to palliate the impact of the crisis.

- **A crisis requires swift decision making.** Effective actions to contain the crisis from becoming widespread should be taken immediately. The failure to act decisively during the acute stage of the crisis can often intensify the ordeal.

Crisis management is a term that encompasses the process by which organizations address crises. Specifically, Pearson and Clair (1998: 61) defined organizational crisis management as "a systematic attempt by organizational members with external stakeholders to avert crises or to effectively manage those that occur." Crisis management seeks to soften the impact of those negative events that occur to the organization and its stakeholders. An emphasis on maintaining positive relationships with external stakeholders is an important byproduct of crisis management. Further into the paper, we will overview a crisis management framework, but first, the trilogy of crisis events that occurred in China will be presented next.

THE TRILOGY OF CRISIS EVENTS IN CHINA

The SK-II Crisis

The SK-II product line of cosmetics is manufactured by Proctor & Gamble (P&G) in Japan and distributed to stores in Australia, China, Hong Kong, Japan, Korea, Malaysia, Singapore, Taiwan, the United Kingdom, and the United States. In the United States, the product line is available through Saks, with a market comprising high-end consumers.

The SK-II crisis began on September 14, 2006, when authorities in South China's Guangdong Province detected chromium and neodymium in a type of SK-II cosmetic. Because these metals can cause skin irritation and disease, they are banned in all cosmetics in China. Sales of SK-II in China represent less than seven percent of the brand's global sales (Crandall, Parnell, Xihui, & Long, 2007).

2

Initially, P&G denied there was a problem with the cosmetics, instead stating that it was working with the authorities to verify the validity of the findings. After the types of allegedly contaminated SK-II products increased to nine, the company reluctantly agreed to offer refunds to consumers. To be eligible for those refunds, consumers had to bring the product back to the store of purchase with no less than one-third remaining, complete and sign a form acknowledging that the product was of good quality, and wait several weeks for a refund to be processed (*China Daily*, 2006a; Guan, 2006a). On September 21, hundreds of Shanghai women sought refunds at P&G's specified locations, only to become frustrated when told that their refunds would take three weeks to process. On September 22, P&G announced that it would suspend its refund operations due to security concerns. A few hours later, tempers flared as an angry group of consumers kicked down the front door at P&G's Shanghai office. Media calls to P&G officials in Guangzhou and Shanghai were not returned. The company's China website was reportedly hacked that weekend. Some retailers of the SK-II products began offering immediate cash refunds to customers after P&G suspended its refund program (*China Daily*, 2006b, 2006c).

The Sharon Stone Crisis

A major earthquake measuring 7.8 on the Richter scale jolted Wenchuan County in southwest China's Sichuan Province on May 12, 2008 (Xinhua, 2008a), resulting in almost 70,000 deaths. An outpouring of relief efforts from around the world followed to help the victims of this tragedy. In addition, the three days from May 19 to 21 were declared as national mourning days by the Chinese government for the earthquake victims.

The tragedy took a strange twist during the Cannes Film Festival on May 24, however. During an interview, actress Sharon Stone offered these comments on the earthquake in China:

> "Well you know it was very interesting because at first, I'm you know, I'm not happy about the ways the Chinese were treating the Tibetans because I don't think anyone should be unkind to anyone else. And so I have been very concerned about how to think and what to do about that because I don't like that. And then I've been this, you know, concerned about, oh how should we deal with the Olympics because they are not being nice to the Dalai Lama, who is a good friend of mine. And then all this earthquake and all this stuff happened and I thought: Is that karma, when you are not nice that bad things happen to you …" (Gardner, 2008)

The "Karma" comment created an uproar in the news media and a wave of criticism on Internet blogs in China since the actress was suggesting that the country's earthquake was retribution for its policies on Tibet (Passariello & Meichtry, 2008). Chinese citizens left Internet messages, saying she was ignorant of the Tibet issue and had no sympathy for those who were suffering. One online comment, from a woman calling herself Mariah, summed up the reaction of many Chinese citizens: "These kind of remarks deeply hurt Chinese people's feeling and are totally unacceptable" (Roberts, 2008: 12).

The media reported that protestors were tearing down billboards featuring the actress in advertisements (McLaughlin & Kaiser, 2008). In addition, many music stores on the Chinese mainland and in Hong Kong cinemas pledged not to show her films again. Ng See-Yuen, the founder of the UME Cineplex chain, said films featuring Stone would be banned from any UME cinema in Hong Kong and the Chinese mainland. Moreover, the Shanghai International Film Festival had also decided to permanently ban Stone and her films (Du, 2008).

The Sharon Stone comment also created a crisis for Dior, the French company that has used Stone in their ads. Dior offers upscale clothing, cosmetics, and apparel, and has a branch in China, appropriately called Dior China. On May 27, 2008, three days after the Stone comment, Dior China issued the following

3

statement through SINA, a popular news-oriented website in China: "We absolutely disagree with Stone's remarks and are deeply sorry for them" (SINA, 2008a).

On May 28, Dior China, issued another statement noting that Stone was "deeply sorry" for the offense and anger caused by her comment, and had offered to take part in relief work in the Sichuan disaster area. However, in an interview in the *New York Times*, she insisted her comments in Cannes had been taken out of context, that she resisted Dior's efforts to control the crisis, and that the apology issued in her name distorted her words (Horyn, 2008). On May 31, Stone seemed to make amends for her misstep, issuing a formal statement of apology through CNN. However, a survey of 250,000 Chinese citizens found that 69 percent did not accept her apology and vowed to never forgive her (Xinhua, 2008b). Many Chinese citizens wrote letters to Dior China to express their opinion indicating they would never buy any Dior products as long as the company was affiliated with Sharon Stone (Passariello & Meichtry, 2008).

Under pressure from its Chinese consumers, Dior China began removing all of its advertisements with Stone's image nationwide (McLaughlin & Kaiser, 2008). On June 2, the company issued an official statement indicating it would stop using Sharon Stone as a spokesman in China (Roberts, 2008).

The Melamine Milk Crisis

Composed of nitrogen, carbon and hydrogen, the compound melamine was invented in the 1830s by a German scientist and came into fashion as a material used to make plastics and laminates in the late 1930s. In some tests used to determine the nutritional value of a foodstuff, melamine shows up as a protein so manufacturers can use the compound to make their products appear more nutritious. Unfortunately, melamine is toxic and inside the body it can cause kidney stones and renal failure (Pickert, 2008).

On June 28, 2008, the People's Liberation Army No. 1 Hospital in Gansu's provincial capital of Lanzhou received the first infant patient with kidney stones. His parents told doctors that they had been feeding the baby milk produced by the Sanlu Group in Shijiazhuang, Hebei province since the baby was born. Within two months, fourteen infants with similar problems had been admitted to the hospital (Cheng, 2008). By September 11, 2008, cases had been reported in other provinces including the Ningxia Hui Autonomous region, Shandong, Jiangxi, Hubei, Shanxi, Jiangsu, Shandong, Anhui and Hunan. All of the affected infants were fed the formula produced by the Sanlu Group. The contamination of Chinese milk products with the toxic industrial chemical melamine had rapidly become a major scandal, complete with widespread and global media coverage.

By September 20, 2008, the World Health Organization (WHO) reported more than 54,000 children in China had sought medical treatment, 12,000 were hospitalized and at least four infants died from melamine-contaminated dairy products (Schlein, 2008). The number of infants affected was likely much higher than the WHO reported, however, as concerned parents were still queuing up at hospitals throughout China to have their children examined.

By September, the controversy had spread outside the Chinese mainland. Five children in Hong Kong had been diagnosed with kidney stones as a result of drinking tainted Chinese milk formula (Liu, 2008). The melamine was even found in a third Chinese-made dairy product, White Rabbit Candy, a popular milk-flavored toffee, causing its producer to halt domestic and foreign sales of the candy (Tan, 2008). Public health officials in Taiwan also announced their findings of melamine-tainted instant coffee, milk tea and chicken-and-corn soup. The import of all such products into Taiwan was banned, including instant coffee made by the popular Taiwan brand Mr. Brown, which is made in China.

In other locations, Japan's Marudai Food Co. issued a voluntary recall of five China-made products, saying they may contain the toxin melamine. Brunei ordered a blanket ban on all China-made milk

4

products and dairy items. Malaysia imposed a "level six import ban" on all Chinese dairy products. Bangladesh also started its own crackdown and ban on three brands of Chinese-made milk powder. Tanzania and Gabon were the first African nations to impose bans on Chinese dairy products, followed shortly thereafter by Burundi (Tan, 2008). Finally, on September 25, the 27-nation European Union banned imports of baby food containing Chinese milk (Liu, 2008). By this time, the milk crisis had become a worldwide scandal and crisis not only for milk companies like the Sanlu Group, but also for the Chinese government.

The Sanlu Group began to receive complaints about its baby formula milk powder in March, and the firm initially claimed that its products had repeatedly passed quality tests, met national quality standards, and that sick babies must have been fed counterfeit milk powder that used the Sanlu brand name. Later, they confirmed the problems by importing melamine-testing equipment before early August, which was proved by Fonterra (Fonterra, 2008), which owns 43 percent of Sanlu. For a time afterwards, however, Sanlu neither reported the problem to the Chinese government nor revealed the information to the public until September 11, at which time the Ministry of Health suspected melamine contamination.

On the morning of September 11, a company spokesperson interviewed by a reporter from the People Daily Online, still insisted that its products were in strict accordance with national standards and met quality tests, and that it believed that the quality inspection department would give a clear explanation later (Sina, 2008b). Ironically, the Sanlu Group issued an announcement later that day recalling all of its 700 tons milk because of the melamine contamination.

Faced with increasingly angry criticism from Chinese parents and the public, Zhang Zhenling, Sanlu's vice president, delivered an apology letter on behalf of the company at a news briefing on September 15, four days after the public became aware of the contamination. The apology expressed regret and included a declaration to recall all the infant milk powder produced prior to August 6, as well as an optional recall for milk produced after that date if consumers have concerns about sick infants. But the late apology and the dismissal of Sanlu president Tian Wenhua--who thought the company was totally innocent and had been disgraced by the fraudulent milk suppliers--did not seem to appease the public sufficiently, as many citizens lost confidence in the Sanlu brand.

A CRISIS MANAGEMENT FRAMEWORK

Understanding a basic framework of crisis management is essential in evaluating an organizational crisis. The framework developed by Crandall, Parnell, & Spillan (2009) follows a holistic view of crisis management that includes the landscape survey, strategic planning, crisis management, and organizational learning. Figure 1 depicts this framework.

5

Figure 1 – A Crisis Management Framework

	Landscape Survey	Strategic Planning	Crisis Management	Organizational Learning
The Internal Landscape	What crisis threats exist inside of the organization?	How can the organization plan for crisis events?	How can the organization manage its internal stakeholders when a crisis occurs?	What did the organization learn from this crisis?
The External Landscape	What crisis threats exist OUTSIDE of the organization?	What planning has been done OUTSIDE of the organization that can help prepare for these crisis events?	How can the organization manage its EXTERNAL stakeholders when a crisis occurs?	What was learned OUTSIDE of the organization from this crisis?

Landscape Survey

Before an organization can effectively plan for crisis events, it must first conduct an assessment of its internal and external environments. This process is called the landscape survey (Crandall, et al., 2009). Figure 1 depicts the landscape survey at the far left. The top half of the landscape survey represents the crisis threats that exist inside of the organization. Typically, these are weaknesses within the organization that need to be addressed, lest they lead to a crisis. An example would be a poorly implemented safety policy, which if not addressed, could lead to the occurrence of a workplace accident.

The lower half of the landscape survey focuses on threats occurring outside of the organization, the external landscape. At the forefront of these threats is the nature of the industry that the organization resides in. For example, companies in the chemical industry are concerned about hazardous chemical spills. In the food manufacturing industry, threats related to food-borne illnesses such as e-coli are of concern. Companies operating across international borders face threats related to the political stability and cultural differences of the host country.

Strategic Planning

Strategic planning refers to conducting activities that seek to prevent those crises that may occur, and mitigating the ones that do occur. Forming a crisis management team is necessary in order to carry out this function. Crisis management teams are charged with compiling a crisis management plan that spells

6

out general guidelines for managing a crisis (Coombs, 2006). Such guidelines include who should talk to the media and procedures for managing specific crises unique to the organization.

Within the external landscape, there are organizational stakeholders that also work at preventing and managing crisis events. For example, government agencies typically enact legislation that helps to prevent future crisis events in certain industries. Examples abound, including the Federal Aviation Administration (FAA) and the Transportation Security Administration (TSA), which work to ensure safety in the air travel industries. Some nongovernmental entities impose additional standards through various trade and manufacturing associations that exist for a particular industry.

Crisis Management

The crisis management stage addresses the immediate occurrence of a crisis event. The primary focus is to get the organization up and running and returning operations back to a normal stage. Within the internal landscape, the organization makes efforts to manage its internal stakeholders, the owners and the employees. The emphasis at this point is on clear communication with the internal stakeholders, making sure that they are not left out of the loop in terms of important information related to the crisis.

Within the external landscape, management must work with its stakeholders that exist outside of the boundaries of the organization. Again, clear communication is often the main task during this stage. Government authorities, customers, suppliers, the media and the local community must be kept abreast of how the organization is progressing in the management of the crisis. When specific stakeholders are affected by the crisis, more direct communication will need to be aimed toward these groups. For example, in the event of a product recall, customers will need to be informed as to how to return their merchandise and receive a fair reimbursement.

Organizational Learning

After the crisis is over, the affected organization must take time to learn from the event. At a minimum, management must evaluate how the crisis was handled and what changes need to be made in the crisis management plan. This is the main activity that takes place within the internal landscape. The optimal time period to learn from a crisis is soon after it has transpired. If too much time elapses before an evaluation of the crisis takes place, management may reach a stage termed "forgetfulness" (Kovoor-Misra & Nathan, 2000). In this stage, the organization has returned to normal operations and the motivation to evaluate and learn from the crisis has waned.

Within the external landscape, industries often reevaluate and renew their procedures after a crisis. The airline industry has changed dramatically in terms of security measures after America's worst terrorist incident on September 11, 2001. External stakeholders to the organization may also change their outlooks after a crisis. In terms of crisis awareness, such stakeholders will be more cognizant and compassionate towards an organization that has experienced a crisis. For example, the Virginia Tech massacre of 2007 occurred when student, Seung Hui Cho went on a shooting rampage, killing 32 people. The result was a wave of sympathy and solidarity among many citizens throughout the country, and worldwide. A crisis will also bring a wave of public concern, with attention being focused on how to ensure a similar crisis does not occur again. After the Virginia Tech massacre, a number of colleges and universities began revamping their on-campus security plans.

APPLYING THE FRAMEWORK: LESSONS
LEARNED IN THE MANAGEMENT OF CRISES

Using the crisis management framework described above, we will now examine the trilogy of events that occurred in China.

Landscape Survey

In choosing a spokesperson, an organization operating in China needs to understand the unintended symbolic power of that spokesperson.

Actress Sharon Stone's unexpected comments immediately damaged Dior China's reputation. Although Dior did nothing to bring about the crisis, one could argue that Stone might not have been the best spokesperson for the company in the first place. Sometimes spokespersons can carry negative perceptions with consumers, not because of what they say, but because of something they represent. Proctor & Gamble (P&G) found this out when they employed Taiwanese model Lin Zhiling, as a brand spokesperson. Zhiling's father once campaigned for Chen Shuibian in his bid to become Taiwan's president. Because Shuibian is an ardent supporter of independence for the province, many Mainland Chinese consumers have linked P&G to Taiwanese independence through its affiliation with Zhiling (Crandall, Parnell, Xihui, & Long, 2007). P&G officials, however, have stated that the firm holds no political position on the matter. Nonetheless, in August 2005, a group of "netizens" (i.e., citizens utilizing the Internet) sought to secure 400,000 signatures on a petition opposing Lin Zhiling and P&G products. This group has committed to a boycott of all P&G products as well as those produced by plants her father owns in Mainland China (*Taipei Times*, 2005).

A spokesperson can also generate negative perceptions if they have engaged in controversial film projects. Pond Cosmetic Company hired as its brand spokesperson Tang Wei, a female star in the popular film *Lust, Caution*. The actress drew the criticism of the Chinese government, however, for several pornographic scenes and for the historical retort in the film (Fitzsimmons, 2008). A number of scenes were deleted from the version shown in China, but many consumers were able to access the complete film on the Internet. As with the previous example, Pond advertisements featuring Tang were banned from Chinese television.

As these examples illustrate, P&G and Pond suffered both financial and reputational losses as a result of their decisions to hire these spokespersons. So did Dior China. The key lesson is that firms need to consider the long term fit between its products and markets, and the individuals it employs to represent them.

An organization must be cognizant of the political realities of operating in China.

China is a country that is very different from its western counterparts. Political issues are treated sensitively and seriously in China, and the media plays an important guidance role under the control of the government. Compared with its western counterparts, China exerts more centralization with political issues, especially on the subject of China's unification. Moreover, the Chinese people have a deep patriotic feeling for China's unification. Therefore, any topics associated with China's unification are very sensitive in the eyes of both the Chinese government and its citizens. China once banned one of Taiwan's top pop stars, A-Mei, after she sang the island's national anthem at the inauguration of President Chen Shuibian in 2000 (BBC, 2000).

8

A company spokesperson with strong political positions can easily be misunderstood as the firm's position as well. If the spokesperson is controversial in the eyes of the host government, image problems are inevitable. A spokesperson represents the style, image and characteristics of a brand and many people may purchase products because of advertisements featuring that individual. But the spokesperson also represents the political bias of the company, whether the company is aware of that or not. Hence, firms like P&G and Dior should reconsider the use of its spokespersons when considerable consumer dissatisfaction may exist.

The rising middle class is becoming a more vocal stakeholder in China.

Multinational corporations have known for a number of years that the rising middle class in China represents a large potential market. What should also be remembered is that, like the United States and other developed countries, the middle class in China is becoming more vocal in its demand for truthful advertising and products that deliver what the ads say they will provide. As Mao Shoulong, professor of Sociology at Renmin University of China put it, "For all foreign brands, the most important thing is to win the heart of Chinese consumers and to maintain their credibility," (Lan, 2007 quoted from China Economic Net). The SK-II incident illustrated how Proctor & Gamble did not anticipate this new level of consumer advocacy in China.

Strategic Planning

It is essential for management to develop a crisis anticipation outlook.

The field of crisis management was officially recognized in America after Johnson & Johnson (J&J) experienced product sabotage when its Tylenol Extra Strength pain reliever was laced with deadly cyanide (Mitroff & Anagnos, 2001; Pines, 2000). Crisis management became more prominent in China after many organizations were forced to address problems associated with SARS (Zhang, Crandall &Parnell, 2007). The onset of crises in organizations is a common occurrence today, but unfortunately, many organizational leaders still carry an "it can't happen to us" mentality (Barton, 2001; Pearson & Mitroff, 1993). Managers are presented with warning signs, but they fail to heed them, which ultimately leads to a crisis.

At the beginning of the SK-II crisis, P&G's initial response was one of denial even after the official sale ban in China. In the melamine milk crisis, the Sanlu Group received complaints about its baby formula milk powder in March, and initially claimed that their products had repeatedly passed quality tests, met national quality standards, and that the sick babies must have been fed counterfeit milk powder that used their brand name. There were clear warning signs of the crisis for both P&G and the Sanlu Group, but neither of their management teams were able to manage the initial stages of the crisis effectively. On the contrary, Sanlu's former president insisted that the company was totally innocent and had been disgraced by alleged fraudulent milk suppliers. This risk denial stance only served to escalate the crisis further.

It is essential for an organization to have a crisis management team and a crisis plan in place.

The crisis management team and the crisis management plan represent the core of an organization's crisis planning efforts. The crisis management team is charged with developing a list of threats facing the organization; also known as the crisis vulnerability assessment. The crisis management plan revolves around addressing these threats, as well as providing other guidelines on how the organization is to respond to crises. Of the three companies involved, P&G was probably the most familiar with the management of crises. The internal landscape of Proctor & Gamble reveals a company well versed in

9

handling crisis events. What is particularly interesting about this case is that several fundamental crisis management principles were violated. P&G immediately went into a denial mode and when finally confronted by angry customers, implemented a rule laden refund policy. Even what is more surprising is the fact that P&G is an experienced multinational organization. Such companies are usually well versed in the procedures of crisis management. Indeed, P&G is no stranger to public outcries that create crises. In the early 1980s, the company was hit by rumors that its corporate logo was a satanic symbol and its CEO was a devil worshipper (Cato, 1982). P&G did a good job responding to this crisis, and in the process, learned some basic facts about crisis management. However, its response to the SK-II crisis was faulty.

Concerning the melamine crisis, it is apparent that Sanlu had neither an active and prepared crisis management team, nor a comprehensive crisis management plan in place. Hence, the crisis that followed should not have come as a surprise. Compared with P&G and Sanlu, Dior China responded more effectively. Unfortunately, however, Sharon Stone's initial denial created more problems for the firm.

Spokespersons should be cautious when addressing political issues.

Tibet is a recognized part of China. The Dalai Lama has been campaigning for Tibet's independence for many years since late 1950s. From its perspective, the Chinese government has instituted democratic reforms, abolished the feudal serf system, and has allocated a significant amount of resources to improve the life of Tibetans. Although actress, Sharon Stone is entitled to her own opinion of the Tibet situation, her attempt to link it to an unrelated tragedy is reckless. From an American perspective, this would be akin to linking human suffering from Hurricane Katrina to one's disagreement with some aspect of United States foreign policy. One simply does not cause the other, and to suggest a connection is ill-advised at best and callous at worst.

In fact, Sharon Stone was not the first celebrity who was repulsed by the Chinese public following questionable and arguably insensitive political comments. Jacky Chen, one of the most popular kung-fu stars in China, referred to a gun-shooting incident that occurred during Taiwan's 2004 presidential election as a joke (Ent, 2008). The comment quickly received strong opposition from some politicians in Taiwan. Others displayed signs at the airport reading "Go back home, Jacky Chen" when he traveled there for a film award ceremony for the first time since his "joke" comment four years later. Hence, one sentence kept Chen away from Taiwan for four years, and he was still not completely welcome when he arrived.

An organization should keep a good social relationship with the news media.

Many managers assume the media are the enemy and out to discredit the organization when a crisis occurs (Sherman, 1989). On the contrary, the media are not the enemy; but are actually beneficial in both crisis communication and general propaganda, because they are able to reach important audiences (Weiner, 2006). The news media are more likely to misrepresent a situation when they lack the facts. The essential rule is to cooperate with the media and understand that journalists by training are always suspicious. (Barton, 2001; Sherman 1989; Wailes, 2003).

Of the three cases in the trilogy, Dior China utilized one of China's most popular websites, SINA, to address crisis concerns and clarify the company's stance. The Sanlu Group tried to conceal the truth and postponed presentation to the media, creating even more suspicion. When journalists lack reliable information, they often pursue and report rumors. In the Sanlu case, some journalists even traced negative reports about the tainted milk of the company back to incidents in 2004 that were not directly related to the current case.

10

Crisis Management

Prompt action on the part of the organization is needed to decrease hostile emotions from the public.

Dior China took prompt action to address the Sharon Stone crisis, distancing itself from the context of her remarks. The firm's effort to issue a statement on her behalf illustrates its concern, but the extent to which Stone was involved in preparing and refining the statement is unclear. In the end, Dior China found itself in an unenviable position. Battered by Stone's hesitation to address the comments in a responsible manner, the company took what was probably the most appropriate course of action by removing advertisements with Stone's image and cutting ties with Stone in the Chinese market. The firm's reputation was at stake, and prompt, decisive action was justified.

Dior's reaction was in stark contrast to the crisis P&G faced with its SK-II products. As mentioned previously, P&G went into a denial mode and required customers to go through a lengthy refund process. Likewise, the Sanlu Group moved slowly in its response to the crisis it faced.

An organization needs to understand the power of the Internet when a crisis occurs.

The Internet can substantially influence the outcome of a crisis. One of the first companies impacted by an Internet crisis was ironically, a computer hardware company. Intel introduced its Pentium chip in 1994, but soon encountered a major problem when Lynchburg College math professor, Thomas Nicely, discovered a computer error while he was working with a math problem (Weiss, 1998). Soon, his spreadsheet showing how the Intel chip could incorrectly calculate certain math problems was available on the Internet (after he had sent an email to a colleague describing the problem). What infuriated consumers was not that the chip had a problem, but that Intel was reluctant to issue a replacement chip without asking a lot of questions on how the consumer used their computer (Clark, 1994).

The first case of tainted milk resulting in infant kidney stones was disclosed on the Internet on the popular Tianya Forum in June 2008. Only one week after September 11—the day the melamine contamination of the milk was made public—there were more than 20 million new reports of various kinds discussing the melamine tainted milk only in Google, as well as innumerable other Chinese forums like Tianya. Hence, knowledge of the crisis became widespread in a short period of time. To address such crises, firms must be poised to act quickly and decisively. Sanlu seemed to have overlooked the speed at which such information can travel.

In the case of SK-II, a group of "netizens" sought to secure 400,000 signatures on a petition opposing Lin Zhiling and P&G products. This group had committed to a boycott of all P&G products as well as those produced by businesses her father owned in Mainland China (*Taipei Times*, 2005). In the case of the Sharon Stone crisis, the "karma" comment created an uproar in the news media and a wave of criticism on Internet blogs in China.

Customers and other stakeholders tend to forgive honest mistakes.

After receiving the first complaints, the Sanlu Group claimed that its products were safe and met national standards for quality. Even before the former president and general manager of the company was detained, she still insisted that the company should be totally innocent. In fact, the company knew about the contamination in early August and attempted to resolve it in a subversive manner with bribes. When

11

everything was made public, it was not surprising to see a serious crisis development. The Sanlu Group was on the verge of bankruptcy due to the milk scandal. Had they taken a more open and assertive approach to managing the crisis, the outcome would probably not have been nearly as severe.

A Chinese moon cake producer of more than eighty years, Nanjing Guanshengyuan, suffered a similar problem. China Central Television (CCTV) disclosed on September 2001 that the company used ingredients leftover from 2000 to produce new moon cakes for sale the following year. The general manager of the company said during an interview that such a practice was very common. Moreover, the company even issued a letter to the public saying that the related report from CCTV was fabricated, claiming its products totally met the national quality standard. The reporter from CCTV refuted the argument with evidence, and customer outrage triggered a downward spiral for the firm. The crisis lasted until February 2002 when it resulted in bankruptcy (Ping, 2005). In both of these cases, a statement of apology would have been more appropriate, as customers due tend to forgive mistakes when they are honest.

Organizational Learning

A repentant attitude carries significant meaning in the Chinese culture.

All companies will make mistakes from time to time, but they should be corrected with diligence and sincerity. It is clear that Sharon Stone, an actress and celebrity, made an ill-advised comment pertaining to the earthquake. Although Dior China later apologized on her behalf, she followed up with contradictory comments of her own. This kind of refusal and arrogance (as perceived by the Chinese market) is counterproductive and especially at a time when the country was overcoming the aftershocks of a major and deadly earthquake. The consumer boycotts rejections by Chinese movie theaters were no surprise. By the time Stone apologized for the comment, the damage had already been done.

In the Dior China crisis, if Sharon Stone had demonstrated her compassion and concern for the earthquake victims and had moved quickly to make amends, it is likely that the negative repercussions could have been contained, at least to an extent. The Sanlu Group had the same problem in that they could have offered apologies early into the crisis, but instead, chose to shift the blame for the problem to other parties.

Companies must acknowledge that the customer is king, even in other cultures.

Companies should always put the well being of their customers first. Long term profits hinge on a company's ability to take care of customer needs. History confirms this point. Consider the case with Johnson & Johnson's (J&J) Tylenol Extra Strength pain reliever. In 1982, cyanide was added to Extra Strength Tylenol capsules after the product had left the manufacturing facility. The product sabotage crisis resulted in the deaths of seven Tylenol consumers who all lived in the Chicago area. Johnson & Johnson quickly responded to the crisis by recalling all batches of Extra Strength Tylenol from the market, a move that cost the company in excess of $100 million (Hartley, 1993).

Sanlu and P&G could have learned from Johnson & Johnson. Halting reimbursements for refunds of opened products did not help alleviate the crisis; in many respects, these actions exacerbated it. Such measures only irritate the public, creating more difficulties for the firm. The Sanlu Group sought to minimize short term costs, which in the end resulted in substantial long term expenditures.

The organization should always take responsibility for its mistakes.

12

The Sanlu Group blamed illegal dairy dealers for adding melamine to milk, as if the company itself had nothing to do with the scandal. The public was not convinced. More than 70 percent of those responding to on an online survey thought the company should take the major responsibility rather than its milk suppliers (Ye, 2008). Even the apology letter became an object to be criticized by the public since it appeared less than forthright in its management of the crisis. The Sanlu Group seemed to avoid addressing the problem head on, taking limited action instead and hoping for the best.

Confronted with a similar situation, KFC China Baisheng Co. Ltd. chose a different way to resolve its crisis. In 2005, reports emerged that KFC was using a poisonous seasoning, Sudan Red I. The company ordered all its fast-food restaurants to stop selling all the products suspected of including the ingredient at once. Although the company later found that the suspected ingredient came from the seasonings purchased from other suppliers, the firm still took responsibility for the problem and offered refunds to customers. The considerate attitude of the Group won the "applause" of many consumers, resulting in the dissolution of the crisis in only three weeks (Sun, 2006). Figure 2 offers a series of lessons that can be learned from these events, several associated with each stage in the framework.

CONCLUSION AND FUTURE DIRECTIONS

This paper addressed the SK-II, Sharon Stone, and melamine milk crises in China within the crisis management framework developed by Crandall and associates (2009). Although there are significant situational differences among the crises, collectively they suggest a number of lessons learned with respect to the stages in the framework: Landscape survey, strategic planning, management of the crisis, and organizational learning.

Several opportunities exist for future research. First, the present study examined three prominent crises in China, but did not consider others. A closer examination of all major crises in a given year, for example, could provide greater insight into key crisis management patterns common to Chinese firms.

Second, the generalizability of crisis management practices across cultures and nations remains unclear. While it appears plausible that frameworks such as the one presented herein may be applicable in various economic and political contexts, the differences and similarities of such contexts require additional investigation. For example, in what ways does crisis management practice in emerging economies differ from that in developed nations? To what extent is crisis management practice contingent on specific cultural attributes? An examination of crises in other nations, particularly emerging ones, could shed light on these questions.

Third, more research that compares and contrasts different approaches to crisis management is worthwhile. Learning from successful firms not only contributes to practical contributions to the field, but also helps scholars rethink and revise their framework and models.

Fourth, the application of early warning systems is an area that has received relatively little research to date. Because crisis avoidance is the most desirable outcome for firms, introducing systems that enable managers to identify prospective crises before they occur is useful.

Finally, the need to link crisis management theory and practice remains a priority in the field. The present study supports this effort by applying a contemporary crisis management framework to recent crises. More work is needed in this area, however.

13

Figure 2 – Lessons Learned in the Management of Crises

	Landscape Survey	Strategic Planning	Crisis Management	Organizational Learning
The Internal Landscape	☐ In choosing a spokesperson, an organization operating in China needs to understand the unintended symbolic power of that spokesperson	☐ It is essential for management to develop a crisis anticipation outlook ☐ It is essential for an organization to have a crisis management team and a crisis plan in place	☐ Prompt action on the part of the organization is needed to decrease hostile emotions from the public	☐ A repentant attitude carries significant meaning in the Chinese culture
The External Landscape	☐ An organization must be cognizant of the political realities of operating in China ☐ The rising middle class is becoming a more vocal stakeholder in China	☐ Spokespersons should be cautious when addressing political issues ☐ An organization should keep a good social relationship with the news media	☐ An organization needs to understand the power of the Internet when a crisis occurs ☐ Customers and other stakeholders tend to forgive honest mistakes	☐ Companies must acknowledge that the customer is king, even in other cultures ☐ The organization should always take responsibility for its mistakes

14

REFERENCES

Barton, L. *Crisis in Organizations II,* Cincinnati, Ohio: South-Western College Publishing, 2001.

Barton, L. *Crisis Leadership Now: A Real-World Guide to Preparing for Threats, Disaster, Sabotage, and Scandal*. New York, NY: McGraw-Hill, 2008.

BBC, "China bans Taiwan's Madonna." *BBC News Online*, 2000. Retrieved 5/24/2000, from http://news.bbc.co.uk/2/hi/asia-pacific/761908.stm

Carroll, A., & Buchholtz, A. *Business & Society: Ethics and Stakeholder Management*. Mason, Ohio: Thomson South-Western, 2003.

Cato, F. "Proctor & Gamble and the Devil." *Public Relations Quarterly,* 1982, 27(3), 16-21.

Cheng, C. "Pay attention to the taxation problems when companies recall the tainted milk formula," 2008. Retrieved 9/26/08, from http://www.ctaxnews.com.cn/syxw/xwxzt/200809/t20080924_1532169.htm

China Daily (September 19). "Actress accused of false advertising," 2006a. Retrieved 11/28/06, from http://www.chinadaily.com.cn/china/2006-09/19/content_692408.htm

China Daily (September 23). "Consumers angry as SK-II pulled from shelves," 2006b. Retrieved 11/28/06, http://www.chinadaily.com.cn/china/2006-09/23/content_695363.htm

China Daily (September 26). "Consumers turn cautious on P&G skin-care row," 2006c. Retrieved 11/28/06, http://www.chinadaily.com.cn/china/2006-09/26/content_696526.htm

Clark, D. (December 14). "Intel balks at replacing Pentium chip without asking owners any questions." *Wall Street Journal*, 1994, A3.

Coombs, W. *Ongoing Crisis Communication: Planning, Managing, and Responding* (2nd ed.). Thousand Oaks, CA: Sage, 2007.

Coombs, W. *Code Red in the Boardroom: Crisis Management as Organizational DNA*. Westport, Connecticut: London, 2006.

Crandall, W. R., Parnell, J. A., & Spillan, J. E. *Crisis Management in the New Strategy Landscape*. Thousand Oaks, CA: Sage, 2010.

Crandall, W. R., Parnell, J. A., Xihui, P., & Long, Z. « When crisis management goes abroad: The demise of SK-II in China." *Journal of International Business Research and Practice*, 2007, 1(1), 38-49.

Du, W. (May 30). "Netizens annoyed by Stone's ignorance." *China Daily Online*, 2008. Retrieved 5/30/2008, from http://www.chinadaily.com.cn/china/2008-05/30/content_6724266.htm

15

Ent . "Go back to Taiwan for the first time since the "joke" remark, receiving the protest of 'Go back home'." 2008. Retrieved 6/19/08, from http://ent.163.com/08/0619/08/4EPMSFDI00031H2L.html

Fink, S. *Crisis Management*: *Planning for the Inevitable*. Lincoln, NE: iUniverse, Inc. 2000.

Fitzsimmons, E. (May 16). "Ban exposes China's ad censorship anomalies." *Campaign,* 2008, Issue 19, 17.

Fonterra. Statement by Fonterra CEO Andrew Ferrier to media conference. *Media Release,* 2008. Retrieved 9/15/2008, from http://www.fonterra.com/wps/wcm/connect/fonterracom/fonterra.com/our+business/news/media +releases/statement+by+fonterra+ceo+andrew+ferrier+to+media+conference

Gardner, D. "Why do we say silly things?" *The Ottawa Citizen*, 2008. Retrieved 5/30/08, from http://www.canada.com/ottawacitizen/columnists/story.html?id=81b2c80c-ddc3-4f4c-94a3-6f9c98f8f608

Greening, D., & Johnson, R. "Do managers and strategy matter? A study in crisis." *Journal of Management Studies,* 1996, 33(1), 25-51.

Guan, X. (September 18). Refunds offered on harmful cosmetics, *China Daily*, 2006. Retrieved 11/26/06, from http://www.chinadaily.com.cn/china/2006-09/18/content_691155.htm

Hartley, R. *Business ethics: Violations of the public trust.* New York: John Wiley & Sons, 1993.

Horyn, C. (June 1). "Actress Stone and Dior differ over apology." *New York Times online*, 2008. Retrieved 9/6/2008, from http://www.nytimes.com/2008/06/01/fashion/01stone.html?_r=1&scp=1&sq=Actress%20Stone %20and%20Dior&st=cse&oref=slogin

Kovoor-Misra, S., & Nathan, M. "Timing is everything: The optimal time to learn from crises." *Review of Business*, 2000, Fall, 31-36.

Lan, X. (May 29). "Famous brands lose face." *Beijing Review*, 2005. Retrieved 9/28/06, from http://www.bjreview.com.cn/En-2005/05-29-e/bus-1.htm

Liu, G. "Crisis Management." *China Economy Publishing House*, 2004, pp. 6.

Liu, J. "Sanlu Group stop reimbursing diagnose fee for infants." *YNET news online*, 2008. Retrieved 9/17/ 2008, from http://china.ynet.com/view.jsp?oid=43262117

Liu M. "A familiar taint: The milk crisis spotlights flaws in Beijing's food system." *Newsweek Online,* 2008. Retrieved 9/25/08, from http://www.newsweek.com/id/160895

16

Marra, F. "Crisis communication plans: Poor predictors of excellent public relations." *Public Relations Review,* 1998*,* 24(4), 461-474.

McLaughlin, K.E., & Kaiser, A. "Dior China drops stone after quake comments." *Women's Wear Daily*, 2008, 195(115), 24-25.

Mitroff, I. & Anagnos, G. "Crisis in crisis management." *Corporate Counsel*, 2001, 8(2), 58-61.

Passariello, C., & Meichtry, S. (May 30). "Dior pulls ads with Sharon Stone." *Wall Street Journal*, 2008, B.7.

Pearson, C. & Clair, J. "Reframing crisis management." *Academy of Management Review*, 1998, 23(1), 59-76.

Pearson, C., & Mitroff, I. "From crisis prone to crisis prepared: A framework for crisis management." *Academy of Management Executive*, 1993, 7(1), 48-59.

Pickert, K. "Brief history of melamine." *Time Online*, 2008. Retrieved 9/17/08 from http://www.time.com/time/health/article/0,8599,1841757,00.html

Pines, W. "Myths of crisis management." *Public Relations Quarterly*, 2000, 45(3), 15-17.

Ping C. "Crisis Management." *Contemporary World Publishing Housing*, 2005, pp.64-65

Roberts, D. (June 2). "China: Multinationals hear it online." *Business Week Online*, 2008. Retrieved 9/6/08, from http://www.businessweek.com/globalbiz/content/may2008/gb20080530_213248.htm

Schlein, L. "China's Melamine Milk Crisis Creates Crisis of Confidence." *Voice of America News Online,* 2008*.* Retrieved 9/26/08, from http://www.voanews.com/english/archive/2008-09/2008-09-26-voa45.cfm?CFID=64268891&CFTOKEN=95716309

Sellnow, T., & Seeger, M. "Exploring the boundaries of crisis communication: The case of the 1997 Red River Valley Flood." *Communication Studies*, 2001, 52(2), 153-168.

Sherman, S. (June 19) "Smart ways to handle the press." *Fortune*, 1989, pp.69-75.

Shrivastava, P. "Industrial/environmental crises and corporate social responsibility." *Journal of Socio-Economics,* 1995, 24(1), 211-217.

SINA. "Dior announcement: Absolutely disagree with the comment of Sharon Stone," 2008a. Retrieved 5/27/08, from http://ent.sina.com.cn/s/2008-05-27/16102038967.shtml

SINA. "Sanlu Group insisted their products meet national standard when responding the milk accident," 2008b. Retrieved 09/11/ 2008, from http://news.sina.com.cn/c/2008-09-11/105416273760.shtml

17

Sun, N. *Out of Crisis Gate.* Wenhui Publishing House, pp. 5-6, 173-174, 2006.

Taipei Times, (August 11). "Chinese fanatics urge boycott over Lin's green parents." *Taipeitimes.com*., 2005. Retrieved 8/11/05, from http://www.taipeitimes.com/News/front/archives/2005/08/11/2003267233

Tan, K. "Singapore finds melamine in White Rabbit candies; Chinese dairy products now banned across Asia and Africa." *Shanghaiist online, 2008.* Retrieved 9/22/08, from http://shanghaiist.com/2008/09/22/singapore_finds_melamine_in_white_r.php

Xinhua. "Earthquake measuring 7.8 Richter scale hits SW China." *Chinaview online*, 2008a. Retrieved 5/12/2008 from http://news.xinhuanet.com/english/2008-05/12/content_8153541.htm

Xinhua. "Stone's quake 'karma' apology doesn't mollify many Chinese." *China Daily Online,* 2008b. Retrieved 5/29/2008 from http://www.chinadaily.com.cn/china/2008-05/29/content_6721642.htm

Wailes, C. "Crisis communication 101." *Business & Economic Review*, 2003, 50(1), 13-15.

Weiner, D. "Crisis communications: Managing corporate reputation in the court of public opinion." *Ivey Business Journal*, 2006, March/April, 1-6.

Weiss, J. *Business ethics: A stakeholder and issues management approach*, Fort Worth, TX: The Dryden Press, 1998.

Ye, M. "Sanlu milk scandal: Self-reflection of crisis public relations." *Yahoo online*, 2008. Retrieved 9/27/08, from http://xk.cn.yahoo.com/articles/080927/1/dpn7_3.html

Zhang, L, Crandall, W.R., & Parnell, J.A. "Study on crisis management from the SK-II Case in China." *2007 International Conference on Wireless Communications, networking and Mobile Computing,* WICOM 2007.

18

Historical Overview in Management Culture:

the Case in Poland[*]

Christopher Ziemnowicz

The University of North Carolina at Pembroke

ziemnow@uncp.edu

John E. Spillan

The University of North Carolina at Pembroke

john.spillan@uncp.edu

Abstract

The traditions and conventions arising from cultural norms influence decision-making, as well as management behavior and style. The history of Poland is replete with upheavals, shifting borders, as well as economic and political changes. Its culture has been central for the endurance of the Polish people. It is important in doing business in Poland. Unique values and traditions continue to affect decision-making and the way enterprises are managed in Poland.

Introduction

Cultures exist in nations, as well as in business organizations. Because culture has a fundamental role the existence of societies and organizations, there is a broad base of research in this field. Business organizations are a significant and a diverse sector of every society. The defining measure of organizational behavior is its corporate culture. The core values of an enterprise provide the foundation for its governance, and thus its performance. Managers, employees, and numerous other stakeholders among these organizations represent an area in corporate operations where a clash of cultures can occur. According to Hofstede, "culture is more often a source of conflict than of synergy. Cultural differences are a nuisance at best and often a disaster."

Organizations consist of a collection of people with different points of view working together to achieve a common goal. Because there can be multiple points of view depending on the backgrounds of individuals, cultural disparities can erupt and alter the compatibility or success of groups of workers. After all,

---

[*] This paper is based on the authors' research appearing in Chapter 10, "Polish Mythology and Leadership" appearing in *Cultural Mythology and Leadership*, edited by: Eric H. Kessler and Diana J. WongJi; Edward Elger Publications, 2009.

employees are the foundation of corporate cultures. Workers themselves determine whether the corporate culture will help, or hinder, the achievement of goal attainment. For example, many organizations claim that dedicated innovative employees are the foundation for corporate success. However, the approach that employees take is overshadowed by their indigenous heritage, values, and behaviors. There have been many studies of the link between corporate culture and effectiveness in a variety of national settings. Examples of endeavors that encounter culture clash include wholly owned subsidiaries operating in multi-cultural environments.

The way people cooperate in their work by developing a solid understanding of the aims and goals of their department or division, particularly within multinational businesses, is important to organizational success. Work forces that are culturally different hold different beliefs, values, and patterns of thinking. Various work forces fashion structures, factors, and strategies that influence the achievement of organizational goals. Many organizations place culture as a low priority. Many managers believe it is one of those fuzzy variables that become part of the organization over time.

The Case of Poland

While stereotyping is misleading, it is often a practical way to begin the analysis of different cultural values. Hofstede's studies of cultural dimensions that were started in the 1970s are an example. Table 1 shows the generalized comparison of the five cultural dimensions between the United States and Poland. Two dimensions are almost identical (Masculinity and Long-Term Orientation), but there are notable differences with three indexes: Power Distance, Individualism vs. community, and Uncertainty Avoidance. These are broad categories that assist in providing a general overview of leadership and management in Poland. However, many conceptual and methodology issues are still unresolved. Hence, the management discipline lacks firm answers to many questions about this topic. Furthermore, stories, traditions, and beliefs associated with specific cultural groups are often ignored. The methodological complications of cross-cultural research denote shortcomings in this field.

Table 1

Geert Hofstede 5D Cultural Dimensions:
United States and Poland

PDI   Power Distance Index (hierarchal vs. cooperative leadership/power)
IDV   Individualism vs. Community
MAS   Masculinity (clear, different gender roles vs. gender equality)
UAI   Uncertainty Avoidance Index (preference for formal structure vs. informal and level of risk tolerance)
LTO   Long-Term Orientation (value family and education vs. valuing shorter feedback and innovation)
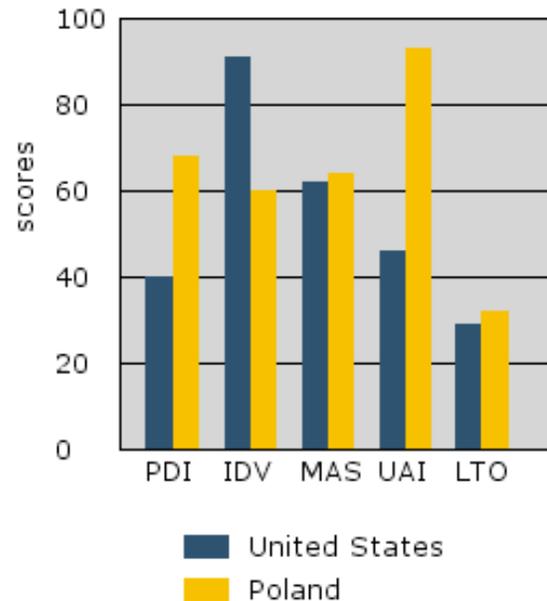
Many issues exist that affect the ability of managers to transact business in an international environment. The interplay in negotiations between individuals from different backgrounds and nations can many times

cause a clash of corporate cultures. It is unfortunate that no major methodologies exist that concentrate on analyzing the effect of corporate culture clash on the results of general business activities (Zalewska). Larsson and Risberg pointed out the impact of culture clashes arising between organizations undergoing international mergers and acquisitions.

This problem is exacerbated due to the absence of inter-cultural communication skills among employees and managers. Additionally, many management practices are equipped with competencies for international management teams to operate properly. Korzenny discovered that large American multinational corporations, which had highly competent staffs, have not methodically organized their inter-cultural management functions. The associations between firms from different cultures produce difficult problems for international managers. Concerns relating to cultural miss-communication emerge because individuals in just about any business firm are triply indoctrinated "into arise culture, into their business, and into their corporate culture." (Terpstra, p 8.)

The literature on this topic clearly maintains that the corporate culture is a major issue in the management of a business. All businesses have cultures whether they label them as a culture or not. Yet, explaining the particular culture is difficult to do. For instance, various companies may have an entrepreneurial culture, some may be bureaucratic, while others may show a customer-oriented culture. Such labels, superficially, may signify different ideas to different people.

The general characteristics of Polish culture include religion, identity, and relationships. The foundation of culture in Poland has been Roman Catholicism ever since the country officially adopted Latin Christianity in the year 966. This has historically been part of what kept the society together during numerous partitions of the lands by neighboring powers, as well as what separates Polish culture from its neighbors. To this day, the Roman Catholic traditions have a bearing on life and culture in Poland. It serves the nation and society with a sense of solidarity and constancy. This also plays a role in the Polish identity that has been retained during centuries of invasion and occupation by its neighbors. This unbroken cultural identity has increased the value the nation's recently attained autonomy. A strong sense of community, as well as commitment to and involvement in the life of the country is also characteristic of Poles. It leads to another characteristic as a family-focused society. Its citizens build and maintain close personal relationships. However, given the nation's history of foreign occupation, outsiders first need to earn trust. These characteristics are important in conducting business in Poland, but there are many additional nuances.

Culture and management that have been important and critical to the delivery of management practices in the Polish economy have taken on new dimensions. They have become, in some cases, substitutes for the old Polish myths. One example of legacy Polish traditions in management culture were the long era where the concept of "it is not mine, so I do not care" thinking was the expected response. This attitude is incompatible within a market-oriented economy. Nevertheless, this illustrates how ideas among nations can be expressed with unique beliefs, values, and points of view. As soon as new managers presented high productivity goals that are very efficiency oriented, Polish employees became angry because there was such a markedly different approach from the management rules of the past. Yet, productivity and increased sales are critical to the workers' success and survival.

Because Poland has progressed through a transition from the centrally planned to a market-based economy, it has confronted major changes that have challenged its society. The fundamental myths and principles that were entrenched in the society had to be disposed, or reformed. Top on the list of changes came to the work environment itself. This sector is an important part of the organization that influences the ability of company staff and management to generate ideas. Absent an environment that supports staff participation in decision-making and idea development, the firm will move towards decay and decline. Managers now agree that motivated employees within a participative work environment are critical to

foster innovation. Another new approach is the learning organization where continuing employee development and training is emphasized. A learning organization keeps its human resources competent, skillful, and current with state-of-the-art capabilities. For any company this requirement cannot be waived, eliminated, or devalued. It must be supported with continuous resources.

Since the American-style of free-market system is pervasive in many markets, there is often a clash between American and Polish management principles and beliefs. There is a clear difference in the way Polish managers view a variety of management practices. This is important because of the possible potential conflicts that can have an impact on productivity. Furthermore, different perspectives influence the composition of the firm's corporate culture that is directly related to strategy development. Since strategy development is at the nucleus of goal attainment, it would seem important that there should exist a balance between the joint management philosophies of each group.

The Stalin-type bureaucratic approach relied heavily on coercion to get work done. The Polish bureaucratic structure has been a huge burden and obstacle to the transformation from a command oriented society to a market system. For example, policies in Poland promoted large mechanized farms over the traditional smaller family-run enterprises. The objective was to capture economies of scale that large agriculture theoretically offers. However, Word Bank studies indicate that such large, mechanized farms are generally less efficient and use less labor than small family farms. It is a slow process, but management structures would be expected to shift away from bureaucracy towards flexibility and entrepreneurship. Joint effort is also an important aspect of idea development and innovation process within the new Polish environment. While independent thinking is important and individual participation is required, most successful firms achieve their goals because they are committed to teamwork.

Another change focused on management issues related to risk-taking, which in prior decades was unknown in the old Polish management structures. Employees did what they were told and carried out the centrally determined five-year plans, what ever that may be. Hofstede's Uncertainty Avoidance Index comparison between the United States and Poland illustrates the contrast in cultural-based decision-making. While Poland moved towards the market-system and new competitors came to, the need to embrace risks, change and even gamble with various resources is a necessity to make short- or long-term gains. Not many enterprises can escape the need to introduce products, processes, or markets that are not guaranteed to provide the desired return. This concept is significant because without taking risks, survival is impossible.

Organization leadership is now at the center of any successful venture. Poland previously had linear leadership that was often focused on unproductive methods that retarded rather than promoted its economic development. The old myths about producing products to meet plans that had no market are no longer acceptable. The leadership factor is critically important in any country and corporate culture. Absent its existence all other factors flounder and companies become aimless, in their pursuits. Lacking proper leadership, corporate culture is doomed, management strategy is worthless, and goal attainment is almost impossible.

A new hierarchy of values relating individual ownership and entrepreneurship has encountered the traditions leftover from the centrally planned system. Even though the old ideas are rapidly fading away, they are still a barrier to a complete transition. The calcified thinking includes Poland's ubiquitous bureaucracy, inefficient judiciary, poor infrastructure, as well as its constantly changing and complicated tax system. Similar to many other nations, the bureaucracy myth continues with its vested interest in maintaining the status quo.

The approaches of the old Polish management functions also originated from how citizens were socialized during the domination by the Soviets. The traditions and beliefs that were inculcated into the culture and

the mass society determined the way the people thought, worked and lived their lives. These beliefs influenced the way organizations were managed and how the managers conducted business. Even though management education teaches students skills and competencies to manage processes and decision making, it also in the Polish society the education not only provided the manager with skills to do his/her job but also a status in the society and the enterprise (Kostera). The skills provided the roles and conditions for the managers to perform and present an image to his/her peers and the community.

In communist Poland, the task related skills and the professional standards of the manager were context specific requiring different attributes that were not seen in western managers. The manager in the Polish context was an administrator with their task focused on performing and not to be creative. The administrator was greatly restricted by regulations and directives he received with a very limited degree of freedom. The manager's role was determined by the "production plan" prescribed by the central planned bureaucracy. The manager was required to enforce labor discipline by making the labor force obey the rules and regulations promulgated by bureaucracy. The managerial role was associated with conventionality rather than imaginatively. Management was not superstar career. They were not to be too noisy or visible. They should not be overzealous (Kostera). In order to survive, the managers played various games with authorities, the party and the secret police that had considerable power over the enterprises. The games were political negotiations including formation of coalitions aimed at maximizing power, as well as countering the symbols created and transmitted by the political authorities (Kostera & Wicha). Playing these games successfully without making him/herself vulnerable nor his/her company and employees was considered the most important quality of the former professional role of the manager, and also kind of a virtue (Kostera). The games were part of the managerial role but were also a necessity - the managers had to play for more power if they wanted their companies to survive and perhaps also to grow (Kostera and Wicha).

The social responsibility of the communist manager was then very broadly defined as related to the society as a whole. Individuality was banned, initiative and stressing of one's own position was not popular. Administrators were not to provide "individualistic gains" but were to subject themselves to the needs of the society (Kostera). The professional role contained a high degree of hypocrisy: declaring loyalty to the communist party and commitment to the system without really thinking so was an important element of the manager's career. Knowing the right people was tremendously important in the Polish managers' life and role as a manager of an enterprise. These were disingenuous declarations and personal networks were tools for accomplishing the most important informal aim of Polish managers: assuring that the central plans for their companies were minimal so that it would be easy to accomplish and not exceed them. This was needed to acquire additional financial and material means for social programs, bonuses for employees and foreign travel. The managers who accomplished this feat were labeled as good managers (Kostera).

Historic Changes

It is essential in today's dynamic global environment for managers and business operators to understand that other cultures have different perspective on issues. Poles were required to reject the Western world's point of view a long time, and needed to sustain their allegiance to the Soviet Union's linear central command point of view. This has changed. However, culture and ideas about other people that are not understood continue to be obstacles to our interactions with other business cultures. The study of Polish management mythology provides another view; another lens for us to see how cultures can change and cultures can make adaptations to different patterns of living. For a long time, those in the West labeled the Poles "backward" unable to compete with the fast growing Western ways. It is interesting that since the incredible transformation of Poland which started in 1989 has made historic changes that allowed Poland

to be part of the European Union and an equal partner in global business activities. Noticeably, Poland has gained enormous strength by transforming its economy and its society.

Poland is in continuous transition conscientiously moving ahead with continuous improvement. Such progress has emerged because Poland has had bold leaders who were always seeking better way to improve the quality of life for it citizens. Lech Walesa demonstrated leadership in the streets of Poland when he led Solidarity toward freedom. His determination demonstrated to the world that Poland may be old and may be constrained by the central command of the Soviet Union, but it will not be enslaved any more. Those daring days led to the fall of communism and the historic change in Central and Eastern Europe. Balcerowicz also demonstrated leadership with the implementation of the "shock therapy" economic program. This created the base for the rapid transformation and the economic success in Poland. Both of these leaders broke away from the old mythology of defeat and "can't do" to a positive, progressive proactive approach. Their methods were difficult for the Polish people to understand and accept but in the end they brought about a new society that is growing and continually improving. These leaders wanted a better quality of life for their citizens and worked to make that goal come true. The successes of the transformation and the old mythologies that were so embedded in the uneducated observer and reader are now long part of history.

The transition of Poland during the late 1980s and through the 1990s until the present day witnessed unprecedented change in the role of the manager. The roles of the new manager are becoming increasingly more like that of Western managers focused on a market economy (Kozminski and Obloj). The new Polish managers are involved in organization and motivation of teams. They are now working with and managing autonomous organizations, which no longer are under several layers of bureaucratic control. The managers believe that their new role is that of organizing tasks, and strategy formulation (Kostera). Moreover, Kwiatkowski and Kozminski assert that there is currently a large group of well-educated management professors in Poland and quite a few institutions offering high quality education.

Polish managers emphasize competence and professionalism and a code of ethics. According to Kostera, the key point to highlight is that managerial roles develop in two parallel tracks that seem to be independent of each other. The first is the mythical one, and it corresponds to the use of the right slogans. The mythical role has changed considerably in Poland. It is entirely different from the communist era, even if the myth it is now based on is in the distant past. The second track is the substantial or enacted role and it can best be described by words: wait and see.

The nation's transformation produced dramatic changes in Poland's business leadership, decision-making, and new organizational values. This gives rise to the possible existence of a shared set of business culture. The experience of organizational learning of new values or behaviors among Polish managers and employees was very rapid. There was acceptance of new corporate cultures that emphasized quality and results from Polish workers. In part, this was due to a historical cultural basis, as well as training for the new values and skills. Another factor was the new structure of rewards that provided incentives for effective decisions and productive behavior. In other words, there appear to be common traits that lead to effectiveness within organizations, but they are expressed differently in Poland.

Application

Examining the firm's corporate culture implies that each enterprise sets up a corporate culture conducive to accommodating the values and myths held by managers in Poland, as well as meeting the goal attainment as established by the organization. The major factors of culture that invigorate, promote, and sustain decision-making, as well as developing new approaches such as innovations are available within each enterprise. There has to be a positive attitude about idea development and a traditional bureaucratic

approach to management will lead to suboptimal results. Studies of successful and sustainable new enterprises in Poland highlight their structure as embracing the modern entrepreneurial culture. They are willing to take risks that have the probability of generating gains either in the short- or long-run.

A significant critical factor in building and sustaining a successful and effective corporate culture is leadership. There is no question that leadership is the key variable or the nucleus of any corporate culture. Absent strong leadership that sets the direction, vision, and culture for goal attainment, no firm can be successful in the long run. In his work, "Organizational Culture and Leadership," Edgar Schein examined companies with a vision to establish a corporate culture that emphasized goal attainment and success and found in all instances that successful firms have strong attitudes or beliefs towards leadership.

Although the world appears to be getting smaller within the dynamic global economy, the cultural differences seem to become less obvious. However, as interaction and business among cultural boundaries increase, the cultural differences become more significant. A major asset that a businessperson, or even a tourist, possesses is the ability to respect and appreciate the history of the country they are visiting. The case of Poland illustrates the role of centuries of difficulties in its history and culture. Poland is a nation that has had to meet challenges both internally and externally. The transformation of Poland towards western organizational and management values has lead to a decreased bureaucracy and corporate culture focused on quality and efficiency. The nation is an important center of production in Central Europe and is now positioned to be a significant economic power in the world. It benefits from geography and demographics that contribute to its pursuit of becoming an advanced nation with a high quality of life for its citizens.

The ideas presented here offer some ideas for doing business in Poland. These cultural-based suggestions include the need to:
- Recognize the history of Poland and its role in shaping culture.
- Value the tenacity and perseverance of the Polish people.
- Appreciate that Poland is eager and anxious to continue to make improvements by discarding the old myths and acquiring new and innovative ways of doing business.
- Be tolerant of the Polish culture as it is.
- Empathize and interact with the Poles, no matter where they come from.

As a strong relationship driven culture, a high level of sincere trust in Poland does not typically extend beyond the family unit. Furthermore, the family (or relationship) will usually take precedence over work, rules, and decisions. Thus, business success in Poland is based on first developing a strong relationship that is grounded in mutual benefit and trust.

Conclusion

Poland has a broad and rich culture. The traditions and conventions arising from its cultural norms continue to influence the management behavior and style in Poland. The experiences that Poles have witnessed over the history of the country have been embedded into their pattern of thinking and living. In many instances this historical baggage has been the glue that held the country together, even with the numerous upheavals, shifting borders, and total elimination of the country. The economic and political changes in Poland, as well as its cultural traditions, have provided an alignment mechanism to the present day society. This impacts on the content and direction of the society. The recent westernization of Poland has had a positive effect with a decreased bureaucracy and improvements in corporate culture. Nevertheless, historical values and traditions continue to affect the way decisions are made and the way enterprises are managed in Poland.

References

Astley, W. Graham (2007) "Subjectivity, Sophistry and Symbolism in Management Science" Journal of Management Studies, 21(3) 259-272.

Davies, Norman (1982) God's Playground, Columbia University Press.

Hofstede, Geert "Geert Hofstede Cultural Dimensions" http://www.geert-hofstede.com/

Kostera, M. (2006) "The Narrative Collage As Research Method" Storytelling, Self, Society, 2(2) (Spring) 5-27

Kostera, M. and Wicha, M. (1995) "The symbolism of the communist manager roles: A study of scenarios" Scandinavian Journal of Management, 11(2) 139-158.

Kostera, M. et al, (1995) "Differing Managerial responses to change in Poland" Organizational Studies, Fall 1995.

Kostera, M., and M. Wicha (1994) "Ponad blokami: Organizacja i otoczenie" [Beyond blocks: Organization and environment]. Przeglad Organizacji 2: 7-1

Kotter, John P. and James L. Heskett (1992), Corporate Culture and Performance, The Free Press, New York.

Kwiatkowski, S. and A. Kozminski (1992), "Paradoxical country - management education in Poland", Journal of Management Development, 11, 28-33.

Larsson, Rikard and Risberg, Anette (1998) "Cultural Awareness and national versus Corporate Barriers to Acculturation" in Cultural Dimensions of International Mergers and Acquisitions, edited by Martine Cardel Gertsen, Anne-Marie Søderberg, and Jens Erik Torp, Walter de Gruyter, New York, page 39.

Schein, Edgar H. (1992), Organizational Culture and Leadership, Second Edition, Jossey-Bass.

Schermerhorn Jr., John R. (1993), Management for Productivity, Fourth Edition, John Wiley and Sons, New York.

Terpstra, Vern and Kenneth David (1991), The Cultural Environment of International Business, Third Edition, South Western.

Van Zyl, Johan, Miller Jr, Bill, and Parker, Andrew (1996) "The Agrarian Structure in Poland: The Myth of Large-Farm Superiority", World Bank Policy Research Working Paper, Number 1596.

Zaleska, Krystyna Johanna (1992), Cross-Cultural Interaction Between Polish and American Managers A Case Study of An American Firm in Poland, Central European University, Prague.

ENTREPRENEURIAL FACTORS AFFECTING THE GROWTH OF CHINESE-OWNED PRIVATE COMPANIES IN CHINA

Powell, Benjamin C., Department of Management, Appalachian State University, Boone, NC 28608, (828) 262-8332, powellbc@appstate.edu
Liang, Xiaoya, School of Management, Fudan University, Shanghai, China, (021) 6463-4393, xyliang@fudan.edu.cn
Donohue, Joan M. Department of Management Science, University of South Carolina, Columbia, SC 29208, (803) 777-5924
Fox, Jeremy B., Department of Management, Appalachian State University, Boone, NC 28608, (828) 262-6225, foxjb@appstate.edu

ABSTRACT

While foreign multinationals and state-owned enterprises in China have been examined in many studies, less is known about Chinese-owned private companies [2] and about the entrepreneurs who start such companies [1]. Private companies are a fast growing part of the Chinese economy. In this study we explore several entrepreneurial factors that may affect sales growth rates of privately-owned companies in China.

In one of the earliest studies concerning Chinese entrepreneurs running private companies, Busenitz and Lau [1] studied growth intentions. We seek to extend this research by linking similar factors to actual growth rates (rather than growth intentions). Yueh [6] found that Chinese entrepreneurs differ from non-entrepreneurs in terms of social networks, motivation and drive, and attitudes toward risk. We seek to determine whether similar factors affect how rapidly Chinese-owned private companies grow. Djankov et al. [3] explained that entrepreneurship research typically employs one of three perspectives: institutional, sociological, or individual. In reviewing articles on entrepreneurship in China that has been published in eleven leading English-language academic journals from 1980 through 2005, Yang and Li [4] classify the research into three different levels of study: individual/micro studies, firm-level studies, and environmental/macro studies. Like Djankov et al. [3], we investigate all three perspectives (study levels) in order to develop a more comprehensive explanation of the growth rates of Chinese-owned private companies.

At the individual/micro level, we focus on the entrepreneurial founders and their backgrounds in order to investigate the impact of cultural and sociological factors on individuals' motivations. More specifically, we examine founders' internal motivations, such as greed or desire to become rich, as well as their external motivations, such as encouragement from family members, as potential drivers of sales growth. We also examine the founders' ages, genders, educational levels, areas of expertise, and the domains of their prior work experience. At the firm level, we examine the origins of the companies and the source of their startup capital. Because family-owned companies may have different growth objectives, we examine the impact of family ownership on growth rates. We also include factors related to the importance of or emphasis on the founder's entrepreneurial spirit, the founder's ability to seize opportunities, employee quality, innovativeness of the company's business model, and luck. Cooke [2] found that Chinese firms are beginning to emphasize corporate social responsibility (CSR) so we also explore the linkage between CSR and sales growth.

The Chinese economy has been undergoing a rapid and large-scale transformation over the last three decades. Entrepreneurial activities under these conditions can be very different from those in a more mature Western-style economy [5]. Initial research on Chinese entrepreneurship in the context of

private enterprise has focused on distinguishing entrepreneurs from non-entrepreneurs. But as the pool of entrepreneurs increases, Yueh [5] notes that it becomes increasingly important to understand why some of these entrepreneurs and their companies perform better than others. Our study contributes to this research stream by identifying factors associated with successful privately-owned companies in China. We measure success using sales growth rates collected from a survey completed by the owners of 260 privately-owned companies in China. Some of the key study variables are listed in Appendix A. Survey results are currently being analyzed and they will be presented at the conference meeting.

REFERENCES

[1] Busenitz, L. W. and Lau, C. M. "Growth Intentions of Entrepreneurs in a Transitional Economy: The People's Republic of China." *Entrepreneurship: Theory and Practice,* 2001, 26(1), 5-20.
[2] Cooke, F. L. "Competition and Strategy of Chinese Firms." *Competitiveness Review,* 2008, 18(1/2), 29-56.
[3] Djankov, S., Yingyi, Q., Roland, G. R., and Zhuravskaya, E. "Who Are China's Entrepreneurs?" *American Economic Review,* 2006, 96(2), 348-352.
[4] Yang, J. Y. and Li, J. "The Development of Entrepreneurship in China." *Asia Pacific Journal of Management*, 2008, 25(2), 335-359.
[5] Yueh, L. "The Chinese Entrepreneur." *Business Strategy Review,* 2008, 19(2), 60-64.
[6] Yueh, L. "China's Entrepreneurs." *World Development,* 2009, 37(4), 778-786.

APPENDIX A
Survey Instrument Variables

Dependent variable: Average sales growth rate over the last 3 years
Independent variables:
  Founder:
    Founder's Age
    Founder's Gender
    Founder's Education (Ph.D., Masters, Bachelor, Junior college, high school, other)
    Founder's Major (science, management, literature/history/philosophy, law, economics, other)
    Founder's Prior Experience (government, private owned business, etc.)
    Founder's Internal Motivation (earn a living, gain high-quality life, become rich, attain career achievements, other)
    Founder's External Motivation (incentive policy, encouragement from family members, entrepreneurial opportunities, others' successful cases, other)
  New Venture:
    Company Origin (started with own funds, restructuring enterprise, started with knowledge capital)
    Startup Funding (innate funds, private lending, bank loan, direct financing from capital market, other)
    Family Firm
    Emphasis on Founder's Entrepreneurial Spirit
    Emphasis on Founder's Ability to Seize Opportunities
    Emphasis on Employee Quality
    Emphasis on innovativeness of the business model
    Emphasis on luck (Q21-17)
    Social Responsibility
  Controls:
    Firm Age
    Total Sales Revenue 2007

Survey Questionnaire available upon request.

Procedural Fairness and Small Business Owner Satisfaction with Grants during Post-Hurricane Katrina Recovery

Obyung Kwun, Ph.D.
62 Brittany Drive, Kenner, LA. 70065
okwun@suno.edu, (504) 284-5462

Louis C. Mancuso, Ph.D.
P.O. Box 1061, Harvey, LA 70059
Lman454574@aol.com, (803) 917-1491

Ghasem S. Alijani, Ph.D.
P.O. Box 24099, New Orleans, LA 70184
dalijani@suno.edu, (504) 284-5462

Tonia A. Doakes
909 S. Jefferson Davis Pkwy. Rm. 325, New Orleans, LA 70118
tsimmon2@xula.edu, (504) 520-7505

Procedural Fairness and Small Business Owner Satisfaction with Grants during Post-Hurricane Katrina Recovery

ABSTRACT

Small businesses in New Orleans have been one of the biggest casualties of Hurricane Katrina. However, small business recovery efforts face a number of challenges, including a lack of inadequate access to capital for recovery, difficulties related to federal government aid, devastated infrastructure, etc. It is critical for government to deploy necessary resources for a smooth and speedy recovery of small business. Based on justice theory research, this study attempts to examine the impacts of procedural fairness on small business owner satisfaction with government grants. To investigate the proposed relationships, data was collected from 200 small businesses in New Orleans. The findings showed that interactional justice (interpersonal treatment), not procedural justice (formal procedure), had a significant positive effect on small business owner satisfaction.

BACKGROUND PERSPECTIVES

Hurricane Katrina further exacerbated the serious economic challenges faced by New Orleans even before Katrina. The flooding, wind, rain, and unfortunate looting and arson associated with the storm, destroyed or damaged thousands of businesses. Commerce was seriously interrupted in industries such as entertainment, hospitality and tourism, finance and transportation. Small businesses and entrepreneurial efforts suffered extensive damages/losses. The city's sales tax (base) plummeted. The labor force declined considerably, particularly in the health and education industries. Unemployment increased, and the city faced significant population losses due to out-migration, particularly of the African-American community. Use of mainly Hispanic workers from outside the state in the huge construction business, while the African-American residents in New Orleans remained without jobs, has raised labor issues (Entertainment, Tourism and Hospitality, U.S. Chamber of Commerce; November 8, 2005).

The severity of Katrina's destruction makes redevelopment of New Orleans, including promoting investments, small businesses and entrepreneurs, job creation and economic growth a herculean task. The incredible extent of damages due to the disaster should be a matter of great concern to residents, businesses, policy makers, and politicians for the purpose of acquiring and deploying necessary resources for a smooth and speedy recovery. In particular, it must be kept in mind that Hurricane Katrina led to small businesses lacking in planning, susceptible to cash flow reductions, a lack of inadequate access to capital for recovery, difficulties related to federal government aid, and devastated infrastructure, slowing early recovery (Runyun, March, 2006). Also, it is important that the government agencies take interest and assist affected businesses to survive, and motivate new entrepreneurs to start fresh businesses (Zolin & Kropp, January, 2007). However, previous study shows a high level of dissatisfaction with government aids among New Orleans business owners (Mancuso, June, 2006). This dissatisfaction, in turn may discourage small business owners from applying government grants, which can speed up the recovery.

JUSTICE THEORY

Justice theory has been successful in explaining attitudes and behaviors in such diverse domains as resource allocation, conflict resolution, personnel selection, and layoffs. Justice, as a perception of fairness of the decision process and decision outcomes, has been shown to influence attitudes (e.g., satisfaction) and behavior (e.g., turnover) (Greenberg, 1990).

Researchers have developed conceptual models of justice theory that explain the role of fairness in organizations, by identifying factors (e.g., Bies, 1987) that account for different dimensions of justice and their effects on attitudes and behaviors (e.g., Andrews, Baker, & Hunt, 2008; Hershcovi, et.al., 2007, and McFarlin & Sweeney, 1992). These dimensions include procedural justice, interactional justice, and distributive justice. Procedural justice refers to the fairness of the formal procedures through which outcomes are achieved (Greenberg, 1990). A number of researches demonstrated that procedural justice affects attitudes toward the organization and its operations (e.g., Korsgaard, Schweiger, & Spienza, 1995). Interactional justice deals with the interpersonal treatment people receive from the decision maker and the adequacy with which formal decision-making procedures are explained (Bies, 1987). The empirical evidence showed that perceptions of fairness may also be affected by the interpersonal treatment received from the decision-maker which causes affective and behavioral reactions (Donovan, Drasgow, & Munson, 1998). Distributive justice refers to the perceived fairness of the resulting distribution of outcomes of decision-making. The fairness of outcomes is evaluated based on some distributive rules that include equity, equality, and needs (Deutsch, 1975).

Based on the preceding discussion of justice theory, this study attempts to examine the impacts of procedural fairness on small business owner satisfaction with government grants. This study focuses on procedural justice and do not consider effects of distributive justice. The following hypotheses were developed for this study, as illustrated in Figure 1:

Hypotheses

H1:   Procedural Justice has a positive effect on satisfaction with government grant for small businesses.
H2:   Interactional Justice has a positive effect on satisfaction with government grants for small business.
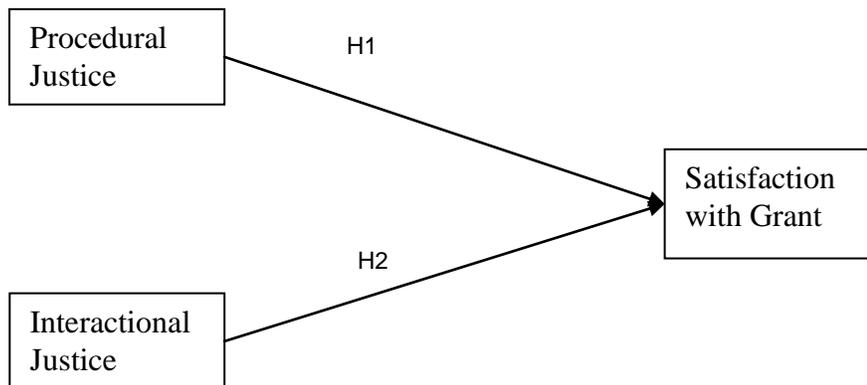
Figure 1. Research Model

RESEARCH METHOD

Data Collection

For this study, owners/managers of small businesses were targeted throughout Orleans Parish (New Orleans). Seniors from Southern University in New Orleans were asked to divide the city into neighborhood districts and randomly select businesses in that neighborhood. The survey was given to the owner of the business and the owner was asked to complete the questionnaire. Different agencies and businesses use different criteria to determine whether a business is small, such as the number of employees, annual income earned and relative dominance in their industry. Different ranges of employee size (size standard) for small businesses are encountered in the literature. For the purpose of this study, the number of employees was used as the determining factor for classification as a small business: firms that employed 100 or less individuals were considered as small businesses.

A survey questionnaire was developed by adapting the items from existing justice literature (e.g., Moorman, 1991). Data was gathered by visiting small businesses and asking the owners/managers to complete the questionnaires.

Characteristics of the Sample

There were 200 respondents in this study (see Table 1). Of the 200 respondents, 50 percent are male. The majority of the respondents were in service and merchandising (63.5% and 29%, respectively). And most respondents (98.5%) are from businesses with less than 50 employees. More than 70% of the respondents reported that their knowledge level in government grants are average or above. While 84% agreed that government grants would help their businesses, 60% of the respondents have applied for a government grant at least once. And only 36% of the respondents have ever received a government grant.

Sample Characteristics	N=200	%
Gender		
Male	100	50
Female	97	48.5
Familiarity with Grants		
Very High	5	2.5
High	55	27.5
Average	83	41.5
Low	30	15
Very Low	10	10
Type of Business		
Manufacturing	9	4.5
Service	127	63.5
Merchandising	58	29
Other	0	0
Number of Employees		
Less than 5	43	21.5
5-10	55	27.5
11-50	93	46.5
More than 50	3	1.5
Grant would help business		
Strongly Agree	113	56.5
Agree	55	27.5
Neutral	21	10.5
Disagree	6	3
Strongly Disagree	3	1.5
Have Applied for Grant		
Yes	120	60
No	80	40
Have Received Grant		
Yes	72	36
No	128	64

Table 1: Characteristics of the Sample

DATA ANALYSIS

Partial Least Squares (PLS) analysis was used to test the proposed research model. PLS is a multiple regression-based technique for testing a research model with multiple-item constructs and direct and indirect paths. PLS, as a structural equation modeling technique, recognizes two parts of model testing: a measurement model and a structural model (e.g., Barclay et al., 1995; Fornell & Larcker, 1981). In order to test a research model, the measurement model first has to be evaluated, and then the structural model has to be tested. The assessment of both models was conducted using SmartPLS 2.0.

The measurement model addresses the relationship between the constructs and the items used to measure them. The test of the measurement model consists of the estimation of the convergent and discriminant validities of the measurement instrument. However, reflective and formative measures should be treated differently. Formative items are considered to form or cause the construct to measure. Thus, these items are not expected to correlate or show internal

consistency unlike items for reflective constructs (Chin, 1998). For this reason, the item weights for formative measures have been used to test the relevance of the items to the constructs (Barclay et al., 1995; Wixom and Watson, 2001). Table 2 shows the relationship between the constructs and the items in this study.

Constructs	Relationship
Procedural Justice (PJ)	Formative
Interactional Justice (IJ)	Formative
Satisfaction with Grant (SG)	Reflective

Table 2. Measurement Model

RESULTS

Measurement Model

Although formative and reflective constructs are treated differently, the loadings are used for interpretive purpose and for the calculation of reliabilities. However, it has been suggested that an absolute value of factor loadings of 0.30 is considered to meet the minimal level, loadings of 0.40 are considered more significant, and loadings of 0.50 or greater are considered very significant (Hair et. al., 1998). Average variance extracted (AVE) of 0.50 or above has also been used to support the convergent validity of the constructs (Fornell & Larcker, 1981).

Table 3 shows individual item loadings and associated weights for the related construct. All of the Cranach's Alphas exceed 0.70 suggested by Nunnally (1978). For the reflective construct of satisfaction with grant (SG), all of the loadings are above 0.90, which is considered very strong. Also, the AVE for SG (0.95) is found to be well above the acceptance level of 0.50 (see Table 4).

Variables	Weights	Loadings
Procedural Justice	Cronbach's Alpha = 0.88	
PJ1	-0.24	0.59
PJ2	0.83	0.95
PJ3	0.25	0.85
PJ4	0.08	0.73
PJ5	-0.08	0.62
PJ6	0.21	0.59
Interactional Justice	Cronbach's Alpha = 0.90	
IJ1	0.25	0.78
IJ2	-0.05	0.72
IJ3	0.26	0.83
IJ4	-0.15	0.19
IJ5	0.41	0.92
IJ6	0.29	0.92
Satisfaction with Grant	Composite Reliability = 0.95	
SG1		0.98
SG2		0.98

Table 3. Weights or Loadings

	PJ	IJ	AVE (SQRT)
SG	0.51	0.81	0.95 (0.98)

Table 4. Average Variance Extracted and Correlations

	PJ	IJ	SG
PJ1	**0.59**	0.50	0.30
PJ2	**0.95**	0.61	0.49
PJ3	**0.85**	0.56	0.44
PJ4	**0.73**	0.52	0.38
PJ5	**0.62**	0.39	0.32
PJ6	**0.59**	0.39	0.30
IJ1	0.55	**0.78**	0.63
IJ2	0.43	**0.72**	0.58
IJ3	0.61	**0.83**	0.67
IJ4	0.22	**0.19**	0.16
IJ5	0.52	**0.92**	0.74
IJ6	0.57	**0.92**	0.74
SG1	0.50	0.78	**0.98**
SG2	0.50	0.79	**0.98**

Table 5. Cross Loadings

Discriminant validity is adequate when the average variance extracted from the construct is greater than the variance shared between the construct and other constructs. Table 4 shows correlations between constructs and square root of AVE. The square root of AVE for the SG is greater than the correlations with other constructs. Also, the cross loadings in Table 5 show that items for SG are loaded higher on SG than on other constructs. This indicates some evidence for discriminant validity.

For the formative constructs, some of the items show negative weights. Formative items are considered to form or contribute to the construct. The negative weights indicate a contradiction to the original expectation supported by justice theory. The items with negative weights are PJ1, PJ5, IJ2, and IJ4.

Structural Model

In order to improve the validity of the results, the items with negative weights were removed when the structural model was tested. As a result, PJ1, PJ5, IJ2, and IJ4 were dropped to estimate the structural model. Figure 2 shows the significance and the strength of the relationships between the constructs and R^2, which indicates the explanatory power of the model. Procedural justice is not a significant factor with a path coefficient of -0.02, while interactional justice shows strong impact, with a path coefficient of 0.81, on satisfaction with grant as

hypothesized. Sixty-four percent of the variance of satisfaction with grant was explained by the proposed model. Table 6 summarizes the results of the hypotheses in this study.
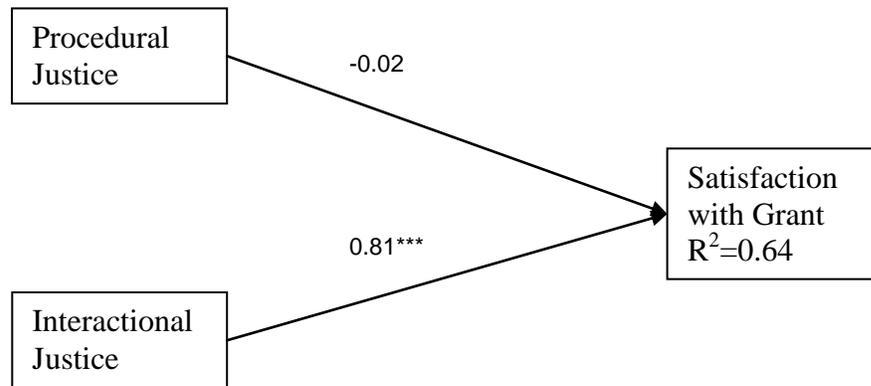
***   Indicates that the path is significant at the p<.001 level.

Figure 2. Results

Hypotheses	t-Statistic	Results
H1: Procedural Justice has a positive effect on satisfaction with government grant for small businesses.	0.21	Not Supported
H2: Interactional Justice has a positive effect on satisfaction with government grants for small business.	8.24	Supported

Table 6. Hypotheses Tests

CONCLUSIONS

This study examined the impact of procedural fairness on small business owner satisfaction with government grants during the post-Hurricane Katrina crisis in New Orleans. The results suggest that interpersonal treatment and the way that formal procedures are implemented are very important to improve the satisfaction with government grants. As the demographic data suggests, considering the fact that small business owners are familiar with government grants and understand the importance of the grants for their success, a small number of small business owners applied for the grants, and the majority of the applicants failed to win the desired grants. The main issue is not the procedure to go through to win the grant. It is more about how the small business owners are treated by the granting agency during the grant application. In order to improve small business owner satisfaction, the grant agents should properly treat the business owners with trustfulness, kindness, justification, respect, etc. This is an important conclusion if and when another natural disaster strikes the United States. Government representatives should be trained in all aspects of the aid to be given and also trained to show kindness, respect, trust, and justification for their actions to the small and middle

sized business owners. One way to improve small business owner perception of these interpersonal treatments can be impression management (Bies, 1987). Impression management has been known to influence people's subjective judgment in social and political interaction. Therefore, impression management skill of the government agents may play a major role in influencing the fairness perception.

However, the results should be interpreted with some caution. As justice theory suggests, items that contribute to each dimensions of justice may be different, depending on the context. The questionnaire was developed based on the previous studies where measuring items were validated in different contexts. Thus, there can be further study to investigate items that can form each dimensions of justice in government grants award context. Also, respondents are from New Orleans metropolitan area only. Because of the unique situation created by the natural disaster, the respondents' attitudes may be drastically different from that of small business owners from the rest of the country.

REFERENCES

Andrews, M.C., Baker, T.L., and Hunt, T.G., "The Interactive Effects of Centralization on the Relationship Between Justice and Satisfaction," Journal of Leadership & Organizational, 15(2), 2008, pp.135-144.

Barclay, D., Higgins, C., and Thompson, R. (1995). The partial Least Squares (PLS) Approach to Causal Modeling, Personal Computer Adoption and Use as an Illustration, *Technology Studies,* 2(2), 285-309.

Bies, R.J., "The Predicament of Injustice: The Management of Moral Outrage", In L.L. Cummings and B.M. Staw (Eds), Research in Organizational behavior, Volume 9, 1987, pp 289-319, Greenwich, CT, JAI Press.

Chin, W.W. (1998). The Partial Least Squares Approach to Structural Equation Modeling, in G.A. Marcoulides (ed.), *Modern Methods for Business Research*, Lawrence Erlbaum Associates, Mahwah, NJ, 295-336.

Deutsch, M. "Equity, Equality, and need: What Determines Which Value Will Be Used as the Basis of Distributive Justice?" Journal of Social Issues, Volume31, Number 3, 1975, pp 137-149.

Donovan, M.A., Drasgow, F., and Munson, L.J., "The Perceptions of Fair Interpersonal Treatment Scale: Development and Validation of a Measure of Interpersonal Treatment in the Workplace", Journal of Applied Psychology, Volume 83, Number 5, 1998, pp. 683-692.

Fornell, C., and Larcker, D.F. (1981). Evaluating Structural Equation Model with Unobservable Variables and Measurement Error, *Journal of Marketing Research*, 18(1) 39-50.

Greenberg, J., Organizational Justice: "Yesterday, Today, and Tomorrow", Journal of Management, Volume 16, Number 2, 1990, pp. 399-432.

Hair, J.F., Tatham, R.L., and Black, W. (1998). *Multivariate Data Analysis*, Prentice-Hall, New Jersey.

Hershcovis, M., Nick Turner, N., Barling, J., Arnold, K., and Dupre, K., Inness, M., LeBlanc, M., and Sivanathan, N., "Predicting Workplace Aggression: A Meta-Analysis," Journal of Applied Psychology, Vol. 92, No. 1, 2007, pp.228–23.

Kassing, J. Kassing. (2008). "Disagreeing about what's Fair: Exploring the Relationship between Perceptions of Justice and Employee Dissent," Communication research reports, 2008, pp.34-43.

Korsgaard, M.A., Schweiger, D.M., and Sapienza, H.J., Building Commitment, Attachment, and Trust in Strategic Decision-making Team: The Role of Procedural Justice", Academy of Management Journal, Volume 38, Number 1, 1995, pp. 60-84.

Mancuso, Louis C. "Understanding the Impact of Natural Disasters on Communities and Minority Business Enterprises and How Universities Can Help," U.S. Department of Commerce Minority Business Development Administration National Convention, New Orleans, Louisiana, June 9, 2006.

McFarlin, D.B. and Sweeney, P.D., "Distributive and Procedural Justice as Predictors of Satisfaction with Personal and Organizational Outcomes", Academy of Management Journal, Volume 35, Number 3, 1992, pp. 626-637.

Moorman, R.H., "Relationship between Organizational Justice and Organizational Citizenship Behaviors: Do Fairness Perceptions Influence Employee Citizenship?" Journal of Applied Psychology, Volume76, Number 6, 1991, pp. 845-855.

Nunnally, J., "Psychometric Theory," 2nd ed., McGraw-Hill, N.Y, 1978.

Runyun, R., 2006. Small Business in the Face of Crisis: Identifying Barriers to Recovery from a Natural Disaster, *Journal of Business Continuity and Emergency Planning,* 1(2), 183-199.

Wixom, B.H., and Watson, H.J., "An Empirical Investigation of the Factors Affecting Data Warehousing Success," MIS Quarterly, Volume 25, Number 1, 2001, pp. 17-41.

Appendix A: List of Items

Construct	Item	Description
Procedural Justice	PJ1	The process for grant award is designed to collect accurate information necessary for making decisions.
	PJ2	The process for grant award is designed to provide opportunities to appeal or challenge the decision made.
	PJ3	The process for grant award promote standards so that decisions can be made with consistency.
	PJ4	The process for grant award is designed to hear the concerns of all those affected by the decision.
	PJ5	The process for grant award is designed to provide useful feedback regarding the decision and its implementation.
	PJ6	The process for award is designed to allow for requests for clarification or additional information about the decision.
Interactional Justice	IJ1	The granting agent considered your view point.
	IJ2	The granting agent was able to avoid any personal bias.
	IJ3	The granting agent provided you with timely feedback about the decision and its implications.
	IJ4	The granting agent treated you with kindness and consideration.
	IJ5	The granting agent showed concern for your rights as a small business owner.
	IJ6	The granting agent took steps to deal with you as a small business owner in a truthful manner.
Satisfaction with Grant	SG1	How would you rate the grant amount?
	SG2	How would rate the timeliness of the grant?

An Investigative Report on a Study Abroad Course for Business Students Concentrating in Hospitality and Tourism Management

Denis P. Rudd, Robert Morris University, rudd@rmu.edu
Richard J Mills Jr., Robert Morris University, mills@rmu.edu
Dave Budziszewski, Robert Morris University, budziszewskid@rmu.edu

International studies and a study abroad are options that are offered by most colleges and universities in the academic arena. These programs allow students to consider courses at locations around the world, by semester, summer programs, or mini semesters. International studies is one of the most effective ways to develop universal perspectives and promote global understanding, yet at many colleges and universities, too few students participate in these programs. Recognition of the added value of the international studies experience is not always acknowledged by the institution or perspective employers upon a participants return to their home campus. Robert Morris University is conducting a pre- and post survey of its specific international studies program for hospitality students in an attempt to evaluate its effectiveness in developing an engaged learner with a heightened awareness of the current international landscape.

Introduction

International programs provide an undeniably valuable curricular activity while at the same time fostering a wider variety of extra-curricular activities. The curricular activities provide students with the opportunity to further their college course work with diverse offerings. At Robert Morris University students in the hospitality program can participate in a course (Cultural Geography) which is aimed at making the most of their study abroad time. The overarching program at Robert Morris University is intended to advance and expand students' knowledge and understanding of different cultures throughout the world. Robert Morris University offers international study programs in Australia, Chile, England, France, Germany, Italy, Norway, Switzerland, Monaco, India, Japan, Mexico, Chile, Honduras, Africa, and many other countries. The purpose of the hospitality international studies program is to assist students in learning in five areas. The program helps students gain a deeper understanding of hospitality in a global environment, enables students to understand the interaction of different cultures in the workplace environment, helps to expand their knowledge and thought processes by finding different ways to problem solve while developing new attitudes about different cultures, helps with the integration of the cultural experiences they obtain with their existing schema, and the ability to communicate in a global environment. It provides the students with the opportunity to participate in international internships, an impressive asset in today's mobile marketplace. Students will become part of the elite 4% of undergraduates were participated in international programs. All of these skill sets are important to hospitality students because these experiences create a well-rounded person who is able to apply their diverse experiences in the workplace when they have completed a degree program.

In a more general sense there are many non-hospitality related advantages to overseas travel. According to IES Abroad, students gain academically, culturally, and personally. Study abroad impacts students academically in the following ways; there is an impact on future educational endeavors, foreign language study and increased interest in more academic studies. Students were impacted culturally because study abroad helped them understand cultural values, mores and biases. It also helped them seek out a greater diversity of friends. Study abroad helped students personally and with their careers by helping them to obtain a specific skill set, increasing their maturity and self confidence while impacting their world view.

The hospitality and tourism's international program makes students well-rounded individuals especially in the world of business. With more companies beginning to outsource, students need to be more cultural diversified, and meet the companies' needs, wants and desires. Studying abroad will provide the student with first-hand experiences in foreign business settings and allow them to incorporate these lessons for their fellow collegians at Robert Morris University.

Robert Morris University's International Studies Program

Our program combines the best of both worlds, an immersion experience at a host university with extensive global, regional, local travel and intercultural experiences, and specific academics in a traditional classroom. We know of no other international programs that combine traditional classroom experiences, and contact hours, with the amount of international travel our program contains. We scheduled the travel components of our program to enhance the academic and personal experiences of the students without disrupting the traditional classroom work. For the student who wants to get the most out of their summer experience, our program is ideal.

The director of the Hospitality and Tourism program at Robert Morris University (RMU) believes that international studies provide an important component to the overall education of hospitality

students. Students from the Hospitality and Tourism program at RMU have gone on to work in Nassau, Bahamas, St. Thomas, Virgin Islands, Costa Rica, Brazil, Russia, Germany, Japan and Australia. Because of the importance of such a program, Robert Morris University is currently attempting to establish a scholarship fund for the hospitality students who wish to participate in the international program. Once the fund is in place every hospitality student who participates in the international program will receive a scholarship that covers $1,000.00 of the cost of the program. In addition, there are other sources for scholarships for study abroad programs such as the IES Abroad's $1.1 million in merit award scholarships.

Class Overview and Experiences

For the spring 2009 semester Dr. Richard J. Mills offered HTMG 3035-CULTURAL HOSPITALITY OF WORLD TOURISM. This course was offered and taught abroad in Germany, Switzerland, and France in the spring of 2009 for eleven days. The Robert Morris University international office coordinated all travel and educational programming through Schiller University. For the 2009 semester Dr. Mills offered the same course as 2008 with some academic changes. The first change was to offer Germany as an additional country. Last year the trip only covered Switzerland and France. From last years' experience Dr. Mills believed the students would benefit more with the additional country due to simple cultural articulation. Dr. Mills noticed that adapting to the European culture in a different country was a whole new educational experience for each student. So Dr. Mills thought an additional country would be justifiable from an educational perspective. For the spring of 2009 Dr. Mills still planned on coordinating the course with Schiller University. Dr. Mills believed there educational programming and itinerary fulfilled all of the educational requirements for the course. The Schiller University itinerary and offering for spring 2009 accounts for the additional country within the eleven day plan. In addition the course offered four evening sessions within the spring semester for three hour pre-travel advice and overviews of the geographical locations and travel arrangements. These class sessions allowed students to get to know each other before the actual trip. This was very beneficial because most international travel is some what confining regarding space and time differences. Some students don't mind these changes but others do. What is meant by this statement is this; each student behaves differently regarding change. For many students changes in there own country are hard enough. By introducing and knowing the students before the trip itself the change occurred at an easier rate of exchange. In essence everyone can get along better due to the social fact that they already know each other.

Outcomes Assessment

The proposed outcomes assessment and grade was based upon the completion of a series of journal entries that were compile and log throughout the students trip through journal form. At the completion of the journey each student submitted all of their final journal summaries and a 10 slide power-point presentation outlining their most favorable and memorable points in the trip itself. Their final work and each journal response was required to be 2-3 pages long typed double spaced and provide a title page with the event, journal assignment number and your name. In addition each student was required to submit a book summary of the assigned text *charting a Hero's Journey.* Each student summary was as long as the student desired to make it. It to was to be typed double spaced and titled with name and assignment identity. The goal was for each student to read it and supply their opinions and thoughts about this universal text and study abroad experiences. This style of assessment will allowed each student to engage in event learning and critical thinking concepts. In other words each student was required to write down as they toured what the event was and how they personally engaged the experience. This is also viewed as destination tourism and service learning. Each and every one of the students is a

steward of the University community. The course additionally met several times throughout the course of the 11 day trip in a class room setting. These meetings allowed each student to exchange ideas, share their personal thoughts and finally organize and compile their journal and final power point presentation. Each student had access to computers and word processors at the University locations throughout their travels. Upon their return several students may be asked by the University to present their experiences and thoughts of international study. Our goal as a class is twofold, first and for most to travel internationally and secondly learn how the gift of journal writing and reporting can and will provide a useful and engaged learning experience.

Achieving Learning Goals and Educational Outcomes

This course was designed to guide University students through a reflective European travel experience. Evaluation of study will be done by preparing, presenting, and reflecting a highly developed form of literature know as the "Journal." The Journal provides the student with substantial practice in writing. It teaches the student the art of careful observation. It provides the student with accurate reporting. It engages the student in real time cross-cultural analysis. All of these academic skills are to taught, learned and credited. In addition a study abroad experience should provide some insight or passage into an experience that individuals are introduced to regarding new and sometimes uncomfortable situations. Some people find new meaning and direction in their lives. A study abroad experience will in many cases provide a life stage awareness that can serve as a goal oriented progression. In their journal responses each student will be recording their observations of their life in the host culture. The program is designed so each student will be experiencing and recording different events that engage their academic study, living situation, and travel time. Dr. Richard J. Mills arranged the program in a way that each student will meet people from many walks of life. Each student will begin to know the richness, variety, contradictions and complexities of the country and culture that has been chosen for study abroad credit. While serving and studying in a new culture, each student became more than just an observer or academic tourist. Through their course meetings and interaction with the people from the host culture each student will have a lasting effect on others and themselves.

Survey Results

In order to determine the program's effectiveness, we designed an evaluation instrument for students to complete. From results obtained we have implemented changes which students requested or suggested. The result has been a stronger program and satisfied students. The evaluation form is given to students on the same day of their final week in the states, and their final week upon return from international travel. The survey is conducted online and the results are tabulated by hospitality faculty. The multipage instrument includes questions on personal background, the academic program, orientation and service at the host institution, and evaluation. There is a comment section at the end of the Paris and post survey. The survey has three main components, educational experience, social cultural experience, and individual development. Of the 18 instruments distributed, 18 were returned, a response rate of 100%. All instruments returned were usable for the study. Most of the participant are female, 21 years of age or older, and between their junior and senior year in college. We did not attempt to identify students' social economic records, but there would seem to be a relationship with the level of Wolfowitz. This is drawn out by our question on previous studies, travel and living abroad prior to entering the program, 77% of the respondents have traveled outside the United States..
The purpose of the study was to determine whether or not the international studies program for hospitality students was effective in enhancing students understanding of intercultural and global

issues. The study focused on the cultural geography course that took place in Germany, Switzerland and France during the summer of 2009.

The hospitality and tourism cultural geography course had two distinct segments; segment one occurred during the spring semester of 2009. Students met with the instructor four times before their overseas experience to discuss what would occur during their overseas class. The second segment consisted of the overseas travel. Before the students traveled overseas they were given a pretest consisting of twenty questions designed to evaluate the effectiveness of the pre-classes and students knowledge and experiences in international travel. When the students returned to the United States they were given a twenty question post test which evaluated their understanding of intercultural and global issues. The complete questions and the results for both surveys can be found in Appendix A.

There were five questions that will be discussed in regards to the pretest. 100% of the students stated that the study abroad program was not a deciding factor for attending the university. This may indicate a lack of awareness by entering students about the international program and that an introduction to the international studies program should be required by the admissions office, counselors and the school of business. 100% of the students felt that the international studies program would add to their global understanding. This concept was reinforced during their classroom experience throughout the semester. 94% felt that the experience would be beneficial for future job opportunities. This was also discussed in the pre-class and there were suggestions given on how to incorporate their experiences overseas and in the international studies program into their resume. 83% of students made arrangements for communications with friends and family in the United States before they left the States. Communications with friends and family was stressed during the pre-classes as a necessary component of being successful in the program. 72% percent of students surveyed felt that they were traveling into a safe environment. The overall safety of the program and the countries involved were discussed during the pre-class.

There were six questions that will be discussed in regards to the post test. 100% of the students felt the program for this particular study abroad experience was marketed correctly. The hospitality program and international student office produced brochures and had meetings discussing the proposed itinerary. 100% of the students in the survey felt they had the freedom to explore in the host country. Students were allowed to participate in unstructured tours on Saturday afternoons and Sundays. 100% of the students indicated they were willing to try new things and were anxious to participate in social, cultural, and culinary related activities. 100% of the students surveyed believed the study abroad program enhanced their future employment opportunities. The four classes the students had prior to their study abroad stressed the importance of including their international participation on their resume and vitae. 100% of students would consider another trip abroad. A number of students volunteered to speak next fall and sprint to students who are interested in participating in the international program in 2010.

Conclusion

The results of this study might provide some guidance to other institutions contemplating study abroad programming. It can be observed that such programs are dynamic and require considerable planning. With increased numbers of students we anticipate that observable differences in our program can be observed and results presented in the current paper are based on a small sample size. We hope, in the future, to be able to present common characteristics and differences among student groups. We see our initial study as a starting point to determine long-range ramifications for hospitality and tourism programs. Perhaps we are at the beginning of a

new phase of academic preparedness for students who will be residing and employed in an ever increasing international environment. Planning and participation in the HTMG 3035 Cultural Geography course constituted a vehicle for connecting pedagogical research, teaching, curriculum development, and student experiences.

Up until now Robert Morris University has focused on Europe as the key location for its international studies program. In the hospitality industry a focus on Europe is excellent, however it is also important for student to gain experiences in countries with emerging economies such as China and India. This is especially important for hospitality students since these two countries represent over 33% of the world's population and 30% of the world's production. Tourism in both countries is booming, and here in the US we are seeing an increase in tourism to the US from both of these countries, making it imperative that hospitality programs prepare their students for potential careers that will include extensive contact with a diverse group of clients and customers. The future goal for RMU's hospitality program is to incorporate China and India into the International Studies program and to provide students with financial aid through the development of scholarship and grant programs.

References

IES Abroad. The Benefits of Studying Abroad. Retrieved May 13, 2009. From https://www.iesabroad.org/IES/Students/alumniSurveyResultsStudents.html

Anonymous. IES Abroad announces $1,190,000 in scholarships and aid awarded for spring 2009. Retrieved May 13, 2009. From ProQuest Database.

Appendix A

Welcome: the hospitality and tourism program would like to evaluate your future international trip. Please fill out the questionnaire as soon as possible and return to Dr. Rudd, Rudd@rmu.edu. If you have any questions please feel free to contact me, or if you need help during the semester, you can call 4123972136, thank you for your assistance.

Pre-Test for Study Abroad Experience

1. Was the Study Abroad Program a factor in deciding to attend Robert Morris University?

   ☐ Yes   ☐ No

2. Have you traveled abroad in the past?

   ☐ Yes   ☐ No

3. Are you traveling with a friend?

   ☐ Yes   ☐ No

4. Are you satisfied with the countries that are available for your study abroad experience?

   ☐ Yes   ☐ No

5. Was any financial aid or incentives available?

   ☐ Yes   ☐ No

6. Do you feel that your host country is diverse in its population?

   ☐ Yes   ☐ No

7. Was a safe environment a factor in choosing your host country?

   ☐ Yes   ☐ No

8. Is the country you are visiting your first selection for studying abroad?

   ☐ Yes   ☐ No

9. Was the cost of the program a contributing factor?

   ☐ Yes   ☐ No

10. Was the reputation of the host institution a contributing factor for your study abroad experience?

    ☐ Yes   ☐ No

11. Are you familiar with the language of your host country if other than English?

    ☐ Yes   ☐ No   ☐ Somewhat Familiar

12. Are you adequately familiar with the customs and laws of the host country?

☐ Yes   ☐ No   ☐ Somewhat Familiar

13. Was your host country referred to you by another student?

☐ Yes   ☐ No

14. Do you feel this trip will add to your global understanding?

☐ Yes   ☐ No

15. Do you have specific goals directly related to your study abroad?

☐ Yes   ☐ No

16. Do you feel this study abroad will be an aid for future job opportunities?

☐ Yes   ☐ No

17. Was your pre-departure orientation from the Study Abroad Office satisfactory?

☐ Yes   ☐ No

18. Were you adequately advised for the course(s) you are taking abroad?

☐ Yes   ☐ No

19. Have you made arrangements on how you can communicate to family and friends back home?

☐ Yes   ☐ No

20. Could anything be added to help prepare you for your study abroad?

☐ Yes   ☐ No

Comments:

Pre-Test Results

1. 100% percent of the students participating in this survey said the study abroad program offered was definitely not a deciding factor for attending the university.
2. 77% have traveled outside the US and Canada was most frequently sited.
3. 77% are taking this trip with an acquaintance.
4. 83% are satisfied with the itinerary for the overseas trip.
5. 11% participated in the trip without any financial aid incentives available.
6. 83% felt the host countries had a diverse population.
7. 72% surveyed that a safe environment was not a matter of concern.
8. 67% were satisfied with the countries chosen for the program.

9. 83% felt the cost was a contributing factor for their participation.
10. 39% felt the host institution in the counties that were part of the study abroad experience was not important.
11. 61% felt they were somewhat proficient in a language outside of English. 0% of the students in the survey felt they are proficient in the languages of the host countries. 39% felt they had no proficiency in a host country's language.
12. 61% believed they are not adequately familiar with the customs and laws of the host countries. 33% somewhat familiar and 5% felt they were familiar.
13. 17% of the students were not referred to this program by past students.
14. 100% of the students felt the trip added to their global understanding.
15. 78% had specific goals they wished to achieve while studying abroad.
16. 94% felt this experience will be an aid for future job opportunities.
17. 56% felt the pre-departure orientation from the Study Abroad Office was satisfactory.
18. 78% felt they were adequately advised for the course.
19. 83% of the students made arrangements for communicating with friends and family back home.
20. 94% of the students commented as to what could be added to help one prepare for a study abroad.

Pretest Comments

Question 2- I have been to Canada.
 I have been to Canada.
Italy, Canada, Cayman Islands, Bahamas, Mexico.
Canada, Mexico and the Caribbean.
Canada and the Caribbean.
Question 4-It would have been nice to be able to see more cities like Paris while we were here and so close.
I would have loved to see Italy as well during our trip. Perhaps even extending the amount of days we spent abroad.
I think there should be a larger range of countries to travel and they should last a bit longer than the trip we are on now such as three weeks or more.
I like how we did three countries in 10 days.
Question 5-There should be more.
It would be nice to see aid available for those who qualify.
Question 8-England, Ireland, or Italy would be my first choice.
Question 9-Expensive but worth it.
Since I am a broke college student, I couldn't afford much.
Question 11-A little German from high school.
Small amount of French.
Some French.
Able to speak some French.
Question 13- Referred by flyer from HATMA meeting.
Question 14-I feel liked I learned a lot. I have a better understanding of another country's way of thinking.
Learned many new things.
Question 15-Try to understand the views of other cultures and get a feel for what Americans look like through another country's eyes.
Eat braut in Germany, wine in France, cheese in Switzerland.
Want to take knowledge back and use at work.

I felt this trip was a great opportunity to observe and learn the culture of several European nations. I am more than satisfied with what I have learned the past week and my goals were definitely met.

I had specific goals and things I wanted to learn about when I traveled here aside from what we were learning in this class specifically.

Became more diverse and more culturally aware of what's going on in the world.

Question 16-Cultural diversification is great.

Possible umbrella programs to assist other students in study abroad.

Question 17-However there is a lot more they can do.

I feel that the Study Abroad Office didn't really do much to help me prepare for going abroad. They seemed very disorganized and never clearly answered my questions. They didn't help you to get ready to fly and what to expect. I sent an e-mail asking a few questions and got vague answers to only half my questions. I feel like the Study Abroad Office could be run better and needs to make some changes.

I feel the staff may need to be increased, become more available, and be more friendly with the students. The coordinator is excellent, however.

The International Office was unorganized with everything and they would tell us things that we did not expect after signing up for the class. I also felt as though we could have done more class work before attending during our scheduled class time.

I feel as if the Study Abroad Office is very unorganized and did not prepare me for this trip. They could have provided information on the hotels, weather, customs and money. It would have been very helpful to even have some language class to prepare. The office also had kept changing the length and activities on us until the last minute.

I thought the Study Abroad Office was very disorganized. I was not impressed with the situation and I will hesitate participating in another trip due to the behavior of the Study Abroad Office.

Somewhat adequate. Would have liked more of a meet and greet with the people I was going with prior to the trip.

Question 18-Somewhat advised. I believe it was a new experience for everyone but it was an awesome experience figuring everything out as we went. An interesting yet fun twist on things.

Question 19-E-mail.

We were given phone cards in our insurance package and they wouldn't work.

Through e-mail and international cell phone.

Paid a lot of money for international phone.

Question 20-I feel like if we were given a chance to learn some of the language before we traveled it would have been beneficial. It is hard to go out and eat when you have no idea how to order. It would be nice to learn some simple words. Also, it would be nice to know that cash is the easiest form of money.

I feel a few things could be added to help prepare for going abroad. Like intro language classes to help a little. Going over what to pack and wear. Currency lessons since credit cards aren't accepted everywhere. We weren't taught much about that and I feel I wasn't as prepared to go abroad as I should be which made me nervous.

Yes, having past participants come and have a question and answer would really be beneficial as it would make us know exactly what we needed. For example, some people did not bring proper clothing or only brought flip flops. They did not bring enough money and credit cards were not accepted. Banks turned debit cards off and people did not have enough cash.

Need student advisors from previous trips to make group bigger.

Cost, more details, the credit card situation. I feel as though the International Office could have told us about all of the additional expenses they wanted us to pay after signing up for the class.

I think we should have spent 1 three hour class going over important basics of the French language and another class going over German. I would have felt more prepared for the culture. I would have liked to learn about laws and regulations of each country as well.

Learning more about the culture and language of the host country. We didn't know how to handle some situations because their customs are completely different. Also getting to know everyone in the group before leaving would have helped a lot.

Better use of class time prior to trip. Brief lesson on the country's language. Better understanding of culture prior to trip. Also, it would have been beneficial if the students got to know each other before the trip instead of half way through the trip.

Post-test Study Abroad Experience

Welcome back: the hospitality and tourism program would like to evaluate your international trip. Please fill out the questionnaire <u>as soon as possible</u> and return to Dr. Rudd, <u>Rudd@rmu.edu</u> . If you have any questions please feel free to contact me, or if you need help during the semester, you can call 4123972136, thank you for your assistance.

Was the length of the trip appropriate for what you studied?

 Yes   No

Was the study abroad program marketed to you correctly as far as expectations?

 Yes   No

Was what you learned relevant to your degree?

 Yes   No

Was your program structured in a way to give you the freedom to explore?

 Yes   No

Were the financial costs more that you anticipated?

 Yes   No

Were you ready for the academic requirements necessary to complete the program?

 Yes   No

Would you consider staying with a host family if given the opportunity?

 Yes   No

Were you willing to try new things and social occasions?

 Yes   No

Was your particular ethnicity a concern?

 Yes   No

Did you appreciate the cultural differences you experienced during your study abroad?

 Yes   No

Were your own values tested while overseas?

 Yes   No

Do you look at life differently since you returned home?

 Yes   No

Do you have a different world view?

 Yes   No

Do you feel your trip will enhance your employment opportunities?

 Yes   No

Do you appreciate the United States more since you returned?

 Yes   No

Would you consider another trip abroad?

 Yes   No

Did you make any new friends that you will stay in contact?

 Yes   No

Did your study abroad enhance any language skills other than English?

 Yes   No

Will this experience enhance your degree?

 Yes   No

Would you recommend your trip to a fellow student?

 Yes   No

Post Test Study Results

 11/20 students participated

1. 64% of the students were satisfied with the length of the trip.
2. 100% of the students felt the program for this particular study abroad experience was marketed correctly.
3. 91% of students felt that the learning experiences that resulted from this trip were relevant to their future degree.
4. 100% of the students in the survey felt they had the freedom to explore in their host countries.
5. 18% of students had financial concerns more than anticipated.
6. 100% of the students in this survey felt they were academically prepared for the program.
7. 77% of students would stay with a host family if that was an option.
8. 100% of the students were willing to try new things and participate in new social activities.
9. 9% of students were concerned with their personal ethnicity.
10. 64% of participants appreciated perceived cultural differences while abroad.
11. 45% of students felt their personal values were tested overseas.
12. 77% of students look at life differently since their return home.
13. 55% of students have experienced a change in their world view.
14. 100% of those in this survey believe the study abroad will enhance their future employment opportunities.
15. 36% of students appreciate the United States more since their return.
16. 100% of the students would consider another trip abroad.
17. 45% of participants made new friends in which they will stay in contact.
18. 77% felt that their trip enhance their secondary language skills
19. 82% hoped the trip overseas will enhance their future degree.
20. 100% would recommend their trip to a fellow student.

Appendix B

ROBERT MORRIS UNIVERSITY

DEPARTMENT OF HOSPITALITY AND TOURISM MANAGEMENT
HTMG 3035-CULTURAL HOSPITALITY OF WORLD TOURISM

Spring 2009

PROPOSED DEPARTMENT SYLLABUS
_____

Instructor:
Dr. Mills
HTMG 3035-A
Days
Time:
Room:
Lab:

Telephone: Numbers
Office: (412) 397-4267
Home: (412) 269-1808
Cell: (412) 478-5989
Email: mills@rmu.edu

Office: Massey 332
Office Hours: By Appointment

I.   COURSE DESCRIPTION

This course is an introductory survey of world travel destinations, including an exploration of the cultures, customs, habits, festivals, languages, religions and historic sites of other countries as they relate to the tourism industry. Included in this course is an in-depth examination of the social psychology of leisure.

This course will focus on the study of hospitality, food, language and intercultural communications to examine how these educational components bring together all human beings in one form or another. The consumption of food is both personal and communal. The Language of hospitality and food consumption reflects and shapes all cultures in regards to general meaning and cultural adaptation. We identify a culture through the words and meanings of food and the dispersion of meals. Hospitality and food, moreover, have a good claim to be considered one the world's most important cultural subjects. Hospitality and food is what matters most to most people for most of the time in every culture. This course will also emphasize research in and application of the historical and cultural aspects of food. As such, the course will provide a vehicle wherein the preparation and presentation of an authentic experience is representative of a particular culture, region and time.

<u>Course Objectives and Evaluation:</u>
By the end of the course, the student will:

- Provide a framework for viewing cross-cultural experiences

- Allow for engagement of various concepts and ideas in regard to intercultural communication (theoretically & experientially)

- Engage in reflective learning in-order to share personal experiences in dining in regards to cultural adaptation

- Discover how food and intercultural communication work together to offer rhetorical engagement with community and the meal

- Develop a definition of the determinants of cuisine and the effect of cuisine upon history.

- Have critical exposure in the preparation, service and evaluation of foods from various historical periods and geographical areas.

- Examine at the distribution of population, culture and tourism activities of countries across space.

- The textbook will show that verbal and nonverbal communication involves much more than transmitting a particular message.

- Geographic overview of the world and each major geographic region providing insights about the geographic character of specific regions to show how they establish settings for tourism.

- The class will learn to move effectively and appropriately through a wide range of trans-cultural situations by combining ethics, cultural-specific knowledge with mindful listening and communication skills. The internet and/or other technologies will be used to strength your knowledge

Course Competencies/Assurances of Learning:

- Sharpen interpersonal and technical skills needed to manage an international commercially oriented food service operation.

- Develop an understanding to the components of the dining experience from an international perspective

- Develop a critical ability to evaluate the dining experience.

- Explore cultural diversity and ethical requirements in menu and world tourism development

- Outline possibilities for identifying a customer base by using on- line tracking systems and menu analysis

- Formulate a public relations piece that uses international recipes and dining experiences to create a culturally diverse reflection essay that can be presented to future students.

Course Philosophy and Method of Instruction:

All work must be handed in on assigned date. A one-half of letter grade will be subtracted for each day (not each class) the work is late. This includes all work sheets, paper assignments, and any other assignments.

Make-up exams are given under only the most exceptional circumstances. Therefore, every effort should be made on the student's part to be in attendance at exams and quizzes.

Students are expected to complete required reading before each class and keep up with current news events.
All written assignments prepared outside of class must be typed or produced on a word processor. Only original documents will be accepted.

Each student is responsible for ALL reading assignments, lecture materials, handouts, and assignments inside and outside of the class. This includes guest lectures, audio-visual materials, and field trips.

Required Text:
Geography of Travel & Tourism; Hudman, Lloyd and Jackson, Richard. 1999 (4th. Ed). Delmar Publishing/I.T.P. Albany, New York. ISBN: 0-7668-3256-2

Charting a Hero's Journey, Chisholm
Dynamics of Intercultural Communication, Dodd
Intercultural Communication, Samovar/Porter

Note:
Many course outlines include a bibliography; traditionally, this is a list of writings on a particular subject that you may use as reference. As this is an introductory course, and for many of you, your first exploration of the hospitality and tourism field, we will "build" a bibliography together, save this page for the titles of journals and periodicals and the names of authors that are standard references for our discipline. We will add to our bibliography each week.

Course Grading/Assessment/ Assurance of Learning

Pretest and Post Test

You will take **a pre and post test of the course.** You will need to take the pre test prior to taking quiz 1 and the post test prior to taking the final exam.

Quizzes and exams will consist of any combination of multiple choice and/or matching questions. Material from the textbook chapters, handouts, and class presentations are areas from which the

questions will be selected. Quizzes will be announced a week in advance. There is NO makeup quiz. Extra credit assignments will be available for those students only, who missed just ONE of the quizzes. If you missed more than one quiz (even if you have an excuse) you will only get ONE extra credit assignment. Class presentation materials (power points) must be sent to the instructor by email, two days in advance to assure your presentation. If you complete your presentation, but fail to present it you will get 50% of your grade.

Grading Policy and Academic Requirements:
Each student is responsible for ALL reading assignments, lecture materials, handouts, and assignments inside and outside of the class. This includes guest lectures, audio-visual materials, and field trips.

Percentage of Grade Value for Each Assignment Listed Your grade is weighted as follows:

2/3 of your grade is from class work including tests, quizzes, assignments and participation in class discussion.

Quiz points	10%
Tests	10%
Final Exam	20%
Assignments (including recipe file)	30%
Notebook/journal of dining experiences/ Tourism Field Work	25%
Class participation	5%

Grade Distribution:
Letter Grade
Percentage Range
Based on 100%

96	-	100	=	A	+
90	-	95	=	A	
86	-	89	=	B	+
80	-	85	=	B	
76	-	79	=	C	+
70	-	75	=	C	
60	-	69	=	D	
59	Or below		=	F	

Additional Course Requirements and General Information Regarding the Course:
Attendance Policy:
You are expected to make responsible decisions about class attendance and you will be held responsible for the full content of the course of study. Because there is so much of the world of hospitality to see, and because much of our most important work will take place in class, attendance is mandatory. Three unexcused absences will result in the loss of one letter grade in you final evaluation. Chronically tardy students will be warned once. After that, each tardy arrival will be considered an unexcused absence. Excellence in our industry demands strong time management skills.

Attendance: Be here. Absences will affect points from exams and in-class assignments.
Punctuality is the same as attendance. Any student missing more than 5 classes of the total

classes in a semester automatically fails the course. These 5 absences include excused and unexcused absences. Leaving class early without the permission of the instructor will result in an absence being assigned. **Please note course material covered in class will be from other sources besides your textbook and readings.** Again Excellence in our industry demands strong time-management skills. *Please be prompt-I usually make important announcements at the start of class and I will not repeat myself once you arrive!*

Late Work: Assignments are due when specified unless the instructor is notified beforehand. Failure to turn in the assignment promptly will result in the assignment not being accepted or points being deducted.

Participation: You have the responsibility to be prepared and to participate in an active manner. The quality and quantity of your contributions will be examined in the evaluation of your performance.

Academic Integrity: You are expected to do your own work. Robert Morris University is committed to creating a culture of academic integrity. Student and Faculty resources regarding academic integrity issues can be accessed below. Robert Morris University joined the National Center for Academic Integrity in 2005. The Center's website at www@rmu.edu provides information about the organization, links to relevant news events, links to various institutions' AI codes and polices, and an extensive resource database of academic integrity-related literature. When using the ideas of others, please reference the sources where they come from. Failure to do so can range from failing the assignment to failing the course

Professionalism: Your behavior is to be professional and appropriate at all times and is a requirement of the class. Cell phones, pagers and all other electronic devices not relevant to the class are to be turned off. The standard is to practice courtesy among our peers and to the instructor.

STUDENTS REQUESTING ACCOMMODATIONS:

"STUDENTS WHO MAY BE ELIGIBLE TO RECEIVE LEARNING SUPPORT OR PHYSICAL ACCOMMODATIONS MUST CONTACT THE CENTER FOR STUDENT SUCCESS AT 412-262-8349 TO SCHEDULE AN APPOINTMENT WITH A COUNSELOR AND TO LEARN MORE ABOUT ACCOMMODATION PROCEDURES. TO RECEIVE ACCOMMODATIONS IN THIS COURSE, ARRANGEMENTS MUST BE MADE THROUGH THE CENTER FOR STUDENT SUCCESS. "

TENATIVE COURSE OUTLINE

Class Period:
Topic: Introduction to course/Interaction in a diverse world/Understanding Intercultural and Co-Cultural Communication/Basic understanding and overview/ Importance of food in culture/Understanding the importance of journal writing
Assigned Reading: Charting a Hero's Journey Stage I/II/III Geography Text 1-15
Assignments: Define vocabulary terms/Set-up a journal for your first entries/Enter answers from questions on page 31 of charting a hero's journey/ Answer questions 1 and 4 in Geography Text Answer questions from lecture

Class Period:
Topic: Understanding culture/Defining intercultural communications/Exploring fundamental axioms of Intercultural Communication/Brief history of food & culture and world tourism/Journal writing procedures
Assigned Reading: Read the ten step inventory from page Continue reading Charting a Hero's Journey Stage I/II/II
Assignments: Define vocabulary terms/Enter answer from questions on page 39 of charting a hero's journey/Answer questions from lecture

Class Period:
Topic: Define culture/location geography/Identify elements of a cultural system/Describe institutional subsystems within culture/Describe means by which cultures develop
Assigned Reading: Read geography text 35-52/Continue reading charting a Hero's Journey I/II/III
Assignments: Define vocabulary terms/Enter answer from Hero's Journey question on page 43 questioned 2 and also page 51 questions 1/2/3 Think paper 1

Class Period: Understanding rhetorical strategies used between in-groups and out-groups in their communication/Identify the models associated with perception of cultural diversity and micro-cultures/List geography factors that block effective intercultural communication concerning cultural diversity/Models associated with food rhetoric and tourism
Assigned reading: Geography Text 61-82 Charting a Hero's Journey I/II/III
Assignments: Define vocabulary terms Enter questions from Hero's Journey page 51 questions 1/2/3 and page 54 questions 1 and page 57 question 1

Class Period: Discuss the important of underlying themes and values of culture as they influence communication Understand mono-chronic poly-chronic cultural orientations/Food and community/geography
Assigned Reading Geography Text 87-114 Charting a Hero's Journey I/II/III
Assignments: Define vocabulary terms/Lecture page 114 question numbers 2/ Enter questions from Hero's Journey Page 63 question 1 page 68 question 1 and 2 and page 75 questions 1 and 2 and page 77 question 2/ Think paper 1 is due

Class Period: Understanding intercultural language and non verbal communication Describe perceptual differences and attitudes people hold toward individuals with accented speech/Linguistic diversity with food and culture
Assigned Reading: Charting a Hero's Journey IV
Assignments: /Define vocabulary/Geography question 1 page 130/Think paper II/ Charting A Hero's Journey page 84 question/page 86 question 1 and 2 page 87 question 1 and page 95 question 1 and 2

Class Period Intercultural communication and non-verbal messages/Define nonverbal communication and its functions/Identify significance of nonverbal communication/Identify nonverbal differences among cultures/Nonverbal communication and food
Assigned Reading: Geography Text lecture questions/Charting a Hero's Journey V
Assignments: Define Vocabulary/Dodd page 152 question 1/Charting a Hero's Journey answer question 2 on page 106 question 1and 2 on page 111 and question on page 118/Think paper II is due

Class Period: Cultural adaptation and communication effectiveness/ Cope with anxiety upon entering a new culture/Adjusting in a new culture/identify negative and positive effects/Cultural adaptation to food and geography

Assigned Reading: Geography Teaxt157-170 Charting a Hero's Journey VII/IX/X

Assignments: Define vocabulary terms/Charting a Hero's Journey answer questions 2 on page 162 and questions 2 and 3 on page 166 and question 1 on page 171 and question 3 on page 180/Think paper III

Class Period: Intercultural communication competencies associated with intercultural effectiveness/ Define effectiveness and its dimensions/ List factors of intercultural competency associated with intercultural effectiveness outcomes/Effective competencies with food and communication

Assigned Reading: Geography Text 173-184 Charting a Hero's Journey IX/X/XI

Assignments: Define vocabulary terms/Charting a Hero's Journey answer questions 1 and 2 on page 205 question 1 on page 206 questions 1 and 2 on page 213 and question 3 on page 215 Think paper III is due

Class Period: Social influence of network/Cultures and information flow/ Determine how similarity homophile influences information and culture/Apply strategies to manage creditability for influence in intercultural interactions/Social influence and food interactions

Assigned Reading: Geography Text 208-232 charting a Hero's Journey IX/X/XII

Assignments: Define vocabulary terms/Charting a Hero's Journey answer 123 on page 227 question 2 on page 230 question 1 and 4 on page 236 and question 1 on page 247/Think Paper IV

Class Period: Media as source of influence on intercultural communication/Identify way in which the mass media influence cultural change/List effects of mass media on cultural thought/Demonstrate the relationship between mass media and cultural learning/Understanding mass media and food culture

Assigned Reading: Geography Text 236-245 Charting a Hero's Journey XI/XII

Assignments: Review For Final Exam/Charting a Hero's Journey answer question 1 on page 256 questions 2-4 on page 259 and question 2 on 266/Due date for final entries in Charting a Hero's Journey to be determined in class.

Factors That Influence Women When Purchasing a Business Format Franchise

Paper #W090525003

INTRODUCTION

Interest in the area of franchising continues to increase; at this time, more than 75 industries use franchising as a way to disseminate products and services to the general population (LBC Franchising Corporation, 2009). Currently, some 50% of all businesses in the United States are franchises, and this number continues to grow (LBC Franchising Corporation, 2009). In addition, the International Franchising Association reports that "…franchising is responsible for 760,000 businesses, 18 million jobs, 14 percent of the private sector employment, and over $500 billion in payroll," and sales by franchises are expected to top two trillion dollars by the end of 2009 (LBC Franchising Corporation, 2009). With many businesses such as restaurants, fast foods and beverage chains, hotels, etc. operating as franchises, this growth has direct impact on those who pursue these businesses, particularly as we consider the current economy. Equally compelling is the information that franchise businesses seem to do better than traditional start-ups. Statistics indicate that up to two-thirds of new businesses are discontinued in their first six years. In contrast, franchise outfits have retained longevity; LBC Franchising Corporation reported the following statistic on their website:

> A 1999 study by The United States Chamber of Commerce found that 86% of franchises opened within the last five years were still under the same ownership and 97% of them were still open for business.

These statistics point to an undeniably persuasive argument: Franchising has become a major American way of doing business. The franchise method of distribution, still relatively young compared to other marketing methods, continues to contribute significantly to the American economy. It provides rapid growth for the franchisor and, more importantly, it vastly increases the likelihood of success for the small business person, namely the franchisee. This unique working relationship offers flexibility and security that is unavailable under other business systems (International Franchise Association, 1990).

Why has the dramatic increase in franchising taken place over the past few decades? A number of reasons are given: (a) a generally accepted perception of a higher rate of success of franchise operated establishments relative to independent stores, (b) the association between franchising and the favorable portrayal of entrepreneurship in the scholarly and popular literature, (c) a growing number of changes in the lifestyle that increasingly pursues convenience goods and services but with the quality assurance offered by franchise outfits, and (d) a general downsizing of employees from larger American based companies. In many, cases these terminated employees leave their respective companies with large severance packages which may form the initial investment to purchase a business format franchise. This is also a time when more women and minorities are seeking to become entrepreneurs and individual business owners (Smith-Hunter, 2006).

The term franchise comes from the old French word franc, meaning free servitude. Its Middle English form, franchise, meant privilege or freedom, today The American Heritage Dictionary of the English Language defines franchise as, "a privilege or right granted a person or a group by a government, state or sovereign, especially ... suffrage ... the grant of certain rights and

powers to a corporation ... authorization granted by a manufacturer to a distributor or dealer to sell [its] products." (Morris, 1969). Since the 1850s when the Singer Sewing Machine Company became the first company to employ franchising as a method of distribution, independent business people have been enjoying unique privileges and freedoms as franchisees. In the first half of the 20th century, franchising took the form of automobile and truck dealerships, gas stations, and soft drink bottlers. These franchised businesses still make up about three-quarters of total franchise sales, but ever since McDonald's arrived on the scene in the 1950s, companies in virtually every industry have adopted business-format franchising as a way of business. As the economic scene changes, franchising finds new and wider applications. Because franchising can be used to distribute just about any product or service, its potential seems almost unlimited (Jones and Lief, 1993). Most franchises fall into one of four categories, each of which has distinct economic and legal characteristics

1. The Manufacturer/Retail Franchise is a manufacturer who sells the right to stock and sell its product line through a retail outlet. An example is an automobile dealership.

2. The Manufacturer/Wholesale Franchise is a manufacturer who sells the franchised wholesaler a product such as syrup or a concentrate. The franchisee adds other ingredients to produce a finished product which is sold to retail outlets. An example is a beverage company.

3. The Wholesaler/Retailer Franchise is a wholesaler who sells a retailer the right to carry the products it distributes. Two examples are Agway or Radio Shack.

4. The Business-Format Franchise is the most common, fastest growing

type of franchise and the one discussed in this study. Here the franchisor sells the franchisee a trade name, an identity, and a proven method of doing business. Every commercial strip in America is rife with examples, from fast food restaurants like Burger King and Pizza Hut to hotel chains like Best Western and Holiday Inn. More specifically, in this arrangement the franchisee purchases the right to use the franchisor's method of marketing, operational systems, logos, trademarks, architectural styles, and other features. The franchisor will dictate many of the details of the business such as prices, quality, products and equipment specifications, and the methods and hours of operation. The business-format franchisor derives income from up-front franchise fees, royalties, percentages of .gross sales, advertising pools, and from the sales of products and services.

A few advantages of the business format franchise are:

1.   The business-format franchise has been proven successful. Therefore, the risks are minimized and the franchisee is provided with as foolproof a product as found in the world of business. The statistics speak for themselves. Almost 97% of franchises are still in operation five years after they open. In comparison, 90% of independent businesses fail within the first five years. Ninety-four percent of franchisees report their franchises have been somewhat successful or very successful, and 86% say they are as satisfied or more satisfied operating their franchises than they were in their previous jobs.

2.   The franchisees have the knowledge and experience of the franchisor to help them. The longer the franchisor has been in business, the more likely he or

she is to have seen most of the problems the franchisee will encounter.

3.   The franchisee benefits from the franchisor's marketing efforts and new product development. The franchisor will want to share these advantages with the franchisee since the more successful the franchisee becomes, the more successful the franchisor will become.

4.   Franchises are better able to weather a down-economy. Business-format franchises are successful because they don't try to be all things to all people; instead, they fit small, neatly defined niches in the market place.

5.   Many franchises can be operated from home or a mobile location which keeps costs and overhead expenses to a minimum (Powers, 1995; LBC Franchising, 2009).

With the success of franchises (it is estimated that one out of twelve businesses is a franchise), this paper specifically examines factors affecting why women engage in Business-to-business franchising. This has implications for businesses including the hospitality and tourism sector as more women become business and franchise owners. Recent research on women and minority entrepreneurs has indicated several factors for wanting to have one's own business and challenges that can negatively affect this. Recent research by Smith-Hunter(2006) found that motivators include: freedom of choice in handling work-family conflict; issues of discrimination such glass ceiling at their work and wage differences; wanting to make a contribution to society and filling a void in a market; and achieving independence and personal development. Some of the challenges to successful entrepreneurship are: lack of significant start-up capital, access to credit and access to adequate business networks; and limited level of business ownership

experience. This can be used as a baseline for exploring issues for women franchisees to determine if similar or different factors exist.

The number of women and minority franchise owners is increasing dramatically. For many years, women were more or less ignored by the franchising industry. That is changing. Franchising is proving to be an excellent way for women to get into business for themselves. Women are now the owners and co-owners of an estimated 34% of all franchises. Since they are starting new businesses at twice the rate of men, that figure should increase dramatically in the next ten years (Powers, 1995). That women find franchising attractive should not be surprising. The glass ceiling is still considered by many to be very much a fact of life in corporate America. Since large numbers of women are purchasing business-format franchises and many of these franchisees are developed, owned and managed by men, this study emphasized gender as an issue in franchise development as factors were investigated to determine which components influence the purchase of business-format franchises by women.

<div align="center">Statement of the Problem</div>

Most franchisors and franchisees agree that it is important to understand and assess the rational and emotional factors inherent in different franchises before making a final decision to purchase. Since most franchises are developed, owned, and managed by men and then sold to male franchisees, not much thought has gone into the needs of women franchisees. For practical purposes, it has been assumed by franchisors that the needs and wants of men and women are the same.

Based on cultural, educational, and job experiences, women may have a special set of needs and wants that should be recognized. These needs and wants have to be satisfied before the female prospect can be influenced to purchase a business-format franchise and subsequently become

successful at that franchise. These wants and needs are manifested in rational and emotional factors offered by a franchisor to influence a woman to purchase that franchise and then to be successful in its operation. Franchisors have not successfully identified the factors that women want and need when making a decision to purchase a franchise. Since women currently make up one-third of business-format franchise purchasers and since this figure is expected to increase, it is vital for the success and growth of franchises that the factors influencing women to purchase be fully researched and reported.

Franchise developers are business specialists who usually are hired to supervise the actual design and development of a successful business into a legal and marketable franchise. Franchise developers, after realizing the enormity of the growing market for women-owned franchises and that women may have dissimilar needs and wants in a business-format franchise than their male counterparts, may design and develop the franchise differently.

Franchise brokers are business specialists who usually are hired to supervise the marketing and sales of the business-format franchise company. Most franchise brokers are intermediaries who make a sales commission only after they successfully influence a prospect to purchase a franchise. As franchise brokers realize that women may have different needs and wants, the franchise broker will want to direct the women prospects to those franchises that have the factors necessary to satisfy women's needs and wants.

<p align="center">Significance of the Study</p>

This study explored and discovered those rational and emotional factors which are key in a woman's decision to purchase a business-format franchise. With the important business factors identified, the franchisor will have a better understanding of the factors that

potential women purchasers want and need when deciding to purchase a business-format franchise. Subsequently, the franchisor could add factors and services that are highly attractive and influential for potential women franchise purchasers. This is important in terms of how franchisors market their business. Likewise, factors and services could be removed that have been found to have a negative impact on potential women franchise purchasers. This would mean a savings of time, effort, and money, and would improve as well as streamline the purchasing process.

Franchisors will be able to design or redesign franchising packages to better assist purchasers in establishing and maintaining successful franchises. This is important because (a) business success and longevity will encourage additional franchise purchases, and (b) a greater understanding of the wants and needs of women franchisees will assist in better communications among all the interested parties. The franchisor needs to promote a climate of trust and cooperation for mutual benefit, communication, and growth for all.

Women will also find this study significant, since it will make them consciously aware of their franchise wants and needs and enable them (a) to ᶴbecome informed decision makers, and (b) to choose the franchise best suited to their rational and emotional requirements. In addition, franchise sales brokers will be better able to advise potential women purchasers because they will have a clear understanding of the unique factors necessary to attract and support women franchise purchasers. This investigation covered all types of business format franchises in the United States.

Research Questions

The need to ascertain what business factors women want and must have before deciding on a franchise purchase generated these research questions: (a) What factors influenced women to

purchase a franchise? (b) What search patterns did women use to find a franchise that they later purchased? (c) Which rational and emotional factors influenced women to purchase a business-format franchise and do these influences differ across age groups, education and geographical regions ?

Assumptions

This research focused on women who had purchased a business-format franchise. The principal assumption underlying this research was that there are rational and emotional factors which will influence a woman to purchase or not to purchase a particular franchise. This is a reasonable assumption because (a) many men own, manage, and develop most business-format franchises; (b) women, due to | their particular experiential and educational background, may need different rational and emotional factors than men; and (c) most franchisors are not aware of the unique needs of potential women franchisees.

Definition of Terms

<u>Business Factors.</u> Business factors are all of the rational and emotional services offered by the franchisor to aid the franchisee in becoming successful.

<u>Business-Format Franchising.</u> The franchisor licenses the business methods it has established and that are identified by its trademark. The franchisee's methods of operation are significantly controlled by the franchisor. The franchisor most often provides significant assistance to the franchisee in the operation of the business, under the guidelines of the federal disclosure rule of 1979. The franchisee is required to pay ongoing fees or royalties to the franchise company. This is the most popular method of franchising today.

<u>Franchise.</u> A franchise is a long term, continuing business relationship where the franchisor grants to the franchisee a licensed right, subject to agreed upon requirements and restrictions, to

conduct business utilizing the trade and/or service markets of the franchisor and also

provides to the franchisee advice and assistance in organizing, merchandising, and managing

the business conducted pursuant to the licensee.

Franchisee Agreement. The franchise industry is a highly regulated industry. The Federal Trade

Commission (FTC) regulates franchising with the Uniform Franchise Offering Circular

(UFOC). The document must disclose much

personal business information concerning the franchise. Failing to do so can cost the

franchisor up to $10,000 per day, per violation.

Franchise Broker. A franchise broker is a person or firm that helps to sell the franchised business.

Franchise Developer. A franchise developer is a person or firm that provides legal and marketing

assistance to a company that wants to become a franchise.

Franchise Support. Franchise support includes service or assistance provided by the franchisor. It

often includes such things as location, selection, lease assistance, facility design and layout,

training, marketing, centralized buying, financial help, advertising, fees, territory rights, and

references.

Franchisee. A franchisee is a person or company who pays the owner, or franchisor, for the

franchise and the right to use it.

Franchisor. A franchisor is the owner of a franchised business who grants the

buyer of the franchise the right and license to operate the business using the

methods and the product the franchisor has developed.

Franchisors provide a wide variety of assistance for franchisees but not all franchisors

provide the same level of support. Assistance and support provided by franchisors include financing, site selection, lease negotiation, co-op advertising, training and assistance with the grand opening. The extent of ongoing support to franchisees also varies among franchisors. Support areas include control data processing, central purchasing, field training, field operation, evaluation, newsletters, regional and national meetings, a hot line for advice and franchisor-franchisee advisory councils. The availability of these services is a critical factor in the decision to purchase a franchise and may be crucial to long-term success of marginal locations or marginally prepared owner/operators.

<u>Factors Offered by Franchisors that Influence Women to Purchase a Franchise</u>

Calvin B. Haskill Jr. of Franchise Solutions, Inc. (Maynard, 1996), suggests that prospective franchisees pose eight questions to established franchisees. These questions include: (a) Is the company always available to answer your questions and help you? (b) What kinds of ongoing training and development are you receiving? (c) What kind of marketing assistance is available? (d) Is your business generating profits? (e) How long did it take for your business to generate profits? (f) How do you spend most of your time? (g) Which of your expectations has ownership of this franchise failed to meet? (h) Would you buy this franchise again?

Hedy Ratner, of Chicago's Women's Business Development Center, says women tend to be more successful than men in starting businesses. Women take classes and attend workshops, and they are often "risk-averse," Ratner explains. "They are more likely to keep their expenses down and not need all the perks that men need as they go into business. They often start their businesses out of their home. Their operating costs are much less. They do much of the work themselves because they're capable of doing it, giving them an opportunity to hang in longer in a (down) economy." (Nelton, 1992, p. 66).

The Search Patterns Women Use to Find a Franchise To Purchase

Generally, the factors found to influence women to purchase business format franchises are security issues, success issues, support/training issues, risk issues, and gender issues. Some of these factors are similar to what the previously mentioned research on women and minority entrepreneurs found.

"A variety of techniques can be utilized to reach women," indicates Tom Gunderson, franchising vice-president for Express Services Temporary and Permanent Personnel. "First, advertising is a necessity. It is imperative you (the franchisor) gain name recognition. This can be done either on a national scale or by concentrating in areas where your company has franchises available." (Haneborg, 1992, p. 30). A second technique, according to Gunderson, would be to saturate an area with advertising, networking and telemarketing.

You must market creatively and aggressively. Gunderson adds, "You should access outplacement organizations, women networking groups and women's business associations." (Haneborg, 1992, p. 30). However, Gunderson believes their most successful and dependable marketing tool by far has been through referrals from within his company structure. "We have acquired

Approximately 50% of our franchises through the company network." (Haneborg,

1992, p. 30).

Some franchisors market specifically to women, targeting them through women's magazines or special seminars. One company took a more creative approach in 1994, sponsoring an essay contest to attract female franchisees (Bernfeld, 1995). However, Bernfeld states that, in general, franchisors find targeted campaigns unnecessary since female corporate dropouts read the same business periodicals and go to the same trade shows as their male counterparts.

Rational and Emotional Factors That Influence Women to Purchase a Business-Format Franchise and Whether These Influences Differ Across Age Groups. Education and Geographical Regions

While there is no such thing as a risk free business venture, the concept of franchising provides needed security to many women who have decided to own and operate their own businesses. Perhaps the reason for this is that when people go into business with a franchise they find they are on their own, but are not alone.

Franchisees, like all small business owners, have to work hard for success but they will have a better chance at success with a franchise organization supporting them. And it is in the franchisor's best interest for the franchisee to be successful. Franchising's role in advancing women in the work place is significant. In the past five years, for example, the number of female-owned McDonald's restaurants has increased by 300%. However, women are particularly vulnerable in franchise deals (Kezios, 1992), and should ask these questions to help choose a franchise wisely: (a) Can you identify with other women in franchise management? (b) Can you identify with the women franchisees? (c) Where are the franchises owned by women located? (d) Are they good locations? (e) Does the franchise you're looking at have a women's franchise association? Is it active and successful in dealing with management?

The traditional obstacles to women in starting a franchise are lack of management or other business experience and difficulty in raising capital. A good franchise with a developed business format can help break through the first obstacle by supplying procedures, training, and ongoing support, making this one reason franchises are attractive to women (Roba, 1994).

Knowledgeable franchisors will realize that raising capital to purchase the franchise is very

difficult for many otherwise well situated potential franchisees. These franchisors will boost the potential franchisees' chances of securing capital by explaining the lending process. In addition, according to Roba (1994), established franchisors are more likely to offer financing or may act as a match-maker between the franchisees and lenders.

Applegate (1993) cites the additional training, moral support, and marketing support as reasons why women purchase franchises. Once the franchise opens, the franchisee receives advertising materials for local newspapers, promotional tips, direct mail, and a multitude of other materials to help define and reach their target market (Harris, 1992).

The greatest challenge for women entrepreneurs and franchises is to find a franchise which will take them seriously (Whittemore, 1995). According to Barnes-Bryant, "It is important for women to have their own vehicles for networking and communicating with other women franchisees. Membership in a franchise advisory group or franchise association can benefit a new franchise immeasurably." (Harris, 1992, p. 75).

Since it was impossible to distribute the questionnaire to every woman in the United States who has purchased a franchise-format business, a sampling population was generated. The following give background of the terms used and how the sampling was accomplished.

The population for this study was women in the United States who have acquired a business-format franchise. The sample used in this study consisted of the members of the Franchising Association. International Franchise Association. and Franchise Time. The organizations list a total of 340 women representing a variety of industries and geographical areas. The women from the above sources became the frame of this study. The survey questionnaires were sent to all of the sted women, and as a follow-up, postcards were also sent a week later to remind iem of the survey. Responding to the survey were 111 women.

Reliability

Reliability of this questionnaire was checked by the rephrasing of the questions. This was established through inter-item questions. That is, questions were phrased differently, but required the same responses. The responses to these questions were then compared for consistency by using 95% confidence intervals. Note that the respondents of the rephrased questionnaire had to be the same respondents as those who answered the original questionnaire. Otherwise, the consistency check would have been purposeless.

In survey sampling, there are two possible types of answers. One is an open answer, where the respondent gives a subjective answer. In this study, however, the questionnaire has closed questions only. A closed question is one that a) has a single numerical answer such as the age of the respondent, or b) refers to questions or a fixed number of predetermined choices, one of which is to be selected by the respondents. The limitation of the closed question is that it does not provide the appropriate alternatives for the respondents, and the alternatives themselves can influence the response of the respondents. In terms of data handling, closed questions are easier to manage and statistical summaries are easily constructed.

In pretesting the questionnaire to determine the factors that influence women to purchase a business-format franchise, a group of 40 women was utilized. The initial group was later divided into two different focus groups. The participants for these focus groups were selected by asking women if they would be interested in purchasing a business-format franchise. Those who answered yes were invited to participate in the design. The result of the pretest helped to determine when a modification of the questionnaire was needed.

Focus groups were held twice with twelve women in each group and lasted about 30 minutes each. Women who were interested in owning a business were asked to participate. The questions focused on four areas: a) Why would you want to own a business-format franchise? b) Would you want to own a franchise instead of a new start-up business? c) What should a franchise offer? d) What would prevent you from getting into your own business?

The answers in each category varied among the participants. To the question "Why would you want to own a business-format franchise?", the answers included the following: a) need for money, b) be my own boss, c) make my own hours, d) flexibility, e) more interesting work, f) opportunity, and g) for family reasons

The question "Would you want to own a franchise instead of a new start-up business?" elicited eight different responses. They included: a) gain experience, b) my father had a business and I want my own, c) married to present job and want a divorce from it, d) beneficial tax purposes, e) may help my family in the future, f) get my kids some business experience, and g) a retirement option. Focus group respondents cited pros and cons of owning a business-format franchise versus a start-up company. The positive aspects they cited for owning a franchise include: a)more successful, b) less risk, c) more support, d) policies and procedures already

developed, and e) market place has been determined. The negative aspects of a start-up company as seen by the focus group were a) too much risk and b) the need for too much prior experience. There were ten responses from the focus groups to the question "What should a franchise offer?" They include a) good track record, b) site selection, c) market research, d) training for both personnel and management, e) on-going support, f) integrity and honesty, g) long term and day to day commitment to the franchisee, h) help in advertising and marketing, and i) assistance in financing. The last question " What would prevent you from getting into your own business?" elicited seven different responses. The focus group participants responded with these reasons: a) time commitments, b) not enough money to commit, c) too much risk for dependents, d) unreliable employees, e) not Aggressive enough of a personality, f) government regulations that are too complex, and g) fear for personal safety in regards to potential robberies, etc.

Questions were formulated as a result of the information obtained through the focus series. The questions emphasized three themes:

1.   Socio-demographic data. These include age, income, education, marital status, and previous business experience.

2. Women's perception of their specific needs with respect to franchise businesses. These questions examined the impact of prior business and educational background.

3. Rational and emotional factors that facilitate or hinder women in franchised businesses. These questions identified those services that franchisors need to offer in order to attract more women buyers.

<div align="center">Data Analysis</div>

All data was processed using a statistical package. Charts and graphs were used for the descriptive component of this study. Chi-Square analysis, ANOVA, and Bartlett's Test of Equal Variance, were used to examine the differences among women in respect to their needs. The Chi-Square distribution is based on sampling from a normal distribution. This distribution method can be used to develop internal estimates and to conduct hypothesis tests about a population variance. A goodness of fit tests uses the Chi-Square distribution to determine whether a hypothesized multinomial probability distribution for a population provides a good fit. The hypothesized test is based on differences between the observed frequencies in a sample and the expected frequencies based on the assumed population distribution. Another important application of the Chi-Square distribution involves using sample data to test for the independence of two variables. ANOVA is a statistical procedure called analysis of variance. ANOVA can be used to test for the equality of three or more population means using data .obtained from an observational study. The analysis of variance may be summarized as a technique for portioning the variation in the observed data into parts, each part assignable in different causes or combination of causes. Analysis 'f variance is appropriate when it can be assumed that the several groups of observations can be treated as random samples from the populations. Bartlett's Test of Equal Variances is a procedure for testing the homogeneity of more than two variances. This test is very helpful in determining whether or not there is a statistical difference between the variance of those that agree or disagree.

Summary of the Study

The major purpose of this study was to gather opinions and feedback from women

franchisees on a) What factors influence women to buy a franchise, b) what search patterns did women use to find a franchise that they later purchased, and c) the rational and emotional factors that influence women to buy a business format franchise and whether these influences differ across age groups, education and geographical regions. To identify the factors which could influence women to later buy a business-format franchise, this study sought assistance and support from two focus groups. From the information generated by the focus groups, a survey questionnaire was constructed. This survey questionnaire was then pre-tested and validated by women members of the business and academic communities.

The questionnaire was distributed to 340 women who had purchased a business format franchise. We had 110 surveys returned from various types of franchises. The sizes of the franchises involved in the study varied. This investigation covered all types of business-format franchises in all the geographical areas within the United States. Within two weeks of sending out the survey questionnaire, a follow-up post card was sent to each woman who received the questionnaire, reminding her to complete the questionnaire if they hadn't already done so and to return it in the self-addressed, stamped envelope within a certain time period.

Summary of Findings

The study explored the relationship between factors which influence women to buy business-format franchises, search patterns to find the right franchise and what, if any rational and emotional factors act as an influence to buy a franchise. From a measurement perspective, this study utilized Chi Square analysis, ANOVA and Bartlett's Test of Equal Variances. With these forms of statistical measurement, the 23 hypotheses were judged fairly.

To summarize, this study was the first investigation of influences on women to buy a business-format

type franchise and whether rational and/or emotional factors play any part as a further influence. Significant findings verified influences and suggested new relationships among influences for women franchises that had not been previously considered.

Research Questions Discussed

The first research question addressed was "What factors influence women to buy a franchise?" According to the results of the survey questionnaire and the subsequent constructs and hypothesis then developed, women agreed that particular issues were important. These included a) security issues, b) success issues, c) support/training issues, d) risk issues, and e) gender issues.

Security Issues

Women agreed that security in the success of a future business was important in their buying decision and saw franchising as a relatively secure form of business. Women took into consideration the convenience and security of this form of business as it related to their family situation. Sample responses:

1. "Cordis (husband) and I have been quite fortunate in our experience during this business relationship. Our franchisor is an exceptional man running an exceptional organization. We got in very early and have watched American Fastsigns grow at a rapid rate. It is solid from the ground up. Our story could have just as easily been a nightmare if our franchisor was not honest and pure in heart."

2. "When you franchise or open a business, you should examine re-sale or closure assistance."

Success Issues

Success for women in their future business enterprise, while it could be considered a part of

the security issue, was tested separately. Women agreed that success was important and the acquisition of a business-format franchise helped to secure this future success. Women who were interested in buying a franchise indicated they were good business managers before they began to look for their own business. This was surprising, since a potential franchisor would probably think a woman (or a man) would likely buy a franchise because he/she needed to learn to be good or better business managers. Comments on the surveys regarding this subject include:

1. "Franchises give you a good sound start. If you follow their advice usually you are successful. Also, you have other people to discuss your successes with, as well as your problems."

2. "I was lucky to get in on the ground floor. Our facility is very successful and is growing daily. I enjoy being my own boss and running a successful, satisfying franchise business all alone."

3. "As a first time business owner, I'm glad I chose a franchise opportunity." "Most of the answers are based on my Billerica store - the North Reading store has not been open long enough to make any decisions regarding success, failure, etc."

4. "The suggested liquidity established by the franchisor should be carefully heeded. The on-going cash requirements, above the initial fee, are real and are paramount to success."

5. "I was tired of working for others. I did research and chose this franchise. Would buy a franchise again if it were a business I knew nothing about. I am not satisfied with my company's financial performance. I believe franchisor's financial info was incorrect."

Support/Training Issues

Women tended to agree that a business format franchise was more supportive to their particular needs. They also believed that a franchise was responsive to their specific situation and

thus saw this as an advantage. Possibly as a further security issue, women perceived that a franchise provided adequate entry level training, at least enough to get a successful start in their marketplace. The on-going training as it related to future development was important as a support issue and security issue. Some of the participants commented on their surveys as follows:

1. "I have had success in my franchised business, but would not go into another franchise."

2. "I am unhappy with franchisors' lack of help after 11 years in business."

3. "As a first time business owner, I'm glad I chose a franchise opportunity. It's given me the support to launch my business. Also, the system, and procedures are already in place so I can spend my time developing my business and satisfying my customers. For my next business venture, I probably will not choose a franchise."

4. "A franchise gives you great support through networking of other franchisees."

5. "My franchisor has been a great company to be involved with."

Risk Issues

Women tended to agree that buying a franchise was not less risky than starting a new business on their own. This finding was very surprising, since a selling point for franchisers has always been that they are much safer than a business start-up. Women were still very interested in finding a franchise that they deem reliable — one they saw as honest, ethical and believable. Their comments include:

1. "I just closed my business. It was not suited to the needs of the community. I do not think I had the correct information when I decided on this category of business. The franchisors were not able to predict the percentage of success I could expect and now agree my part of the country does not lend itself well to my class of business."

2. "It is extremely difficult to find any employees much less the quality labor force I would

like because unemployment in this are is 2%. This has been my major challenge."

3. "My husband kept on putting more and more of our funds into paying ice cream and rent bills that easily built up because the business did not make enough to pay for the high cost of product, rent, franchise fees and other requirements each month."

Gender Issues

Women tended to agree that they have similar opportunities in business as their male counterpart. They believed that they were not taken seriously enough in the business world. Women agreed that they needed administrative help from male business people, possibly one reason why they felt less favored than men in business. Their comments include:

1. "Franchises are easier for women who work to go into their own business. However, the franchisor is still men and men control the finances. My husband had to get the loan needed to start."

2. "I believe this is a male oriented business. Within the franchise there are only a small percent owned strictly by women. Men tend to argue prices more with women (than men)."

3. "I really don't know why I filled this out because it is not going to change matters at all. Women will never get credit like men in this world today. Fact!"

4. "Franchising a business for me is not enough. I still have to decide different marketing techniques and procedures to succeed. Women in particular are very meticulous with business operation and I don't get satisfied with what franchise dictates. Women like me are very motivated to succeed in business."

5. "Some of these questions should not be female oriented. It doesn't matter in some cases that we are females. Owning our particular franchise has been good for us because of the support we

get from our franchisor and it's probably a lot easier starting a franchised business than starting

another business from scratch, but that is not a female versus male issue."

6. "Men and women make both good and poor managers. Sex has nothing to do with

ability. Acquisition of a franchise is only good for a woman or man if they have an entrepreneurial

personality. Many men and women don't!"

7. "Like any other business, there are great franchises and lousy ones. It doesn't matter if

you're a man, a woman, or a dog — Do your homework!!"

The second research question asked "What search patterns did women use to find a franchise

that they later purchased." According to the results of the survey questionnaire women had mixed

opinions when they answered this research question.

Developed from the relevant literature and the focus groups, six major sources (constructs) of

information used by women in the search of a franchise that they later purchased were identified as

a) commercial advertising, b) peer recommendation c) personal research, d) business consultants, e)

business clubs, and f) family member. Surprisingly, most women did not agree that commercial

advertising was their main method for finding and purchasing their franchise.

Few of the women questioned supported the hypothesis that they would purchase a franchise

based on the advice of a business club. College educated women franchisees agreed that they would

not purchase a franchise based on peer recommendations. Women with prior training in a particular

franchise industry group agreed that they would purchase a franchise based on their own personal

research. The third of the research questions asked "Do rational and emotional factors influence

women to buy a franchise?" According to the results of the survey questionnaire, women had strong

opinions when answering this research question. Most women agreed that rational issues, such as

insuring success and ongoing training, were very important ingredients and influential in their purchasing decision. Most women agreed that emotional issues, such as security, risk and gender, are also high on their list of priorities when seeking to purchase a franchise business.

Conclusion

As a result of this study, and through the help of the focus groups and survey questionnaires, a series of constructs for the research questions were developed. The development of the constructs led to the development of 23 testable hypotheses.

The results of the tested hypotheses indicated that issues concerned with security, success, support/training, risk and gender tend to be very important to women. They tended also to be a very powerful influence in womens' decisions to purchase a business-format franchise.

This study revealed the way women learn about the franchise they eventually purchase. The findings indicated that most women disagreed that commercial advertising was very important in their search for a business format franchise. It further indicated that most women with a college education will not purchase a franchise based primarily on peer recommendations. However, this does not mean that college educated women would completely discount peer recommendations, but would be more inclined to rely on primarily personal research. In addition to highly educated women, results indicated that women with some prior specific training also tended to purchase a business-format franchise based on personal research

Results indicated that most women agreed that both rational and emotional factors are important in choosing a business-format franchise. Rational factors, such as success issues and training programs, are weighed heavily in the decision to purchase or not to purchase. Emotional factors including security issues, the amount of perceived risk in a franchise, and perceptions on

how their gender is accepted and appreciated were also important to potential purchasers.

The results of this study supported the importance of the developed constructs and that both rational and emotional factors are important for women when purchasing a franchise. It reveals that franchisors and franchise sales brokers must pay closer attention to these issues in order to successfully influence more women to purchase their franchises.

Limitations

As with the general nature of any research, there are a number of limitations associated with this study. "It is important to realize that there is no one best way to conduct research, but rather all research can be viewed as a series of interlocking choices in which one tries simultaneously to maximize several conflicting desiderata. There is no one true or correct set of methodological strategies, rather, from a dilematic point of view, all research strategies and methods are seriously flawed, and it is simply not possible to do good — that is methodologically sound— research." (McGrath, 1982).

One of the limitations of this study was that the sample size was limited. Franchisors are very guarded of the franchisees names and addresses, but the researcher was able to get 340 respondents from trade associations, magazines, and a few franchisors. This was problematic and only after promises of sharing research outcomes were potential respondents offered.

Another limitation was that not all franchise industries participated, and the ones that did were predominantly those in their early growth phases. A further limitation was the interpretation of the focus group conclusions, the development of the survey questionnaire and the interpretation of the pre-testing of said questionnaire. Bias certainly may partially result as the results of the survey are interpreted. This may occur because each survey participant may interpret words and phrases

and their meanings differently, based on their individual experiences.

<div align="center">Recommendations for Future Research</div>

Since business-format franchising continues its popularity and growth as a business form, continued research in this area is important. The findings and recommendations of this study suggest some future research topics related to this particular area:

1. The finding that the risk issue (i.e. franchises are far less risky form of business than a start-up) was seen by women as not an advantage when buying a franchise. Future research should focus on developing and refining a survey to assure a reliable and valid measure of the attitudes of woman franchisees. This certainly has implications for practitioners in this field because they will be better able to match women who will be more likely to be successful for a particular franchise.

2. This research effort considered only franchises early in their growth or introductory business cycle stage. Enlarging future research to incorporate more mature franchises might either support that conclusion or lead to different conclusions.

3. It would be of benefit to replicate this research in several years to chart changes in the attitudes, values and feelings of women franchisers at that time.

4. Another study would be to survey men franchisees to see how they view the same three research questions. A further comparison of the genders would prove beneficial to practitioners and future franchisees alike.

5. More research is necessary in areas of how women find franchises.

Rational and Emotional Factors
Security issues
Success issues
Support/training issues,
Risk issues, and
Gender issues
Being taken seriously
Having own network
Understanding the financial risks
Financial Access

Six major constructs of information used by women in the search of a franchise
a) commercial advertising,
b) peer recommendation,
c) personal research,
d) business consultant,
e) business club, and
f) family member.

Why would you want to own a B- franchise?
a) need for money,
b) be my own boss,
c) make my own hours,
d) flexibility,
e) more interesting work,
f) opportunity,
g) for family reasons

SELF-REPORTED HEALTH AND RISK BEHAVIORS: DO THEY INFLUENCE ATTITUDES TOWARD PRICING HEALTH INSURANCE?

R. Eugene Hughes, East Carolina University, College of Business, Greenville, NC 27858
(252) 328-6026; hughesr@ecu.edu

ABSTRACT

Responding to increasing cost of providing employee health care insurance, employers have instituted a number of direct (e.g., reduced benefits, limited access, increased co-payments, etc.) and indirect (e.g., differential premiums, wellness programs, etc.) cost-savings efforts. While employee support for direct cost reductions may be limited, indirect efforts may receive modest support. Of interest in the present paper are indirect cost abatement efforts that focus on 12 lifestyle behaviors. The present paper will investigate the extent to which the individual's self-reported health and risk behaviors influence his/her attitudes regarding differential premiums based on these lifestyle behaviors.

INTRODUCTION

Some form of health insurance is offered to employees by approximately 60% of private organizations. While 59% of organizations with less than 100 employees offer health insurance, this benefit is offered by 93% of those organizations with 100 or more employees. Approximately 24% of all employers pay the full cost of health insurance and 13% pay for the cost of family coverage [14].

The average total monthly cost of health insurance for the employee is $428 and an average of 81% is paid by the employer. The average total monthly cost for family coverage is $1078 with the employer paying approximately 71% of cost [14].

In a survey of 400 firms, it is reported [15] that the average annual cost of medical insurance for an employee was $5924. This amount represented approximately 14.5% of total payroll cost in 2005 and is an increase from the 11.9% reported in 2004.

Employers began to observe increased cost associated with providing health insurance beginning in the 1970s and 1980s [12]. Such increases continue today and it is expected that these costs will increase by approximately 10% in 2008 [1]. As employers were negatively impacted by increasing health benefit costs, they pursued a number of cost control options. The options can be considered as direct and indirect cost control methods. While these methods have the same goal, cost reduction, the process and impact on the employee are different. Consequently, these two methods will be briefly discussed below.

Direct Cost Control

Risk management through beneficial selection was a major tool for controlling cost prior to the passage and enactment of the Americans with Disabilities Act in 1990. Before ADA, risk reduction associated with the use of health benefits was pursued through pre-employment medical exams, which were, for some organizations, extended to family members. By selecting low risk employees with low risk families, an organization could significantly reduce its exposure to increased insurance premiums based on employees' health care utilization.

After passage of the ADA, which seems to prohibit pre-employment physicals, the use of this form of risk reduction has been severely limited. That is, ADA does allow pre-employment physicals when it is determined that the applicant's health is a bona fide occupational qualification for job performance. It is obvious, however, that employers may secure health data from other sources [7].

The prohibition of beneficial risk selection as a risk reduction tool, caused employers to a focus on direct cost reduction efforts. In its most direct and extreme form, the organization simply discontinues the health care benefit. Because of the unfavorable variability of premiums, this course of action appeals primarily to small employers [10]. Larger employers seldom experience wide variations in premiums and, consequently, have fewer reasons to discontinue health benefits. Because of the assumed relation between health benefits and the employer's ability to attract applicants [11], employers appear to view discontinuation of health benefits as a last resort.

Many employers identified cost sharing as a reasoned approach to increased health benefit costs. Such cost-sharing efforts can take a number forms such as increased premiums, limits placed on covered health benefits, or the removal of certain health benefits. However, these efforts result in decreased health benefits for the employee or increased costs for the same benefits.

Employers often, however, simply increased the employee's deductibles and/or co-payments. In many situations, employers also began to reduce employees' choice of medical providers by requiring higher employee co-payments for providers who were not included in the employer's or insurance provider's list of preferred providers.

These cost saving efforts may, unintentionally, compound the problem through adverse selection. That is, the healthiest employees will, if so motivated, simply drop the insurance and seek a less expensive personal policy. Only those who are the sickest will remain in the program, resulting in increased claim experiences. Because of problems associated with adverse selection, many employers are exploring indirect cost control methods.

Indirect Cost Control

Differential premiums based on lifestyle behaviors may seem a reasonable indirect cost control method. However, regulatory issues generally limit this approach to organizations that self-insure. Because a large medical claim may jeopardize the survival of a small organization, self-insurance, is considered a feasible approach only for large organizations. For large firms, self-insurance has the advantage of removing its health benefits from state jurisdiction and places it under federal regulation (ERISA, Employee Retirement Income Security Act). It also allows the organization to implement some form of individual pricing that charge employees higher premiums or deductibles for recognized unhealthy behaviors or conditions that do not fall under regulations of ADA.

Efforts to charge premiums based on the employee's health were ended by HIPAA (Health Insurance Portability and Accountability Act of 1996), which requires that covered employees be charged the same premium regardless of pre-existing conditions or health. In 2007, employers received some relief from the prohibition when HIPAA rules were modified to allow financial incentives for wellness programs. These incentives or rewards can be as large as 20% of the cost of coverage for the employee [8].

Federal and state regulations of differential premiums and/or incentives are insufficiently precise that legal assistance is required prior to implementation of any premium/incentive programs [8] [18]. However, single company examples of successful efforts to decrease health benefit costs (e.g. [1]; [3]; [6]; [13]; [17]) suggest that incentive programs have the potential to reduce health care benefit costs.

None of the above examples suggests, however, that all employees are willing to participate in offered wellness programs. Participation in wellness programs can vary from approximately 75% for intensive intervention programs to not more than 20% for a simple program [17]. Similar participation rates are observed for visits to employer provided health clinics [4].

Low participation rates lead Dow Chemical [13] to institute a bonus system for it health staff that is based on their ability to enroll employees in the company's wellness program. As would be expected, organizations choose the unhealthy behaviors based on health cost, and the lower level of participation may be a function of whether employees agree with the list of unhealthy behaviors that are eligible for incentives. In essence, employees may not participate in company sponsored wellness programs simply because of their attitudes toward the included unhealthy behaviors.

Health and Risk Behavior

It can be assumed that both adverse selection and moral hazard may influence the individual's decision to purchase health insurance. Adverse selection, noted earlier, describes the situation where those who are unhealthy tend to purchase health insurance, while healthy individuals will not make such a purchase. Moral hazard is created by

those who have health insurance engaging in unhealthy behaviors that lead to increased insurance usage.

The present paper is concerned with the potential impact of adverse selection on employees' attitudes toward indirect cost control efforts. Specifically, to what extent do the employee's perceptions of his/her healthy risk behavior influence attitudes toward differential premiums for health insurance? Because moral hazard concerns the use of health insurance, it will not be discussed here.

The effects of different attitudes toward health insurance, health, and risk have been noted for race and ethnic background [19], outcome risk [16], and genetic testing [5]. Each of these studies suggests that in one form or another, the person's attitudes regarding his/her health will influence attitudes toward health insurance.

Similar to the focus of the present study, Doirnon, Jones, and Savage [2] report that self-assessed health status reflects a strong positive correlation with the purchase of private health insurance. If support for indirect cost control efforts (i.e., differential pricing or wellness programs) is to be obtained, it is necessary to understand the impact of a person's self-reported health and risk behaviors on his/her attitudes toward unhealthy lifestyle behaviors.

METHOD

Data were collected from 84 undergraduate business students enrolled in a senior level business class at a southeastern state-supported university. Responses were recorded on a questionnaire that described 12 lifestyle behaviors (Appendix A) that are similar to factors for which health risk has been established by epidemiology [9].

Instructions provided students information as to how premiums for group health are determined. The instructions then asked if it were rational for the premiums to be the same for everyone regardless of an individual's health behavior. For the 12 lifestyle behaviors, respondents were asked whether it was rational (support)or irrational (lack of support) to consider an individual's health behavior in determining that person's health care insurance premium. While, as noted above, most programs that differentially price health insurance are based on some form of incentive, it was thought that this approach would best measure respondents' attitudes regarding the identified lifestyle behavior.

Two similar questions asked respondents to provide a general evaluation of their health and risk behaviors. The two questions used a six point scale and each was anchored by Above Average (1) and Below Average (6).

The analysis sample was 83 (one respondent failed to complete the questionnaire) and consisted of 45 females and 38 males with an average age of 22.7 years. As expected for an undergraduate class, 72.3 percent indicated no management experience ($M=.9518$, $s.d.=2.67$), eight were married, and five indicated they had children. Three scales developed through factor analysis (Unsafe Behavior, Indulge, Unhealthy Behavior) are

used for analysis purposes and no overall effect was detected for the gender, age, work experience, or marital status variables (MANOVA: Unsafe Behavior, $F=1.380$, $p=$ns; Indulge, $F=.855$, $p=$ns; Unhealthy Behavior, $F=1.11$, $p=$ns). As a result the sample was treated as homogeneous.

RESULTS AND DISCUSSION

The means and standard deviations for the 12 lifestyle behaviors are shown in Table 1. Preliminary information regarding support for recognizing an individual's behavior in setting health care insurance premiums can be developed by using values less than the mid-point of the response scale (3.5) as indicating support with values greater than 3.5 showing a lack of support. Values less than 3.5 are underlined in Table 1 and show that five lifestyle behaviors receive support for recognition in determining health insurance premiums. The strongest support is reflected for Smoking, Other Uses of Tobacco, and Drinking. Strong resistance to recognition of unsafe lifestyle behavior is shown for Risky Recreational Behavior and Not Maintaining Healthy Weight.

Table 1

Means and Standard Deviations Measuring the Rationality of Recognizing Individual Behavior in Setting Health Insurance Premiums for 12 Lifestyle Behaviors

Lifestyle Behavior	*M*	*S.D.*
Smoking	2.30	1.50
Other Uses of Tobacco	2.58	1.47
Drinking (Liquor, Wine, etc.)	3.22	1.38
Unsafe Sex	3.38	1.58
Not Following Doctor's Orders	3.65	1.45
Unhealthy Eating Habits	3.88	1.34
Unsafe Driving	3.90	1.49
Not Using Seat Belts	3.67	1.68
Lack of Exercise	3.81	1.40
Risky Recreational Behavior (skydiving, auto racing, etc.)	3.94	1.64
Not Maintaining Healthy Weight	3.94	1.19
Not Getting Annual Physical Exam	3.39	1.58

Given the recent attention to obesity, the lack of support for Not Maintaining Healthy Weight is surprising. However, respondents may be sensitive to health issues related to obesity, but may not equate healthy weight to obesity. This may suggest the need to change the weight "message."

Table 2 shows the results of factor analysis (principal components, varimax rotation), which identified three underlying dimensions (eigen values ≥ 1.0). Each factor is defined by three lifestyle behaviors (underlined and bold). The remaining lifestyle behaviors

exhibited cross-loadings that prevent their inclusion in any one of the three factors. Lifestyle scales were named based on the lifestyle behaviors that compose the factors and scale values were computed (average responses for the summed lifestyle behaviors).

Table 2

Factor Analysis of the Rationality of Recognizing Individual Behavior
in Setting Health Insurance Premiums for 12 Lifestyle Behaviors

	Factors		
Lifestyle Behavior	I	II	III
Smoking	-.003	**.961**	-.037
Other Uses of Tobacco	.083	**.934**	.055
Drinking	.231	**.622**	.359
Unsafe Sex	.612	.455	.200
Not Following Doctor's Orders	.495	.327	.203
Unhealthy Eating Habits	.334	-.011	**.801**
Unsafe Driving	**.805**	.093	.338
Not Using Seat Belts	**.810**	.178	.172
Lack of Exercise	.590	-.134	.608
Risky Recreational Behavior	**.842**	-.086	.142
Not Maintaining Healthy Weight	.053	.240	**.830**
Not Getting Annual Physical Exam	.271	.120	**.666**

The means, standard deviations, and reliabilities for the Unsafe Behavior, Indulge, and Unhealthy Behavior are shown in Table 3. Using the same values, above, to indicate support (<3.5) or lack of support (>3.5), it can be observed that only the Indulge factor, underlined, receives support for recognizing the individual's behavior in setting health care insurance premiums. This is consistent with the discussion of the means shown in Table 1 because the Indulge factor includes the three lifestyle behaviors noted above as receiving the strongest support.

Table 3

Means, Standard Deviations, and Reliabilities for Three Factors Representing the
Rationality of Recognizing Individual Behavior in Setting Health Insurance Premiums

	Factor	*M*	S.D.	Alpha
I.	Unsafe Behavior	3.84	1.41	.847
II.	Indulge	2.70	1.27	.844
III.	Unhealthy Behavior	3.59	1.13	.749

Self-reported Health Behavior (SRHB) and Risk Behavior (SRRB) were measured by two questions that asked respondents to evaluate, in general, their Health and Risk Behavior. A response scale of 1-6 was used with anchors of Above Average (1) and Below Average (6). Data for the SRHB and SRRB questions were divided at the mid-point for analysis purposes. For the SRHB question, responses 1-3 were set to a value of one with a value of two representing responses 4-6. Because "Below Average" would represent a low risk behavior for the SRRB question, the scoring was reversed (i.e., 1-3=2 and 4-6=1).

Analysis of the three factors by the Health Behavior and Risk Behavior question was by MANOVA and the results are shown in Table 4. As shown in Table 4, SRHB exhibited a significant effect on Unhealthy Behavior, but no significant effect on the other two factors. Neither SRRB behavior nor the interaction between SRHB and SRRB show a significant effect on any of the three factors.

Table 4

MANOVA Results for the Effects of Self-Assessed Health and Risk Behaviors on
Unsafe Behavior, Indulge, and Unhealthy Behavior Factors

Factor	Health Behavior		Risk Behavior		Health x Risk	
	F^*	p	F^*	p	F^*	p
Unsafe Behavior	3.413	.068	.938	.336	.259	.613
Indulge	.179	.673	.001	.982	.137	.712
Unhealthy Behavior	5.011	.028	.858	.357	.000	.992

*d.f.=1,82

An evaluation of the group data shows that the low SRHB, or healthy, group evaluated the Unhealthy Behavior factor (*M*=3.69, *s.d.*= 1.162) higher than did the high SRHB, or unhealthy, group (*M*=2.97, *s.d.*=.594) and the mean differences is statistically different (*t*=2.087, *d.f.*=81, *p*=.04). In essence, the healthy group would be less inclined to increase health insurance premiums for unhealthy behavior. And, obviously, the unhealthy group would be more inclined to increase health care insurance premiums. Correlation results (r=-.226, *p*=.04) confirmed this negative relation.

These results are inconsistent with the concept of adverse selection, which posits that those who are unhealthy will choose to purchase health insurance, but that those who are healthy will tend not to make such a purchase. These results are, however, consistent with research which consistently shows the opposite [2], suggesting that adverse selection may not operate in the manner proposed by many risk models.

CONCLUSIONS

The concept of adverse selection argues that individuals who are at high health risk are more likely to purchase health insurance than those who are considered at low risk. Differential premiums for health insurance that recognize the individual's health risk might be considered a method of equalizing the risk-cost difference between the high and low risk groups. As such, the high risk group would be required to pay more than the low risk group. While the Health Insurance Portability and Accountability Act of 1996 prohibits differential premiums for employer provided health insurance, recent changes in the law allow wellness benefits. Good health behavior or participation in a wellness program can effectively reduce the individual's health insurance premiums. Or, of concern to the organization, reduce its health care costs.

Overall, respondents agreed to increased premiums for those whose behavior included Smoking, Other Uses of Tobacco, and Drinking. It might be concluded that those who express a willingness to consider these behaviors as a basis for health care premiums may also be willing to participate in wellness programs directed at the same behaviors.

Inconsistent with the concept of adverse selection, neither SRHB nor SRRB had an effect on Unsafe Behavior or Indulge behavior nor was there and interaction effect on any of the three factors. Only Unhealthy Behavior was affected by SRHB. Analysis of the SRHB groups produced results inconsistent with the adverse selection model. That is, those in the unhealthy group were willing to support increased health care premiums, but those in the healthy group were not.

These results may suggest that factors other than health risk influence respondents' attitudes toward health care premiums. One reasonable explanation is that those who engage in unhealthy behavior believe it is fair to pay higher premiums. Except for a "social good" explanation, it is difficult to explain why those who are healthy would not support differential health care premiums. Obviously, the lack of a concrete explanation for the healthy group's attitudes offers the opportunity for additional research directed at the influence of the individual's attitudes on adverse selection.

REFERENCES

[1]. Covel, S. & Spors, K. K. (2008, June 26). Providing health benefits on a budget. *The Wall Street Journal,* p. B6.

[2]. Doiron, D, Jones, G. & Savage, E. (2008). Healthy, wealthy and insured? The role of self-assessed health in the demand for private health insurance. *Health Economics*, 17, 317-334.

[3]. Feinberg, D. (2007). Managed Care. *The Journal of Child and Adolescent Psychopharmacology, 17(3)*, 391-392.

[4]. Hansen, F. (2009). Currents in compensation and benefits. *Compensation & Benefits Review,* 41 (5), 5-20.

[5]. Hoel, M., Iversen, T., Nilssen, T., & Vislie, J. (2006). Genetic testing in competitive insurance markets with repulsion from chance: a welfare analysis. *Journal of Health Economics*, 25, 847-860.

[6]. Hodge, J. (2006). Lowering healthcare premiums by increasing staff wellness. *Nursing Homes, 55(11)*, 66-69.

[7]. Kapur, K. (2004). The impact of the health insurance market on small firm employment. *The Journal of Risk and Insurance, 71(1)*, 63-90.

[8]. Knight, V. E. (2008, January 16). Wellness programs may face legal tests. *The Wall Street Journal,* p. D9.

[9]. Long, D. A. (2006). The cost of lifestyle health risk: Obesity. *The Journal of Occupational and Environmental Medicine,* 48(3), 244-251.

[10]. Monheit, A. C., & Schone, B. S. (2003). How has small group market reform affected employee health insurance coverage? *Journal of Public Economics*, 88, 237-254.

[11]. Monheit, A. C., & Vistnes, J. P. (1999). Health insurance availability at the workplace. *The Journal of Human Resources, 34(4)*. 770-785.

[12]. Park, C. H. (2000). Prevalence of employer self-insured health benefits: National and state variation. *Medical Care Research and Review, 57(3)*, 340-360.

[13]. Rubenstein, S. (2005, October 24). Keeping workers healthy pays off at Dow Chemical. *The Wall Street Journal Online,* (http://online.wsj.com/article/SB113011180643877125.html)

[14]. U. S. Department of Labor Statistics (2007). National compensation survey: Employee benefits in private industry in U. S. (http://www.bls.gov)

[15]. U. S. Chamber of Commerce (2008). Chamber survey employers pay more for benefits. (http://www.uschamber.com/publications/reports/benefits.htm)

[16]. Wang, M. & Fischbeck, P. S. (2004). Similar in how to frame, but different in what to choose. *Marketing Bulletin*, 15, 1-12.

[17]. Wellness; MacAllister Machinery reduces healthcare costs, Improves employee health with CareGuide's predictive modeling and health coaching program, (2007, October 13). *Obesity, Fitness, and Wellness Week,* 375.

[18]. Zhang, J. (2008, June 4). Lawsuits test disabilities act. *The Wall Street Journal,* D1, 6.

[19]. Zuvekas, S. H. & Taliaferro, G. S. (2003). Pathways to access: health insurance, the health care delivery system, and racial/ethnic disparities, *Health Affairs,* 22 (2), 139-153**.**

APPENDIX A

PRICING HEALTH INSURANCE

In general, if you are a member of a group health insurance plan, everyone in the group is charged the same price for the insurance. When members of the group engage in unhealthy or risky behavior that results in medical costs, all members of the group share in any increase in the cost of the insurance. One might ask why all members of the group must pay for the unhealthy or risky behaviors of a few members.

The following questions ask you whether **you think** it would be RATIONAL to consider an individual's unhealthy or risky behavior in pricing group health insurance for that person. In answering the following questions, **consider only the listed behavior, do not be concerned either about the intensity or "how much" of the behavior would be required to initiate an additional cost or how the behavior would be detected.**

	Very Rational					Very Irrational
SMOKING	1	2	3	4	5	6
OTHER USES OF TOBACCO	1	2	3	4	5	6
DRINKING (Liquor, Wine,etc.)	1	2	3	4	5	6
UNSAFE SEX	1	2	3	4	5	6
NOT FOLLOWING DOCTOR'S ORDERS	1	2	3	4	5	6
UNHEALTH EATING HABITS	1	2	3	4	5	6
UNSAFE DRIVING	1	2	3	4	5	6
NOT USING SEAT BELTS	1	2	3	4	5	6
LACK OF EXERCISE	1	2	3	4	5	6
RISKY RECREATIONAL BEHAVIOR (e.g., skydiving, auto racing)	1	2	3	4	5	6

NOT MAINTAINING A
HEALTHY WEIGHT   1   2   3   4   5   6

NOT GETTING ANNUAL
PHSYCIAL EXAM   1   2   3   4   5   6

REACTIONS TO SIGNALS OF A FIRM'S INVESTMENT IN PEOPLE: INVESTIGATING THE SHORT-TERM AND LONG-TERM IMPACT ON SHARE PRICE

Joshua R. Aaron, East Carolina University,134 Slay Hall, Greenville, NC 27858,aaronj@ecu.edu,252 737 1597

Andrew O. Herdman, East Carolina University,121 Slay Hall, Greenville, NC 27858, herdmana@ecu.edu, 252 737 2017

W. Lee Grubb III, East Carolina University, 321 Slay Hall, Greenville, NC 27858, grubbw@ecu.edu, 252 737 1103

Abstract

There is growing evidence that investments in a firm's human resource are associated with superior firm performance. Employing event study methodology, we examine the impact of these investments on firm performance. Specifically, we develop hypothesis related to both the short-term investor reactions and long-term performance.

Introduction

More than a decade ago, Hannon and Milkovich (1996) provided evidence suggesting signals of significant investments in people positively impacted short-term share price. In this study, the authors used a number of announcement types—including "100 Best to Work for", "Best for Working Mothers", "Best for Blacks" and others, to create a sample of events acting as signals of high investment in people. While the authors concluded a positive impact on share price, the results were generally mixed with only 1 of the 6 announcements resulting in significant positive reactions. Moreover, they used data drawn from a single announcement for each of the selected lists. Further, the signaling events used in these studies all had release dates of prior to 1990. In the intervening decades significant empiric evidence has accumulated related to the influence of investments in people on firm performance (Combs, Liu, Hall & Ketchen, 2006) as well as a considerable growth in practitioner oriented attention to these investments (e.g. O'Reilly & Pfeffer, 2998; Pfeffer, 2005). In light of these methodological issues and possible shifts in public perceptions, we believe there is significant utility in revisiting these findings. In the present study, we attempt to provide rigorous replication by limiting our sample to a single list—100 Best, and following these announcement over a period of seven years.

Our intent here is to provide a full investigation of the performance impacts of signals of investments in people in terms of both short-term investor reactions and long-term market performance. We accomplish this by employing event study methodology to track the any abnormal short-term movement in share price in the days following these signaling events. Additionally, we plan to examine the long-term performance of these firms when compared to the performance of the larger market. We use the annual announcements of the Fortune Magazine's 100 Best Places to Work (100 Best) for the years 2000-2007 as a dramatic and obvious signal of a firm's investment in its people. This methodology provides a robust context to investigate how these investments are interpreted by shareholders.

The Relationship Between High-investment HR Strategies and Firm Performance

Research has shown collective workplace attitudes and individual performance outcomes to be related. Meta-analysis has shown a substantial relationship between individual job satisfaction and individual performance (ρ =.30; Judge, Thoresen, Bono, & Patton, 2001). Extending this relationship to the organizational level, employee attitudinal and motivational variables have been demonstrated to impact organizational performance outcomes (e.g. Ostroff, 1992; Schneider, Hanges, Smith & Salvaggio, 2003). Finally, research has also demonstrated firms appearing on the 100 Best list outperform other firms in terms of return on assets and share price (Fulmer, Gerhart & Scott, 2000; Lau, 2000).

This research is complemented by a growing attention to the study of Strategic Human Resource Management (SHRM). This line of research investigates bundles, or sets, of high commitment work practices and their relationship to firm level outcomes. Employee centered outcomes are argued to result in improved organizational functioning and performance (Barney, 1991, 2001; Cappelli & Singh, 1992; Wright & McMahan, 1992). Empirically, there is growing evidence that a positive relationship exists between the use of employee intensive HR practices and firm level outcomes. Recent meta-analytic treatments of the literature suggest a relationship between adoption of these systems of practices and organization level outcomes, including profitability, productivity, and turnover (Combs et al., 2006; ρ = .19, SD= .12). Consistent with these findings, we expect:

> Hypothesis 1 - Events signaling significant investments in people will positively impact firm share price in the long-term.

The collective impact of this research to the management of human resources—including the importance of investments in people, is to increase likely that the public's awareness and sensitivity to

organizational approaches to the management of human resources. Signaling theory suggests the public's perception of firm is shaped by key and reputational signals in evaluating an organization (Spence, 1974). Clearly, one way to create a quality HR reputation is to be recognized as a "Best Employer" through popular practitioner outlets such as Fortune magazine's "100 Best Companies to Work for in America" (Ballou, Godwin, & Shortridge, 2003). Being named to such a list is presumed to enable organizations to attract and keep more talented employees which may result in both strategic and financial benefits. Therefore, we expect that events signaling investment in employee satisfaction and commitment will manifest in short-term reputational and long-term positive impacts on a company's stock price. Based on these assertions we propose the following:

> Hypothesis 2 - Events signaling significant investments in people will positively impact firm share price in the short-term.

The Possible Influence of Firm Characteristics on Shareholder Decision-making

The implicit assumption in the previous discussion is that shareholders apply a consistent logic across all organizations when interpreting these high investments in employee signals. However, this may not be the case. There is a growing literature suggesting organizations may not be best served by the universal application of high-investment in people strategies (Lepak & Snell, 1999; Lepak & Snell, 2002; Huselid, Beatty & Becker, 2005). Generally, the intensity of the human capital requirements in the firm's environment is asserted to be the most important moderating condition in shaping the efficacy of these strategies (Wright & Snell, 1999).

For example, Lepak and Snell (1999, 2002) have argued the optimal approach to HR management is driven by characteristics of the jobs within the firm. Strategic value is determined by the degree to which job functions possess value creation potential through the enactment of strategies that improve efficiency, effectiveness and exploit market opportunities. In circumstances where employee skills are not readily obtained in the market and are characterized by interdependencies and firm specificity, a job function may be considered to have unique human capital characteristics. These arguments are largely consistent with Huselid and colleagues' (2005) assertion that organizations are best served by developing unique HR responses contingent upon the strategic importance of the firm's human resources.

In line with this reasoning, we assert that the impact of progressive HR practices may be contingent on industry characteristics. We considered several different industry orientations that may shape shareholder perceptions of the relative strategic importance of the firm's human capital. The first is the possible difference between industries considered to be technology intensive. In these instances, shareholders may perceive the difficulty of finding and retaining talent as placing a premium on developing a stable and committed workforce. Further, the demands placed on these firms by their relatively dynamic competitive environments would likely be perceived as requiring a more skilled, capable and committed workforce. For this reason, we expect both:

> Hypothesis 3 - The relationship between events signaling significant investment in people and share price will be more positive in the long-term for firms in technology intensive industries than less technology intensive industries.

A second distinction in industry orientation that may shape shareholder perceptions of the relative importance of the firm's human resources is the difference between firms in the manufacturing versus service industries. Manufacturing is generally perceived to be more reliant on exploiting manufacturing technologies, economies of scale, supplier relationships and physical plant investments. Within the service industry, the firm's are more reliant on their employees in the creation of the product/service. Moreover, the employee and customer often interact very directly in the creation of the product/service (Heskett, 1986; Porter, 1985). For these reason, on balance, the human resource capabilities of the firm—

especially significant investment in people, would be more likely viewed as positive in a service than a manufacturing context.   Therefore, we expect:

> Hypothesis 4 - The relationship between events signaling significant investment in people and share price will be more positive in the long-term for firms in service industries than manufacturing industries.

This relatively intuitive line of reasoning may also be applied to investors' reactions to signaling events regarding the firm's investment in people. In other words, shareholders may employ a contingent logic in their decision-making following announcements by believing that investment in people may be more appropriate in certain contexts. If so, the upward or downward movement of the firm's share price following a signaling event would rely on the inherent strategic importance of the firm's human resources. Using this industry segregation described above, this would mean more positive short-term reaction by investors in technology intensive industries where firms rely more heavily on the firms human assets.   Similarly, this variability in short-term reactions would also be expected between service and manufacturing, with a generally more positive short-term reaction for service intensive industries. Thus, we hypothesize:

> Hypothesis 5a - The relationship between events signaling significant investment in people and share price will be more positive in the short-term for firms in technology intensive industries than less technology intensive industries.

> Hypothesis 5b - The relationship between events signaling significant investment in people strategies and share price will be more positive in the short-term for firms in service industries than manufacturing industries.

Sample

The data for this study come from the annual "Fortune 100 Best Companies to Work For" from the years 2000-2007. Fortune's rating is based on six different criteria, with multiple questionnaire items within each of them. These criteria include: (1) pay and benefits; (2) opportunities; (3) job security; (4) pride in work and company; (5) openness and fairness; and
(6) camaraderie and friendliness (Lau, 2000).

There are 800 firms listed from 2000-2007. The companies must be publicly traded in order for us to collect the dependent variable, cumulative abnormal returns. Nearly half (46%) of these firms are private companies, reducing the total usable observations to 425.

Analysis

To estimate abnormal performance, we conducted an event study, employing a CRSP market model. The essence of the event study methodology is to determine if there is a statistically significant change in the stock price of a company during a specified event window following an announcement of interest. Here, we are interested in whether there is a significant increase in stock price following a firm being named to the 100 Best. We start by considering a market adjusted model using the equally weighted CRSP index. This model is stated as:

$$R_{jt} = \alpha + \beta_j R_{mt} + \varepsilon_{jt}$$

where *Rjt* is the rate of return of the *jth* firm in month *t*; *Rmt* is the rate of return on the market index in month *t*; and *j* is a parameter that measures the sensitivity of *Rjt* to the market index.

For robustness, however, we also estimate abnormal returns using buy and hold abnormal returns. The CRSP market model allows us to take all eight Fortune lists and aggregate them to one event date. Thus, we are able to examine the returns around the specific date. The issue date of the Fortune magazine article containing the Top 100 serves as the event date. We use mean cumulative abnormal returns to examine the performance around the event date. Cumulative abnormal returns are the returns for a specific firm over a specified number of days following the issue date over and above the return for the market as a whole. The use of the CRSP market model allows us to control for market expectation, industry membership, and firm risk as well as stock market fluctuations. Market expectation and firm risk are controlled because the market model first calculates what a "normal" return should be in order to calculate the "abnormal" return. The normal return is itself the market expectation and takes the inherent risk of the firm into account.

Results

To test hypothesis 1, we conducted an event study using the CRSP equally weighted market adjusted model. We examined the mean cumulative abnormal return from 1 month before the issue date announcing the list of Fortune 100 Best Places to Work to 3 months, 6 months, 12 months, 18 months and 24 months after the press release. There are a total of 800 firm observations on the Fortune list from 2000 through 2007. Nearly half of those (372) are privately-held firms and must be excluded from the analysis, leaving a sample of 428 observations. The 2008, although published cannot be used because 2008 data are not available yet on CRSP.

Table 1: All firms – Equal Weighted

	Return	Sign.
3 months	-3.59	.001
6 months	-5.75	.001
12 months	-6.88	.001
18 months	-10.14	.001
24 months	-11.05	.001

Table 2: All firms – Value Weighted

	Return	Sign.
3 months	1.14	N/S
6 months	0.91	N/S
12 months	4.48	.100
18 months	3.36	N/S
24 months	5.68	N/S

Each of the estimation periods produce a negative cumulative abnormal return (CAR) ranging from -3.59% to -11.05%. All of these returns are significant at the .001 level. The market adjusted value weighted produces no significant CARs for any of the estimation periods, although it should be noted that all long-term estimation periods produce positive CARs.

To test hypothesis 2, we conducted an event study using the CRSP equally weighted

market adjusted model. We examined the mean cumulative abnormal return from 3 days before the issue date announcing the list of Fortune 100 Best Places to Work to 3 days, 5 days, 10 days, 15 days, 20 days and 30 days after the press release.

Table 3: All firms – Equal Weighted

	Return	Sign.
3 days	-1.29	.001
5 days	-2.01	.001
10 days	-2.75	.001
15 days	-2.17	.001
20 days	-1.98	.001
30 days	-3.43	.001

Table 4: All firms – Value Weighted

	Return	Sign.
3 days	0.05	N/S
5 days	-0.09	N/S
10 days	0.02	N/S
15 days	0.48	N/S
20 days	0.79	N/S
30 days	0.61	N/S

Each of the estimation periods produce a negative cumulative abnormal return (CAR) ranging from -1.29% to -3.43%. All of these returns are significant at the .001 level. The market adjusted value weighted produces no significant CARs for any of the estimation periods. The fact that equally weighted are highly significant while the value weighted are not suggests there is a firm level effect. Small firms must be severely underperforming large firms. The large firms' better performance is causing the value weighted returns to be higher.

To test hypothesis 3, we divided the overall sample into high and low-tech firms by using the AEA (American Electronics Association) industry classification system. The AEA is a national non-profit trade association founded in 1943 that represents all segments of the technology industry. They identified 45 SIC codes in 13 categories as high-tech industries. The 13 categories include: computer and office equipment, consumer electronics, communications equipment, electronics components and accessories, semiconductors, photonics, defense electronics, electromedical equipment, communications services, software services, data processing and information services, and retail and other computer-related services. Based on SIC code, 126 observations are in high-tech industries (29.4%) and 302 are in low-tech industries (70.6%).

Table 5: High-tech firms – Equal Weighted

	Return	Sign
3 months	-6.05	.010
6 months	-12.20	.001
12 months	-11.36	.010
18 months	-20.70	.001
24 months	-19.71	.001

Table 6: High-tech firms – Value Weighted

	Return	Sign.
3 months	-0.69	N/S
6 months	-4.41	N/S
12 months	1.75	N/S
18 months	-5.26	.100
24 months	-0.46	N/S

Table 7: Low-tech firms – Equal Weighted

	Return	Sign.
3 months	-2.56	.010
6 months	-3.05	.050
12 months	-5.00	.050
18 months	-5.71	.050
24 months	-7.42	.050

Table 8: Low-tech firms – Value Weighted

	Return	Sign.
3 months	1.90	N/S
6 months	3.14	N/S
12 months	5.62	.050
18 months	6.98	.050
24 months	8.25	.050

We tested the market adjusted equally weighted model as well as the value weighted model for each group for 3 months, 6 months, 12 months, 18 months and 24 months. High-tech firms have highly negative (-6.05% to -20.70%) and significant returns ($p<.01$) according to the equally weighted model. The value weighted model produces no significant returns at the .05 level. Low-tech firms also have highly negative (-2.56% to -7.42%) and significant returns (all at least $p<.05$ level) according to the equally weighted model. The value weighted model, however, tells a completely different story. All estimation periods produce positive CARs and three of those (12 months, 18 months, 24 months) are significant at the .05 level. It is clear that low-tech firms are outperforming high-tech firms in our sample and, again, we have a firm size effect where the large firms are outperforming small firms.

To test hypothesis 4, we divided the sample into service and manufacturing firms. SIC codes ranging from 2000-3999 are classified as manufacturing; all others are classified as service. As a result, 275 observations (64.3%) are service firms while 153 observations (35.7%) are manufacturing firms.

Table 9: Service firms – Equal Weighted

	Return	Sign.
3 months	-3.66	.001
6 months	-5.07	.001
12 months	-6.35	.050
18 months	-8.75	.001
24 months	-10.15	.010

Table 10: Service firms – Value Weighted

	Return	Sign.
3 months	0.93	N/S
6 months	1.29	N/S
12 months	4.35	N/S
18 months	4.03	N/S
24 months	5.67	N/S

Table 11: Manufacturing firms – Equal Weighted

	Return	Sign.
3 months	-3.47	.050
6 months	-6.98	.050
12 months	-7.84	.050
18 months	-12.64	.001
24 months	-12.67	.050

Table 12: Manufacturing firms – Value Weighted

	Return	Sign.
3 months	1.51	N/S
6 months	0.23	N/S
12 months	4.70	.100
18 months	2.16	N/S
24 months	5.71	.050

We tested the market adjusted equally weighted model as well as the value weighted model for each group. Both service and manufacturing firms have highly negative and significant returns ($p<.05$) according to the equally weighted model. The value weighted model, however, produces all positive returns. None of the five estimation periods are significant for the service firms. The 12 and 24 month returns are positive and significant for manufacturing firms. Hence, there is no clear difference between service and manufacturing firms in terms of long-term performance.

To test Hypothesis 5a, we examined the short-term implications of the Fortune announcement from 3 days before the announcement to 3 days, 5 days, 10 days, 15 days, 20 days and 30 days after the announcement for high-tech and low-tech firms.

Table 13: High-tech firms – Equal Weighted

	Return	Sign
3 days	-2.83	.001
5 days	-3.71	.001
10 days	-4.50	.001
15 days	-4.78	.001
20 days	-3.60	.001
30 days	-5.74	.001

Table 14: High-tech firms – Value Weighted

	Return	Sign.
3 days	-0.95	.010
5 days	-0.95	.010
10 days	-1.22	.010
15 days	-1.44	.010
20 days	-0.34	.050
30 days	-1.13	.100

Table 15: Low-tech firms – Equal Weighted

	Return	Sign.
3 days	-1.44	.001
5 days	-2.31	.001
10 days	-2.58	.001
15 days	-1.72	.010
20 days	-1.65	.050
30 days	-2.72	.010

Table 16: Low-tech firms – Value Weighted

	Return	Sign.
3 days	0.12	N/S
5 days	-0.05	N/S
10 days	0.18	N/S
15 days	0.98	.010
20 days	0.97	.050
30 days	1.03	.100

We tested the market adjusted equally weighted model as well as the value weighted model for each group. High-tech firms have highly negative (-2.83% to -5.74%) and significant returns ($p<.001$) according to the equally weighted model. The value weighted model also has all negative returns for high-tech firms (-0.34% to -1.44%) but they are less significant (four at .01 level, one at .05 and one at .10 level). Low-tech firms also have highly negative (-1.44% to -2.72%) and significant returns (all at least $p<.05$ level) according to the equally weighted model. The value weighted model, however, tells a different story. Five of the six returns are positive, three of which are significant. It is clear that low-tech firms are outperforming high-tech firms in our sample and, again, we have a firm size effect where the large firms are outperforming small firms.

To test Hypothesis 5b, we examined the short-term implications of the Fortune announcement from 3 days before the announcement to 3 days, 5 days, 10 days, 15 days, 20 days and 30 days after the announcement for service and manufacturing firms.

Table 17: Service firms – Equal Weighted

	Return	Sign.
3 days	-1.49	.001
5 days	-2.46	.001
10 days	-2.90	.001
15 days	-2.13	.001
20 days	-1.94	.010
30 days	-3.33	.001

Table 18: Service firms – Value Weighted

	Return	Sign.
3 days	0.13	N/S
5 days	-0.09	N/S
10 days	-0.05	N/S
15 days	0.68	N/S
20 days	0.81	N/S
30 days	0.53	N/S

Table 19: Manufacturing firms – Equal Weighted

	Return	Sign.
3 days	-2.49	.001
5 days	-3.19	.001
10 days	-3.58	.001
15 days	-3.50	.001
20 days	-2.73	.010
30 days	-4.12	.010

Table 20: Manufacturing firms –Value Weighted

	Return	Sign.
3 days	-0.79	N/S
5 days	-0.72	N/S
10 days	-0.57	N/S
15 days	-0.48	N/S
20 days	0.18	N/S
30 days	0.14	N/S

We tested the market adjusted equally weighted model as well as the value weighted model for each group. Service firms have highly negative (-1.49% to -3.33%) and significant returns ($p<.01$) according to the equally weighted model. The value weighted model, however, has positive returns for four of the six estimation periods (-.09% to 0.81%). None of the six estimation periods are significant for the value weighted model. Manufacturing firms also have highly negative (-2.49% to -4.12%) and significant returns ($p<.01$) according to the equally weighted model. In the value weighted, none of the returns are significant. Four of the six are negative ranging from -0.79% to 0.18%. Here, it is clear that service firms are outperforming manufacturing firms in our sample and, again, we have a firm size effect where the large firms are outperforming small firms.

Discussion

In considering the overall reaction to the public valuation of firms appearing on the 100 Best lists, the direction and strength of the effects were unexpected. Considered in light of the first hypothesis, it

would seem that the collective interpretation of a high investment in people signal is largely negative and results in significant abnormal downward pressure on share price.

Obviously, this finding is counter to rather consistent evidence that high investment in employee strategies is associated with superior performance. The reactions of the market then to these announcements belie these findings. We believe that there are several possible explanations. First, it may be that shareholders believe that endeavoring to compete via the deliberate development of a highly committed workforce is ill-advised. This issue may be exacerbated by the notoriously slow distillation of research findings into the marketplace. Several researchers have suggested that research-practitioner gap is especially acute regarding the effects of human resource practices (Rynes, Colbert, & Brown, 2002; Rynes, Bartunek, & Daft, 2001).

A second explanation for the decrease in share price could be related to a belief that the organization was preparing for a period of strategic growth. If becoming named a member of the Best 100 list signaled that the organization hoped to attract employees, it could be seen as an attempt to hire more employees to prepare for a period of growth. The signal received by the shareholders may be that in the short term, the organization plans to focus on growth which may in turn result in short term uncertainty or an accumulation of debt that could negatively affect the stock price.

A third possible explanation may be some anomalous occurrence beyond the knowledge of the researcher that systematically influenced these findings. However, we think this is unlikely for several reasons. First, by only examining the changes in market pricing of the shares in the day immediately following the announcement, we minimize the noise, or extraneous influences of the market. Further the publicity surrounding the announcement of the list in January of each of the sampled years ensure that the signal is indeed salient to shareholder in their decision-making in the days following the announcement. Finally, the consistency of these findings in the sampled years further strengthens our confidence in our findings.

Limitations and Future Research

There are several potentially fruitful avenues of future research stemming from the current study. First, the current study is limited to the immediate impact on stock price within the first 30 days of public announcement. We would like to examine the impact of being named to 100 Best list over time. We will examine the impact on stock market valuation over longer periods of time such as one year, two years and three years after the announcement.

Second, we want to examine the impact on the firm's growth following inclusion on the list. One potential reason for a firm to desire inclusion on the list is to attract quality job candidates immediately preceding a major expansion or growth phase. It would be interesting to examine the similarities and differences between firms before and after announcement in terms of number of employees, net sales, market capitalization, etc.

Third, we need to further explore the differential impact for small and large firms. It appears, from the results of the present study, that smaller firms are significantly underperforming larger firms. It is obvious that smaller firms experience a deeply significant negative impact and are influencing the overall result. It would be interesting to see what the real impact is for the larger firms on the list.

REFERENCES

Ballou, B., Godwin, N. H., & Shortridge, R. T. (2003). Firm value and employee attitudes on workplace quality. *Accounting Horizons*, *17* (4), 329-341.

Barney, J.B. (1991). Firm resources and sustainable competitive advantage. *Journal of Management*, 17 (1), 99-120.

Barney, J.B. (1995). Looking inside for competitive advantage. *Academy of Management Executive*, 9 (4), 49-65.

Barney, J.B. (2001). Is the resource-based 'view' a useful perspective for strategic management research? Yes. *The Academy of Management Review*, 26 (1), 41-56.

Bromiley, P., Govekar, M. & Marcus, A. (1988). On using event-study methodology in strategic management research. Technovation, 8, p. 25-42.

Capelli, P. and Singh, H. (1992). Integrating human resource management. In: P. Sherer, D. Lewin & O. Mitchell (eds). *Research frontiers in industrial relations and human resource managemen*t, Madison, WI: IRRA Series: 165-192.

Combs, J., Liu, Y., Hall, A. and Ketchen, D. (2006). How much do high-performance work practices matter? A meta-analysis of their effects on organizational performance. *Personnel Psychology*, 59(3), 501-528.

Fama, E.F. (1970). Efficient capital markets: A review of theory and empirical work. *Journal of Finance*, 25, p. 383-417.

Fulmer, I.S., Gerhart, B., Scott, K.S. (2003). Are the 100 Best Better? An Empirical Investigation of the Relationship Between Being a "Great Place to Work" and Firm Performance. *Personnel Psychology*, 56, 965-993.

Hannon, J.M. & Milkovich, G.T. (1996). The effects of human resource reputation signals on share price: an event study. *Human Resource Management*, 35(3), p. 405-424.

Harter, J. K., Schmidt, F. L. and Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *Journal of Applied Psychology, 87,* 268–279.

Huselid, M., A., Beatty, R., W., & Becker, B., E. (2005). A Players or A Positions? *Harvard Business Review, 83*(12), 110-117.

Heskett, J. 1986. Managing in the service economy. Boston: Harvard University Press.

Judge, T. A., Thoresen, C. J., Bono, J. E. and Patton, G. K. (2001). The job satisfaction-job performance relationship: A qualitative and quantitative review. *Psychological Bulletin*, 127, 376-407.

Lau, R.S.M. (2000). Quality of work life and performance. *International Journal of Service Industry Management,* 11(5), p. 422-437.

Lepak, D.P. and Snell, S.A. (1999). The human resource architecture: Toward a theory of human capital allocation and development. *Academy of Management Review*, 24, 31-48.

Lepak, D.P. and Snell, S.A. (2002). Examining the human resource architecture: The relationships among human capital, employment, and human resource configurations. *Journal of Management*, 28: 517-543.

Miles, R.E. and Snow, C.C. (1984). Designing strategic human resources systems. *Organizational Dynamics*, 3, 36-52.

O'Reilly, C. and J. Pfeffer. (2000). Hidden Value: How Great Companies Achieve Extraordinary Results with Ordinary People. Boston, MA: Harvard Business School Press.

Ostroff, C. (1992). The relationship between satisfaction, attitudes, and performance: An organizational level analysis. *Journal of Applied Psychology*, 77: 963-974.

Pfeffer, J. (1998). The human equation: Building profits by putting people first. *Boston: Harvard Business School Press*.

Pfeffer, J. (2005). Producing sustainable competitive advantage through the effective management of people. *Academy of Management Executive*. 19(4), 95-105.

Pfeffer, J. and Baron J.N. (1988).Taking the workers back out: recent trends in the structuring of employment. B.M. Staw and L. L. Cummings (eds.), *Research in Organizational Behavior*. Greenwich, CN: JAI Press

Porter, M. E. 1985. Competitive advantage: Creating and sustaining superior performance. New York: Free Press.

Rynes, S.L., Bartunek, J.M. & Daft, R.L. (2001). Across the great divide: knowledge creation and transfer between practitioners and academics. *Academy of Management Journal*, 44(2), p. 340-355.

Rynes, S.L., Colbert, A.E. & Brown, K.G. (2002). HR professionals' beliefs about effective human resource practices: Correspondence between research and practice. *Human Resource Management*, 41(2), p 149.

Schneider, B., Hanges, P. J., Smith, D. B. and Salvaggio, A. N. (2003). Which comes first: Employee attitudes or organizational financial and market performance? *Journal of Applied Psychology*, 88, 836-851.

Wright, P.M. and McMahan, G.C. (1992). Theoretical perspectives for strategic human resource management. *Journal of Management*, 18: 2, 295-320.

Wright, P.M. and Snell, S.A. (1991). Toward an integrative view of strategic human resource management. *Human Resource Management Review*, 1, 203-225

ABITIBIBOWATER DEALS WITH A PERFECT STORM: A Business Case Study

Emma Jane Riddle, College of Business, Winthrop University, Rock Hill, South Carolina, 29733, riddlee@winthrop.edu

ABSTRACT

This paper presents a case study of the expropriation of resource assets belonging to AbitibiBowater (AB), a large paper manufacturer, by the Canadian province of Newfoundland and Labrador. The assets were seized after AB announced the closure of the Grand Falls-Windsor (GFW) paper mill and a wood processing facility in the province. After an unsuccessful attempt to obtain compensation for the seized assets, AB filed a Notice of Intent to Submit a Claim to Arbitration under the North American Free Trade Agreement (NAFTA). The case would be appropriate for senior-level and MBA courses in International Business and International Management.

THE CASE STUDY

AbitibiBowater

AB was created in October, 2007, by a "merger of equals" between Canadian paper giant Abitibi-Consolidated and Bowater, a paper manufacturer headquartered in South Carolina. The combined company is incorporated in Delaware and has its operating headquarters in Montreal, Canada. In 2008, AB operated fifteen pulp and paper mills in Canada, seven in the United States, and one each in England and South Korea (AbitibiBowater, 2009b). The company also had fourteen hydroelectric plants and eight cogeneration plants that process waste biomass into power; these plants provide much of the electric power needed for the company's manufacturing (AbitibiBowater, 2008c).

Paper is made from wood fiber, which can be obtained from pulp wood or from recycled paper. To ensure a steady supply of pulp wood, AB has leased timber rights on 44.7 million acres of public land in Canada; the company also owns 1.3 million acres of timber land in Canada and the southeastern United States. (AbitibiBowater, 2009b). In addition, the company purchases timber from loggers and timber brokers. About 38% of the wood fiber in AB's paper products comes from recycled paper.

In 2007, AB reported revenues of 3.9 billion U.S. dollars, an operating loss of 400 million dollars, and a net loss of 490 million dollars (AbitibiBowater, 2008c). The company's 2007 sales were distributed as follows: newsprint – 41%; coated and specialty papers – 35%; market pulp – 16%; and wood products – 8%. The North American market accounts for more than half of AB's sales, but the company sells its products in more than ninety countries around the world.

AB faced challenges from the start. Declining demand for newsprint and commercial printing papers had left the company, and the industry, with excess capacity. One month after the Abitibi-Bowater merger, the company announced plans to reduce its paper-making capacity by approximately one million metric tons per year (AbitibiBowater, 2007). Several paper mills in Canada and one mill in Texas would be closed;

1

the GFW facility was not included in this round of plant closings. As the company had hoped, eliminating unneeded capacity enabled AB to raise prices (AbitibiBowater, 2008c).

The capacity reduction was part of an ambitious action plan to improve the company's financial situation (AbitibiBowater, 2007). The company also expected to reduce operating costs by 375 million dollars per year, a target that it met in one year (AbitibiBowater, 2008a). The cost reduction plan included renegotiating union contracts in Canada and making benefits for salaried workers in various countries more consistent. To raise cash and reduce its debt, the company announced plans to sell 500 million dollars worth of assets, including selected timber lands. A substantial amount of the company's debt was scheduled to mature in 2008. To meet debt payments and improve cash flow, AB restructured its debt and suspended dividends to shareholders (AbitibiBowater, 2007, 2008b).

These measures did not solve the problem of declining demand for newsprint and coated paper. In December 2008, AB announced plans to reduce its annual papermaking capacity by an additional million metric tons (AbitibiBowater, 2008a). When those reductions have been completed, AB will have reduced its capacity by about one-third, to approximately 4.1 metric tons, since the merger of Abitibi-Consolidated and Bowater (Yakabuski, 2008a).

The Grand Falls-Windsor Facility

The GFW pulp and paper mill was built in 1909 by the Anglo-Newfoundland Development Company (Yakabuski, 2008b). Before building the plant, Anglo-Newfoundland leased large tracts of public land from the provincial government and obtained the right to harvest timber from those lands. The province also granted Anglo-Newfoundland the right to use water from a local river for manufacturing, and the right to build and operate dams and a hydroelectric power plant on the river. In addition to the pulp and paper mill, Anglo-Newfoundland built a hydroelectric plant and at least one dam. The company also set up logging operations to supply raw material for the mill. To attract workers and provide housing for them, Anglo-Newfoundland built the town of Grand Falls, which has since grown to a community of 13,500 (Roberts, 2008).

In recent years, the GFW plant had two paper production lines (AbitibiBowater, 2009b), which are called paper machines. According to a union official, Gary Healey, the newer of the two machines was installed in 1968 (Yakabuski, 2008a). The GFW facility had a capacity of about 200,000 metric tons of newsprint per year (AbitibiBowater, 2009b). In contrast, AB's two largest plants, which are located in South Carolina and Tennessee, each have a capacity of about 900,000 metric tons of paper per year. Jean-Philippe Cote, a spokesman for AB, said that the GFW plant was "the most expensive [paper] mill to run in North America" (Moore, 2008a). Mr. Cote cited labor costs and transportation costs as particular problems.

Newsprint was the only product line that GFW could produce (AbitibiBowater, 2009b). Canadian newsprint producers must compete with manufacturers in Asia and South America. These overseas competitors usually have more modern technology, larger facilities, and lower labor costs than Canadian plants. Consequently, North America's share of global newsprint production dropped from 44% in 1996 to 31% in 2006, while Asia's share increased from 19% to 30% (Atlantic Provinces Economic Council, 2008). With the availability of online news, newspaper readership has dropped sharply in Europe and North America. As a result of these developments, shipments of newsprint from North American plants dropped by 40% between 2000 and 2007 (Atlantic Provinces Economic Council, 2008). Consequently, a number of Canadian paper mills have been shut down.

Fluctuations in currency exchange rates have also created problems for Canadian paper producers (Atlantic Provinces Economic Council, 2008). In world markets, products are usually priced in a major

currency, such as the U.S. dollar, the euro, the British pound, or the Japanese yen. Canadian paper producers pay for their inputs in Canadian dollars, but their exports are priced in U.S. dollars. The value of one U.S. dollar fell from $1.57 Canadian. on January 1, 2002, to $0.98 Canadian on January 1, 2008 – a decrease of 57%. (Currency exchange rates were obtained from www.oanda.com.) Canadian paper producers could not raise their prices enough to compensate for the declining value of the U.S. dollar. The companies were caught in a "cost-price squeeze", where costs rose or remained stable, while revenues dropped.

To deal with these problems, AB's predecessor company, Abitibi, followed a strategy of acquisition, consolidation, and cost cutting. This strategy was designed to increase efficiency and pricing power. The merger between Abitibi and Bowater was another step in Abitibi's consolidation strategy.

A Plant Closure and An Expropriation

As stated earlier, AB's cost reduction plan included renegotiating its labor contracts in Canada. The company was determined to reduce costs and vowed not to continue operating the GFW plant at a loss (Moore, 2008b; Roberts, 2008). There were two rounds of negotiations between the company and the Communications, Energy, and Paperworkers union, which represented workers at GFW and related logging operations (Moore, 2008b). When the first round of negotiations ended in failure, AB revised its proposal and tried again. The company has not revealed the details of its proposals to the public. However, there was a widespread belief among workers that the company's "renewal plan" would result in the loss of 150 jobs in the mill and at least 20 in the logging division (Roberts, 2008). A leaked AB memo suggested turning logging operations over to a contractor, implementing new logging methods, and changing the seniority rights of equipment operators. In September, 2008, union members voted overwhelmingly against the company's second and final proposal (Moore, 2008b).

Gary Healey, the union official, was critical of the company's decision to focus on cost reduction and its refusal to invest in improvements at the mill. He said that at least $20 million Canadian was needed to make the mill more functional, and that a $225 million investment in new technology would be required to make the mill competitive (Roberts, 2008). Jean-Philippe Cote, the company spokesman, disagreed. He said, "Investment alone won't fix the … cost structure and the labor structure of that mill. Without that, the mill will never be competitive." (Roberts, 2008)

On December 4, 2008, AB announced that the GFW mill would permanently close by the end of March, 2009 (Yakabuski, 2008a). About 400 mill workers and 350 loggers would lose their jobs; Grand Falls would lose its largest employer. On Friday, December 12, Kathy Dunderdale, Newfoundland's Minister of Natural Resources, sent a written message to AB's headquarters, demanding that the company "surrender forthwith entitlement to [all] resources" (Moore, 2008a). According to Jean-Philippe Cote, the message arrived after working hours and demanded a response by noon on Monday. Cote said that the company sent a reply, which suggested the creation of a working group to address issues related to the closing of the GFW plant.

On Tuesday, December 16, the legislature of Newfoundland and Labrador province passed Bill 75, which expropriated all of AB's hydroelectric plants, dams, water rights, timber leases, and timber rights in the province (Moore, 2008a); the company owned three hydroelectric plants and several dams (AbitibiBowater, 2008c). The new owner of the seized assets is Nalcor, a recently created corporation that is owned by the provincial government (Brautigam, 2008). Bill 75 allowed AB to seek compensation from the provincial government for its hydroelectric plants and dams, but not for its leases, water rights, and timber rights. The amount of any compensation will be determined by Newfoundland Premier Danny Williams and his Cabinet. Bill 75 forbids AB from bringing lawsuits in the provincial courts to recover the seized assets or contest the amount of compensation (AbitibiBowater, 2009b).

Williams justified the legislation by saying that AB had broken a "covenant" with the province when it decided to close the plant (Moore, 2008a). According to him, the company's water and timber rights were dependent on operating logging and papermaking facilities in the province; to support his position, he quoted excerpts from a 1905 lease and a 1903 letter written by the first president of the Anglo-Newfoundland Development Corporation. He later told reporters, "We are not giving away these hydro assets and these timber assets to a company that is no longer doing business in the province" (Brautigam, 2008). Williams said that the company would be allowed to use the seized assets until the plant closed. He also stated that he was trying to find a buyer for the mill.

Robert Leckey, an expert in constitutional law at McGill University in Montreal, stated that Canadian provinces have broad authority to expropriate business property (Moore, 2008a). According to Leckey, provinces are not required to pay compensation for the seized assets.   "The legislature has the power to state in the legislation that it can offer no compensation," he said.

According to AB, the value of the seized assets was more than $300 million Canadian (AbitibiBowater, 2009b). The company and the provincial government began negotiations about a severance package for the laid-off loggers and compensation for the seized dams and hydroelectric plants (Gibbens, 2009). On March 23, 2009, Kathy Dunderdale told the provincial legislature that the company had withdrawn from the talks. She did not give any details about the negotiations or the unresolved issues. A company spokesman expressed surprise, saying that "we still hope to resolve this issue in a collaborative way" (Gibbens, 2009). Company officials in Newfoundland said that the government's offer was much too low. Industry analysts said that it would be hard for AB to get more than $165 million Canadian for its dams and power plants.

The Aftermath of the Expropriation

As AB tried to negotiate with Newfoundland, the company's financial difficulties continued to mount. These problems were reflected in the company's Annual Report for 2008, which reported sales of 6.77 billion U. S. dollars, an operating loss of 1.43 billion dollars, and a net loss of 2.23 billion dollars (AbitibiBowater, 2009a). The net loss included a write-off of $256 million dollars U.S. for the value of the assets seized by the province of Newfoundland and Labrador. During the first quarter of 2009, the company tried unsuccessfully to refinance a portion of its debt. On April 16, 2009, AB filed for protection from its creditors in both the United States and Canada.

Since the expropriation, AB has consistently said that it would take legal action to procure fair compensation for its assets if negotiations with the provincial government were unsuccessful. As stated earlier, Bill 75 barred the company from filing a lawsuit in the provincial courts of Newfoundland. Since AB is incorporated in Delaware, it is legally an American company. However, U.S. courts do not have jurisdiction in disputes between American companies and governments of foreign countries or provinces. Therefore, AB decided to take advantage of provisions in the North American Free Trade Agreement (NAFTA) that protect foreign direct investment among NAFTA countries. Specifically, an investor can request arbitration of its claim against the government of another NAFTA country. In this situation, AB can attempt to hold the government of Canada responsible for the actions of the province of Newfoundland and Labrador.

The NAFTA agreement sets specific requirements for expropriation of investment property (NAFTA, Article 11, 1994). The expropriation must serve a public purpose, and it must be done in a non-discriminatory way. "Non-discriminatory" means that the investor must be treated in the same way as other domestic and foreign investors. The expropriation must be done "in accordance with due process of law" (NAFTA, Article 11.10, section 1(c); 1994). The investor must be compensated for the fair market

4

value of the assets, and the compensation must be paid promptly. Expropriation cannot be used to retaliate against a company for actions that the government does not like.

On April 23, 2009, the company filed a Notice of Intent to Submit a Claim to Arbitration under the North American Free Trade Agreement. Under the NAFTA treaty, this notice must be submitted at least 90 days before an actual claim is submitted. AB's Notice of Intent alleges that (1) the expropriation of its assets does not serve a public purpose; (2) the expropriation was discriminatory and retaliatory; (3) due process of law was not followed; and (4) the company has not been offered fair compensation for its assets. AG could have submitted a NAFTA claim as early as July 22, 2009; as of August 15, 2009, it had not done so.

Case Questions

1. How has the global business environment contributed to AB's financial problems?
2. After the union rejected AB's final offer, did the company have any reasonable options for making the GFW plant profitable? Justify your answer.
3. Will the expropriation benefit Newfoundland's economy, or will it harm the economy? Consider both short-term and long-term effects.
4. Does AB has a valid claim under the NAFTA agreement? Why or why not?

DISCUSSION

This would be an appropriate brief integrative case for senior-level and MBA courses in International Business and International Management. The case integrates material related to the global business environment, public policy, business strategy, and NAFTA. While most of the NAFTA treaty focuses on trade, this case can be used to make the point that NAFTA also includes important provisions on foreign direct investment.

Expropriation without fair compensation is a growing problem for global firms. In recent years, there have been well-publicized examples in Russia, Venezuela, Bolivia, and Ecuador. Luthans and Doh (2009) note that this type of expropriation is most likely in extractive industries, agriculture, utilities, and transportation. Newfoundland's expropriation of BA's timber rights and hydroelectric assets fits this pattern. Luthans and Doh (2009) also state that expropriation without fair compensation is most common in countries that are poor, politically unstable, and suspicious of foreign companies. From that perspective, the expropriation of BA's assets in Newfoundland is unusual. However, Professor Leckey's comments in the case suggest that Canadian provinces have the power to seize assets without paying compensation.

Sample answers to the case questions are given below:

1. AB has faced increasing global competition from Asian and South American paper mills, which have larger plants and more efficient technology. The availability of online news has caused newspaper readership to drop sharply in Europe and North America. AB's Canadian plants pay for raw materials in Canadian dollars, but their exports are priced in U. S. dollars. Canadian paper producers could not raise their prices enough to compensate for the declining value of the U.S. dollar and were caught in a "cost-price squeeze".

2. It is unlikely that AB could have made the GFW plant profitable without major concessions from labor. AB does not have the financial strength to invest in more efficient technology at GFW, or even to make the existing facility more functional.

5

3. In the short term, Newfoundland can offer the seized timber and hydroelectric assets to any company that is interested in purchasing the GFW mill from AB. However, it may be hard to find a buyer. Any buyer would have to deal with the same cost, technology, and market issues that AB faced.

    In the long term, the expropriation may deter new investment in the province. Nalcor could attempt to use the hydroelectric assets to offer low-cost electric power to computer server farms or other power-hungry facilities.

4. At least a portion of AB's case is strong. Law 75, and the manner in which it was implemented, violate NAFTA provisions related to due process of law and fair, prompt compensation. Due process requires an impartial judge, along with clear rules and procedures. Law 75 blocked the company's access to the provincial court system. The Premier and his cabinet, who initiated the expropriation and are not impartial, were given the authority to determine the amount of compensation. Law 75 does not guarantee that AB will receive fair market value for its assets, and the company has received no compensation. It is likely that this portion of the case is strong enough to show that AB is entitled to compensation.

    The issues of retaliation and public purpose are more debatable. The expropriation occurred less than two weeks after AB announced the closing of the GFW facilities. One viewpoint is that the timing of the expropriation shows that it was retaliatory. Another perspective is that Newfoundland had a legitimate public purpose in securing assets that could be made available to companies that needed timber rights, water rights, or hydroelectric power in the future. According to that line of reasoning, the primary purpose of the expropriation may have been to improve the province's prospects for attracting future jobs.

6

Works Cited

AbitibiBowater (2007). AbitibiBowater announces Phase 1 of action plan to address company challenges. AbitibiBowater press release, Nov. 29.

AbitibiBowater (2008a). AbitibiBowater announces action plan to address market challenges. AbitibiBowater press release, Dec. 4.

AbitibiBowater (2008b). AbitibiBowater announces comprehensive refinancing plan. PR Newswire-First Call.

AbitibiBowater (2008c). Annual report for 2007. Wilmington, DE.

AbitibiBowater (2009a). Annual report for 2008. Wilmington, DE.

AbitibiBowater (2009b). Form 10-K filing for the period ending December 31, 2008. Wilmington, DE

Atlantic Provinces Economic Council (2008). Building competitiveness in Atlantic Canada's forest industries: A strategy for future prosperity. Atlantic Provinces Economic Council: Halifax, Nova Scotia.

Brautigam, T. (2008). Premier Williams takes on pulp giant. *Toronto Star*. Toronto, Canada, Dec. 17.

Gibbens, R. (2009). Abitibi breaks off compensation talks. *The Gazette*. Montreal, Canada, Mar. 24.

Luthans, F., & Doh, J. (2009). *International management: Culture, strategy, and behavior*, 7th ed. New York: McGraw-Hill.

Moore, O. (2008a). Newfoundland seizes assets of AbitibiBowater. *Globe and Mail*. Toronto, Canada, Dec. 17.

Moore, O. (2008b). Newfoundland workers await fate of paper mill after rejecting restructuring proposal. *Globe and Mail*. Toronto, Canada, Nov. 21.

North American Free Trade Agreement (1994). North American Free Trade Agreement Final Text, Chapter 11.
    http://www.nafta-sec-alena.org/en/view.aspx?x=343&mtpiID=142#A1110

Roberts, Terry (2008). AbitibiBowater vote coming. *The Gazette*. Montreal, Canada, Aug. 30.

Yakabuski, K. (2008a). Abitibi axes Newfoundland paper mill. *Globe and Mail*. Toronto, Canada, Dec. 5.

Yakabuski, K. (2008b). Newfoundland seizes assets of AbitibiBowater. *Globe and Mail*. Toronto, Canada, Dec. 17.

WHO MANAGES YOUR SUPPLY CHAINS?

Richard E. Crandall
Appalachian State University
CIS Dept, Raley Hall
Boone, NC 28608
(828)-262-4093
crandllre@appstate.edu

William "Rick" Crandall
School of Business
University of North Carolina at Pembroke
Pembroke, NC 28372
(910)-522-5786
rick.crandall@uncp.edu

ABSTRACT

Whether they realize it or not, managers of ALL businesses have supply chains to some degree. But how should they manage them? In this paper, we look at the stakeholders that are involved in supply chain management and how their roles may be changing. We begin by reviewing the past, future, and present state of supply chains. Next, we look at ways supply chains are managed. We then review the various roles of third-parties in managing parts of the supply chain. Finally, we propose some future research questions that need to be examined in relation to supply chain management.

1

INTRODUCTION

Whether they realize it or not, managers of ALL businesses have supply chains to some degree. But how should they manage them? Put another way, when we speak of supply chain management (SCM), are we really talking about the management of the supply chains, or are we describing the concepts and techniques of how supply chains operate?

To give the reader an understanding of the magnitude of this question, Giannakis and Croom categorized the supply chain as having three strategic dimensions: **Synthesis**, with insights from the industrial organization, institutional economics and network theory literature; **Synergy**, drawing primarily from the inter-organizational relationships and strategic management literature; and **Synchronization**, founded on research in operations management, logistics, operational research and systems engineering. While sounding entirely academic, these three dimensions actually offer an easy to understand starting point in understanding supply chains (Giannakis & Croom, 2004).

A more recent study looked at theoretical explanations of how to structure and manage supply chains from three different perspectives – an economic perspective, a socio-economic perspective, and a strategic perspective. They concluded there is no such thing as "a unified theory of SCM" at the present time. (Halldorsson, Kotzab & Mikkola, 2007).

In this paper, we look at the stakeholders that are involved in supply chain management and how their roles are changing. We begin by reviewing the past, future, and present state of supply chains. Next, we look at ways supply chains are managed. We then review the various roles of third-parties in managing parts of the supply chain. Finally, we propose relevant future research questions that need to be examined in relation to supply chain management.

THE PAST AND FUTURE OF SUPPLY CHAIN MANAGEMENT

As a starting point, we will consider the extremes of supply chain management (the past versus the future) and then see if we can find some places in between that fairly represent the present. First, let's look at the past. We do not have time to go back centuries when supply chains were first formed; so let's go back just a century or so to Ford's River Rouge plant. This highly integrated factory brought iron ore off the Great Lakes and processed it into steel for use in assembling the Model T automobile (Ford 1988).

This manufacturing arrangement was about as tightly controlled as companies got – a period when vertical integration was a commonly accepted way to manage supply chains. Granted, their supply chain went back to the ore mines and forward to their sale of cars but it was largely under the control of one organization. (Some might even say under the control of one person, Henry Ford himself). If problems arose, they were resolved on site. Figure 1 shows an example of a tightly integrated supply chain under the control of the owning, or focal, company.
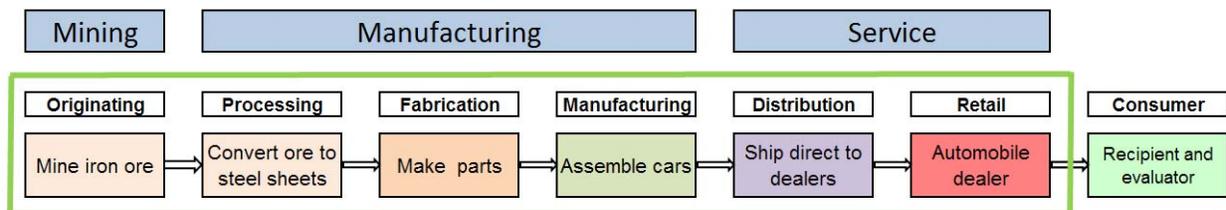
Figure 1. Tightly linked or controlled supply chain under one major participant

While Ford's River Rouge plant represents the past, what about the future? Many writers portray the supply chain of the future as a series of tightly connected links (chains) in which each link is a separate entity that collaborates with its customers downstream and its suppliers upstream. These links are necessary so products and services can flow smoothly from the original suppliers to the ultimate consumers. In this arrangement, the supply chain participants have an agreed upon view of their mission and are all motivated to do what is best for the ultimate consumer, believing that objective will create prosperity for all members of the supply chain. The participants trust each other completely and collaborate to plan and execute their mutually agreed to responsibilities. Should problems arise, they work together to resolve them quickly and equitably. In a manner similar to self-directed teams within a company, the supply chain becomes a self-directed supply chain with members that use their understanding of the big picture to manage their own operations.   Geographically speaking, the participants in the supply chain may be any place in the world. Figure 2 shows a supply chain that achieves this singularity of purpose through collaborative links between participants.
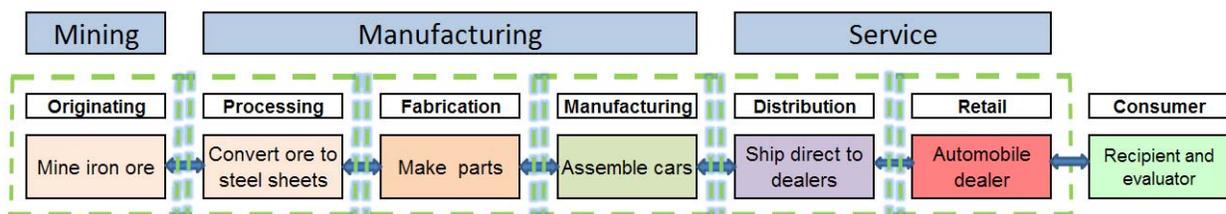
Figure 2. Loosely coupled supply chain with aligned direction through collaborative links throughout

While the future supply chain model has many advocates, they also point out that the scenario described above is not easily achieved. "All managers recognize technology, information, and measurement systems as major barriers to successful supply chain collaboration. However, the people issues – such as culture, trust, aversion to change, and willingness to collaborate – are more intractable" (Fawcett, Magnan, & McCarter 2008).

PRESENT SUPPLY CHAINS

We believe it is safe to say that most supply chains today are somewhere in between the end points described above. But exactly where are they? How are companies dealing with the problem of moving from the security of vertical integration to the uncertainty of loosely-coupled, globally-dispersed, independent operations? Figure 3 shows a supply chain that moves toward the ultimate consumer through loosely coupled links that work at varying levels of effectiveness and efficiency.
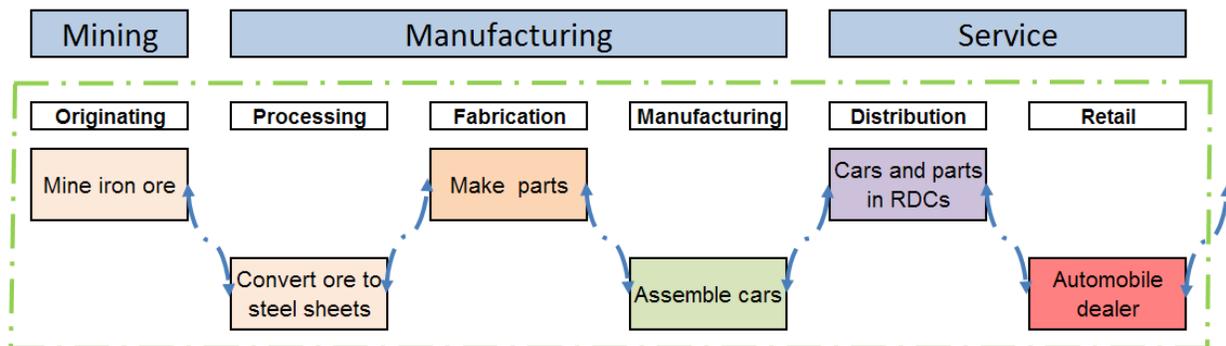
Figure 3. Loosely linked supply chains without direct route to ultimate consumer

3

In reviewing the literature on supply chains, it is difficult to find articles that deal directly with this issue of supply chain management, or governance. Much of the forward-looking research describes efforts in moving toward trusting and collaborative relationships. However, there is little written on what to do in the interim, although there are some suggestions. Presently, there are at least five major approaches that supply chain management falls under. They are:

1. Virtual supply chains
2. Contractual alliances
3. Dominant party management
4. Third-party direct management
5. Third-party indirect management

We will describe these alternatives in generic terms; however, there are variations for each of these approaches, depending on industry and individual company practices.

Virtual supply chains

The APICS Dictionary defines a virtual corporation as "the logical extension of outpartnering. With the virtual corporation, the capabilities and systems of the firm merge with those of their suppliers, resulting in a new type of corporation where the boundaries between the suppliers' systems and those of the firm seem to disappear. The virtual corporation is dynamic in that the relationships and structures formed change according to the changing needs of the customer," (Blackstone 2008).

A further definition of a virtual organization is "short-term alliances between independent organizations in a potentially long-term relationship to design, produce, and distribute a product. Organizations cooperate based on mutual values and act as a single entity to third parties" (Blackstone 2008). This latter definition has more relevance to supply chains. An example of this type of virtual supply chain is the one established by Boeing to create their Dreamliner 787. They created a tightly linked supply chain for the entire life cycle of that specific airplane. Participants are clearly identified and bound together with contractual agreements involving mutual commitments (Wikipedia 2009).

Contractual Alliances

A step removed in the formal arrangement from virtual supply chains is a supply chain linked together by contractual agreements. These agreements can clarify many issues, but are not guarantees disputes will not arise or adjustments will not be required as the supply chain evolves over time and changing conditions.

Williamson (2008) suggests that, as bilateral dependency increases between participants, the relationship moves from a simple market exchange to a hierarchical form involving contractual safeguards.

Dominant party management

Supply chains are composed of companies ranging in size from small to large. In recent years, retail companies have tended to become the largest entities in the supply chain. Companies such as Wal-Mart, Target, Home Depot, Lowe's, Best Buy and Macy's are large in comparison with most of their suppliers. As a result, the retail company is often the dominant player in a supply chain and can exercise significant direction over other members of the supply chain. While they may not have direct control, they have considerable influence on what their suppliers do.

4

Some manufacturing companies are equally dominant in their supply chains. For example, automobile manufacturers, computer manufacturers, oil drilling operators, refining companies, and pharmaceutical companies can also effectively dictate what other members of their supply chains do.

Third-party direct management

Another possible alternative is to have a third party that is not a member of the supply chain, assume a measure of managerial responsibility for the supply chain. UPS provides a variety of services, including the operation of warehouses that receive orders and ship products to customers for other companies. Amazon provides website management and order processing services for a vast number of companies. Contract manufacturers, such as Selectron, provide manufacturing services for a number of companies that design and market their products. The outsourcing movement offers numerous opportunities for transferring not only production work but also the management of a portion of the supply chain.

One recent study by Fabbe-Costes, Jahre, and Roussat (2009) looked at the role of logistics service providers (LSPs) in supporting supply chain integration (SCI). In their literature review, they were surprised to find that very few articles consider LSPs in discussing supply chain management. LSPs are divided about whether they should be pure "resource providers" or assume the riskier role of "supply chain designers." Apparently, there is indecision about the role of third providers in supply chain management.

Third-party (indirect) management

There is a growing interest in the use of third parties to assist in the indirect management of supply chains. We will highlight several approaches that may be considered.

Systems Integrator

As supply chains expand in size and complexity, the interfaces between partners become more difficult to maintain. One study by Britran, Gurumurthi and Sam (2007) maintains the process of disintegration in many industries is not sustainable from a coordination and control viewpoint, and therefore will be followed by eventual reintegration - although it may take different forms in different industries. They believe there is a need for a systems integrator, which, in many cases, goes beyond critical coordination services and extends into issues related to control and governance of portions of the supply network.

Advisory Board

A variation of the systems integrator would be to select an advisory board, composed of representatives from companies participating in the supply chain. The advisory board would be more concerned with strategic and jurisdictional issues; however, they could be empowered to become more directly involved in day-to-day issues should the partners agree on the increased responsibilities.

Auditor

Still another variation would be to use third parties to audit the functioning of a supply chain and identify problems or opportunities for improvement. This function would be similar to public accounting firms that audit companies, but would not carry the same regulatory requirements. This approach could lead to the development of standards for use in designing effective supply chain partnerships.

Program Manager

5

Designing and building an integrated supply chain has similar characteristics to a project. Companies can use a third-party (consultant) to help them design their supply chain and assist them in its implementation. Once the supply chain is working satisfactorily, its management can revert to the companies involved.

Arbitrator

Another type of third party involvement can include an arbitration function to resolve disputes and, in so doing, establish policies that can serve the supply chain members in resolving future disputes.

MANAGING THE INTERFACES

If businesses want to more clearly identify the management structure in a supply chain, they need to manage not only the operations within their companies, but more importantly, the interfaces between companies.

Davis and Spekman (2004) distinguish between typical boundary-spanning activities and emerging boundary-spanning activities. They point out that typical boundary-spanning activities such as gatekeeping (managing information flow), transacting (managing flow of goods) and protecting (due diligence, forecasting and monitoring supplier performance) are not new. Emerging boundary-spanning activities include managing information exchange, formation and implementation of strategic relationships, co-management of external manufacturing, and leveraging the skills of the supply chain. The authors believe a skills gap exists in most organizations that limits their ability to manage essential boundary-spanning activities.

Building interfaces requires technology, primarily in the form of interorganizational systems (IOS) that enable supply chain partners to communicate effectively. In addition to the ability to communicate, supply chain members must be willing to share information with their partners. This task requires trust, another topic that has been widely written about, but which remains one of the most important barriers to achieving integrated supply chains (Crandall 2008).

MANAGING THE VITAL FEW

Whatever the approach that members of a supply chain take in managing it, one must conclude that, at best, they can manage only the vital few issues that arise. The sheer complexity of most supply chains make it impossible to manage it with the same level of precision that companies can take in managing their own internal operations.

RELEVANT RESEARCH QUESTIONS

While the management of supply chains is in itself, a complicated endeavor, the research of supply chains is equally difficult. A number of research questions need to be considered.

1. What methods do companies use to manage their supply chains?
2. Are companies currently satisfied with their present supply chain management format, or do they plan to change?
3. What are the benefits from a more formal supply chain management method?
4. What are the obstacles incurred in implementing a more formal method?
5. Are there other organizational variations that need to be considered?
6. What does "management" of supply chains include?

6

7. What are the objectives of supply chain management?
8. What are the possibilities for changes in the future?

SUMMARY

How do companies manage their supply chains? One group of management scholars summarize their research efforts with the following comment: "Our study suggests an increased need for emphasis on managing the supply chain and the key role that knowledge sharing plays in effective supply chains. More broadly, collaborative inter-organizational relationships, such as supply chains, can be strategic weapons geared towards improving focal firm performance," (Crook et al. 2008).

At present, research in supply chain management has focused on a number of issues related to supply chains, including:
- Concepts and definitions
- Objectives – cost, quality, response time, flexibility
- Benefits and obstacles in building integrated supply chains
- Components of supply chains – types of suppliers and customers
- Technologies used, especially information technology (IT)
- Strategies to employ, such as outsourcing
- Need for communication and flow of goods along the supply chain
- Issues of establishing trust and collaboration among participants in the supply chain
- Issues of changing infrastructures and cultures in transition to supply chains
- Needs for flow of goods, services, information and funds along the supply chain.

While there has been extensive research in a number of areas related to supply chains, there is a lack of research in the best way to organize and manage supply chains. We see this as an area of future research opportunity.

References

1. Bitran, Gabriel R., Suri Gurumurthi, Shiou Lin Sam, The need for third-party coordination in supply chain governance. *MIT Sloan Management Review*. Vol. 48, No. 3, p. 30, 2007.

2. Blackstone, John F. III, *APICS Dictionary* (Twelfth Edition), 2008, APICS – The Educational Society for Resource Management.

3. Crandall, Richard E., Just Trust Me, Lack of confidence inhibits effective supply chain collaboration, *APICS Magazine*, Vol. 18, No. 2, p. 14, 2008.

4. Crook, T. Russell, Larry Giunipero, Taco H. Reus, Robert Handfield, Susan K. Williams, Antecedents and outcomes of supply chain effectiveness: an exploratory investigation, *Journal of Managerial Issues*, Vol. 20, No. 2, p. 161, 2008.

5. Davis, Edward W., Robert E. Spekman, *The Extended Enterprise, Gaining Competitive Advantage Through Collaborative Supply Chains*, Prentice Hall, Upper Saddle River, New Jersey, 2004.

6. Fabbe-Costes, Nathalie, Marianne Jahre, Christine Roussat, Supply chain integration: the role of logistics service providers, *International Journal of Productivity and Performance Management*, Vol. 58, No. 1, p. 71, 2009.

7

7. Fawcett, Stanley E., Gregory M. Magnan, Matthew W. McCarter, Benefits, barriers, and bridges to effective supply chain management, *Supply Chain Management*, Vol. 13, No. 1, p. 35, 2008.

8. Ford, Henry, *Ford Today and Tomorrow* (Special Edition of 1926 Classic), Productivity Press, 1988.

9. Giannakis, Mihalis, Simon R. Croom, Toward the development of a supply chain management paradigm: A conceptual framework, *Journal of Supply Chain Management*, Vol. 40, No. 2, p. 27, 2004.

10. Halldorsson, Arni, Herbert Kotzab, Juliana H. Mikkola, Complementary theories to supply chain management, Vol. 12, No. 4, p. 284, 2007.

11. http://en.wikipedia.org/wiki/Boeing_787. Accessed March 1, 2009.

12. Williamson, Oliver E., Outsourcing: Transaction cost economics and supply chain management, *Journal of Supply Chain Management*, Vol. 44, No. 2, p. 5, 2008.

8

College Students' Impressions of Managers without a College Degree: The Impact of Parents' Educational Attainment

James O. Smith, Department of Management, College of Business,
East Carolina University, Greenville NC 27858, SMITHJAM@ECU.EDU,
(252)737-1296

Joseph Tomkiewicz, Department of Management, College of Business,
East Carolina University, Greenville NC 27858, TOMKIEWICZJ@ECU.EDU,
(252) 328-6836

William C. McDowell, Department of Management, College of Business,
East Carolina University, Greenville NC 27858, MCDOWELLW@ECU.EDU,
(252)737-1539

Alan T. Oglesby, TERRYOGLESBY@GMAIL.COM

ABSTRACT

This study investigated the impressions which college students held concerning managers who did not possess a college degree compared to those who possess a degree. Contrary to expectations the results showed no difference between the perceptions when analyzed by the educational level of the parent or the industry of parents' employment.

INTRODUCTION

While there are many articles written concerning impressions or attitudes of managers with different characteristics including being Hispanic, African American, female and even gay or lesbian (2,3,4,5,6,9 & 10); there is scant information available regarding the impression held of managers without college degrees. Either through promotion or entrepreneurial activity many individuals find themselves as managers without a college education supporting that appointment. As there are no licensing requirements for most managerial jobs in the non-technical private sector this is likely to occur at least part of the time. Surprisingly, there is very little written about these managers including attitudes of coworkers or the impressions of potential subordinates or peers. Smith *et al.* in 2009 indicated that while impressions were favorable overall there tended to be no difference with regard to college major. (7)

Educational attainment might be a factor in how the others in the command group perceive those individuals in the command group. Therefore, these perceptions could influence how subordinates or peers interact and work with others.

This paper will investigate college students' impressions of mangers that do not hold a degree. Based on Adam's equity theory, there will be a variation in the perceptions that subordinates hold of their supervisors (1). The student impressions are expected to be inversely related to the parent's educational levels. It is believed that these impressions held by subordinates of their supervisors will be reflected in their subsequent behavior toward those supervisors. Thus knowing something about the impression of future peers and subordinates will help in understanding the place of these managers in the organization.

SAMPLE

The sample was collected in the Fall semester of 2008 and was composed of students enrolled in the entry level management course at a large regional university in the southeast. The students were a mix of business and non-business majors. There were 285 completed surveys. Table One displays the sample demographics.

TABLE ONE
SAMPLE DEMOGRAPHICS

Average age	21.2 years
Male	59.3 percent
Currently employed	58.2 percent
Years in current job	2.2 years
Business major	51.8 percent

The instrument for this study is a modified version of the Blacks in Business Scale [BIBS], developed in the 1970's by Stevens (8) and used to measure attitudes toward Blacks as managers. This scale is widely accepted and has been modified for several uses. For this study the scale is modified to assess attitudes toward managers without college degrees. Managers without a degree are thus compared to other managers who possess a degree. The type of degree or major is not specified. Respondents are asked to indicate agreement or disagreement on a 7-point Likert-type scale with each of 33 statements (The BIBS as modified for this study is displayed in Appendix One.) Scores can range from 33, indicating a highly unfavorable attitude toward those without a degree as managers, to 231, indicating a highly favorable attitude toward individuals with a college degree as managers. Neutral attitudes are indicated by a total BIBS score of 132. Since scores above the mean indicate more positive attitudes concerning the group in question, several questions were reversed in coding. Total BIBS scores significantly greater than 132 indicate a more positive attitude about managers without a college degree than those at or below the mean. The higher the score the more positive the perceptions; conversely the lower the score the more negative the perceptions.

Questions were also asked as to the level of educational attainment of each parent and the industry of the parent's occupation. Both father's and mother's level of educational attainment were surveyed. The data were collected categorically as follows:

TABLE TWO

PARENTS' EDUCATIONAL LEVEL

LESS THAN HIGH SCHOOL DIPLOMA
HIGH SCHOOL DIPLOMA
SOME COLLEGE
COLLEGE DEGREE
MASTER'S DEGREE OR HIGHER

TABLE THREE

PARENTS' INDUSTRY OF OCCUPATION

RETAIL
EDUCATION
GOVERNMENT
NONPROFIT
MANUFACTURING
FINANCIAL
OTHER/NOT EMPLOYED/DECEASED

ANALYSIS

Previous research has indicated that there was very little variation in any aspect of the BIBS with regard to overall score or individual items when the data were subjected to ANOVA by sex, college major or employment status of the respondent.(7) However it was assumed that the respondents' perceptions would be related to the educational level of their parents, and that this would be an inverse relationship. That is, the higher the educational attainment of the parent the more negative the overall perception of the respondent toward managers without degrees. There was no expectation as to industry of employment and its relationship to the total BIBS score.

The data were subjected to ANOVA by mothers' educational level, father's educational, mother's industry of employment and father's industry of employment. In all cases there was no

significant difference found between the total BIBS scores for each group and the mean of 132. Further, there was no difference found between any two groups. In fact, there was nothing approaching even a significant difference at the .10 level.

Data pertaining to the total BIBS score alone were tested here as it was thought that the individual items would lose their meaning when spread over such broad categories.

DISCUSSION AND CONCLUSION

The results, while rejecting the notion that the respondents have clear preferences in their perceptions about managers without degrees, are in line with past research taken as a whole. There are several possible reasons for the basically neutral perceptions, each of which could be tested further. It could be supposed that these respondents were completely neutral, having no expectations, towards working with or for managers who did not have a degree, perhaps because they themselves did not have a degree yet. If they are representative of their generation perhaps they are truly indifferent as to credentials and will be more impressed with results. Much has been made of this generation – millennials - being less biased than those in the past. If attitudes toward sexual orientation are an indicator this might be true. (6) Also the results could indicate complete indifference to the overall research question.

Future research needs to continue to examine this question. While these results found no significant difference, other sample groups may indicate statistically significant differences. Some potential samples that may find interesting differences are those who are currently working who are not working towards attaining a degree, those who have already attained a degree, and even those who are working toward a Master's degree. Also, it may be interesting to see differences of perceptions for those in various industries.

In conclusion, this study hopes to begin the discussion of employee attitudes towards individuals without degrees. More research needs to be completed in order to more fully develop this understanding and model. This area of research could be an important area of understanding for the academic community as well as practice.

APPENDIX ONE

MODIFIED BIBS

	QUESTION
1	In business situations, it is not acceptable to have Managers without a college degree in positions of authority.
2	Managers without a college degree possess the dominance to be a successful leader.
3	Managers without a college degree tend to allow their emotions to influence their managerial behavior more than would Managers with a college degree.
4	Managers with a college degree should be given preference over Managers without a college degree in being hired or promoted.
5	Managers without a college degree cannot cope with stressful situations as effectively as Managers with a college degree can.
6	In general, Managers with a college degree and Managers without a college degree are equally suitable for the professions (e.g., lawyer, doctor, etc.) and management positions.
7	It is as desirable for Managers without a college degree as for Managers with a college degree to have a job that requires responsibility.
8	Managers without a college degree lack the objectivity required to evaluate business situations properly.
9	Challenging work is as important to Managers without a college degree as it is to Managers with a college degree.
10	If a job as manager were available, given two equally qualified applicants, one Manager with a college degree and one Manager without a college degree, the Manager with a college degree should be recommended.
11	A job that allows one to develop their own special abilities is more important to Managers with a college degree than it is to Managers without a college degree.
12	In a demanding situation, a Manager without a college degree would be no more likely to break down than would a Manager with a college degree.
13	Recognition for a job well done is equally important to Managers without a college degree and to Managers with a college degree.
14	Managers without a college degree are less capable of learning mathematical and mechanical skills than are Managers with a college degree.
15	Managers without a college degree are ambitious enough to be successful in the business world.
16	Managers with a college degree and Managers without a college degree should not be given equal opportunity for participation in management training programs.

17   Managers without a college degree do not have the capability to acquire the necessary skills to be successful managers.

18   Manager without a college degree can acquire full job equality without any loss of their identity.

19   On the average, Managers without a college degree are equally capable of contributing to an organization's overall goals as are Managers with a college degree.

20   It is acceptable for Managers without a college degree to assume leadership roles as often as Managers with a college degree.

21   It is justifiable for a Manager with a college degree to resent working for a Manager without a college degree as a superior.

22   Managers with a college degree have justifiable reason to feel uncomfortable having to take orders from Managers without a college degree.

23   The business community should never accept Managers without a college degree in key managerial positions.

24   In job appointment and promotion, Managers with a college degree should be preferred to Managers without a college degree.

25   All things considered, Managers with a college degree are intellectually superior to Managers without a college degree.

26   Society should regard work by Managers without a college degree as valuable as work by Managers with a college degree.

27   It is not acceptable for Managers without a college degree to compete with Managers with a college degree for top executive positions.

28   It is only fair that Managers without a college degree and Managers with a college degree should receive the same pay for identical work.

29   Managers without a college degree can be aggressive in business situations that demand it.

30   Most Managers without a college degree are capable of making managerial decisions under stress.

31   Managers without a college degree are competitive enough to be successful in the business world.

32   Managers without a college degree possess the self-confidence required of a good leader.

33   It is as important for Managers without a college degree as for Managers with a college degree that their work be interesting.

REFERENCES

1. Adams, J. S. 1963. "Toward an Understanding of Inequity." *Journal of Abnormal and Social Psychology* 67: 422-436.

2. Herek, Gregory M. & Glunt, Eric, "Interpersonal contact and heterosexuals' attitudes toward gay men: Results from a national survey" *Journal of Sex Research*, 2003, Aug 30(3) 239-244.

3. Hernandez, B.; Keys, C.; & Balcazar F. "Employer attitudes toward workers with disabilities and their ADA employment rights: A literature review" *Journal of Rehabilitation*; 2000, Oct-Dec.

4. Horvath, Michael & Ryan, Ann Marie, "Antecedents and potential moderators of the relationship between attitudes and hiring discrimination on the basis of sexual orientation" *Sex Roles,* 2003 Feb 48(3/4) 115-130.

5. Smith, J.O. & Tomkiewicz, J. "Attitudes toward disabled persons as managers" *Proceedings of SeinForms*, 1999.

6. Smith, J.O. & Tomkiewicz, J. "Attitudes toward gay white males as managers" *Proceedings of SeinForms*, 2004.

7. Smith, J.O. ; Tomkiewicz, J.; McDowell W. & Oglesby A. "Assessing College Students' Impressions of Managers: The Significance of a College Degree" *Proceedings of SEDSI* 2009.

8. Stevens,G "Attitudes toward Blacks in management are changing" *Personnel Administrator,* 1984, 29, 163-171.

9. Tomkiewicz, J. & Adeyemi-Bello, T. (1997). Perceptual differences in racial descriptions of euro-american and hispanic persons, *Psychological Reports*, Vol 80 (3, Pt 2): 1339-1343.

10. Tomkiewicz, J. & Brenner. O.C. (1996). The relationship between race (hispanic) stereotypes and requisite management characteristics, *Journal of Social Behavior and Personality*, 11, 3, 511-520.

BREAKING DOWN THE OFFER: EVALUATING RECENT THEME PARK PROMOTIONS

Mark Mitchell, Coastal Carolina University, mmitchel@coastal.edu
Sheila Mitchell, Coastal Carolina University, smitchel@coastal.edu

ABSTRACT

The purpose of all promotional activity is to inform, persuade, and remind consumers of our offerings. In the current economic slowdown, Theme Parks are offering promotions encouraging visitors to visit their parks or to extend previously planned trips. In Spring 2009, examples included Disney World's "Buy Four, Get Three" or Universal Studio's "Buy Three, Get Two Free" promotions. Such promotional offers are evaluated from the perspective of the consumer and the Theme Park operator.

INTRODUCTION

Economists break down the aggregated expenditures in an economy to a simple formula:

$C + I + G + (NX)$, where

C = *Consumer Spending*
I = *Business Investment*
G = *Government Spending*
NX = *Net of Imports and Exports*

In the United States, Consumer Spending (or, C) has historically represented approximately two-thirds (2/3) of aggregated expenditures [7]. In 2007, economic activity began to slow. Anxious consumers, uncertain of their job security, cut back on consumer spending. This slowdown in economic activity caused some firms to cut back or, possibly, cease to exist. At the time of this writing, a new U.S. President and Congress are trying to determine the best way to stimulate increased economic activity. That is, how can we increase C, I, G, or EX to create more economic activity?

Consumers (C) have remained apprehensive about spending given uncertainty in the economy. Businesses (I) have been foregoing some planned investment waiting for an uptick in consumer spending. Government (G) can spend money but the political processes influencing that spending may mean a less than optimal impact. And, there is a time lag to the stimulus of building, say, infrastructure projects. It may take 1-3 years to complete environmental impact studies, engineering approvals, and so on before a large road or bridge construction project can move forward. Meanwhile, the United States continues to run trade deficits so the Net of Imports and Exports (NX) remains a negative. A weak dollar can help stimulate economic activity but, again, this takes time.

The purpose of all promotional efforts is to inform, persuade, and/or remind buyers of our goods and services [6]. In the midst of this economic slowdown, individual firms are trying to be creative in promoting their brands. Consumers are cutting back. Businesses are cutting back. Governmental responses take time to implement. The individual firm cannot wait. Recently, Theme Parks have attempted to stimulate demand with promotions such as:

- "Buy Four Nights, Get Three Nights Free"
- "Buy Three Nights, Get Two Nights Free"
- "Buy a 6 Day/5 Night Package, Get Dining Free"

Visitors previously not considering such a Theme Park may be attracted by such promotions. Visitors already leaning toward such a trip may commit to that destination given the promised cost savings.

The purpose of this manuscript is to evaluate some Theme Park promotions offered in Spring 2009 to stimulate demand for the Spring, Summer, and Fall 2009 seasons. A representative family of five (2 adults, 3 children) is used and the projected costs of their travel are evaluated from their consumer perspective as well as that of the Theme Park. First, some background on the Theme Park Industry, with a particular emphasis on Orlando, Florida, is provided. Next, specific promotions offered by Theme Park operators are profiled and evaluated. Finally, summary statements and conclusions are offered.

THE THEME PARK INDUSTRY

Themed entertainment amusements provide visitors experience-based tourism in venues such as museums, science centers, corporate visitor centers, live events and live performance venues, themed entertainment and retail centers, casinos and resorts, themed restaurants, aquariums, zoos, heritage centers, Theme Parks and more [11]. Economists would suggest a visit to a themed-entertainment venue is a luxury and not a necessity. As such, in tight economic times, some consumers will forego attending a Theme Park and/or alter their planned stays. The Themed Entertainment Association's 2008 Attraction Annual Report offered the following interpretation of the recent past and near-term future attendance patterns [10]:

> *"It is typical of destination parks to be impacted more by a recession than regional parks, because they are located farther away from their markets, and cost more to visit."*

> *"Overall, the numbers and the economy are pointing to lower attendance in 2009."*

Most Theme-Park operators do not release attendance figures mid-year. However, some reports support this stated expectation. Cedar Fair Entertainment, which operates 11 Theme Parks and 7 water parks, has reported a decline in 2009 ticket sales as well as spending within the parks [13]. Six Flags reported a 13% decline in revenue due to a decline in ticket sales and lower spending by guests while in the parks [2]. Disney has reportedly eliminated positions at its domestic Theme Parks in 2009 based on lagging Theme Park attendance. The company has offered no specifics to the media.

Orlando, Florida

Today, Orlando, Florida is the undisputed Theme Park capital of the world [1]. According to the "Attraction Attendance Report 2008" compiled by the Themed Entertainment Association / Economics Research Associates [10], the Orlando Area is home to 7 of the top 9 Theme Park attractions in North America (in terms of annual attendance):

- Disney World's 4 Parks (Magic Kingdom, EPCOT, Hollywood Studios, and Animal Kingdom)
- Universal Orlando's 2 Parks (Universal Studios and Island of Adventure)
- SeaWorld

See **Table One** for a complete look at Theme Park Attendance in North America in 2008. The reader will note Disney's four Orlando Theme Parks are numbers 1, 3, 4, and 5 on the list (with Disneyland in

California in the #2 position). See **Table Two** for a complete list of Top Ten Theme Park Chains Globally. Again, the reader will see Disney as the global market leader with total attendance some 300% higher than the number two firm (Merlin Entertainment Group).

Table One
Top 20 Theme Parks for Attendance in North America - 2008

Park	Attendance	% Change from 2007
1. Disney World – Magic Kingdom (Orlando)	17,063,000	Flat
2. Disneyland (Anaheim)	14,721,000	-1.0%
3. Disney World – EPCOT (Orlando)	10,935,000	Flat
4. Disney – Animal Kingdom (Orlando)	9,608,000	+1.0%
5. Disney – Hollywood Studio (Orlando)	9,540,000	+-0.5%
6. Universal Studios @ Universal Orlando	6,231,000	+0.5%
7. SeaWorld Florida (Orlando)	5,926,000	-2.9%
8. Disney – California Adventure (Anaheim)	5,566,000	-2.0%
9. Islands of Adventure @ Universal Orlando	5,297,000	-2.4%
10. Universal Studios Hollywood (Hollywood City, CA)	4,583,000	-2.5%
11. Busch Gardens (Tampa)	4,410,000	-2.0%
12. SeaWorld California (San Diego)	4,147,000	-2.7%
13. Knott's Berry Farm (Buena Park, CA)	3,565,000	-1.8%
14. Canada's Wonderland (Maple, ONT)	3,380,000	+4.0%
15. Cedar Point (Sandusky, OH)	3,198,000	+2.5%
16. King's Island (King's Island, OH)	3,126,000	+2.5%
17. Busch Gardens Europe (Williamsburg, VA)	3,094,000	-2.0%
18. Hershey Park (Hershey, PA)	2,842,000	-4.4%
19. Six Flags Great Adventure (Jackson, NJ)	2,761,000	+1.5%
20. Six Flags Great America (Gurnee, IL)	2,669,000	+1.5%

Source: Themed Entertainment Association / Economics Research Associates'
               Attraction Attendance Report 2008 [10].

Table Two
Top Ten Theme Park Chains – 2008

Name	Locations	2008 Attendance (in millions)
Walt Disney Attractions	United States (Florida, California), France, Hong Kong, and Japan	118.0
Merlin Entertainment Group	United States (New York, California, Nevada, Illinois, District of Columbia), Denmark, United Kingdom, Germany, Netherlands, Italy, Hong Kong	35.2
Universal Studios	United States (Florida, California)	25.7
Six Flags, Inc.	United States (California, Georgia, Illinois, Kentucky, Louisiana, Maryland, Massachusetts, Missouri, New Jersey, New York, Texas), Canada, Mexico, United Arab Emirates	25.3
Parques Reunidos	United (Pennsylvania, Connecticut, New Hampshire), Spain, Italy, Belgium, Denmark, Norway, United Kingdom, Argentina, France	24.9
Busch Entertainment	United States (Florida, California, Texas, Virginia, Pennsylvania)	23.0
Cedar Fair Entertainment	United States (California, Ohio, Pennsylvania, South Carolina Michigan, Missouri, Minnesota, Virginia), Canada	22.7
OCT Parks China	China	13.4
Compagnie Des Alpes (Grevin)	France, Netherlands, Germany, Switzerland,	9.5
Herschend Family Entertainment	United States (Tennessee, South Carolina, New Jersey, California, Kentucky, Missouri, Georgia	8.3

Source: Themed Entertainment Association / Economics Research Associates'
             Attraction Attendance Report 2008 [10].

RECENT THEME PARK PROMOTIONS

As noted earlier, Theme Parks are experiencing stagnant to slightly falling attendance. And, visitors to the parks are spending less money on food, beverages, and souvenirs while in the parks. To counter these trends, Theme Park operators have instituted aggressive promotional programs. *The Los Angeles Times* reported Disney's strategy the following way in July 2009 [8]:

> "Second-quarter margins for the parks were squeezed by aggressive promotions to keep visitors traveling to Disney's domestic parks, including discounted hotel rates at the Walt Disney World in Orlando, Fla. These promotions largely propped up attendance, which slipped a modest 1% in Orlando, and grew by 2% at the Disneyland Resort in Anaheim."

Price discounting is helping to keep attendance stable but lower revenue is adversely affecting profitability. In the sections that follow, we'll break down specific Theme Park promotions to see the cost savings for the traveler and the concurrent foregone revenue by the Theme Park had such discounting not been needed to generate Theme Park attendance. Data was collected to plan the hypothetical trips using resort websites in March 2009 [4] [5] [12] [14].

Walt Disney World - Summer 2009 Promotion

Walt Disney World offered a "Buy 4 Days, Get 3 Days Free" promotion in Spring 2009 for attendance in Spring and Summer of the same year. Visitors would stay in Walt Disney World Resort and purchase Theme Park admission for the duration of their stay. **Table Three** outlines the differences in pricing for a 3-day, 4-day, 7-day discounted, and 7-day non-discounted stay for our representative family of 5 (2 adults, 3 children).

Table Three
Walt Disney World – "Buy 4, Get 3 Free" Promotion for 2009

	3-Day / 3-Night	4-Day / 4-Night	7-Day / 7-Night 'Buy 4 Get 3" Promotion	7-Day / 7-Night Without Discounting
Room	$ 636.00	$ 844.00	$ 1,929.00	$ 1,479.00
Theme Parks	$ 1,058.00	$ 1,097.00	Included with room.	$ 1,135.00
Water Parks	$ 266.00	$ 266.00	$ 266.00	$ 266.00
Dining – Quick Service Package	$ 330.00	$ 433.00	$ 765.00	$ 765.00
Total	$ 2,290.00	$ 2,640.00	$ 2,950.00	$ 3,645.00

Source: Original. Data taken from Walt Disney World website [14].

- Some rounding was done. It did not affect the general analysis.
- Nominal difference in price of a 3-day, 4-day and 7-day Theme Park pass (see **Table Four** below).
- No difference in price of a 3-day, 4-day and 7-day Water Park pass.
- Dining costs are not included in the "Buy 4, Get 3 Free" promotion.
- The "Buy 4, Get 3 Free" package included a stay at a Disney Resort and Purchase of Theme Park Tickets. Approximate breakdown (Room = $844, Theme Parks = $1,085)

- **The "Buy 4, Get 3 Free" promotion saves the family $685 (largely savings is in the resort hotel savings for 3 evenings, not in Theme Park or water park savings).**
- The marginal cost of extending the stay from 4 days to 7 days with the promotion includes the additional expense for meals for these 3 days (approximately $310).
- The marginal cost of extending the day from 4 days to 7 days in the absence of the promotion is $1,005 for the family (room = $635, dining = $332, Theme Parks = $38).
- Beginning Date for Analysis = July 25, 2009.

As noted above, there is nominal difference between 4 and 7-day Theme Park admission to Walt Disney World. **Table Four** presents that Disney World Theme Park Pricing Program "Magic Your Way."

Table Four
Walt Disney World – Magic Your Way Ticket Pricing

Ticket	Total Price (excluding tax) Ages 10+	Total Price (excluding tax) Ages 3-9	Price Per Day Ages 10+	Price Per Day Ages 3-9
1-day	$ 79.00	$ 68.00	$ 79.00	$ 68.00
2-days	$ 156.00	$ 133.00	$ 78.00	$ 66.50
3-days	$ 219.00	$ 187.00	$ 73.00	$ 62.33
4-days	$ 225.00	$ 192.00	$ 56.25	$ 48.00
5-days	$ 228.00	$ 195.00	$ 45.60	$ 39.00
6-days	$ 231.00	$ 198.00	$ 38.50	$ 33.00
7-days	$ 234.00	$ 201.00	$ 33.43	$ 28.71

Source: Original. Data taken from Walt Disney World website [14].

Walt Disney World – Summer, Fall 2009 Promotion

Walt Disney World offered a "Free Disney Dining" promotion for Summer and Fall 2009. Visitors would stay in Walt Disney World Resort, purchase Theme Park admission, and receive Disney's Dining Plan ($39 per adult per day) free. **Table Five** outlines the differences in pricing for a 6-day, 5-night vacation with and without the inclusion of free Disney Dining for our representative family of 5 (2 adults, 3 children).

Table Five
Walt Disney World – Free Disney Dining Promotion in 2009

	6-Day / 5-Night 'Free Dining" Promotion	6-Day / 5-Night Without Discounting
Room	$ 1,968.00	$ 838.00
Theme Parks	Included in Package	$ 1,125.00
Water Parks	$ 266.00	$ 266.00
Dining – Disney Dining Package	Included in Package	$ 710.00
Total	$ 2,234.00	$ 2,944.00

Source: Original. Data taken from Walt Disney World website [14].

- Some rounding was done. It did not affect the general analysis.
- Nominal difference in price of a 4-day and 6-day Theme Park pass.
- No difference in price of a 4-day and 6-day Water Park pass.
- Guests are given the "Magic Your Way Plus Disney Dining Plan" with this promotion. Daily costs for this family of five (2 adults, 10, 8, 8 year old children) is $140 per day (or, $700 for 5 days).
- The "Free Dining Promotion" package included a stay at a Disney Resort and Purchase of Theme Park Tickets. Approximate breakdown (Room = $838, Theme Parks = $1,125)
- **The "Free Disney Dining" promotion saves the family $710 (largely savings is in the food costs, not in Theme Park or water park savings).**
- Beginning Date for Analysis = August 16, 2009.

Disneyland (Anaheim, CA) - Spring 2009 Promotion

Disneyland Resort in Anaheim, California (the second-most visited Theme Park in North America behind Disney World's Magic Kingdom) offered a "Buy 3, Get 1 Free" promotion with Partner Hotels (Disneyland hotels do not participate in this promotion). **Table Six** outlines the differences in pricing for both discounted and non-discounted stays (including dining) for our representative family of 5 (2 adults, 3 children).

Table Six
Disneyland – Free Nights Promotion in 2009

	3-Day / 3-Night	4-Day / 4-Night 'Buy 3 Get 1" Promotion with Good Neighbor Hotels	4-Day / 4-Night Without Discounting
Room	$ 1,317.00	$ 1,392.00	$ 1,587.00
Theme Park	Included	Included	Included
Dining	$ 442.00	$ 632.00	$ 632.00
Total	$ 1,759.00	$ 2,024.00	$ 2,219.00

Source: Original. Data taken from Disneyland website [4].

- Marginal cost to add the 4th day in the Theme Parks = $75.00 for the family (or, $15 per person).
- Marginal cost to add the 4th day of dining in the Theme Parks = $190 for the family.
- The "Buy 3, Get 1 Free" package included a stay at a Disney Good Neighbor Hotel (Anaheim Fairfield Inn) and purchase of Theme Park tickets. Approximate breakdown (Room = $585, Theme Parks = $807)
- Hotel alone books for $195 per evening (3 nights = $585, 4 nights = $780).
- The marginal cost of extending the stay from 3 days to 4 days includes the additional cost of $265 for the family (Theme Park admission = $75.00, meals = $190).
- Marginal cost of extending the stay from 3 days to 4 days in the absence of the promotion is $460 for the family (room = $195, Theme Park admission = $75.00, meals = $190).
- **The "Buy 3 Get 1" promotion saves the family $195 (largely savings is in the lodging, not in Theme Park or dining savings).**
- Beginning date for analysis = April 12, 2009.

Disneyland Paris (France) – Spring and Summer 2009 Promotion

Disney offered a "40% Discount" promotion at its Disneyland Paris resort this past in 2009. According to Themed Entertainment Association / Economics Research Associates, the park hosted 12.6 million visitors in 2008 (the most of any European Theme Park with next closest competitor at 4.0 million visitors) [10]. **Table Seven** outlines the differences in pricing for both discounted and non-discounted stays (including dining) for our representative family of 5 (2 adults, 3 children). Please note that dining (i.e., Half Board) was not discounted in this promotion.

Table Seven
Disneyland Paris (France) – Spring and Summer 2009 Promotion

	3-Day / 2-Night	4-Day / 3-Night	5-Day / 4-Night	6-Day / 5-Night	8-Day / 7-Night
Room	E 1,295.00	E 1,803.00	E 2,283.00	E 2,764.00	E 3,729.00
Theme Parks	Included in room fee	Included in room fee	Included in room fee	Included in room fee	Included in room fee
Dining Package (Half Board Premium)	E 222.00	E 333.00	E 444.00	E 555.00	E 777.00
Total	E 1,517.00	E 2,103.00	E 2,727.00	E 3,319.00	E 4,506.00

Estimated Room and Theme Park Savings with 40% Discount Promotion

	3-Day / 2-Night	4-Day / 3-Night	5-Day / 4-Night	6-Day / 5-Night	8-Day / 7-Night
Room and Theme Parks @ 40% savings	E 1,295.00	E 1,803.00	E 2,283.00	E 2,764.00	E 3,729.00
Room and Theme Parks savings	**E 863.00**	**E 1,202.00**	**E 1,522.00**	**E 1,842.00**	**E 2,486.00**
Room and Theme Parks at no discount	E 2,158.00	E 3,005.00	E 3,805.00	E 4,606.00	E 6,215.00

Source: original. Data taken from Disneyland Paris website [5].

Similar to Walt Disney World, the cost per day of Theme Park attendance at Disneyland Paris goes down the longer the visit. And, dining expenditures were not included in the promotion.

Universal Studios (Orlando, FL) – Spring and Summer 2009 Promotion

Universal Studios offered "Buy 3 Days, Get 2 Days Free" and "Buy 4 Days, Get 3 Days Free" promotions for Spring and Summer 2009. Visitors would stay in one of 3 on-site properties. For ease of comparison to the cost of the Walt Disney World stays profiled above, water parks and dining plans were also added to this analysis. **Table Eight** outlines the differences in pricing for both discounted and non-discounted stays for our representative family of 5 (2 adults, 3 children).

Table Eight
Universal Studios – Free Nights Promotion in 2009

	2-Day / 2-Night	3-Day / 3-Night	5-Day / 5-Night "Buy 3 Get 2" Promotion	4-Day/4-Night	7-Day / 7-Night '"Buy 4 Get 3" Promotion
Room	$ 583.00	$ 733.00	$ 1,386.00	$ 1,332.00	$ 1,678.00
Theme Parks	$ 535.00	$ 535.00	Included in room fee	Included in room fee	Included in room fee
Wet and Wild Water Park	$ 240.00	$ 240.00	$ 240.00	$ 240.00	$ 240.00
Dining – Quick Service Package	$ 215.00	$ 322.00	$ 538.00	$ 430.00	$ 750.00
Parking ($15 per day)	$ 30.00	$ 45.00	$ 75.00	$ 60.00	$ 105.00
Total	$ 1,603.00	$ 1,875.00	$ 2,239.00	$ 2,062.00	$ 2,773.00

Source: Original. Data taken from Universal Studios website [12].

- The "Buy 3, Get 2 Free" package included a stay at a Universal Resort (Loews Royal Pacific Resort) and purchase of Theme Park tickets. Approximate breakdown (Room = $851, Theme Parks = $535)
- The "Buy 4, Get 3 Free" package included a stay at a Universal Resort (Loews Royal Pacific Resort) and purchase of Theme Park tickets. Approximate breakdown (Room = $1,143, Theme Parks = $535).
- The 4-Day/4-Night option included a stay at a Universal Resort (Loews Royal Pacific Resort) and purchase of Theme Park tickets. Approximate breakdown (Room = $797, Theme Parks = $535).
- When purchased separately, Theme Park admission (for solely Universal Studio properties) costs $106.49 per person for unlimited visits for 7 days. This equals $535 for the family.
- Water park passes for unlimited annual use are currently available for $48 per person. This equals $240.00 for the family.
- **The marginal cost for the family to extend a planned 3-day stay to 5-days is $364.00.**
- **The marginal cost for the family to extend a planned 4-day stay to 7-days is $711.00.**
- Beginning Date for Analysis = July 25, 2009.

SUMMARY STATEMENTS AND CONCLUSIONS

Discounting has become the norm for the Theme Park industry as operators seek to keep people in their parks, restaurants, and hotels during the current recessionary period. The examples presented above are illustrative and not exhaustive. Almost every park in operation is offering assorted discounts as operators try to drive traffic to the parks. Attendance is flat and operators are lowering prices just to keep

operations at prior attendance levels. This lowering of revenue on a per-guest basis is lowering overall profitability. And, guests that do frequent the parks are spending less on a per-visit or per-person basis. This further negatively impacts total revenues.

Theme Park operators are serving their clients but realizing lower levels of revenue and profitability by doing so. They are taking a longer-range view: a happy client in 2009 may return in 2010, 2011 and beyond when (assumedly) the economy has turned around. By then, the pattern of deep discounting may disappear. And, happy clients will stimulate positive word-of-mouth communication. This discounting may create goodwill that will serve themed entertainment operators well in the future. Surely, Theme Park operators do not wish discounting to become a norm of the industry (akin to automobile rebates). Still, it is proving effective at keeping operations level during a turbulent operating period.

REFERENCES

[1]   Birmbaum Guides (2008), Walt Disney World 2009: Expert Advice from the Inside Source, New York, NY: Disney Book Group.

[2]   *Chicago Tribune* (2009), "6 Flags Posts $121.6 Million Loss in 2nd Quarter as Attendance at Parks Declines," (August 3, 2009).

[4]   Disneyland website: http://disneyland.disney.go.com.

[5]   Disneyland Paris website: http://www.disneylandparis.com.

[6]   Grewal, Dhruv and Michael Levy (2008), M Marketing, Burr Ridge, IL: McGraw-Hill Irwin.

[7]   Hall, Robert E and Marc Lieberman (2005), Economics: Principles and Practices (3rd Edition), Mason, OH: Thomson Southwestern Publishing.

[8]   *LA Times* (2009), "Despite 'Up' and other Hit Movies, Disney Revenue Drops, Net Income Sinks," (July 30, 2009).

[9]   Neal, Julie and Mike Neal (2009), The Complete Walt Disney World 2009, Sanibel, FL: Coconut Press.

[10]   Themed Entertainment Association / Economics Research Associates (2009), "Attraction Attendance Report 2008, available online: http://www.themeit.com/TEAERA2008.pdf.

[11]   Themed Entertainment Association website: http://www.themeit.com.

[12]   Universal Studios Orlando website: http://www.universalorlando.com.

[13]   *USA Today* (2009), "Economy Shakes Up Cedar Fair Theme Park Attendance," (August 4, 2009).

[14]   Walt Disney World website: http://Disneyworld.disney.go.com.

ECONOMIC EXPECTATIONS FOR THE HOLIDAY SEASON: A COMPARISON OF RETAILER VERSUS CONSUMER PERCEPTIONS

Jacob Forehand, Georgia Southern University, Statesboro, GA 30460-8154

Jacqueline K. Eastman, Georgia Southern University, Statesboro, GA 30460-8154

Benjamin McKay, Georgia Southern University, Statesboro, GA 30460-8153

ABSTRACT

Two probability samples in the southeastern United States, of consumers and retailers, to measure economic perceptions were conducted. Comparisons were made between consumers' and retailers' perceptions in the areas of the economy, financial soundness, cost of living, and consumer holiday spending. The results suggested that retailers and consumers held similar negative perceptions in terms of the state of the economy. Consumers though felt less financial sound than retailers did. Additionally, consumers felt the cost of living had increased to a greater degree than retailers felt their cost of operating had. Finally, retailers better predicted that consumers were planning to spend less for the holiday season.

INTRODUCTION

This paper will compare the opinions and expectations of consumers and retailers in the southeast United States in fall, 2008 regarding the 2008 Holiday shopping season. The time of year of the study is significant in the study as the holiday season is considered a barometer of economic activity and consumer confidence. Many retailers have become extremely dependent on the months during the holiday season; for example, in 2007, holiday sales represented 19.1% of total retail industry sales (Davis, 2008). Dodes, Zimmerman, and McCracken (2009) suggest that retailers can generate up to 40% of their annual sales during the holiday season. Thus, understanding and comparing consumer and retailer perceptions of a significant business event, the holiday shopping season, is vital for marketers to understand.

This paper makes a distinct contribution to the literature by being one of the first comparisons of two distinct populations (consumers and retailers) within the same region, during the same time, about similar topics. The following topics are addressed by both the retailer and consumer samples: economic expectations, financial stability, cost of living/operating, and perceptions of holiday shopping. Zimmerman, Saranow, and Bustillo (2009) offer that this was one of the worst holiday sales seasons on record with total retail sales (excluding automobiles) declining 2.5% in November and 4% in December of 2008; these declines were worse than what was previously forecasted. In comparison, last year holiday retail sales increased 2.4%. In trying to understand why there was such a decrease, the opinions of consumers and retailers in fall, 2008 may indicate why the 2008 holiday season happened the way that it

did. Furthermore, understanding where consumers and retailers agree and disagree on the economy and the holiday shopping season may better help marketers successfully serve consumers and succeed in future holiday shopping seasons and throughout the year in the future.

In this paper, we will review supporting literature for the topics studied including retailer's economic expectations, consumer's economic expectations, retailer financial soundness, consumer financial soundness, retailer's cost of operating, consumer's cost of living, and holiday shopping expectations. After reviewing the supporting literature, we will propose four hypotheses in order to test the relationships of the variables studied between retailers and consumers. This paper is important because it highlights the similarities and differences in perceptions that existed between retailers and consumers. The impact of these differences was felt in the holiday retail results. Thus it is critical that retailers better understand consumer perceptions and how they relate to their own views.

LITERATURE REVIEW

Perceptions of the economy

For years, consumer spending has sustained the U.S. economy (Roeder, 2008). With all the reports of the U.S. economy slipping and the stock market teetering with uncertainty, the question of "if" the country is in a recession has turned into the question of "how bad?" According to a survey from NPD Group, 58 percent of consumers in May believed that the U.S. was in a recession, up 55 percent from the month before ("Recession State of Mind", 2008). A study conducted by the Nielson Co. found that of the 49 percent of consumers who said that they planned to reduce spending in 2008, more than a third (18 percent) were reducing costs by a "great degree," while the remaining 31 percent were scaling back to a "small degree" (Foucher, 2008).

Consumers are valuable gauges of the economic environment, mostly because their perceptions drive their spending and their spending drives the economy. Here is where perception became reality. Consumers may have foreseen the downturn years before it was publicized by the media. A 2007 survey found that Southeastern residents overwhelmingly perceived the economy as doing badly compared to 2006. With 57 percent of respondents indicating they felt the economy was worsening; additionally, only 6 percent of the region thought that the economy was better than the year before (Hill, 2007).

With the 2008 figures coming in, we see more and more that retailers are feeling the impact of a worsening economy. But did they see it coming? A survey conducted in 2008 of 1,800 small businesses owners by the National Federation of Independent Businesses trade group shows that an index measuring optimism among the owners has dropped to its lowest since 1991. Only 5 percent expected the economy to improve in the coming months (Iwata, 2008). In 2007, a survey of retailers in the Southeastern region found that when asked about the current economy only 15 percent of retailers thought that the economy was better in 2007 than 2006, an 18 percent drop in confidence compared to the 2006 survey (Hill, 2007).

Thus given the literature we propose the following hypothesis to measure the relationship between consumer economic expectations and retailer economic expectation:
H1: Perceptions of the economy are the same for retailers as consumers.

Financial Soundness

Amid job losses, declining values of retirement funds, and a weaker outlook for financial markets, consumers have decreased nonessential spending (Cheng, 2008). Per the U.S. Labor Department, the number of Americans drawing unemployment benefits rose to 4.6 million for the week ended December 26, the highest since 1982 (Cheng, 2008). Consumer confidence slumped in December to the lowest level since the Conference Board first started tracking it 40 years ago, as consumers expressed deep concerns about the economy and some 42 percent thought jobs were hard to get (Cooper 2008).

With such uneasiness about job securities, consumers are truly reevaluating their perceptions of how sound their household is financially. With incomes pinched, access to credit tightened, and nest eggs

drastically shrunken, Americans are poised to save much more and spend much less. Consumers are struggling with many years of accumulated debt amid dwindling resources, and they are now forced to begin saving a higher percentage of their income, leaving less for spending (Cooper, 2009). The savings rate is heading up, reaching 2.9 percent of income in the fourth quarter, the highest in seven years (Cooper, 2009). Compared with the last two recessions, the savings rise has been fast, but with the stress from lost wealth and tighter credit, it will persist for some time (Cheng, 2008).

Millions of U.S. small businesses have felt the harmful effects of the housing crisis and current economic recession. Though large corporations are not impervious to the changes in the economy, small businesses lack the financial reserves of bigger companies to weather the slump and are severely impacted by emptier shops, weaker sales, and cautious consumers unwilling to spend (Iwata, 2008). Small businesses historically, have often led the country out of recessions. That will be difficult if they cannot get the credit and capital they need to grow. A 2008 Federal Reserve survey found that 30 percent of banks were tightening standards on commercial and industrial loans to small companies, compared to only 10 percent in 2007 (Cooper, 2009). Unfortunately, conditions are likely to get worse; The International Council of Shopping Centers predicts nearly 5,800 store closures this year, outpacing last year's 4,600, in shopping malls across the country (Hudson, 2008).

Thus given the literature we propose the following hypothesis to measure the relationship between consumers' perceptions of financial soundness and retailers' perceptions of financial soundness:

H2: Retailers' and consumers' perceptions of their financial soundness are the same.

Cost of Living/ Cost of Operating

U.S. consumers are challenged daily by growing inflation, credit card debt and interest payments, declining house values, and the constant threat of gasoline prices skyrocketing. In December 2007, Nielsen Home Scan conducted a survey on the impact of higher gas prices on nearly 26,000 consumers which were geographically and demographically representative of the U.S. population. The findings were that half (49 percent) were reducing their spending to compensate for rising gas prices, a four percent increase from 6 months earlier (Hale, 2008). The largest component of the CPI is housing which counts for about 42 percent of the total index. The Standard & Poor's Case-Shiller Home Price Index for 10 cities fell by 2.2 percent in November, 2008 (Sweet, 2008). So now consumers, having taken a blow in their home equity, are facing other pressure from higher prices for food and commodities and from potential job losses.

American retailers have come under tremendous financial pressure as beleaguered consumers curtail their spending. But of all the troublesome economic news, inflation is what's worrying most businesses owners. According to a 2008 poll by the National Federation of Independent Businesses, inflation is the number one concern of small businesses, with inflation fears being the highest since 1982 (Sweet, 2008). For small business owners, it is difficult to cope with the increase in commodity costs. Sweet (2008) acknowledges that businesses are consolidating departments, laying off employees, honing markets, and re-evaluating every facet of their operations in order to stay lean and efficient.

Thus given the literature we propose the following hypothesis to measure the relationship between consumers' cost of living and retailers' cost of operating:

H3: Perceptions of the cost of living for consumers are the same as perceptions of the cost of operating for retailers.

Holiday Spending Perceptions of Retailers and Consumers

Holiday spending has always been a major stimulant to the U.S. economy. In 2007, holiday sales represented 19.1 percent of total retail industry sales (Davis, 2008). Unfortunately, retail sales declined 1.7 percent in December 2008 from 2007 (Bustillo, 2008), even as retailers resorted to sharp discounts in attempt to attract credit strapped consumers. When the National Retail Federation initially forecasted 2008 holiday sales, it estimated that retail sales would grow 2.2 percent, well below the industry's 10 year

average of 4.4 percent sales growth ("Holiday Sales Expected to Lag", 2008). But as the talk of the recession increased, expectations decreased. Stores hired fewer part-time staffers during the holidays to control labor costs (Zimmerman, 2008). Monthly retail-sales figures were a critical barometer of how Americans were reacting to the discouraging news, each month's numbers showing a nation paring back in the face of economic uncertainty, fleeing extravagance in favor of low-priced basics (Bustillo, 2008). As it came closer to December, retailers edited their expectations to match the gloomy outlook. According to a survey done in September of 2008 by BDO Seidman LLP of 100 large retail companies, they expected their companies' same-store sales in November and December to fall an average of 2.7 percent from year-ago levels (Saranow, 2008). In the survey, 88 percent of the executives also said that they plan to offer more discounts and promotions than last year. In a more ominous sign, 65 percent of the executives said they don't expect to see a meaningful economic turnaround until the third quarter of 2009 at the earliest. Economists were soon predicting the "worst holiday season since the recession of 1991 (Zimmerman, 2008). Retailers started fighting back with an arsenal of new selling techniques, staff cutbacks and more emphasis than ever on value and low-prices (Cheng, 2008). With five fewer days between Thanksgiving and Christmas than in 2007, the 2008 holiday season was looking even bleaker.

Retailers planned bigger, bolder, and earlier campaigns to lure shoppers as early as possible, racing to make the most of the shorter season. Markdowns allowed retailers to keep inventories from climbing, but dramatically reduced their profit margins (Evans, 2009). In another worrisome sign for consumer spending, the rapid expansion of credit that helped fuel spending in previous holiday seasons continued to reverse. The Federal Reserve stated in the days after Christmas that total consumer credit outstanding declined 3.7 percent in November to $2.57 trillion (Evans, 2009). But the holidays were not all doom-and-gloom for all retailers; the world's largest retailer, Wal-Mart's, sales grew 1.7 percent, with more Americans shopping at the low-cost seller.

Thus given the literature we propose the following hypothesis to measure the relationship between consumers' and retailers' perceptions of holiday spending:
H4: Perceptions of holiday spending will be the same for retailers as consumers.

METHODOLOGY

Data was collected using two probability stratified samples, one of retailers and one of consumers in the Southeast with the stratification based on county population in that region. Trained research assistants administered telephone surveys to both samples.

Measures

Hypothesis 1: The question used to measure economic perceptions of retailers comprised of "How do you think the economy is doing this year compared to last year?" With the given responses including: (1) worse than last year, (2) about the same as last year, (3) better than last year. The survey question used to measure consumer's economic opinions asked "Do you think the economy is (1) worse than it was last year, (2) about the same as it was last year, (3) or better than it was last year?"

Hypothesis 2: The query used to measure retailers' perceptions of their financial soundness was "How financially sound is your company this year compared to last year?" With the given responses being: (1) worse than last year, (2) about the same as last year, (3) better than last year?" Similarly, the survey question used to measure consumers' perceptions of their financial soundness was "Are you (1) better off financially this year than last year, (2) about the same financially this year compared to last year, (3) better off financially this year than last year?"

Hypothesis 3: The question that was used to measure retailers' perceptions of their cost of operating asked "During the past year, do you think that the cost of operating your business has (1) decreased, (2) remained the same, (3) increased?" In order to measure consumer's perceptions of their

cost of living, respondents were asked the question "During the past year, do you think the cost of living has (1) decreased, (2) remained the same, (3) increased, in your area?"

Hypothesis 4: The question that was used to measure retailer's perceptions of holiday spending inquired "This holiday season, do you think consumers (1) will decrease their holiday spending, (2) will keep their holiday spending about the same, (3) will increase their holiday spending?" The survey question used to measure consumers' expectations of their holiday spending asked respondents "Is the amount you are spending on holiday gifts (1) less than last year, (2) about the same as last year, (3) more than last year?"

Sample

The first sample population was made up of retailers in the Southeast with the sampling unit being owners/managers of retail stores and the time frame was late October, 2008. A total of 278 surveys were collected with a 20 percent response rate. A list of retailers purchased from InfoUSA was used as the sampling frame. When asked their title in the business, 36.7 percent stated that they were the owner. "Manager" was the most recurrent answer at 43.2 percent of the respondents. Also, an 19.3 percent of those who answered claimed other titles such as key holders, assistant managers, sales managers, supervisors, and family members of the owners/managers. Sales of the businesses called varied significantly, showing the diversity of the sample, however the majority of the businesses surveyed were small businesses whose sales were $100,000 and less.

Of the surveys collected, 19.8 percent stated that their company's sales were less than $100,000 a year, 17.9 percent stated that their company sales were $100,001 to $250,000 a year, and 14.5 percent had annual sales of $250,001 to $500,000. In addition, the two categories of "$500,001 to $750,000" and "$750,001 to $1,000,000", both made up 10 percent. Respondents that answered "over $1,000,000" made up 13.4 percent. The retailers were also asked the amount of employees they currently retained. The answers ranged from 1 to 101 or more. A very large portion (74.2 percent) of the businesses surveyed employed 10 or fewer employees. Approximately 14.82 percent claimed 11 to 25 employees, 5.7 percent with 26 to 50 employees, 2.3 percent with 51 to 75 employees, 1.6 percent with 72 to 100 employees, and a final 1.6 percent out of the 263 respondents said they had 101 or more employees.

The fact that small businesses were the majority of the sample fits the profile of the national marketplace: In 2007, there were 27.2 million businesses in the United States, according to Office of Advocacy estimates. Census data show that there were 6.0 million firms with employees and 20.4 million without employees in 2005. Small firms with fewer than 500 employees represent 99.9 percent of the 27.2 million businesses in the U.S. (Small Business Administration, 2007). Most small businesses have a single location only; this was true of the sample when asked "How many locations does your firm have in the Southeastern region?" The majority of businesses surveyed (63.4 percent) were single proprietorships. 13.8 percent had only 2 locations in the region. "Three or more locations" made up 6.3 percent, and "4 or more locations" was 15.6 percent.

The second sample population was made up of consumers in the Southeast and the sampling unit was households. The time frame was also late October to early November, 2008 (just before the U.S. election.) A total of 450 surveys were collected with approximately a 20 percent response rate. Respondents were asked demographical questions in order to categorize variables such as gender, employment status, education level, residence, and income. Approximately 59.8 percent of the individuals that took the survey were females. When asked about their employment status, survey respondents fell mostly into two main groups: full-time employment (47.2 percent of the sample) and retired (31.3 percent of the sample). Consumers were also asked about their level of education; some of the frequencies answered were 4-year college degree (at 23 percent of the sample), and some college (at 29.7 percent of the sample). The sample proved to be varying from respondents with grade school educations to graduate degrees. Almost 86 percent of the population sample claimed they owned their home, with 13 percent claiming they rent their homes. Income levels were diverse, with 28.6 percent respondents classifying

themselves in the \$50,000 to \$74,999 range and 21.3 percent claimed "\$100,000 or above" as their household income. The median and mode was 23.7 percent in the "\$50,000 to \$74,999" category.

RESULTS

Hypothesis 1 was tested using an independent sample t-test using the variables of economic perceptions of retailers and economic perceptions of consumer. The results of the t-test were not significant (t=1.28). Hence, we fail to reject the null hypothesis and conclude perceptions of the economy are the same for retailers as consumers.

Hypothesis 2 was tested using an independent sample t-test with the variables of retailers' perceptions of financial soundness and consumers' perceptions of financial soundness. The results of the t-test were significant at the .005 level (t=4.84). Therefore, we reject the null hypothesis and conclude that perceptions of financial soundness differed from retailers to consumers. Retailers felt more financially sound compared to consumers. Retailers overall felt about the same financially as last year, while more consumers felt financially worse off than the year before.

Hypothesis 3 was tested using an independent sample t-test using the variables of retailers' perceptions of cost of operating and consumers' perceptions of cost of living. The results of the t-test were significant at the .005 level (t=3.94). Therefore, we reject the null hypothesis and conclude that retailers' perception of cost of operating and consumers' perception of cost of living differed. Consumers felt their cost of living had increased to a greater degree than retailers felt their cost of operations had increased.

Hypothesis 4 was tested using an independent sample t-test using the variables of retailers' perceptions of consumer holiday spending and consumers' perceptions of their holiday spending. The results of the t-test were significant at the .001 level (t=6.72). Hence, we reject the null hypothesis and conclude that retailers' and consumers' perceptions of holiday spending differed. There was a significant difference in what retailers thought consumers would spend and what consumers claimed they planned to spend. Retailers were more likely to see consumers spending less than consumers perceived themselves spending.

INDEPENDENT T-TEST RESULTS

	N	Mean	SD	t	DF	Sign
Economic Expectations						
Retailers	272	1.14	0.42			
Consumers	446	1.19	0.46			
Equal Variances Assumed				1.28	716	NS
Financial Soundness						
Retailers	255	1.95	0.68			
Consumers	445	1.70	0.68			
Equal Variances Assumed				4.84	698	.005
Cost of Living/Operating						
Retailers	272	2.60	0.62			
Consumers	439	2.77	0.52			
Equal Variances Assumed				3.94	709	.005
Holiday Sales						
Retailers	260	1.37	0.60			
Consumers	422	1.69	0.62			
Equal Variances Assumed				6.72	680	.001

IMPLICATIONS, LIMITATIONS, AND FUTURE RESEARCH

In order to stay relevant and afloat in troubling times, retailers must forecast consumers' behavior and perceptions, and evolve within their markets. That means coming up with new ways to price their products, or scrapping old marketing approaches, or focusing on figuring out where the economy is heading next and how to use that information to grab market share (Roth, 2009). The economic climate has already led to sharp cuts in marketing budgets, and more are inevitable. When figuring out the best way to allocate ever-scarcer resources, there's one crucial principle to remember: Keeping customers one already has is a lot easier, and less expensive, than trying to land new ones.

This paper has discussed the importance of holiday spending for the retail sector. We will propose strategies that retailers can use to make this important time of the year even more effective. First, given that retailers may have to discount more to encourage consumer spending, it is more vital now than ever that they reduce their operating costs. Second, Davis (2008) also recommends holiday retailers researching when the bulk of their holiday shoppers will intend to shop. Understanding the perceptions and plans of their consumers, retailers can break their market down into different groups, each with different characteristics, that reacting to marketing differently. The motivations and behaviors of the consumer that shops the day after Thanksgiving differs greatly from behaviors and motivations of a consumer that dashes in the night of Christmas eve. If a retailer can tap into the items that these different customers are shopping for, and map out how they go about purchasing their gifts, that retailer can greatly influence their holiday sales. Thus holiday shopping is a very important portion of retail annual business, and retailers should be concerned with consumers' perceptions, and edit their perceptions to match.

Based on the findings of this research, retailers must be realistic both in terms of their own expectations as well as forecast the expectations of their customers. In terms of financial soundness, both retailers and consumers must constantly evaluate their stability and make fiscal decisions based upon their soundness. Retailers must watch their cost of operating and its effect on their bottom line, and focus on becoming a leaner, more efficient business. Consumers must also watch their cost of living. As they cut back more and more, consumers must develop a balance between saving and spending that does not negatively affect their lifestyle. Retailers need to monitor consumers' perceptions of their cost of living as these perceptions may impact how much retail spending they do; as we found in this study, consumers had a more negative view of their cost of living than retailers did for the costs of operating.

Our study suggests that retailers did a better job of predicting consumer holiday spending than consumers did; individual retailers this year did recognize sooner than consumers did, the impact of the negative economy on holiday spending. Thus, they were able to plan accordingly. They must continue to do this so they can make market adjustments throughout the year to better serve consumer needs. Finally, our results suggest that the holiday season may no longer be the economic boom for retailers in terms of sales and profits. In today's economic climate, retailers simply must focus on the customer, not just during the months of October, November, and December, but 365 days of the year. We feel the holiday season will still be a pivotal and important season for the U.S. retailer, but as consumers become more skeptical and fickle in these uncertain times, a year-round customer will be far more valuable than one simply looking for the cheapest door-buster of a Black Friday blitz.

Over the course of the study, many limitations presented themselves. Although our research focused on a regional location of the southeast, future research could conduct this type of study on a national basis. Within the instrumentation used to gather the data, only single-item measures were used for ease of conducting the phone surveys. In the future, multiple-item measures would be useful to further understand economic perceptions. Thus, this paper makes an important contribution by comparing retailers and consumer holiday spending perceptions in the southeast. We hope this study spurs additional research nationally comparing retailer and consumer spending perceptions.

REFERENCES

Bustillo, Miguel. "Retailers Brace for Lean Holiday." *Wall Street Journal* 9 Oct. 2008: A6.

Cheng, Andria. "Penny, Abercrombie Scale Back Expectations as Profits Tumble." *Wall Street Journal* 17 Nov. 2008: B3.

Cooper, James. "Consumer Spending Has Further To Fall." *Business Week* 16 Feb. 2009: 14.

Davis, Ellen. "Holiday Survival Kit." *NRF Holiday Survival Kit* 23 Oct. 2008: 2.

Dodes, Rachel, Ann Zimmerman, and Jeffrey McCracken (2009), "Retailers Brace for Major Change," *Wall Street Journal* December 29, http://online.wsj.com/article/SB123033610871336369.html

Evans, Kelly. "Battered Stores Pare Forecasts." *Wall Street Journal* 9 Jan. 2009: A1.

Foucher, Shawn. "Consumers Crunch Their Coins." *Convenience Store Decisions* Apr. 2008: 12.

Hale, Todd. "How Retailers Can Stay Relavent When Shoppers Reduce Spending." *The Nielsen Company* 1 (2008): 2.

Hill, Jeremy. "Consumer Survey Shows Dismal Confidence in Economy This Holiday Season." *Bureau of Business Reasearch and Economic Development* 1 (2007): 1.

Hill, Jeremy. "Retailers' Perceptions of the 2007 Holiday Season and Expectations for 2008." *Bureau of Business Research and Economic Development* 1 (2007): 1.

"Holiday sales expected to lag." *Playthings.com.* 23 Sep. 2008. 25 Mar. 2009 <http://www.playthings.com/article/CA6598384.html>.

Hudson, Kris. "Retailers' Woes Weigh on Mall Owners." *Wall Street Journal* 9 Apr. 2008: 1.

Iwata, Edward. "Time to Cut Back, Hunker Down." *USA Today* 20 Feb. 2008: 1, 3.

"Recession State of Mind: Consumers Cutting Back." Brandweek 9 June 2008: 5.

Roeder, David. "Consumer engine runs on fumes." *Sun Times* 14 Sep. 2008. 15 Sep. 2008 <http://www.suntimes.com/business/reorder/116105,CST-urious14.article>.

Roth, Martin. "Surviving the Downturn: Lessons From Emerging Markets." *Wall Street Journal*. 29 Mar. 2009 <http://online.wsj.com/article/SB123731293002758943.html>.

Zimmerman, Ann, Jennifer Saranow, and Miguel Bustillo (2009), "Retail Sales Plummet," *Wall Street Journal* December 26, http://online.wsj.com/article/SB123025036865134309.html.

SPILLOVER EFFECTS OF GOLF VACATIONS ON ATTRACTIONS, RESTAURANTS, AND RETAIL SHOPPING

Michael Latta, Coastal Carolina University
Albert J. Taylor, Coastal Carolina University
Mark Mitchell, Coastal Carolina University
Charles Thrash, Coastal Carolina University

ABSTRACT

Spillover effects have been studied typically by economists looking at effects of sports stadiums subsidized by government and manufacturing plants built in developing countries. This study looked at a golf marketing affinity program (PassPort) to encourage Visitors to golf on the Grand Strand and its spillover effects into visits to Attractions, Restaurants, and Retail Shopping Locations where Visitors spend money off-course. Greatest spillover was found for Retail Shopping Locations followed by Restaurants and Attractions. It can be concluded that there is economic spillover of golfers who visit the Grand Strand and Myrtle Beach and are members of the PassPort affinity group. This economic spillover is estimated at $1 billion spent off course attributable to 785,000 golf Visitors who played golf on one or more of the 368 golf courses in the state of South Carolina

INTRODUCTION

Since the opening of America's first golf course in Charleston in 1786, golf has played a significant role in the economy of South Carolina. A study by the Department of Parks, Recreation, and Tourism shows the spillover of economic activity from visiting golfers on and off golf courses created a $2.72 billion economic impact in 2007 with the Grand Strand (Myrtle Beach) creating more than half of that impact. In the tourism industry, golf creates more income than any single entertainment or other activity in South Carolina. In addition, it has been estimated that golf generates nearly 39% of the state's tax revenues according to the South Carolina Department of Parks, Recreation, and Tourism. Therefore, the spillover effects of the estimated 785,000 trips to South Carolina including a round of golf are an important issue for the State, the Grand Strand, and Myrtle Beach itself [2].

Spillover is a process where one business activity affects a second business activity and creates revenues or costs for the second business activity. Traditionally, economists have studied spillover in high tech industries [1], manufacturing [4], and R&D [5]. More recently a marketing orientation has been adopted regarding spillover in branding [6] [8] , target marketing [3], and even entrepreneurship [9]. With all the interest in government subsidies for new sports stadiums in New York City, it is no surprise that spillover in professional sports is a hot topic today [7].

The purpose of this study is to determine if Visitors to the Grand Strand and Myrtle Beach who belong to a golf marketing affinity group known as PassPort sponsored by the Myrtle Beach Golf Owners create spillover economic activity in the areas of Attractions, Restaurants, and Retail Shopping.

METHOD

Attractions

The ten Attractions to Visit are listed below. They cover events for adults and children and represent the main attractions on the Grand Strand and Myrtle Beach.

1. Alabama Theatre
2. Carolina Opry
3. Casino Boat Gambling
4. Comedy Cabana
5. Dixie Stampede
6. House of Blues
7. Legends in Concert
8. Medieval Times
9. Myrtle Waves
10. Ripley's Aquarium

Restaurants

The seven Restaurant Types are listed below and are varied in cost, social status, and themes. Some are in natural groups because of ownership, and they represent a cross section of restaurants available in the Grand Strand area.

1. Theme Restaurants (Planet Hollywood, Hard Rock Cafe, NASCAR Cafe, etc)
2. Italian Restaurants (Olive Garden, Carrabba's, etc)
3. Steakhouse Restaurants (Outback, Carolina Roadhouse, Logan's, etc)
4. Seafood Restaurants (Joe's Crab Shak, Crabby Mike's, Captain George's, etc)
5. Sandwich Shops (Jersey Mike's, Firehouse Subs, Quizno's, etc)
6. Sports Bars (Handley's, Overtime, Spencers, Beef O'Brady's, etc)
7. Mexican Restaurants (El Patio, El Cerro Grande, Burro Loco, etc)

Shopping Locations

The ten Shopping Locations to Visit are listed below and represent both golf specialty retail outlets and general merchandise retail locations.

1. Barefoot Landing
2. Broadway at the Beach
3. Coastal Grand Mall
4. Colonial Mall
5. Golf Dimensions Superstore
6. Inlet Square Mall
7. MacFrugal's Golf (Murrells Inlet)
8. Martin's PGA Tour Superstore
9. Old Golf Shop (North Myrtle Beach)
10. Tanger Outlets

The survey questionnaire was distributed by the Myrtle Beach Golf Owner's Association using their email facility. In addition to a variety of demographic items, the survey participants were asked if they were an occasional visitor, seasonal visitor, part-time resident, or full-time resident to the Grand Strand and Myrtle Beach area. The participants were then grouped into Visitor and Resident segments. For each of the Attractions, Restaurant Types, and Shopping Locations, the participants indicated whether or not they never, rarely, sometimes, or always visited the list of Attractions, Restaurant Types, and Shopping Locations.

The survey yielded responses from 529 Residents, and 199 Visitors for a total sample size of 728. These data were then analyzed for differences between Visitors and Resident segments.

RESULTS

Overall, the Attractions showed fewer participants willing to always visit them ranging from 1.2% for Myrtle Waves to 8.5% for Carolina Opry. This low level of willingness to visit is in contrast to Restaurant Types which showed a low of 2.3% for Theme Restaurants and a high of 33.7% for Steakhouses as well as a low of 1% for Old Golf Shop and a high of 57.2% for Martin's PGA Superstore in the Retail Shopping Locations category.

Individual significant differences between Residents and Visitors in their willingness to always visit locations on the Grand Strand and Myrtle Beach are summarized below.

Attractions

The summary table for Attractions appears in Table 1 below.

Table 1

Attractions Visit Frequency by Visitors and Residents

Alabama Theatre	% Resident	% Visitor	% Total
Never Visit	29.9	42.1	33.2
Rarely Visit	25.9	28.4	26.6
Sometimes Visit	35.4	27.4	33.2
Always Visit	8.5	2.0	6.7
Carolina Opry			
Never Visit	31.8	51.2	37.1
Rarely Visit	24.4	21.8	23.7
Sometimes Visit	33.0	23.8	30.5
Always Visit	10.6	3.0	8.5
Casino Boat Gambling			
Never Visit	65.5	69.0	66.5
Rarely Visit	21.7	18.2	20.8
Sometimes Visit	10.7	12.1	11.1
Always Visit	1.9	0.5	1.5

Comedy Cabana			
Never Visit	66.0	71.1	67.4
Rarely Visit	19.6	17.5	19.1
Sometimes Visit	12.1	9.2	11.3
Always Visit	2.1	2.0	2.1
Dixie Stampede			
Never Visit	46.5	62.0	50.7
Rarely Visit	33.1	21.0	29.8
Sometimes Visit	18.1	15.8	17.5
Always Visit	2.1	1.0	1.8
House of Blues			
Never Visit	30.4	35.0	31.7
Rarely Visit	28.7	26.0	27.9
Sometimes Visit	35.8	32.0	34.7
Always Visit	5.0	7.0	5.5
Legends in Concert			
Never Visit	42.3	60.2	47.2
Rarely Visit	25.5	21.9	24.5
Sometimes Visit	26.3	14.2	23.0
Always Visit	5.7	3.5	5.1
Medieval Times			
Never Visit	60.4	72.4	63.6
Rarely Visit	29.0	16.8	25.7
Sometimes Visit	8.4	10.7	9.0
Always Visit	2.1	0.0	1.5
Myrtle Waves			
Never Visit	70.6	73.9	71.5
Rarely Visit	19.3	12.2	17.4
Sometimes Visit	8.8	12.2	9.7
Always Visit	1.1	1.5	1.2
Ripley's Aquarium			
Never Visit	38.9	50.0	41.9
Rarely Visit	27.4	30.1	28.1
Sometimes Visit	27.8	17.8	25.1
Always Visit	5.7	2.0	4.7
Base	529	199	728

Significant Chi Squares were found for the six Attractions listed below along with their p values.

- Alabama Theatre ($p < .0001$)
- Carolina Opry ($p < .0001$)
- Dixie Stampede ($p < .002$)
- Legends in Concert ($p < .0001$)
- Medieval Times ($p < .0001$)
- Ripley's Aquarium ($p < .003$)

In all cases, Residents were significantly more willing to visit these Attractions compared to Visitors. However, on average Visitors always went to these attractions 2.3% while in Myrtle Beach and most frequently went to House of Blues (7%) and Legends in Concert (3.5%) most often.

Restaurant Types

The summary table for Restaurant Types appears in Table 2 below.

Table 2

Restaurant Types Visit Frequency by Visitors and Residents

Theme Restaurants	% Resident	% Visitor	% Total
Never Visit	33.8	28.1	32.2
Rarely Visit	40.8	40.2	40.6
Sometimes Visit	22.8	29.6	24.7
Always Visit	2.4	2.0	2.3
Italian Restaurants			
Never Visit	4.5	8.5	5.6
Rarely Visit	15.9	23.5	18.0
Sometimes Visit	50.0	49.5	49.9
Always Visit	29.4	18.5	26.4
Steakhouse Restaurants			
Never Visit	2.6	3.0	2.7
Rarely Visit	11.9	17.6	13.5
Sometimes Visit	51.2	46.4	49.9
Always Visit	34.1	32.8	33.7
Seafood Restaurants			
Never Visit	9.7	7.5	9.1
Rarely Visit	17.5	14.5	16.7
Sometimes Visit	45.7	37.6	43.5
Always Visit	27.0	40.2	30.6
Sandwich Shops			
Never Visit	12.2	19.5	14.2
Rarely Visit	36.6	36.0	36.4
Sometimes Visit	40.9	35.0	39.3
Always Visit	10.1	9.5	10.0
Sports Bars			
Never Visit	15.1	22.6	17.1
Rarely Visit	31.0	26.1	29.6
Sometimes Visit	35.6	34.6	35.3
Always Visit	18.1	16.5	17.7
Mexican Restaurants			
Never Visit	24.9	28.6	25.9
Rarely Visit	28.5	32.6	29.6
Sometimes Visit	34.0	25.1	31.6

	12.3	13.5	12.7
Always Visit	12.3	13.5	12.7
Base	529	199	728

Significant Chi Squares were found for the two Restaurant Types listed below along with their p values.

- Italian Restaurants (p < .002)
- Seafood Restaurants (p < .008)

As might be expected, Visitors always went to Restaurants more often than to Attractions with an average of 19.0% for the seven Restaurants. In addition, high percentages visited Steakhouses (32.8%) and Seafood Restaurants (40.2%) with Visitors significantly always going to Seafood Restaurants more than Residents.

Retail Shopping Locations

The summary table for Retail Shopping Locations appears in Table 3 below.

Table 3

Retail Shopping Locations Visit Frequency by Visitors and Residents

Barefoot Landing	% Resident	% Visitor	% Total
Never Visit	11.4	11.0	11.3
Rarely Visit	25.0	24.6	24.9
Sometimes Visit	40.8	35.6	39.4
Always Visit	22.6	28.6	24.2
Broadway at the Beach			
Never Visit	5.1	9.0	6.1
Rarely Visit	14.2	13.6	14.0
Sometimes Visit	42.9	35.8	41.0
Always Visit	37.6	41.4	38.7
Coastal Grand Mall			
Never Visit	10.8	20.8	13.5
Rarely Visit	15.5	23.3	17.7
Sometimes Visit	41.6	37.0	40.3
Always Visit	31.9	18.7	28.3
Colonial Mall			
Never Visit	19.6	25.3	21.2
Rarely Visit	28.8	32.4	29.8
Sometimes Visit	35.1	32.9	34.5
Always Visit	16.4	9.1	14.4
Golf Dimensions Superstore			
Never Visit	8.9	4.0	7.5

Rarely Visit	21.4	17.0	20.2
Sometimes Visit	40.7	43.7	41.5
Always Visit	28.8	35.1	30.5
Inlet Square Mall			
Never Visit	36.5	46.2	39.2
Rarely Visit	27.0	36.1	29.5
Sometimes Visit	24.1	13.0	21.0
Always Visit	12.2	4.5	10.1
MacFrugal's Golf (Murrells Inlet)			
Never Visit	65.7	71.5	67.3
Rarely Visit	22.2	22.8	22.3
Sometimes Visit	9.1	5.5	8.2
Always Visit	2.8	0.0	2.0
Martin's PGA Tour Superstore			
Never Visit	3.9	3.5	3.8
Rarely Visit	9.0	6.5	8.3
Sometimes Visit	30.7	29.9	30.5
Always Visit	56.2	59.8	57.2
Old Golf Shop (North Myrtle Beach)			
Never Visit	68.6	67.3	68.2
Rarely Visit	23.2	23.9	23.4
Sometimes Visit	7.1	7.6	7.2
Always Visit	0.9	1.0	0.9
Tanger Outlets			
Never Visit	8.7	13.5	10.0
Rarely Visit	14.2	16.0	14.7
Sometimes Visit	38.5	33.0	37.0
Always Visit	38.5	37.5	38.2
Base	529	199	728

Significant Chi Squares were found for the five Retail Shopping Locations listed below along with their p values.

- Coastal Grand Mall ($p < .0001$)
- Colonial Mall ($p < .04$)
- Golf Dimensions Superstore ($p < .044$)
- Inlet Square Mall ($p < .0001$)
- MacFrugal's Golf (Murrells Inlet) ($p < .034$)

On average, Visitors always go to Retail Shopping Locations (23.6%) more often than to Attractions (2.3%) or Restaurants (19.0%). The most frequently visited Retail Shopping Locations include Broadway at the Beach (a diversified outdoor mall) and Martins PGA Tour Superstore (a golf specialty shopping location).

Furthermore, Retail Shopping Locations are always visited by Visitors in high percentages including the following:

- Martin's PGA Superstore (60%)
- Broadway at the Beach (41%)

- Tanger Outlets (38%)
- Golf Dimensions Superstore (35%)
- Barefoot Landing (29%)

DISCUSSION

There is spillover of visits to Attractions, Restaurants, and Retail Shopping Locations by golfers who visit the Grand Strand and Myrtle Beach. The results of this study suggest the economic impact of Visitors who come to the area for golf is greatest for Retail Shopping Locations followed in order by Restaurants and Attractions. For example, 59.8% of Visitors say they always visit Martin's PGA Tour Superstore, while 40.2% always visit a Seafood Restaurant and only 7% say they always visit The House of Blues while in the area for golf.

The economic benefit to the community by Visitors holding PassPort cards is most likely enough to pay for the cost of the marketing program associated with PassPort. The South Carolina Golf Course Owners Association estimates $1 billion was spent off course by 785,000 golf Visitors who played golf on one or more of the 368 golf courses in the state of South Carolina [2]. That defines a significant spillover effect for the state's economy.

REFERENCES

[1] Bernstein, J. and Nadiri, I. Interindustry R&D Spillovers, rates of return, and Production in High-Tech Industries. *AEA Papers and Proceedings*, 2001, 78 (2), 429-434.

[2] Blondin, A. Golf is Still a Top Draw, *The Sun News*, Friday, May 15, 2009, p 7C.

[3] Dimofte, C. and Goodstein, R. Explaining the Negative Spillover Effect in Target Marketing: Automatic Social Comparisons that Threaten Collective Self-Esteem, *Advances in Consumer Research*, 2006, 33 (1), 276-276.

[4] Goto, A., and Suzuki, K. R&D Capital, Rate of Return on R&D Investment and Spillover of R&D in Japanese Manufacturing Industries, *The Review of Economics and Statistics*, 1989, 71 (4), 555-564.

[5] Griliches, Z. The Search for R&D Spillovers, *Scandinavian Journal of Economics*, 1992, 94, Supplement, 29-47.

[6] Jankiraman, B., Sismeiro, C., and Dutta, S. Perception Spillovers Across Competing Brands: A Disaggregate Model of How and When, *Journal of Marketing Research*, 2009, Forthcoming.

[7] Perry, K. Professional Sports Attendance as a Proxy for New Stadium Spillover Benefits, *The Park Place Economist*, 2009, 9, 62-70.

[8] Simonin, B. L, and Ruth, J. A. Is a Company Known by the Company It Keeps? Assessing the Spillover Effects of Brand Alliances on Consumer Brand Attitudes, *Journal of Marketing Research*, 1998, 35, 30-42.

[9] Zoltan, J., Audretsch, D., Braunerhjelm, P., and Bo Carlson The Knowledge Spillover Theory of Entrepreneurship, *CESIS Electronic Working Paper Series*, 2006, Paper No. 77.

THE IMPACT OF COMMUNCIATION MEDIA ON COMPLAINT OUTCOMES

In today's marketplace, companies are facing increasingly intensive pressures to resolve consumer complaints than ever before (Smith et al. 1999). How these companies successfully handle complaints and generate service recovery can significantly impact consumer satisfaction and further build loyal customer groups (Genesh et al. 2000; Tax et al 1998). Previous studies have identified various factors that influence customer satisfaction with the resolution of post-purchase complaints, such as compensation, speed of response, and politeness when handling such complaints (Tax et al. 1998). However, most of the studies focused on organization and customer complaint interaction, leaving a few questions about a key perspective, media use in the complaint process, unanswered.

Given the fact that "complaint handling can be viewed as a sequence of events beginning with communicating the complaint" (Tax et al. 1998, P 61), it is important to understand how the selected complaint communication media influence complaint outcomes. It is well known that media can convey meanings. Mattila and Wirtz (2004) found that when consumers seek complaint recovery, they prefer certain media over other media. Communication literature also suggests that media are different in terms of information richness, with the outcomes of the communication message dependent on the match between media capacities and communication requirements. As a result, individuals have different perceptions of communication depending on their use of different media (Daft & Lengel 1986).

Building on previous literature, the current study attempts to understand media use in complaint communication and how such use leads to consumer satisfaction. Specifically, the study will address the following research questions: 1) Do complaint media use influence

consumers' perceptions of communication effectiveness? 2). Do consumers' perceptions of communication characteristics affect complaint communication? and 3) Does the use of complaint media contribute to overall consumer satisfaction?

Theoretical Background

A dissatisfied customer can engage in a number of possible actions. The customer will either complain about the quality of the service or the product or s/he will not. In most instances, estimated to be 96% of the time, the customer will not complain and will, if feasible, simply take his/her business elsewhere (LeBoeuf, 2000). In the 4% of the cases where a consumer will complain, the complaint resolution process and outcome are keys to maintaining a relationship with the customer. Estimates show that 70% of customers will continue as customers if the company resolves the problem to their satisfaction; 95% will stay if the issue is resolved to their liking immediately (LeBoeuf, 2000). In instances where the company has quickly and effectively resolved the customer's problem, research shows that customers can be even more loyal than they were before the service problem.

Consequently, an effective service recovery process is important to retaining consumer satisfaction. However, the recovery process is complex with the interplay of several factors. One leading factor is that commutative service providers need to be proactively informative (Keaveney 1995). Companies should provide the right information and embrace good communication with consumers. Media selection plays an important role in the complaint communication process. First, media differ in their ability to communicate certain types of information effectively, and the effectiveness relies on the match between communication requirements and media richness (Daft and Lengel 1984, 1986).

Media richness theory addresses "the ability of information to change understanding within a time interval" (Daft and Lengel, 1986). The more capable media is of improving understanding in a given communication encounter, the richer it becomes. As such, communication media can be arrayed along a continuum of richness on the basis of media's capacities to resolve ambiguity (Fulk and Boyd 1991). Understanding the level of ambiguity in certain tasks where there are "multiple and possibly conflicting interpretations of the available information (Dennis and Kinney, 1998)" is pivotal for understanding communication activities and identifying uncertainty reduction mechanisms. Daft and Lengel (1986) defined four criteria for media richness: speed of feedback, variety of communication cues, personalization of medium, and language variety. Generally speaking, face-to-fact communication is the richest media, followed by telephone, internet chatting, email and written memos or letters. Daft and Lengel (1986) contend that performance in an organization improves if richer media are used in ambiguous situations.

However, research based on media richness theory has some mixed findings. The theory seems to work well when dealing with traditional media, but does not seem to be as explanatory with new media such as internet chatting and email (Lee 1994). To resolve the controversy, researchers have proposed other factors in predicting media evaluation. An emerging research approach is based on rational choice perspective that complements media richness theory with social presence theory.

Social presence has been defined as not only a sense of "being with others (Heeter, 1992)" but also in terms of how involved or aware individuals are when interacting (Biocca and Nowak, 2001; Short, Williams, & Christie, 1976). Social presence theory posits that task completion requires a certain level of interpersonal involvement. Matching the correct level of

involvement with the appropriate communication mechanisms determines the success of the outcomes. Social presence theory indicates that individuals view media based on the degree to which social presence is necessary for the particular task. Fulk and Boyd (1991) argue that media users are generally aware of the degree of social presence available with specific media, and tend to avoid using the media for interactions that require higher degrees of social presence than what they perceive is associated with the media.

To sum up, media richness theory and social presence theory reinforce that communication is not just about information, but also about how information is communicated. It is expected that media can impact consumers' complaint and service recovery process by influencing consumers' complaint approach and how accurately the approaches are perceived. Because media have different abilities to effectively communicate different types of information, complaints communicated through different media would be perceived differently in terms of communication features, and that may lead to different communication outcomes.

Research Framework

The study proposed a research framework (Figure 1) that illustrates theoretical foundations of the study and related hypothesis.

*Figure 1 Model of Proposed Relationship among complaint media, media features,
communication outcomes, and customer behavior*

Media Types	Communication Features	Communication Outcomes	Customer Behavior
Face to Face Telephone Instant Chatting Email	Amount of Information Two-Way Communication Personal Focus Social Presence	Customer Satisfaction	Purchase Intention Trust
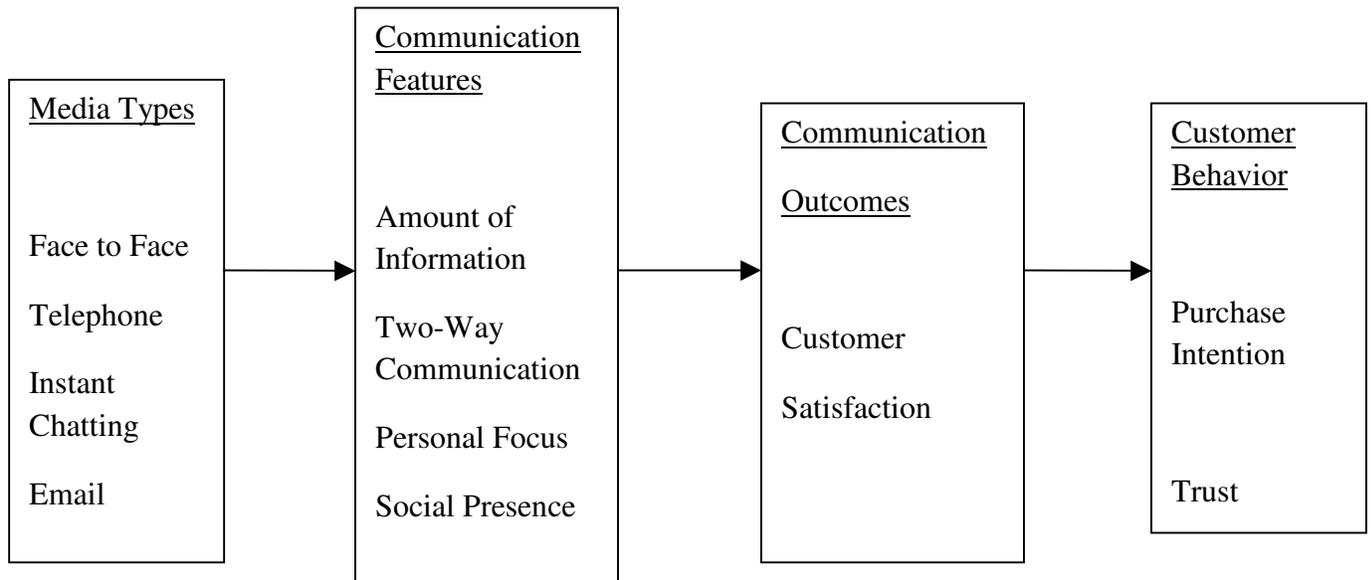
The model focuses on the understating of how companies handle complaints by using four different media, and consumers' perceptions of using the different media. Specifically, the model will first test the relationship between media and consumers' perceptions of media characters, and then examine media impact on complaint outcomes that include consumers' overall complaint satisfaction and their further behavior outcomes.

Sources

Biocca, F. and Nowak, K. (2001). "Plugging Your Body into the Telecommunication System: Mediated Embodiment, Media Interfaces, and Social Virtual Environments," in C.Lin & D. Atkin (Eds.), Communication Technology and Society, Waverly Hill, VI: Hampton Press, pp. 407-447.

Biocca, F. and C. Harms, "Defining and Measuring Social Presence: Contribution to the Networked Minds Theory and Measure," in progress.

Daft, R. and R. Lengel (1986). "Organizational Information Requirements, Media Richness, and Structural Design, " Management Science, 32:5, pp. 554-571.

-------- (1984). Information Richness: A New Approach to Managerial Behavior and Organization Design, Greenwich, CT: JAI Press.

Dennis, A.R. and Kinney, S.T. (1998). "Testing Media Richness Theory in the New Media: The Effects of Cues, Feedback, and Task Equivocality." Information Systems Research, 9, 3, September, 256-274.

Fulk, J. and Boyd, B. (1991). "Emerging Theories of Communication in Organizations." Journal of Management, 17, 2 (June, 1991), 407-446.

Heeter, C. (1992). "Being There: The Subjective Experience of Presence." Presence, 1(2), 262-271.

LeBoeuf, Michael (2000). How to Win Customers and Keep Them for Life, New York: Berkley Books.

Lee, A. (1994). "Electronic Mail as a Medium for Rich Communication: An Emperical Investigation Using Hermeneutic Interpretation," MIS Quarterly, 18, 2, 143-157.

Short, J., Williams, E., & Christie, B. (1976). The Social Psychology of Telecommunications. London: John Wiley & Sons, Ltd.

Running head: IMC and Internal Marketing

IMC and Internal Marketing

Jeananne Nicholls is a Doctoral Student at the Coles School of Business at

Kennesaw State University

Kurt Schimmel Professor of Marketing and Associate Dean of the School of Business at

Robert Morris University

IMC and Internal Marketing

Introduction

Scholars and business people alike have been trying to address the best marketing and management practices to ensure the success of organizations. Recently the concepts of branding and integrated marketing communications (IMC) have been put forth as drivers of success. There is a body of literature which relates brand orientation, market orientation and IMC to outcomes such as brand performance and marketing communications performance (Lee and Park, 2007; Low, 2000 and Naik, P.A., Raman, K. 2003). To describe this succinctly, a company's strategic brand orientation and strategic market orientation drive the components and focus of the IMC which then result in outcomes such as brand image and brand awareness as well as brand performance outcomes such as sales, market share and revenue generation. This paper proposes to examine the relationship between IMC and revenue generation.

Current Model

The American Marketing Association (Schultz 1993, p. 17) defines IMC as: "A concept of marketing communications planning that recognizes the added value of [a] comprehensive plan that evaluates the strategic roles of a variety of communication disciplines—for example, general advertising, direct response, sales promotion and public relations—and combines these disciplines to provide clarity, consistency, and maximum communications impact." For many years marketing communications were not integrated. Advertising, public relations, direct response were not coordinated. In fact, a debate still exists as to the measurable value of integrating marketing communications (Cornelissen, 2001; 2003). However, to a great extent, current advertising literature and marketing practitioners have begun to accept the concept that there are benefits of integrating marketing communications to create communication synergy

across media. Studies looking at IMC adoption have reported results ranging from 66% to 75 %

and as high as 95% of the responding organizations reporting implementing IMC (Carlson,

Grove and Dorsch, 2003) and the trend is to believe that IMC is not going to go away and will

continue to be a driving force in both academia and management decision making (Gould, 2000).

Current IMC research has begun to estimate and infer the effectiveness of and synergy

among multimedia communications, specifically, the synergy among the media budget, media

mix, and advertising carryover (Naik and Raman, 2003). They further provided empirical

evidence of the synergy between television and print advertising in consumer markets

demonstrating not only media effectiveness but also cross-media synergy. This synergy exceeds

the sum of the individual effects. Also Dewhirst and Davis, 2005 demonstrated that greater

brand equity and shareholder value were achieved using three IMC practices (brand

communication, cross-functional planning and monitoring, and data-driven targeting and

communication).

Within the IMC literature there are several somewhat divergent streams. There are those

like Schultz and Duncan who view IMC as a managed coordinated process, while another group

(Grunig and Grunig, 1998) contends that IMC should eliminate the M and be IC or integrated

communications. A difference which both alters the philosophy of the communications and

changes the overarching control of communications. Integrated communications would be

reserved for the overall corporate image and be the purview of the public relations department.

While this is an interesting intellectual debate, the proposed study, while recognizing the

existence of this literature, will not address this debate or focus on the IC literature. While the

brand image, brand attitude and brand recall are also outcomes of IMC and have been

empirically explored (McGrath, 2005; Ratnatunga & Ewing, 2005) they are encompassed in the

brand outcomes. .

Figure One
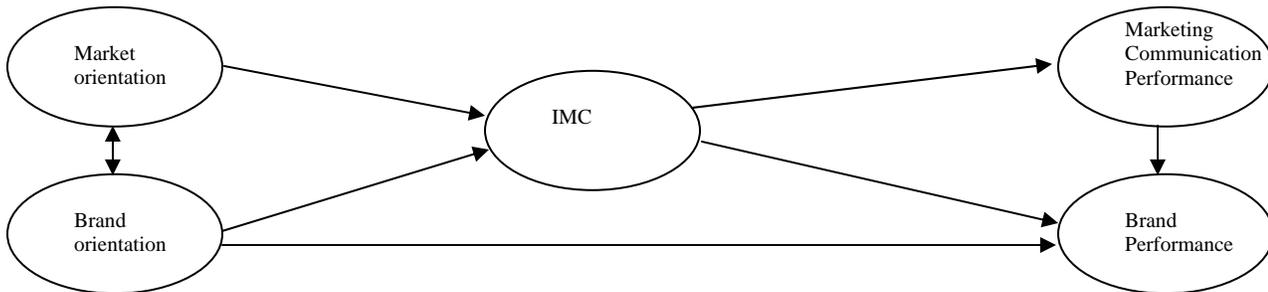
Reid, Luxon, Mavondo (2005)

Reid, Luxon, Mavondo (2005) conceptually (figure 1) demonstrated the nexus between

market orientation, brand orientation and IMC with the commonality being brand identity.   They

denote market orientation in this model as including both a customer and competitor orientation,

having interfunctional coordination and an emphasis on profit. Brand orientation consists of

shared brand vision, functionality and brand positioning while including a brand return on

investment, a value-adding capability and symbolism. They further contend that IMC is the

mediating variable between market orientation and brand orientation and the desired outcome of

marketing communication performance and brand performance. Typically performance measures

in marketing are seen as expenses however in this model IMC is being treated as an investment

in communication and the measures encompass internal process metrics and return on campaign

efforts. On the other hand, brand performance is related to customer and market impact

measures in addition to profit and cash flow. As such companies implementing an IMC strategy

would see the benefits of such a strategy as a positive outcome in brand and marketing

performance.

Further supporting the link between branding and IMC Kitchen and Schultz (2003) and

Schultz, 1998; 2004 have also proposed that branding is central to marketing communications.

Empirically this has been demonstrated by Ratnatunga, Ewing 2005 who demonstrate that IMC

practices (advertising, direct marketing, sponsorships, promotions and internet) impact branding

variables such as recognition which in turn impacts revenue such as future sales. McGrath, 2005

addresses the validity of IMC and that messages using key aspects of an IMC strategy prompt

stronger attitudes toward brand level than messages using traditional strategy.

Internal Marketing

Internal marketing is a subset of marketing communications that has been largely left out

of the integrated marketing communications literature. Internal marketing refers to

communicating the organizational values and goals of an organization to employees through

example or through internal communications channels. This communication reflects a

systematic and ongoing process not just one time speeches or training offered. (Wieske, Ahearne,

Lam and van Dick 2009).

Internal marketing has been found to have a positive impact on both internal and external

goals for organizations. Internally, there was increased job satisfaction (Ahmed, Rafiq and Saad

2003) and work motivation (Bell, Menguc and Stefani 2004) as well as organizational

commitment (Carauna and Calleya 1998) and organizational identification (Wieske, Ahearne,

Lam and van Dick 2009).

The relationship of internal marketing to external goals has been empirically explored by

Bell and Menguc 2002 and Bell, Menguc and Stefani 2004 who found internal marketing was

positively related to service quality. Lings and Greenley (2009) found internal marketing to be

causally related to a firms market orientation, financial performance and customer satisfaction.

IMC and Market Orientation

As noted earlier Reid, Luxon, Mavondo (2005) denoted market orientation in this model as including both a customer and competitor orientation, having interfunctional coordination and an emphasis on profit. The adapted model is changed to reflect internal marketing's role within IMC and the impact of internal communication on having a greater marketing orientation and a greater customer service. Thus the relationship within the model is changed from a one way indicator flowing from the market orientation to IMC to a two way arrow to reflect the interrelationship and impact between the two variables as demonstrated empirically by Lings and Greenley (2009). Therefore proposition one is:

P1 –   The practices of integrated marketing communication will have a positive impact on a firms marketing orientation.

IMC and Brand Orientation

Brand orientation as defined here is comprised of shared brand vision, functionality and brand positioning while including a brand return on investment, a value-adding capability and symbolism. In the previous conceptual model brand orientation guided the integrated marketing communications and the brand performance. The shared brand vision and symbolism are conveyed and internalized through, and due to, an organizations internal marketing. The direction of the connection should be two way to represent this. In the adapted model the direction of the arrow is changed from being one way from brand orientation to a two way arrow to reflect the impact of internal communications. Therefore proposition two is:

P2 –   Integrated marketing communications impacts brand orientation through internal marketing which results in a greater sense of shared vision and symbolism.

IMC and Marketing Communications Performance

IMC has been modeled as the mediating variable between market orientation and brand

orientation and the desired outcome of marketing communication performance and brand

performance. Typically performance measures in marketing are seen as expenses however in this

model IMC is being treated as an investment in communication and the measures encompass

internal process metrics and return on campaign efforts. On the other hand, brand performance

is related to customer and market impact measures in addition to profit and cash flow. As such

companies and nonprofits implementing an IMC strategy would see the benefits of such a

strategy as a positive outcome in brand and marketing performance. We propose extending this

to include a two way arrow to incorporate feedback and adjustments to the IMC campaign based

on the results. In this manner the constructs of organizational learning and feedback are

incorporated into the model. Strategic agility is also implied in the ability to adjust. Thus,

proposition three is:

P3 - To reflect the impacts of feedback and organizational learning the connection between IMC
and the Performance Variables should reflect the two way interaction.

The resultant model is :
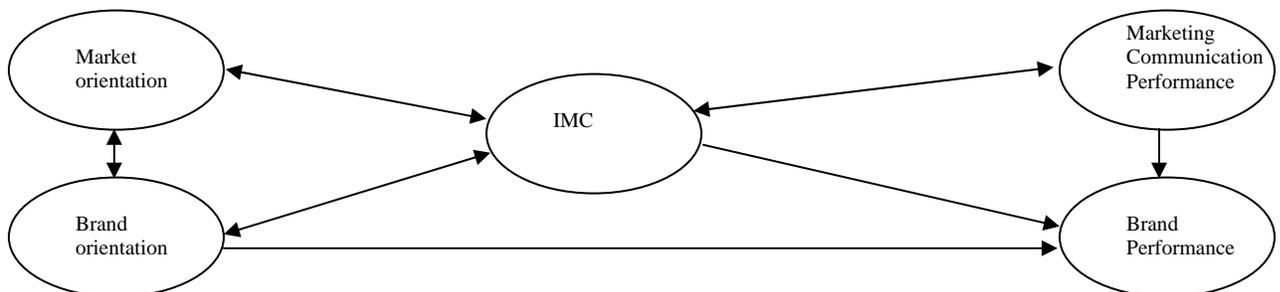
Summary

This model reflects the inclusion of internal marketing and its impact within the organization. Once included as a intra-organizational function of integrated marketing communications internal marketing's impact can be seen to change the relationships among the constructs of marketing orientation, brand orientation and IMC as well as IMC performance to reflect their dyadic relationships.

References

Ahmed, P.K., Rafiq, M. and Saad N.M. (2003) "Internal marketing and the mediating role of organizational competencies" *European Journal of Marketing* 37 (9) 1221-1241.

Bell, S. J. and Menguc, B. (2002) "The employee-organization relationship, organizational citizenship behaviors and superior quality" *Journal of Retailing* 78 (2) 131-146.

Bell, S. J., Menguc,B. and Stefani S. (2004) "When customers disappoint: A model of relational internal marketing and customer complaints" *Journal of the Academy of Marketing Science* 32,2, 112-126.
.
Bergstron, A, Blumenthal, D., & Crothers, S., (2002). Why internal branding matters: the case of Saab, *Corporate Reputation Review, 5(2, 3)* pp. 133-142. The quotation is from p. 134.

Carlson, Les, Grove, S.J., & Dorsch, M.J. (2003). Services advertising and integrated marketing communications: An empirical examination. *Journal of Current Issues and Research in Advertising, 25, 2,* 69-82.

Caruana, A. and Calleya P. (1998) "The effect of internal marketing on organizational commitment among retail bank managers.' *International Journal of Bank Marketing* 16 (2-3) 108-116.

Cornelissen, J.P. (2001). Integrated marketing communications and the language of marketing development. *International Journal of Advertising, 20*, 483-498.

Cornelissen, J.P. (2003). Change, continuity and progress: The concept of integrated marketing communications and marketing communications practice. *Journal of Strategic Marketing, II,* 217-234.

Dewhirst, T., & Davis, B. (2005). Brand strategy and integrated marketing communications (IMC). *Journal of Advertising, 34, 4*, 81-92.

Gould, S.J., Lerman, D.B., & Grein, A.F. (1999). Agency perceptions and practices on Global IMC. *Journal of Advertising Research, January-February,* 7-20.

Gould, S.J. (2000). The state of IMC research and applications. *Journal of Advertising Research, September-October,* 22-23.

Gounaris, Spiros (2008) "Antecedents of internal marketing practice: some preliminary empirical evidence" *International Journal of Service Industry Management* 19, 3, 400-434.

Grunig, J.E. & Grunig, L.A. (1998). The relationship between public relations and marketing in excellent organizations: evidence from the IABC study. *Journal of Marketing Communications* 4, 3, 141-163.

Kitchen P.J. & Schultz, D.E. (2003). Integrated corporate product brand communication (1). *Advances in Competitiveness Research, 11, 1,* 66-86.

Lee, D.H. & Park, C.W. (2007). Conceptualization and measurement of multidimensionality of integrated marketing communications. *Journal of Advertising Research*, September, 222-235.

Lings, Ian, Greeley, g. (2009) "The impact of internal and external market orientations on firm performance," *Journal of Strategic Marketing* 17 1 41-53.

Low, G.S. (2007). Correlates of integrated marketing communications. J*ournal of Advertising Research*, January-February, 27-39.

Madhavaram, S., Badrinarayanan, V., & McDonald, R.E. (2005). Integrated marketing communications (IMC) and brand identity as critical components of brand equity strategy. *Journal of Advertising*, 34, 4, 69-80.

Mukherjee, A.and Malhotra N. (2006) " Does role clarity explain employee perceived service quality" *International Journal of Service Industry Management* 17 (5) 444-473.

McGrath, J.M. (2005). A pilot study testing aspects of integrated marketing communications concept. *Journal of Marketing Communications, 11, 3,* 191-214.

Naik, P.A., Raman, K. (2003). Understanding the impact of synergy in multimedia communications. *Journal of Marketing Research, XL,* 375-388.

Ratnatunga, J. & Ewing, M.T. (2005). The brand capability value of integrated marketing communication (IMC). *Journal of Advertising, 34, 4,* 25-40.

Reid, M., Luxon, S., & Mavondo, F. (2005). The relationship between integrated marketing communication, market orientation, and brand orientation. *Journal of Advertising 34, 4,* 11-23

Schultz, D.E. (1998). Branding: The basis for marketing integration. *Marketing News, 32, 24,* 8.

Schultz, D.E. (2002). Mastering Brand Metrics. *Marketing Management, May/June,* 8-9.

Schultz, D.E. (2004). A clean brand slate. *Marketing Management, September/October,* 10-11.

Stride, H. & Lee, S. (2007). No Logo? No way. Branding in the non-profit sector. *Journal of Marketing Management, 23, 1-2,* 107-122.

Wieske, J., Ahearne M., Lam, S.K. and van Dick R (2009) "The role of leaders in internal marketing" *Journal of Marketing* 73 march 123-145.

REMANUFACTURING SCHEDULING AND CONTROL: WHERE ARE WE?

Shona D. Morgan, Ph.D.
Associate Professor of Operations Management
Department of Management
North Carolina A&T State University
Greensboro, North Carolina 27411
smorgan@ncat.edu

Roger J. Gagnon, Ph.D.
Associate Professor of Operations Management
Department of Management
North Carolina A&T State University
Greensboro, North Carolina 27411
gagnonr@ncat.edu

ABSTRACT

We examine our progress in scheduling remanufacturing operations by reviewing the literature in detail. We individually examine published research in scheduling disassembly, remanufacturing/repair, and reassembly operations and their integration. The objective functions/performance criteria, quantitative methodologies, and complexities/issues are examined. Finally, an overall assessment of our progress and continued research needs are presented.

1. INTRODUCTION

Remanufacturing allows products that are no longer functional to re-enter the manufacturing process to be refurbished or disassembled into usable modules, components, or materials or disposed. Remanufacturing in the U.S. is a $53 billion per (Giuntini and Gaudette 2003). This reprocessing can significantly reduce the amount of waste directed at landfills and conserve natural resources involved in product development. This is particularly important when manufacturers are facing increasing pressure to produce products in an environmentally supportive manner. According to Carter and Ellram (1998), over $124 billion is spent in the United States to comply with mounting environmental statues and regulations and this undoubtedly will escalate. Remanufacturing received academic attention at MIT's Center for Policy Alternatives as early as 1979 (Lund 1984) and published reports of industrial applications of remanufacturing/recycling in the automobile industry emerged in the early 1990's (e.g., Wolfe 1991, Stix 1992, Anon 1993).

There is enormous complexity involved with developing effective and efficient remanufacturing operations. They are arguably more difficult than designing and managing forward supply chains, since forecasting the timing and quality of product returns and determining the optimal disassembly sequence(s), as examples, are so problematic (Toktay 2003). Guide (2000) outlines the characteristics that significantly complicate the production planning and control activities involved in remanufacturing: (1) the uncertain timing and quantity of returns, (2) the need to balance returns with demands, (3) the disassembly of returned products, (4) the uncertainty in materials recovered from returned items, (5) the requirement for a reverse logistics network, (6) the complication of material matching restrictions, (7) the stochastic routings for materials for remanufacturing operations, and (8) highly variable processing times. Other researchers (e.g., Krupp, 1993; Brennan, Gupta, and Taleb, 1994; Flapper et al., 2002; and Kim et. al., 2007) have noted other significant challenges, issues, and decisions involving remanufacturing scheduling, such as the selection of order release mechanisms, lot sizes, and priority scheduling rules; capacity restrictions; part commonality among multiple products; the planning of buffer inventories; scheduling over multiple time periods; integration of forward and reverse manufacturing operations, etc. and these are listed in Table 1.

INSERT TABLE 1 ABOUT HERE

Guide (2000) describes a typical remanufacturing facility to consist of three distinct operations: (1) disassembly, (2) remanufacturing/repair, and (3) reassembly. Disassembly separates the returned item into its modules, components, or basic materials. These are evaluated and determined to be acceptable for reuse, repairable, sold for scrap, or discarded. Those modules and components needing repair or rework are inventoried for later recall or sent to the remanufacturing/repair operations. After reconditioning to a usable state the modules or parts are inventoried awaiting use or sent directly to the reassembly processes, where they are reassembled into products for resale and readied for finished goods inventory or shipment. As emphasized by the complicating characteristics, the scheduling and control of each of these operations is an extremely challenging task.

However, progress has been made in: (1) identifying the realistic complexities and issues in remanufacturing scheduling needing address, (2) reporting how industry is actually addressing these issues, and (3) developing numerous quantitative methodologies and testing various objective criteria to achieve improved, if not optimal, solutions. Numerous articles have been published and research projects completed on these subjects; the review article by Gungor and Gupta (1999) alone contains over 300 references. Review articles are needed periodically to summarize and analyze these efforts – establish where we are and the future directions needing exploration. Thus, the purpose of this research effort can be divided into three stages: (1) review the progress we have made in the scheduling and control of disassembly and remanufacturing operations; (2) assess how we have advanced our ability to address the scheduling complexities mentioned in the literature; and (3) highlight additional research needs. We know of no other research that has reviewed in detail the disassembly scheduling and remanufacturing literature and the complexities/issues that impact this environment. Figure 1 delineates the boundaries of our research effort, which includes the three remanufacturing operations and the buffer inventory considerations.
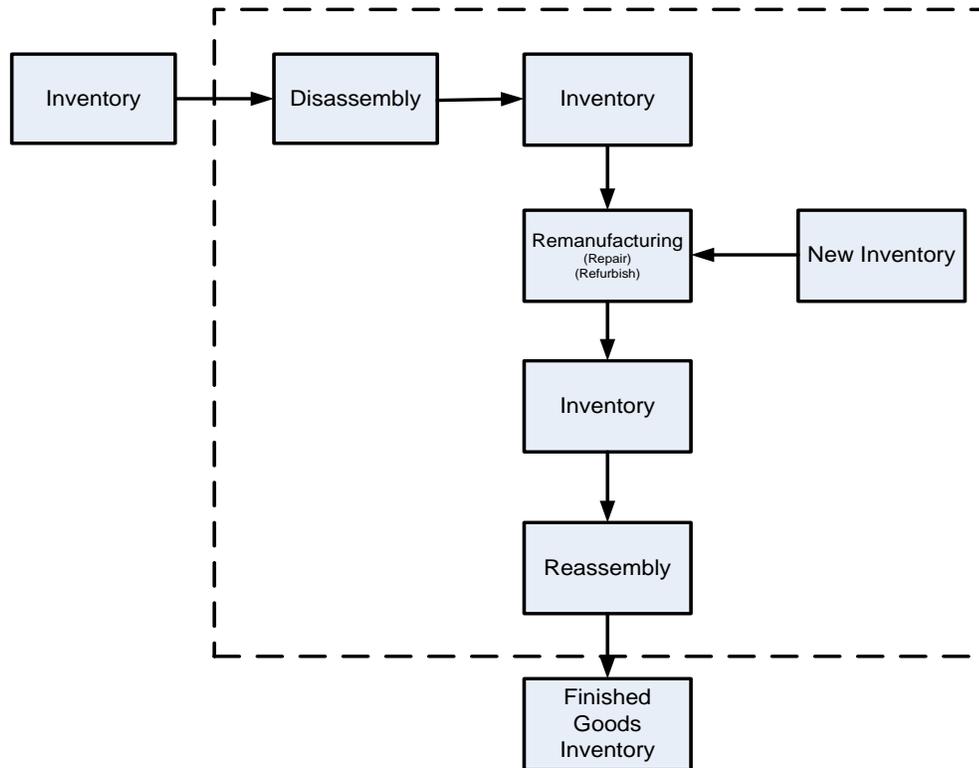
Figure 1: Remanufacturing Shop

Our literature analysis is organized in a strategic-to-tactical decision framework (product decisions before process decisions, etc.) supplemented by the necessary technological and operational progressions that need to be made in the disassembly environment.   We devote section 2 to a review and analysis of the single and multiple product disassembly literature. We further subdivide this literature into infinite versus finite capacity, no parts commonality to parts commonality, and the use of deterministic versus stochastic parameters. Using the same organizational structure section 3 reviews the literature that integrates the scheduling/planning of several remanufacturing operations (aggregates disassembly, remanufacturing and/or assembly scheduling/planning). Section 4 investigates the progress on the complexities, issues and areas related to the disassembly scheduling problem. Such generalizations include capacity planning, lot sizing and inventory effects, order release priority dispatching rules, and control mechanisms. Section 5 discusses the objective criteria/functions and methodologies used in remanufacturing scheduling.   Section 6 characterizes future research needs.

2. SCHEDULING DISASSEMBLY OPERATIONS

We first characterize the disassembly structure and the important nomenclature of the problem environment. The root item is the product to be disassembled. A leaf item cannot be disassembled further and are the items to satisfy demand. In Figure 2, item 1 represents the root and items 4, 5, 6, and 7 are leaf items. A child is defined as any item that has at least one parent and a parent has at least one child. Referring to Figure 2, item 3 is a parent to child items 6 and 7. Numbers in parentheses represent the item yield when the parent item is disassembled. Thus, when item 2 is disassembled it yields four units of item 5. From this, we define the basic disassembly problem as follows:

> For a given disassembly structure, determine the quantity and timing of disassembling all parent items (including the root item) while satisfying the demand of leaf items over a given planning horizon with discrete time periods (Kim 2007).
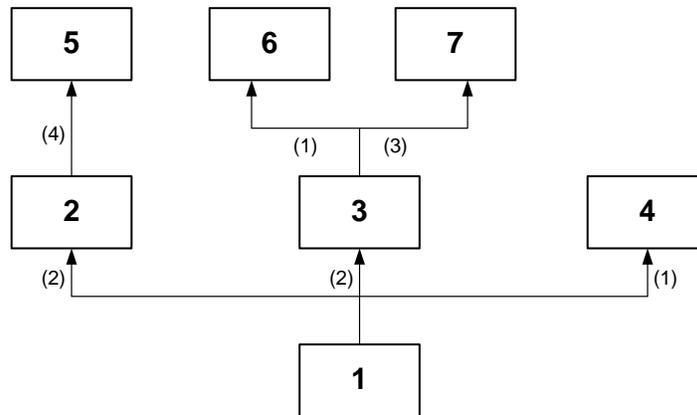
Figure 2: Disassembly Structure/ No Commonality

2.1 Disassembly Operations for Single Products

Much of the work that addresses the single product disassembly scheduling problem assumes infinite capacity. That is, no limitations on resources (e.g., setup time, storage, etc.). Articles that investigate the infinite capacity, single product environment can be further classified according to whether part commonality is considered. Commonality implies that products or subassemblies have common or shared parts and/or components. Part commonality adds considerable complexity to the disassembly scheduling problem since there are multiple procurement sources for demand items. Figure 3 summarizes the research efforts for scheduling disassembly operations for single products. We further explore the research accomplishments in the paragraphs to follow.
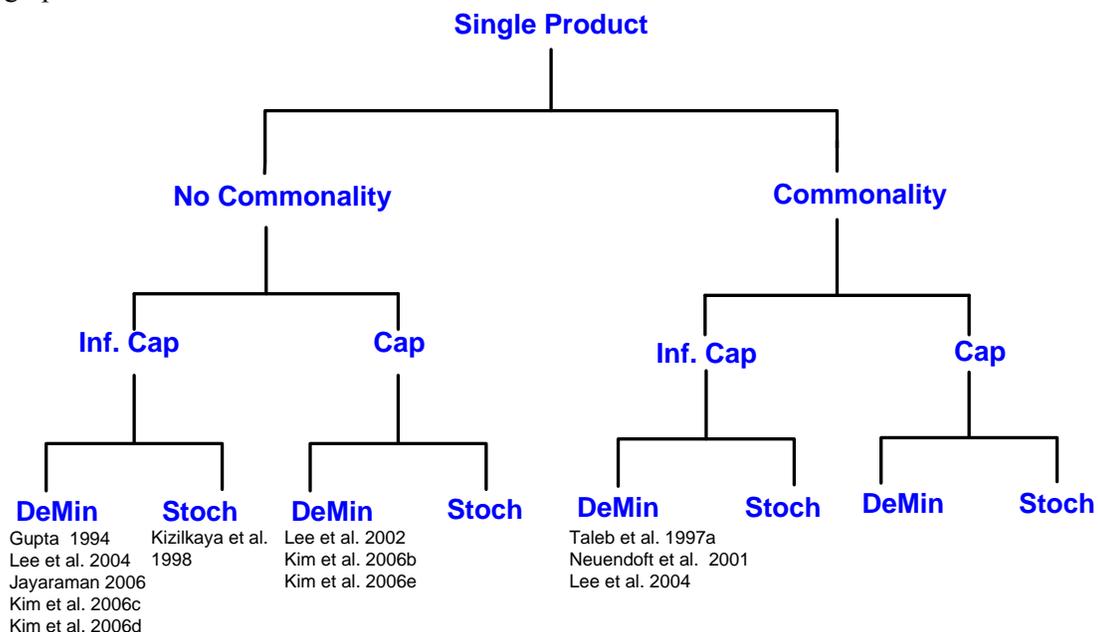
Figure 3: Summary of Disassembly Scheduling Research for Single Products

2.1.1 Infinite Capacity with No Parts Commonality

Gupta and Taleb (1994) help define the disassembly scheduling problem and reiterated that MRP cannot be applied to shop floor operations that require disassembly of some items. They present an algorithm that is essentially a reverse version of materials requirements planning. In their algorithm the demand for leaf items (parts) is converted into the required demand for parent items level-by-level up to the root item (finished good). Thus, the disassembly schedule for the root item and all other parents is determined so as to satisfy the demand for all leaf items; no other objective is addressed. The authors demonstrate the procedure for a single product assuming constant lead times and no defects. They recognize

the likelihood of excess part inventories that can result. Finally, they also mention the need to address part commonality and the necessity to integrate the scheduling of disassembly and assembly operations.

Lee et al. (2004) develop integer-programming models to solve disassembly scheduling. Integer programming models are developed to solve three cases of the disassembly-scheduling problem – (1) single product without part commonality, (2) single product with part commonality, and (3) multiple product types with part commonality. The integer programming results for each problem case will be discussed in the appropriate section of this paper. The objective is to minimize the sum of the purchase, set-up, inventory holding, and disassembly operations costs. The authors do not compare their results directly to the results obtained by Gupta and Taleb (1994; single product with no part commonality), since the MRP-like algorithm of Gupta and Taleb provides the optimal solution, but utilizes a different objective. However, the authors do test the performance of their integer programming formulation on a set of 900 randomly generated test problems for each combination of three levels of the number of items (10, 20, and 30) and three levels of the number of periods (10, 15, and 20) for a total of 2700 evaluated test problems. Results show that most problems are solved optimally. The performance of the integer programming models becomes worse as the number of items increase and as the number of periods increase.

According to Kim (2007) more recent work has been done that demonstrates that the disassembly scheduling problem is NP hard (see Kim 2006d). The authors solve the problem using a branch and bound algorithm that determines the upper and lower bounds using a Lagrangean relaxation technique.

Kim et al. (2006c) consider the two-level disassembly structure. This special case of the basic disassembly scheduling problem assumes a direct link between the root item and leaf items with no intermediate non-root parent items. This special structure is exploited in the development of a polynomial optimal algorithm based on the theme of the Wagner Whitin (1958) algorithm. More specifically, the problem is formulated as a dynamic programming model by decomposing it into sub-problems.

Jayaraman (2006) presents a linear programming model that minimizes the total cost per remanufactured unit. The solution to the model provides a value for the number of unit cores with a nominal quality level that are disassembled and remanufactured in a period, the number of modules remanufactured, and the number of cores that remain in inventory at the end of a time period.

Kizilkaya and Gupta (1998) consider stochastic elements of disassembly scheduling in terms of the time to disassemble a product. They investigate the need to control the material flow from the disassembly cell to remanufacturing. The focus is on the disassembly cell, which consists of N workstations in series. Unlike the traditional Just-in-Time (JIT) system where demand is generated at the last station, demand in the disassembly cell can occur at any of the N workstations. The authors invoke a flexible Kanban system (FKS) that has the ability to adjust the number of Kanbans at each station on a daily basis according to a predetermined percentage of the demand. The simulation model developed takes into account that retrieved products may be defective, thus necessitating the need to disassemble several units of the used product. The FKS model also accounts for uncertainty in the disassembly time needed for a product. Results indicate that as the number of Kanbans increases, the work in process increases, yet the order completion times (exponentially distributed) and shortages decrease yielding better customer satisfaction.

Gupta and Taleb (1994) address the disassembly scheduling problem by developing a reverse MRP procedure with no explicit objective function – merely satisfy demand for all leaf items. More recently Lee et al. (2004), Kim et al. (2006d), Kim et al. (2006e), and Jayaraman (2006) develop deterministic, mathematical programming models that consider various cost-based objective functions and are shown to achieve optimal solutions to restricted, test problems. Kizilkaya and Gupta (1998) use a computer simulation methodology to introduce a flexible Kanban approach that incorporates stochastic processing times. Due to its ability to adjust to production uncertainties, they recommend FKS as a viable production strategy for remanufacturers. More work is needed to integrate disassembly planning and scheduling that specifically addresses the need for feasible shop schedules.

2.1.2 Infinite Capacity with Part Commonality

Disassembly scheduling that takes into account part commonality is more challenging to solve. Part commonality implies that a product or subassembly shares its parts or components. The complexity with parts commonality arises from the multiple procurement sources for each common part and the additional interdependencies between parts/components (see Figure 4).
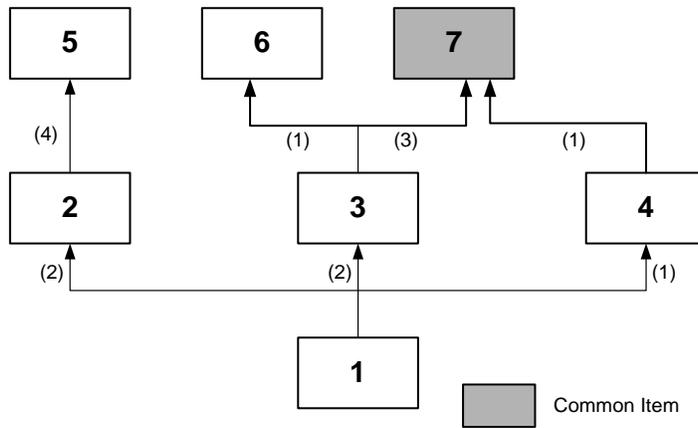
Figure 4: Single Product with Part Commonality

All open literature within this category address the disassembly scheduling problem with deterministic parameters. In 1997 Taleb, Gupta, and Brennan (TGB) offer a reverse MRP-based algorithm for a disassembly product structure that includes common parts and materials. Their objective is to minimize the total number of end items to disassemble to fulfill the demand for components. The authors assume lead times are constant and no defects.

Neuendoft et al. (2001) extend the work of TGB (1997) by presenting an algorithm based on Petri Nets. In the first step of the algorithm, the minimal number of root items to meet the total demand of all leaf items is computed. The second step details the disassembly schedule of the root item so that demand in each period can be satisfied. The authors show that their Petri Net algorithm, overcomes many of the shortcomings of the TGB algorithm. Most notably, the TGB algorithm has the assumption that parts commonality occurs at the same level within the disassembly product structure making the algorithm less extendable to a variety of product structures.

Lee et al. (2004) modify their integer programming formulation to solve single product disassembly problems with parts commonality. The cost-based objective remains the same. However, the inventory balance constraints are modified to account for the potential of multiple parents for a given item. The result of their integer programming solution are compared with TGB (1997; single product with part commonality) and Neuendorf et al. (2001) who in addition to their Petri Net algorithm, present a corrected version of TGB to overcome the round-off errors observed in the TGB original solution. Results show that the integer programming models achieve the optimal solution for the existing problems in the open literature and provide optimal or near-optimal solutions to a set of randomly generated test problems. The cost-based objective function proves to be particularly useful when compared with TGB, since the cost-based objective presented in the paper provides a method to distinguish among multiple solutions generating the same number of products to be disassembled.

A variety of solution methodologies (i.e., MRP, Petri Nets, and IP) have been applied to disassembly scheduling of single products with parts commonality. Several of these are extensions to previous work completed for the "single product - no commonality case". (For the mathematical programming models additional constraints were added to account for the multiple component sources.) As with the "no commonality case" optimal solutions have been achieved for restricted problems and near-optimal solutions to sets of larger, test problems. Additional advancements need to address the realistic, stochastic issues of defective parts and components, customer demands, and disassembly operation times.

2.1.3. Finite Capacity with No Part Commonality

The work of Lee et al. (2002) focuses on extending the efforts of Gupta and Taleb (1994) to handle capacity constraints. The authors develop an integer programming model, which is a reversed form of the capacitated multi-level lot-sizing problem. A case study on end-of-life inkjet printers is used to test the model. Results demonstrate that optimal solutions can be obtained for the set of test problems within a reasonable amount of computation time. Extensions to this work need to consider multiple products, parts commonality, and heuristic strategies to accommodate large-sized problems.

Kim et al. (2006e) extend the work of Lee et al. (2002) by tackling a shortcoming of the integer programming model's inability to handle real-sized problems due to excessive computational needs. Kim et

al. (2006e) overcome this drawback by introducing an additional phase of the solution process. This second phase utilizes the initial solution obtained from the integer program. The initial solution is evaluated to determine if the capacity constraints are satisfied. If the constraints are satisfied, the optimal solution has been found. If the capacity constraints are not satisfied, a search commences for a feasible disassembly schedule that simultaneously maintains the current value of the objective function.

Additional extensions to the work of Lee et al. (2002) are made by Kim et al. (2006b). The authors develop an integer programming formulation with the objective of minimizing the sum of set-up, disassembly operation, and inventory holding costs. The extensions are manifested in two areas. First, fixed set-up costs are considered over the disassembly planning horizon. Second, a Lagrangean heuristic algorithm is suggested that allows for the problem to be decomposed into the single item, lot-sizing problem, which is easily solved with a polynomial time algorithm. Several randomly generated problems are used to test the algorithm and indicate that the heuristic provides near optimal solutions within reasonable computation time.

Clearly, from the research in this area, there has been increased focus on the capacitated problem since 2002. The initial work of Lee et al. (2002) laid the groundwork for incorporating a time limit for the disassembly operation to be performed. Improvements are made in Kim et al. (2006e) and Kim et al. (2006b) which specifically confront the limitations of the integer program presented in Lee et al. (2002) in solving practical sized problems. Additional work in this area calls for effective solution methodologies for the more general capacitated problems (i.e., parts commonality or multiple products).

2.2 Scheduling Disassembly for Multiple Products

The multiple products case with no part commonality is essentially multiple, independent, single products. These are typically run in separate batches and are, thus, considered a special case under the single product category. The research pertaining to scheduling disassembly operations for multiple products is outlined in Figure 5. We summarize this literature now.
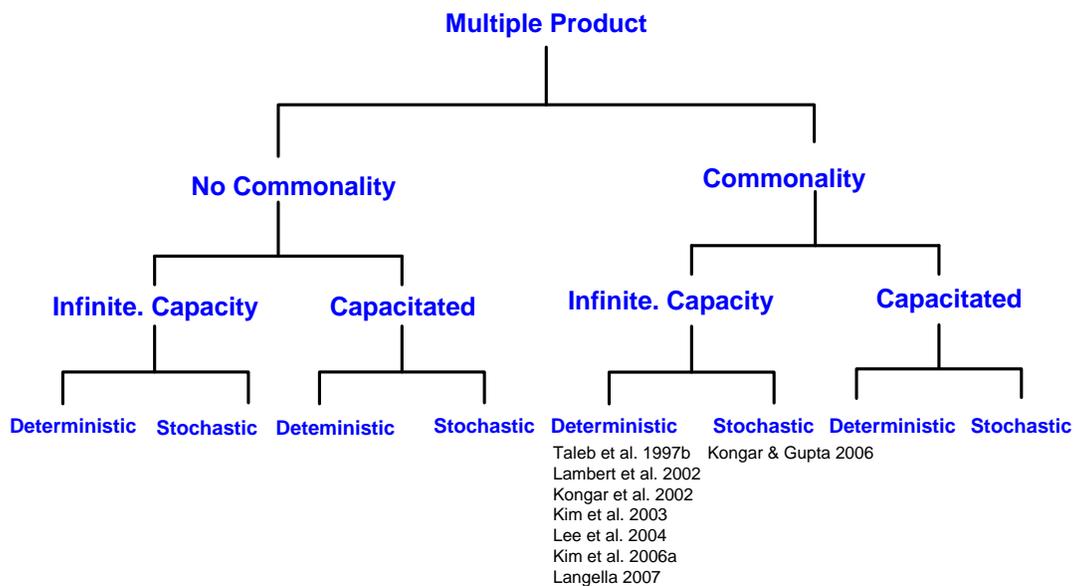
Figure 5: Summary of Disassembly Scheduling Research for Multiple Products

2.2.1 Infinite Capacity with Part Commonality and Deterministic Parameters

The case of multiple products with parts commonality adds additional complexity. In this scenario there is more than one root item and items that may have more than one parent (see Figure 6).
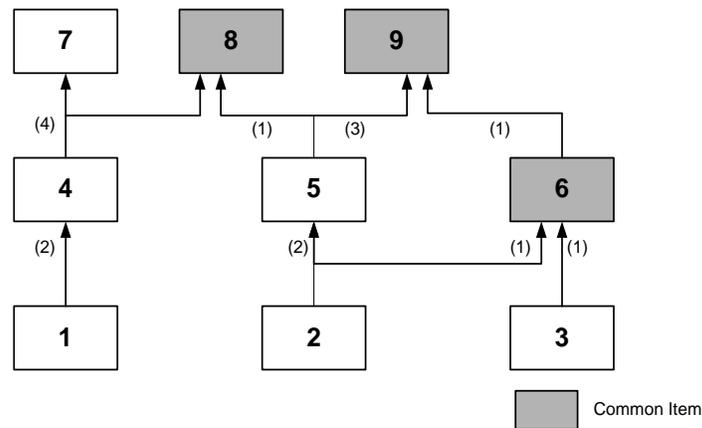
Figure 6: Multiple Products with Parts Commonality

Taleb and Gupta (1997) present a methodology, in part employing reverse MRP logic, for disassembling multiple product structures with parts and material commonality. This methodology consists of two algorithms: the Core Algorithm and the Allocation Algorithm. The first algorithm determines the total disassembly requirements of the root items over the planning horizon in order to minimize the total disassembly cost. The latter algorithm provides a schedule for disassembling the root items and subassemblies by allocating requirements over the planning horizon and implicitly minimizes the holding cost by delaying disassembly as much as possible. The methodology assumes constant and known lead times, no defects, and unrestricted capacity.

Kim et al. (2003) consider the cost-based objective of minimizing the sum of setup, disassembly operation, and inventory holding costs. A heuristic procedure rooted in the linear programming relaxation is developed that provides near optimal solution for real-sized problems. In essence the heuristic solves the LP relaxation and then rounds down the solution. The second phase of the heuristic modifies the rounded down solution such that all of the original constraints are satisfied while also factoring in cost changes. Computational results reveal that the algorithm performs the best when setup costs are small, which is a rare feature of disassembly processes.

Lee et al. (2004) modify their integer programming model once again to handle the case of the multiple product types with parts commonality. Their integer programming model is compared to the two-phase heuristic of Taleb and Gupta (1997) described above. Two objective functions are considered (i.e., minimize the number of products to be disassembled and minimize the sum of product disassembly costs) with the integer program for adequate comparison with the Taleb and Gupta (1997) two-phrase heuristic. Results indicate that the integer program outperformed the two-phrase heuristic under both objective function scenarios using the existing problems from the literature.

Kim et al. (2006a) present an integer programming model for disassembly scheduling (i.e., the quantity and timing of disassembly) such that the sum of set-up, disassembly operation, and inventory-holding costs are minimized. Multiple products with part commonality are considered. A two-phase heuristic procedure is presented which first finds an initial solution by solving the linear programming relaxation and then refines the solution using a dynamic programming algorithm. This paper extends the work of Kim (2003). Test results show that the two-phase heuristic provides near-optimal solutions in short computation time. Extensions to this work call for the elimination of several assumptions to the model. Specifically, the complicating characteristics of (1) defective part and component recovery, (2) stochastic demand and lead times, and (3) resource capacity constraints need to be incorporated into the model.

Kongar and Gupta (2002) suggest an alternative to the single criteria objective of the disassembly scheduling problem found in the open literature. The authors assert that the single criterion objective often limits full consideration of the problem environment. A goal programming model is developed that allows the decision maker to meet the demand for leaf items while satisfying a variety of physical, financial and environmental constraints and multiple goals. The six goals incorporated in the decision model are (1) maximize the total profit value, (2) maximize profit from material sales, (3) minimize the number of disposed items, (4) minimize the number of stored items, (5) minimize the cost of disposal, and (6) minimize the cost of preparation.

The model is tested via a case example comprised of three products that are made up of various combinations of 15 different items. Model results provide the number of reused, recycled, stored and disposed items as well as the values of the six aforementioned performance measures.

Lambert et al. (2002) consider demand driven disassembly. More specifically, optimal lot-sizes of end-of-life products must be determined to fulfill the demand for components from multiple products. The authors assert that traditional approaches fall in one of two categories: (1) component mining where strategies rely on applying the reverse bill of material or (2) full material mining where in addition to components, frames, castings and fasteners are mined for reuse. The later approach may be too comprehensive for industries concerned only with component recovery, yet component recovery is limited in its ability to be extended to more general problems.   To overcome this, the authors present a new method that combines the advantages while simultaneously eliminating the disadvantages of both methods.   The new procedure succeeds at devising a linear constraint to represent the disassembly quantity.   A mixed integer program is developed and optimally solved. As the component demand increases, the LP relaxation solution provides reasonable approximations.

Finally Langella (2007) develops an integer programming model with the objective of minimizing the sum of procurement, separation, holding, and disposal costs. A heuristic procedure is developed that modifies the algorithm of Taleb and Gupta (1997) in order to alleviate the potential of infeasible solutions. Results reveal that the algorithm performs well in large majority of generated test problems that vary by product structure, cost, and demand. The performance of the algorithm declines as the problem size grows.

As researchers explore more practical-sized problems with increased (and realistic) problem complexity such as parts commonality and longer time horizons, this requires a move away from exact methods due to excessive computation time. Numerous heuristic techniques with varying objectives are shown to provide good solutions.   More specifically, Taleb and Gupta (1997) look at minimizing disassembly costs, Kim et al. (2003) minimize the sum of setup disassembly operations and inventory holding costs. Integer programming models with varying objective functions were developed in Lee et al. (2004), Kim et al. (2006a), and Lambert et al. (2002). Kongar and Gupta (2002) use goal programming as a solution methodology to satisfy six objectives. Each advancement attempts to increase the industrial relevance of disassembly scheduling by considering extensions to the pioneering work of Taleb and Gupta (1997). However, additional work needs to be done to incorporate the realistic challenges of defective parts, stochastic demand and lead times, and resource capacity constraints.

2.2.2. Infinite Capacity with Part Commonality and Stochastic Parameters

Kongar and Gupta (2006) extend their earlier work (Kongar and Gupta 2002) by incorporating uncertainty in terms of the total profit goal, the number of EOL products retrieved from end users or collectors, and the sum of the number of reused and recycled components.   The authors utilize fuzzy goal programming (FGP) to solve a multi-criteria decision problem. FGP allows for the goals of the problem to be characterized with intentional vagueness to better mimic the imprecise real world environment.   A case example consisting of three products made up of a combination of 24 different items is used to test the model. Results provide optimal the number of products to be taken back to satisfy the demand, the number of items reused, recycled, stored, and disposed.   Values of numerous other physical, financial, and environmental performance measures are also provided.

2.2.3 Finite Capacity with Part Commonality

We uncovered no articles that address multiple products with capacity restrictions *and* part commonality.

3. SCHEDULING INTEGRATED OPERATIONS

This section reviews research addressing the scheduling and control of all disassembly, remanufacturing, and reassembly processes. Scheduling integrated operations (disassembly, remanufacturing/repair, and reassembly) encompasses the full range of complexities associated with remanufacturing supply chains.

3.1. Scheduling Integrated Operations for Single Products
3.1.1. Order Release Mechanisms and Priority Dispatching Rules

Materials requirements planning (MRP) encompasses all remanufacturing operations from core returns inventory through reassembly, storage, and shipping. While the MRP planning and control methodology had been a prime choice for OEM manufacturers for years, researchers (e.g., Panisset 1988, Krupp 1993, Gupta and Taleb 1994) recognized that traditional material requirements planning (MRP II) was inadequate to address the needs of remanufacturing due to multiple demand points (leaf items), the divergence property, the uncertain rate of recovery, uncertain routings, uncertain yield from material recovery, stochastic task times, etc. However, a number of efforts were made to modify or augment elements of MRP to make it more amenable to remanufacturing scheduling. Panisset (1988) pointed out that traditional material requirements planning (MRP) logic and the supporting bills of materials do not provide sufficient guidance for repair/refurbish industries (e.g., diesel locomotives and railcars).

He offered a "repair bill", which had lead-time offsets for disassembly, repair, and assembly. He recognized that different repair plans and times would be needed and would often be unknown until the end item was disassembled. Thus, he created different "repair classes" which prescribed different repair operations and times. These were based on the repair class that occurred most frequently, is the most complex repair, or the most pessimistic repair time. Finally, some had only one type of repair. The planners decided the appropriate repair class. Thus, Panisset handled the uncertain nature of the work (routings, operations, times) by creating repair classes and employed the intervention of the planner to select the appropriate repair class before disassembly and modify the plan, if necessary, after disassembly operations. The production strategy here was essentially a make (or repair)-to-order job shop, since one or multiple items could be sent for repair (locomotives, box cars, electrical equipment, etc.) and similar items were sent for repair/refurbish operations allowing somewhat standardized planning.

Krupp (1991) offered suggestions and evidence of how restructuring and adding additional bills of materials (BOMs) can address some of the challenges of using MRP II systems in a remanufacturing environment. These challenges include the uncertain timing and quality of returned of cores, salvage yield, and the need to having matched sets of replaced parts.

Inderfuth et al. (2001a) consider product recovery with multiple remanufacturing options. Products entering the reverse network are not all suitable for the same reuse option. Different remanufacturing options have different cost and profits values associated with them that must be considered. The objective of this work is to select the correct quantities of product for a specific remanufacturing option such that the costs (i.e., disposal, remanufacturing, stock holding, backordering) are minimized. A periodic review system is employed with stochastic returns.

Souza et al. (2002a) investigate the impact of various dispatching rules to determine the optimal remanufacturing policy. This work considers the case where a remanufacturer can sell products "as is" to the consumer or remanufacture the product. Products returned to the remanufacturer are categorized or graded based on condition. Graded products that are not sold "as is" to the consumer are assigned to a remanufacturing station based on three different dispatching rules (*Random*, *MaxDiff*, and *Dynamic*). The objective is to maximize profit while achieving a desired service level, which is measured by the flow time (lead time) for an order. Results show that the Dynamic dispatching rule which accounts for the current workload at each remanufacturing stations outperforms the *Random* and *MaxDiff* dispatching rules.

Thus, we see efforts in a multiple product environment to modify or enhance traditional MRP II systems to allow use in remanufacturing. Additional repair bills and BOMs, augmented with planner intervention, are introduced to handle various returns timing, quality, and yield issues. Costs are addressed as Inderfuth et al. (2001) model the multiple remanufacturing options with the objective of minimizing the costs of disposal, remanufacturing, holding, and even backordering. In addition to employing multiple, internal remanufacturing "bills" Souza et al. (2002a) introduce the "sell as is" (non-remanufacturing) option, which expands the portfolio of choices for satisfying market demand.

3.1.2. Product Structure Complexity, Disassembly Release Mechanisms, Priority Scheduling/Expediting Rules, and Control Mechanisms

The vast majority of research on product structure complexity focuses on the impact of product structure on stocking decisions, such as lot sizing and safety stocks (Blackburn and Millen 1982, Collier 1982, Benton and Srivastava 1985, and Sum et al. 1993) in OEM assembly operations. Other research (Fry et al. 1989, Philipoom et al. 1989, and Russell and Taylor 1985b) examined the effect of product structure on the performance of dispatching rules in an assembly job shop.

Guide, Srivastava, and Kraus (1997) use computer simulation to test the impact of different types of product structures (simple, intermediate, and tall) on the performance of remanufacturing operations using sixteen different priority-scheduling rules. Four different performance criteria were employed. They conclude that for simple product structures the best performing priority-dispatching rules are the high level (level 0) bill of material-based rules (HLB). However, as the complexity of the product structure increases, the shortest processing time rule (SPT) and dynamic priority dispatching rules perform better than the HLB rules. When the product structure becomes very complex, due date rules outperform all others. The authors conclude that the mechanism guiding the release of materials from the disassembly operations to the remanufacturing stage is also critical.

In a related work Guide and Srivastava (1997b) use computer simulation to evaluate the performance of four order release strategies (level, local load oriented, global load oriented, and batch) and two priority scheduling rules (first come-first served (FCFS) and earliest due date (EDD)) against five performance criteria (mean tardiness, mean flow time, work-in-process, mean idle time, and mean throughput units). They determined that in this complex and highly variable environment: (1) the batch release strategy performed poorly and should not be considered, (2) the EDD rule outperformed the FCFS rule in four out of five performance measures (all but throughput), and (3) since there was no clear victor among the three remaining release strategies, managers should opt for the simplest strategy, the level order release strategy. Thus, the authors conclude that a simple level order release strategy combined with a due date priority scheduling rule provides an effective means of releasing and scheduling work in this environment.

Guide (1996) introduces the drum-buffer-rope (DBR) production philosophy as a means of planning, scheduling, and controlling remanufacturing operations. He promotes this "synchronous manufacturing" methodology as a means to cope with routing uncertainties (frequency and time) and required task sequences. In this scheme the final assembly schedule and the assembly buffer, which feeds the final assembly operation, drive the order releases. The "drum" and primary constraint is the schedule of parts arriving to the final assembly area. The final assembly inventory "buffer" acts to protect against assembly disruptions (late parts due to routing delays, scrap, rework, etc.). The "rope" pulls parts into the repair shop to ensure that all parts appear at the final assembly area at the right time. Guide uses computer simulation to test the DBR approach against an existing modified MRP system. Since the set-up and processing times were stochastic, Guide utilized beta distributions with the mean, maximum, and minimum expected times based on historical data. Material release schedules for individual parts were dictated by the buffer size per part. Parts with longer expected processing times had precedence. Each work center follows a FCFS queue discipline. The primary objective was to complete orders on schedule with secondary performance measures including the mean WIP, the mean throughput rate, and the mean flow time. He learned that the DBR approach, regardless of buffer size multiplier outperformed the MRP-based method on every performance measure. Guide concludes that the inventory buffer multipliers help the system to cope with variability in the remanufacturing environment.

Guide (1997) later employs computer simulation to examine the impact of different priority dispatching rules (FCFS, SPT, EDD, longest processing time (LPT), global SPT, and Slack) on the performance of the DBR methodology at non-constraint work centers. He assesses the mean flow time, lateness, percentage of parts expedited, and throughput at non-constraint work centers. He also tests his results over three shop load levels and incorporates one complicating characteristic – the requirement for mating specific parts. His results indicate that at low levels of utilization any of the PDRs examined performed well; the only performance measure which was sensitive to the PDR the was percentage of units expedited for which EDD and FCFS performed the best. At intermediate levels of utilization EDD or FCFS produces the best results with respect to all performance measures. The results from these levels of utilization indicate that the simpler priority rules, EDD or FCFS, outperform the more complex and that rules that perform well in a typical job shop, e.g. SPT, had poor results in this remanufacturing shop. Finally, at high levels of utilization *none* of the PDRs performed well. Guide suggests that in this situation variability and queues increase and, as a result, the part buffer sizes need to be enlarged.

Guide, Srivastava, and Kraus (1998) investigate the performance of proactive expediting policies with different product structures and disassembly release mechanisms. Using computer simulation they find that the proactive expediting systems do not significantly improve performance regardless of the level of utilization or threshold value (the percentage of a product's parts that have arrived at the reassembly operation and which is used to initiate the expediting). In addition they report that the performance of these policies decrease with increasing product complexity. They also report that the disassembly release

mechanisms (DRM) do not affect the performance of the expediting policies nor was there any difference in the performance of the various DRMs. Additionally, they note that the highest level BOM priority dispatch rule performed well for simple product complexity, but was outmatched by the earliest due date release at intermediate and high product complexity. Therefore, Guide et al. reassert the value of simple priority rules (e.g., EDD) for the remanufacturing environment.

Veerakamolmal and Gupta (1998) develop a procedure, which sequences multiple, single-product batches through disassembly, and retrieval operations in order to minimize machine idle time and makespan. The procedure requires that returned (electronic) products be grouped into like product batches. A standard process plan (and time) for disassembly is then assigned to each batch and used to determine the optimal batch sequence.

Thus, we see that product structure plays an integral role in the performance of remanufacturing operations. High-level BOM rules perform best for simple structures, with the SPT and dynamic rules the choice for intermediate structures, and EDD outperforming all for complex structures. It is also shown that, as the level of utilization of the remanufacturing system increases, the EDD rule dominates; however, at high levels of utilization none of the PDR rules perform well and part buffers must be enlarged. Research indicates that the drum-buffer-rope methodology outperforms MRP-based methods on every performance measure tested. Perhaps not surprisingly, larger inventory buffers are shown to help with system variability and performance. Finally, research shows that proactive expediting policies do not significantly improve system performance.

3.2. Scheduling Integrated Operations for Multiple Products

3.2.1. Part Commonality and Product Structure

Kim et al. (2006), present a mixed integer program to aid remanufacturers decide how many cores should be designated for remanufacturing and how many new parts to purchase from an external supplier, such that the cost savings from remanufacturing is maximized. A numerical example with multiple products and part commonality is presented to test the proposed model. Sensitivity analysis is conducted to assess how changes in the capacity of the remanufacturing facility impacts the objective function. Results indicate that an optimal remanufacturing capacity exists such that additional capacity expansion does not improve the cost savings.

3.2.2. Order Release Mechanisms, Lot Sizing, Priority Dispatching Rules, and Control Mechanisms

Guide, Kraus, and Srivastava (1997) use computer simulation to comprehensively test the performance of fifteen priority dispatching rules and four disassembly release mechanisms against four performance measures (mean flow time, mean tardiness, root means square tardiness, and mean percentage tardy) in a multiple product remanufacturing environment. They found that: (1) there were no significant performance differences among the disassembly release mechanisms and interestingly the time-phased release mechanism provided no significant advantages over the simpler mechanisms, (2) due date priority rules provided good, and in some cases the best, overall performance, and (3) the use of reassembly accelerator rules to proactively expedite parts to the assembly operation made no significant difference in any of the performance measures. They, therefore, concluded that use of the simplest disassembly release mechanisms (first off, first to shop - FOFS) is warranted. They also encouraged the use of due-date-based rules and discouraged the use of accelerator priority rules, which provided no significant benefits in performance.

Guide, Jayaraman, and Srivastava (1999) use computer simulation to assess the effect of lead time variation on the performance of disassembly release mechanisms in a multiple product environment. They tested five disassembly release mechanisms and three performance measures - mean flowtime, RMS tardy, and percentage tardy. Since the due date priority rule had worked well in previous studies for the authors (e.g., Guide, Kraus, and Srivastava, 1997), EDD was used exclusively in this analysis. Job batches were a mixture of three products with simple, intermediate, or complex structures. Five different levels of lead time variability were tested. Results indicate that the lead time variation does have an effect on the release of parts from the disassembly operation. At all levels of variation the FOFS release mechanism performed well,

particularly for serial specific parts. Although at high levels of variability there is less distinction between the performance of various DRMs, the authors encourage the use of the FOFS DRM for both serial number specific and common parts over a range of lead time variances.

While there is less published research pertaining to this section, several, reported results are noted. Kim et al. (2006a) show that for multiple products with part commonality an optimal remanufacturing capacity exists that minimizes remanufacturing costs. Guide et al. (1997) reveal that there are no significant performance differences among DRMs and that reassembly accelerator rules to proactively expedite parts to the assembly operation had no impact on performance. Thus, they encourage the use of the simplest disassembly release mechanisms (FOFS) and EDD priority rules and discouraged the use of accelerator priority rules. In addition they promote the FOFS release mechanisms when lead time varies for either common or specific parts. As for single products we see that simple DRMs and priority scheduling rules (EDD) having advantages over more sophisticated variations for a wide range of several common complexities.

Table 2 provides a summary of the pertinent features of the remanufacturing scheduling literature.

<u>**INSERT TABLE 2 ABOUT HERE**</u>

4. GENERALIZATIONS

This section examines research results not directly focusing on remanufacturing scheduling, but can, nonetheless, impact remanufacturing scheduling.

4.1. Capacity Planning

The difficulties in planning capacity for remanufacturing operations have been cited by Fourcaud (1993). Guide and Spencer (1997) state that traditional methods of manufacturing planning and control are difficult to use because of complicating factors such as probabilistic routings, uncertain material replacement, and highly variable processing times for repair operations. To aid in planning capacity with these uncertainties they develop a modified bill of resources method. This methodology incorporates an occurrence factor (OF), the percentage of time that a particular operation is required, and a material recovery rate (MRR), the frequency that material recovered from a core unit is repairable, into the bill of resources. These modifications help to account for the variation inherent in remanufacturing.

Later Guide, Srivastava, and Spencer (1997) use computer simulation to evaluate the performance of five rough-cut capacity planning techniques in a remanufacturing environment. These are the bills of resources, capacity planning using overall factors, modified bills of resources, bill of resources with variances, and modified bills of resources with variances. The latter two techniques are modified from the original methods in order to account for the inherent variability in the remanufacturing system. This is done by adding the standard deviation of the historical utilization rates at each work center to the calculations for the required capacity. Results indicate that the modified bill of resources with variance is the best choice. A clear result of this analysis is that techniques for capacity planning which recognize and include a measure of the variability inherent in the uncertain remanufacturing environment will perform better than the standard rough-cut capacity planning models.

Lee et. al. (2001) present a review of disassembly planning and scheduling research and call for an integrated approach to disassembly planning and scheduling. They emphasize that since the disassembly plan feeds into the disassembly schedule, it is imperative that both are considered at the same time.

The difficulties in planning and controlling integrated remanufacturing systems (disassembly, remanufacturing/repair, and reassembly) have been well documented. Several studies have focused on this difficult problem area. Guide and Spencer (1997) initially promote a modified bill of resources, which incorporates an occurrence factor and a material recovery rate into the bill of resources. Testing several techniques Guide et al. (1997) later report the modified bill of materials with variance as the best selection. This technique includes a measure of the variability inherent in the uncertain remanufacturing environment and appears better adapted to the uncertainties of this environment.

4.2. Lot Sizing and Inventory Effects

Perry (1991) reports the differences in lot sizing and lead times for thirteen remanufacturers in seven industries and compares these to traditional manufacturers and concludes that the differences were due to management and control policies.

Guide and Srivastava (1997) study the impact of safety stocks in a MRP system on remanufacturing customer service and inventory levels. The computer simulation study focuses on a single product, both a homogeneous and a heterogeneous material recovery environment, smooth and lumpy product demand, short and long component lead times, and five different safety stock levels (including none). Results from the study indicate that for both types of material recovery environments safety stock does protect against uncertainty and improve customer service, but only to a certain point. Slightly more buffer inventory is required for the heterogeneous environment to achieve equivalent customer service levels. The authors conclude that, due to the high degree of uncertainty in remanufacturing, increasing buffer inventories to enhance customer service levels has limits and they suggest managers also investigate shorter lead times and demand management as alternative areas of exploring improved customer service levels.

Guide and Srivastava (1998) emphasize the importance of inventory buffer locations to connect remanufacturing operations and provide managerial flexibility and control. They study the interaction of disassembly release mechanisms (DRM) (time-phased to minimize flow time, time-phased according to due date, and disassembly flush - all parts disassembled and released to the shop floor) and the location of inventory delay buffers – after disassembly, before reassembly, or mixed (at both locations). They conduct their experiments using computer simulation based on an actual facility, allow both common and serial specific parts within a single product, and examine three levels of utilization. Results are assessed on mean flow time, mean lateness, and mean reassembly delay time. They learn that serial numbered parts should be managed distinctly from common parts with the best DRM being a flush leading to a reassembly delay buffer. This combination performs well for flow time and lateness. However, for common parts the authors encourage a time-phased, minimum flow time DRM with mixed inventory buffers. Finally, the authors note that the time-phased, due date DRM and the resulting disassembly delay buffer, predicated on MRP logic and commonly favored by managers, is an extremely poor performer regarding flow time and lateness. They emphasize the significance of this finding, given the popularity of MRP systems. They attribute this finding to the higher degree of uncertainty and unpredictable lead times in remanufacturing versus traditional operations.

Inderfurth et al. (2001) develop a stochastic, dynamic optimization model to tackle the complex problem of determining optimal or near–optimal, periodic review inventory policies necessary to support various remanufacturing options (including disposal). Both the returns and the demands for the single product are stochastic. The objective is to select quantities of returned product to be remanufactured via each option so that the total expected, discounted total costs of remanufacturing, disposal, stock holding, and backordering is minimized, while satisfying the demand over a finite or infinite horizon. The authors show the complexity of this multiple recovery option problem, particularly when returnable products are scarce and an allocation scheme must be employed. However, the authors illustrate that use of linear allocation rules allow the development of fairly simple, near-optimal control policies. The authors assume infinite remanufacturing and inventory storage capacities.

Teunter and Vlachos (2002) study a single item, stochastic, hybrid production system (manufacturing and remanufacturing). They examine a variety of demands, returns, and manufacturing/remanufacturing characteristics to determine what the cost reduction for incorporating a disposal option for returned items would be. They conclude that under the assumptions that, on average, demands exceed returns and remanufacturing is marginally profitable, a disposal option is not necessary. Exceptions are for very slow-moving items (fewer than a demand of 10 per year) for which remanufacturing is almost as expensive as manufacturing plus disposal (at least 90 %), and for which the recovery rate is large (at least 90%). As returns exceed demands a disposal option is increasingly desirable. However, such situations simplify the production system, as the manufacturing option would be increasingly unncecessary.

Barba-Gutierrez et al. (2008) extend the reverse MRP algorithm of Gupta and Taleb (1994) by incorporating the concept of lot sizing in connection with disassembly scheduling. The authors use the period order quantity (POQ) lot-sizing rule on a portion of the example from Gupta and Taleb (1994). Results indicate that the POQ turns out to be one and thus the ordering sequence has the same structure that the sequence for planning disassembly. To test the behavior of the algorithm further the authors consider nine different scenarios with different cost combinations. Four different lot-sizing rules (i.e., lot-for lot (L4L), POQ, best disassembly schedule in each subassembly (BIES), and best combination (BC)) are tested

on the nine different problem scenarios. Results indicate that the BC lot-sizing rule is the best in all cases considered.

From these studies we learn that for both homogenous and heterogeneous material recovery environments safety stock does protect against uncertainty and improve customer service, but only to a certain point. Slightly more buffer inventory is required for the heterogeneous environment to achieve equivalent customer service levels. The locations of safety stock and find that serial numbered parts should be managed distinctly from common parts with the best DRM being a flush leading to a reassembly delay buffer. However, for common parts a time-phased, minimum flow time DRM with mixed inventory buffers is encouraged. Thus, the material recovery environment, the amounts of inventory buffers, and the inventory locations do make a difference in the remanufacturing environment. Also, linear allocation rules allow the development of fairly simple, near-optimal, periodic review inventory control policies. In addition, when demands exceed returns and remanufacturing is marginally profitable, a disposal option is not necessary and as returns exceed demands a disposal option is increasingly desirable.   Finally, Barba-Gutierrez et al. (2008) incorporate the concept of lot sizing in connection with disassembly scheduling. They conclude that the best combination (BC), lot-sizing rule is the best in all cases considered.

4.3. Order Release, Priority Dispatching Rules, and Control Mechanisms

Kizilkaya and Gupta (1998) introduce the use of a Flexible Kanban System (FKS) to control the flow of returns to a disassembly cell, the partially disassembled products and parts among work stations within the cell, and to demand points external to the work cell. The authors report the results of a simulation study, which shows the FKS system had slightly higher WIP inventory than a traditional Kanban system (TKS), but that the amount of shortages were less.

4.4 Uncertainty and Stochasticity

Guide, Kraus, and Srivastava (1999) emphasize that remanufacturing systems face a greater degree of uncertainty and complexity than traditional manufacturing systems and thus, require planning and control systems designed to deal with the added uncertainty and complexity. A number of researchers support this position (e.g., Flapper 2002, Gupta and Taleb 1994, and Johnson and Wang 1995).

Guide (2000) insists that managers must be deliberate in their actions to reduce the uncertainty in the remanufacturing environment. Unlike the traditional forward supply chain, production planning and control in a remanufacturing environment must contend with acquiring cores. In this work, a framework for product acquisition is developed that links reverse logistics activities with production planning and control activities. A set of six managerial guidelines are presented and encouraged to be used as the starting point to reduce uncertainty in the timing and quantity of materials. This in turn provides the potential to reduce uncertainty throughout the remanufacturing system particularly in regard to inventory control and balancing returns with demand.

Kizilkaya and Gupta (1998) use computer simulation to study the material flow in a disassembly environment using the Flexible Kanban System (FKS). In their study the disassembly time at each station is modeled using an exponential distribution.

Inderfurth et al. (2001) develop a stochastic, dynamic optimization model to tackle the complex problem of determining optimal or near–optimal, periodic review inventory policies necessary to support various remanufacturing options (including disposal). Both the returns and the demands for the single product are stochastic. The objective is to select quantities of returned product to be remanufactured via each option so that the total expected, discounted total costs of remanufacturing, disposal, stock holding, and backordering is minimized, while satisfying the demand over a finite or infinite horizon.

Teunter and Vlachos (2002) use computer simulation to study a hybrid production system (manufacturing and remanufacturing).   They examine for a variety of demands, returns, and manufacturing/remanufacturing characteristics what the cost reduction associated with a disposal option for returned items would be. Poisson and normal distributions are used to model demands and returns per time period.

Tang et. al. (2007) estimate planned lead times in a make-to-order remanufacturing environment. Specifically, the problem of determining when to disassemble such that component parts are available in the right quantity and condition for reassembly is modeled as a newsboy problem.   The authors also use a mixture of Erlang distributions in their stochastic computations.

The high degree of uncertainty surrounding remanufacturing as well as its causes (uncertain returns and their quality, stochastic routings and processing times, disposal and scrap percentages, customer demand, etc.) have been known for some time. Several techniques have been employed to incorporate this uncertainty into remanufacturing planning and control. The most prevalent technique has been computer simulation. Guide and coauthors have relied on computer simulation for many research efforts (refer to Table 2). These include the impact of product structures on the performance of remanufacturing operations, the performance of various order release strategies and priority scheduling rules on remanufacturing performance, the use of the drum-buffer-rope philosophy (synchronous manufacturing) to cope with routing and task time uncertainties, the performance of proactive expediting policies with different product structures and disassembly release mechanisms, and the effect of lead time variation on the performance of disassembly release mechanisms. In many of these studies the set-up and processing times are stochastic, often modeled using beta distributions based on historical data. Kizilkaya and Gupta (1998) use computer simulation to study material flow in a disassembly environment using the Flexible Kanban System (FKS). In their study the disassembly time at each station is modeled using an exponential distribution. Teunter and Vlachos (2002) also employ computer simulation coupled with Poisson and normal distributions to study a hybrid production system. Thus, we see computer simulation harnessed with well-known statistical distributions to successfully study the stochastic complexities of remanufacturing.

Inderfurth et al. (2001) use stochastic, dynamic optimization with stochastic returns and demands to determine remanufacturing lot quantities and periodic review inventory policies in order to minimize remanufacturing, disposal, holding and backordering costs. Thus, this research couples inventory review policies with various remanufacturing options in a stochastic environment.

Tang et al. (2007) recently utilize the newsboy model with a mix of Erlang distributions to determine when to disassemble cores such that parts are available in the right quantity and condition to satisfy demand.

The sophistication of the stochastic distributions appears to have progressed with time. However, computer simulation may by the most powerful methodology to study the impact of numerous stochastic complexities simultaneously.

5. OBJECTIVE CRITERIA/FUNCTIONS AND SCHEDULING/PLANNING METHODOLIGIES USED

5.1. Objective Criteria/Functions
As shown in Table 2 the use of objective criteria seemed to span three eras. Usage of MRP-type objective criteria (satisfy demand for the time period, minimize the root items utilized to satisfy demand, and minimize the lot size and lead time) was predominant in the late 1980's and early 1990's. This was followed by more sophisticated technical, performance-based criteria such as minimize flow time, tardiness, root mean square tardiness, % of parts expedited, idle time, stockouts, safety stock, machine idle time, WIP, and makespan and maximize throughput. The third period, the economic period, gained its foothold around 2002. Published research, most involving linear, integer, or dynamic programming, now employed a variety of economic (cost-oriented) objective functions. These costs included set-up, holding, (cores and/or disassembled parts) purchase (cores), disassembly, and disposal (defective cores and parts). Even a maximize profit function (revenue - disassembly cost – disposal cost) is noted. Thus, while the economic objectives now appear dominant, the MRP-type still appear (e.g., Kim et al., 2006e; Kongar and Gupta, 2006).

5.2. Scheduling/Planning Methodologies
The study of remanufacturing scheduling, planning, and control has attracted a number of varied methodologies. As depicted in Table 2 reverse MRP was the initial methodology of choice for disassembly planning. Guide and his associates introduced the use of computer simulation to disassembly/remanufacturing scheduling, planning, and control throughout the 1990's. One benefit, of course, was that computer simulation could employ stochastic data. Much research on disassembly release mechanisms, priority dispatching rules, buffer inventory locations, the influence of product structure, and control mechanisms were conducted utilizing this methodology. Even the use of Kanban (drum-buffer-rope) has been applied with noted advantages. The mathematical programming era launched in earnest circa 2002 and research utilizing linear, integer, dynamic, and fuzzy goal programming appeared. These models

addressed directly the disassembly scheduling problem and were typically coupled with economic objective functions. We noted one article (Neuendorf et al., 2001) that utilized Petri nets. While we note the occasional use of the reverse MRP approach (Barb-Guitierrez and Gupta, 2008), the mathematical programming methodologies appear to be currently prevalent.

While the mathematical programming methodologies can achieve optimal solutions for restricted, test problems, heuristics still offer the best hope for achieving useful, near optimal solutions for realistically-sized scheduling efforts.

7. AREAS FOR FUTURE RESEARCH

It can proceed without comment that the barren, end branches in Figures 3 and 5 signal research needs. The combination of finite capacity (e.g., machine, labor, storage), part commonality (within the same product and across multiple products), and stochastic parameters (core returns, processing times, processing routes, material recovery, production scrap, product demand, etc.) are complex, stand-alone issues to address and extremely formidable in combination. Yet, these are the unresolved areas for research.

We agree with the recent suggestions put forth by Kim et al. (2007), which call attention to the need to:

- Incorporate backlogging, realistic stochastic considerations, and multiple periods into disassembly scheduling.

- Integrate disassembly process planning with disassembly scheduling.

- Integrate all the remanufacturing operations (disassembly, remanufacturing/repair operations, and reassembly) into the remanufacturing scheduling decisions.

We pose several pertinent questions and offer some additional suggestions for future research:

- It is not clear what objectives, methodologies, constraints, etc. practitioners currently use in their remanufacturing scheduling operations. An industrial survey could assess what difficulties practitioners face, what they feel they need, and in what form. One hypothesis is that practitioners need more than an appropriate and computationally efficient model, they want a complete computer package - flexible, ready to run, and user-friendly.

- The simulations and models of remanufacturing scheduling and performance concern mainly technical data, operations, and decisions. However, remanufacturing design and performance can be influenced by strategic, managerial, economic, and behavioral issues and decisions. How have these issues impacted remanufacturing scheduling, operations, and performance, and how are they accommodated?

- While there has been some research involving multiple criteria (Hoshino et al., 1995; Kongar & Gupta, 2002 & 2006) most research efforts have used singular objectives. Since remanufacturing employs an economic, socio-technical system would managers desire to achieve or trade-off multiple objectives? Thus, we should support research employing technical, economic, strategic, and/or humanistic goals, which may provide a greater challenge, but result in more useful and realistic solutions.

- Twenty-eight remanufacturing scheduling complexities and issues are listed in Table 1.   Are they all a concern to all remanufacturers? Are they all equally important? Conduct a survey of remanufacturers to learn which of these are important to companies by industry, by product, by process type, and by position of their product life cycle.   Conduct an ABC analysis to determine the most-to-least important complexities overall and by industry group. It may then be feasible to develop models specifically tailored for each group. If longitudinal studies were conducted, it may be possible to determine how these complexities and their importance change over time.

- Assess how remanufacturers, who have employed the results of reported studies, have economically performed over time. It may be possible to assess their cradle-to-grave costs including design, construction, implementation, operation, maintenance, control, disposal, and updating.

- Kizilkaya and Gupta (1998) suggest that as customer satisfaction becomes a more differentiating factor between manufacturers, flexible Kanban systems (FKS) may give remanurfacturers the ability to reduce delivery times and shortages while keeping average WIP inventory levels at reasonable levels compared to batch manufacturing strategies. While Kizilkaya and Gupta (1998) determine the number of Kanbans to be added or removed from a FKS system based on a percentage of the (stochasitic) demand, what procedures can be developed to provide the optimal numbers of base Kanbans employed in the system and the amount to be added or removed from the base in a stochastic environment?

- It would be useful to learn what can be or has been the technical and economic impact of remanufacturing automation/robotics (which can reduce the variability of process times) on remanufacturing scheduling and operations?

- Assemble research teams involving both academic and industrial practitioners to formulate the objectives, constraints, and complexities to be examined.

Indeed, while much has been advanced, many remanufacturing industry needs yet remain for future research.

REFERENCES

Anon. The First British Plant for Dismantling Cars and Reusing Their Parts, *Al Hayat Newspaper*, January 3, 1993.

Barba-Gutierrez, Y., Adenso-Diaz, B. and Gupta, S. M. Lot Sizing in reverse MRP for Scheduling Disassembly, *International Journal of Production Economics*, 2008, Vol. 111, 741-751.

Benton, W. C. and Srivastava, R. Product Structure Complexity and Inventory Storage Capacity on the Performance of a Multi-Level Manufacturing System, *International Journal of Production Research*, 1993, 31, 2531-2545.

Blackburn J. and Millen R. The Impact of a Rolling Schedule in a MultiLevel MRP System, *Journal of Operations Management*, 1982, 2, 125-135.

Brander, P. and Forsberg, R. Cyclic Lot Scheduling with Sequence-dependent Set-ups: A Heuristic for Disassembly Processes, *International Journal of Production Research*, 2005, 295-310.

Brennan L, Gupta SM, Taleb KN. Operations Planning Issues in an Assembly/ Disassembly Environment, *International Journal of Operations and Production Management*, 1994, 14(9): 57-67.

Busher, Udo and Lindner, Gerd, Optimizing a Production System with Rework and Equal Sized Batch Shipments, *Computers and Operational Research*, 2007, Vol. 34, 515-535.

Clegg, A. J., Williams, D.J. and Uzsoy R. Production Planning and Control for Companies with Remanufacturing Capability, *Proceedings of the 1995 IEEE International Symposium on Electronics and the Environment*, 1995, 186-191.

Collier, D. A. A Product Structure Measure: The Degree of Commonality, *Proceedings of the 10th National American Institute for Decision Sciences Conference*, 1978, 313.

Dobos, I. Optimal Production –Inventory Strategies for a HMMS-type Reverse Logistics System, *International Journal of Production Economics,* 2003; 81(82): 351-360.

Flapper, Simmd Douse P., Fransoo, Jan C., Broekmeulen, Rob A.C.M., and Inderfurth, Karl. Planning and Control of Rework in the Process Industries, *Production Planning & Control*, 2002, 13(1), 26-34.

Fleischmann M, Bloemhof-Ruwaard J, M Dekker R, van der Laan E, van Nunen J, van Wassenhove L. Quantitative model for reverse logistics: a review, *European Journal of Operational Research* 1997; 103: 1-17.

Fourcard, R. Is Repair/Remanufacturing Really Different? APICS 1993 Remanufacturing Seminar Proceedings, Oklahoma City, OK (American Production and Inventory Control Society: Falls Church, 1993, 4-9.

Franke C, Basdere B, Ciupek M, Seliger S. Remanufacturing of Mobile Phones-Capacity, Program and facility Adaptation Planning, *Omega* 2006; 34: 562-570.

Fry, T.D., Oliff, M. D., Minor, E. D. and Leong, G. K. The Effects of Product Structure and Sequencing Rules on Assembly Shop Performance, *International Journal of Production Research*, 1989, 27, 671-686.

Guide, Jr. V. D. R. Scheduling using Drum-Buffer-Rope in a Remanufacturing Environment, *International Journal of Production Research,* 1996; 34(4): 1081-1091.

Guide, Jr. V. D. R. Scheduling with Priority Dispatching Rules and Drum-Buffer-Rope in a Recoverable Manufacturing System, *International Journal of Production Economics,* 1997; 53: 101-116.

Guide V. D. R. Production planning and control for remanufacturing: industry practice and research needs. *Journal of Operations Management*, 2000; 18: 467-483.

Guide, Jr. V. D. R., Souza G. C. van der Laan E. Performance of Static Priority Rules for Shared Facilities in a Remanufacturing Shop with Disassembly and Reassembly, *European Journal of Operational Research* 2005; 164: 341-353.

Guide, V. D. R., Srivastava, Rajesh, "An Evaluation of Order Release Strategies in a Remanufacturing Environment", *Computer and Operations Research*, 24(1), 37-47, 1997a.

Guide V. D. R. Srivistava R. Buffering from Material Recovery Uncertainty in a Recoverable Manufacturing Environment, *Journal of the Operational Research Society,* 1997b; 48: 519-529.

Guide, V. D. R., Jayaraman, V., Srivastava, R., " Production Planning and Control for Remanufacturing" A State-of-the-Art-Survey", *Robotics and Computer Integrated Manufacturing*, 15, 221-230, 1999.

Guide V. D. R. Jayaraman V. Linton J. C. Building Contingency Planning for Closed-Loop Supply Chains with Product Recovery, *Journal of Operations Management,* 2003; 21: 259-279.

Guide V. D. R. Srivastava R. Inventory Buffers in Recoverable Manufacturing, *Journal of Operations Management* 1998; 16: 551-568.

Guide V. D. R. Spencer M. S. Rough-Cut Capacity Planning for Remanufacturing Firms, *Production Planning & Control*, 1997; 8(3): 237-244.

Guide V. D. R. Kraus M E. Srivastava R. Scheduling policies for Remanufacturing, *International Journal Production Economics*, 1997; 48: 187-204.

Guide V. D. R, Jayaraman V. Product acquisition management: current industry practice and proposed framework, *International Journal of Production Research*, 2000; 38(16): 3779-3800.

Guide VDR, Srivastava R, Kraus. R. E. Product structure complexity and scheduling of operations in recoverable manufacturing, *International Journal of Production Research,* 1997; 35(11): 3179-3199.

Guide VDR, Srivastava R, Spencer M S. An evaluation of capacity planning techniques in a remanufacturing environment, *International Journal of Production Research,* 1997b; 35(1): 67-82.

Guide, Jr.VDR, Jayaraman V, Srivastava, R. The effect of lead time variation on the performance of disassembly release mechanisms, *Computers and Industrial Engineering*, 1999; 36: 759-779.

Guide, Jr., V. Daniel and Spencer, Michael S. Are Production Systems Ready for the Green Revolution, *Production and Inventory Management Journal*, 1996, 37(4), 70-76.

Guide, Jr., V. Daniel and Ghiselli, Gerald A. Implementation of Drum-Buffer-Rope at a Military Rework Depot Engine Works, *Production and Inventory Management Journal*, 1995, 36(3), 79-83.

Guide, Jr., VDR, Srivastava R, and Kraus. R. E. Proactive Expediting Policies for Recoverable Manufacturing, *The Journal of the Operational Research Society*, 1998, 49(5), 479-491.

Gungor A, Gupta S M. Issues in environmentally, conscious manufacturing and product recovery: a survey, *Computers and Industrial Engineering,* 1999; 36: 811-853.

Gungor A, and Gupta, S M. Disassembly sequence planning for products with defective parts in product recovery. *Computers and Industrial Engineering* 1998; 35(1-2): 161-164.

Gupta, S. M. and Taleb, K. N. Scheduling Disassembly, *International Journal of Production Research*, 1994, vol. 32, No. 8, 1857-1866.

Gupta, Surendra M. and McLean, Charles R. Disassembly of Products, *Computers and Industrial Engineering*. 1996, Vol. 31, No. 1/2, 225-228.

Hoshino, T. , Yura, K. and Hitomi, K. Optimization Analysis for Recycle-Oriented Manufacturing Systems. *International Journal of Production Research*. 33 (8): 2069-2078, 1995.

Inderfurth K, de Kok A, Flapper S D P. Product recovery in stochastic remanufacturing systems with multiple reuse options, *European Journal of Operational Research*, 2001a; 133: 130-152.

Inderfurth, Karl and van der Lann, Erwin. Leadtime Effects and Policy Improvement for Stochastic Inventory Control with Manufacturing, 2001b, 71, 381-390.

Inderfurth K, and Langella I M. Heuristics for Solving Disassemble-to-Order Problems with Stochastic Yields; *OR Spectrum*, 2006; 28: 73-99.

Jayaraman V. Production Planning for Closed-Loop Supply Chains with Production Recovery and Reuse: An Analytical Approach, *International Journal of Production Research,* March 2006; 44(5): 981-998.

Kiesmuller, G. P., "A New Approach for Controlling a Hybrid Stochastic Manufacturing/Remanufacturing System with Inventories and Different Leadtimes", *European Journal of Operational Research*, 2003, Vol. 147, Issue 1, 62-71.

Kim, H-J, Lee, D-H, Xirouchakis, P., and Zust, R., "Disassembly Scheduling with Multiple Product Types", *CIRP Annals-Manufacturing Technology*, 2003, **52**, 403-406.

Kim, H.–J., Lee, D.-H. and Xirouchakis, P. Two-Phase Heuristic for Disassembly Scheduling with Multiple Product Types and Parts Commonality, *International Journal of Production Research*, Vol. 44, No. 1, 2006a, 195-212.

Kim, H. –J., Lee, D. –H., and Xirouchakis, P., A Lagrangean Heuristic Algorithm for Disassembly Scheduling with Capacity Constraints, *Journal of the Operational Research Society*, 57 (10), 2006b, 1231-1240.

Kim, H.-J., Lee, D.-H. Xirouchakis, P. A Branch and Bound Algorithm for Disassembly Scheduling with Assembly Product Structure, *Technical Report, Institute of Production And Robotics, Swiss Federal Institute of Technology*, Lausanne (EPFL), 2006c.

Kim, H.-J., D. –H. and Xirouchakis, P., A Branch and Bound Algorithm for Disassembly Scheduling with Assembly Product Structure, *Technical Report, Institute of Production and Robotics, Swiss Federal Institute of Technology*, Lausanne (EPFL), 2006d.

Kim, H. –J., Lee, D. –H. and Xirouchakis, P. Disassembly Scheduling: Literature Review and Furure Research Directions, *International Journal of Production Research*, 2007, Vol. 45, No. 18-19, 4465-4484.

Kim, J. G., Jeon, H. B., Kim, H-J., Lee, D. H, and Xirouchakis, P., "Disassembly Scheduling with Capacity Constraints: Minimizing the Number of Products Disassembled", *Proc. Inst. Mech, Eng.: J. Eng. Manuf. – Part B*, 2006e, 220, 1473-1481.

Kim, Kibum Iksoo, Song; Kim, Juyong and Jeong, Bongju. Supply Planning Model for Remanufacturing System in a Reverse Logistics Environment, *Computer & Industrial Engineering*, 51, 2006b, 279-287.

Kizilkaya, Elif and Surendra M. Gupta, Material flow Control and Scheduling in a Disassembly Environment, *Computers and industrial Engineering*, 1998, Vol. 35, Nos. 1-2, 93-96.

Kongar E. and Gupta, S. M., Disassembly to Order System under Uncertainty. Omega 2006; 34: 550-561.

Krupp, James A.G., Structuring Bills of Material for Automotive Remanufacturing", *Production and Inventory Management Journal*, 1993, Fourth Quarter, 46-52.

Lee, D-H. Kim, H-J, Choi, G. and Xirouchakis, P. Disassembly Scheduling: Integer Programming Models, *Proceedings of the Institution of Mechanical Engineers, Vol. 218, Part B: Journal of Engineering Manufacture,* 2004, 1357-1372.

Lee, D-H. Kang, J-G and Xirouchakis, P. Disassembly Planning and Scheduling: Review and Further Research, *Proceedings of the Institution of Mechanical Engineers, Vol. 215, Part B: Journal of Engineering Manufacture,* 2001, 695-709.

Lund, Robert T. Remanufacturing, *Technology Review*, 1984, 87, 18-26.

Manufacturing Systems, Decision Support Scheduling at Motorola, 1995, 13(4), 13-17.
Panisset, Brian D. MRP II for Repair/Refurbish Industries, *Production and Inventory Management*, 1988, Vol. 29, No. 4, 12-15.

Perry, James H. The Impact of Lot Size and Production Scheduling on Inventory Investment in a Remanufacturing Environment, *Production and Inventory Management Journal*, 1991, Vol. 32, No. 3, 41-45.

Philipoom, P. R. and Markland, R. E., and Fry, T. D. Sequencing Rules, Progress Milestones and Product Structure in a Multistage Job Shop, 1989, *Journal of Operations Management*, 8, 209-229.

Richter, K. Sombruzki M. Remanufacturing Planning for the Reverse Wagner/Whitin Models. *European Journal of Operational Research,* 2000; 121: 304-315.

Richter, Knut and Weber, Jens, "The Reverse Wagner/Whitin Model with Variable Manufacturing and Remanufacturing Cost", *International Journal of Production Economics*, 2001, 71, 447-456,

Russell, R. S. and Taylor B. W. An Evaluation of Sequencing Rules for an Assembly Shop*, Decision Sciences*, 1985, 17, 219-2332.

Souza, G. C. Ketzenberg M. E. Guide, Jr. V.D.R. Capacitated Remanufacturing with Service Level Constraint,. *Production and Operations Management* 2002; 11: 231-248.

Souza, G. C., and Ketzenberg, M. E., "Two Stage Make-to-Order Remanufacturing with Service Level Constraints", *International Journal of Production Research*, 40(2), 477-493, 2002.

Stanfield, Paul M., King, Russell E. and Hodgson, Thom J., "Determining Sequence and Ready Times in a Remanufacturing System", *IIE Transactions*, 2006, 38, 597-607

Stanfield, Paul M., Wilson, J.R. and R. E. King, Flexible Modeling of Correlated Operations Times with Applications in Product-Reuse, 2004, Volume, 42, No. 11, 2179-2196.

Stix, G. Green Machine: Volkswagen Gears Up to Recycle Autos, *Scientific American*, 266, 1992, 140-141.

Sum, Chee-Choung, Png, Daniel Oon-Sen, and Yang, Kum-Khiong, Effects of Product Structure Complexity on Multi-level Lot Sizing, *Decision Sciences*, 1993, vol. 24, No. 6, 1135-1155.

Taleb, K N, Gupta S M, Brennan. L.   Disassembly of complex product structures with parts and materials commonality, *Production Planning and Control* 1997a; 8(3): 255-269.

Taleb, K N, Gupta S. M. Disassembly of Multiple Product Structures, *Computers and Industrial Engineering* 1997b; 32(4): 949-961.

Tang, Ou., Grubbstrom, R.W., Zanoni, S., "Planned lead time determination in a make-to-order remanufacturing system", *International Journal of Production Economics*, 2007, 108, 426-435.

Tang, Ou, Teunter, Ruud. Economics Lot Scheduling Problem with Returns, *Production and Operations Management,* 2006, Vol. 15, No. 4, 488-497.

Teunter R H, Vlachos D. On the necessity of a disposal option for returned items that can be remanufactured. *International Journal of Production Economics,* 2002; 75: 257-266.

Torres, F., Gil, P. and Puente, S. T. Automatic PC Disassembly for Component Recovery, *International Journal of Manufacturing Technology*, 2004, Vol. 23, 39-46.

van der Laan E. Salomon M. Production planning and inventory control with remanufacturing and disposal, *European Journal of Operational Research* 1997; 102: 264-278.

van der Laan E. Dekker R. Salomon M. Product Remanufacturing and Disposal: A Numerical Comparison of Alternative Control Strategies, *International Journal of Production Economics* 1996; 45: 489-498.

van der Laan E. Salomon M. Dekker R. Van Wassenhove L. Inventory Control in Hybrid Systems with Remanufacturing, *Management Science* 1999; 45(5): 733-747.

van der Laan E. Salomon M. Dekker R. An Investigation of Lead-Time Effects in Manufacturing/Remanufacturing Systems under Simple PUSH and PULL Control Strategies, 1999; 115: 195-214.

Veerakamolmal, Pitiopong and Gupta, Surendra M. High-mix/low-volume Batch of Electronic equipment Disassembly, *Computers and Industrial Engineering*, 1998, Vol. 35, Nos. 1-2, 65-68.

Wolfe, P.R. BMW Takes Leadership Role in Automotive Recycling, *Recycling Today*, 29, September 1991, 48.

Zhou L. Naim M. M. Tang O. Towill D. R. Dynamic a Performance of a Hybrid Inventory System with a Kanban Policy in Remanufacturing Process, *Omega* 2006; 34: 585-598.

TABLE 1
REMANUFACTURING SCHEDULING COMPLEXITIES AND ISSUES[1.]

- Mission or objective/objective function
- Need for a reverse, rather than forward, logistics network and operations
- Facility location decisions (location decisions now must consider recovery, transport, and remanufacturing considerations)
- Stochastic demands
- Balancing returns with demand
- Remanufacture or sell product as is
- Single vs. multiple stage operations
- In line vs. off-line rework
- Buffer stock location decisions
- Resource availability and allocation (particularly for facilities that produce new products and remanufacture returned items)
- One versus multiple products
- Product structure considerations (e.g., material or part commonality)
- Focused versus integrated (scheduling one or more than one operation simultaneously)
- Sourcing decisions (number of cores needed from returns, brokers, and new production and when)
- Uncertain timing and quantity of core returns
- Capacity restrictions per operation and for inventories
- Uncertainty in recovery materials or parts quality (material recovery rate or yield)
- Inaccuracies in grading returned product/component quality
- Uncertain routing for materials and parts in the remanufacturing operations
- Highly variable and uncertain processing (disassembly, reprocessing, and/or assembly) times
- Lot sizing
- Order release mechanisms
- Priority scheduling rules
- Scheduling for single vs. multiple time periods
- Complication of material or parts matching restrictions
- Accumulation of excess inventories for certain kinds of materials or parts
- Scheduling methodology employed (RMRP, mathematical programming, heuristic, queuing theory, computer simulation, etc.)
- Allowing backlogging

List compiled from Krupp 1993; Brennan, Gupta and Taleb 1994; Guide 1997(a); Guide 2000; Flapper, Fansoo, Broekmueulen and Inderfurth 2002; Sousa, Ketzenberg, and Guide 2002; Lee, Kim, Choi, and Xirouchakis 2004; and Kim, Lee, and Xirouchakis 2007.

TABLE 2
AN ANALYSIS OF REMANUFACTURING SCHEDULING RESEARCH

Reference	Year	Operations Focus	Production Strategy	Product-Related	Process-Related	Work Schedule Related	Performance Measurement/ Objective Criteria	Quantitative Methodology
Panisset	1988	I	MTO	S, NC	IC, US	PO, D	MRP	MMRP
Krupp	1991	I	MTS	M	US	MP, D	MRP	MMRP
Perry	1991	I	MTO	M	FC	MP	MLL	
Krupp	1993	I	MTS	M, NC	IC, US	D*	MRP	MMRP
Gupta and Taleb	1994	DS	MTS	S, NC	IC, KS	MP, D	MRP	RMRP
Clegg, Williams, Uzsoy	1995	I		S, NC	IC, KS	D		LP
Hoshino, Yura and Hitomi	1995	I	MTS	S, NC	IC, KS	MP, D	MC	GP
Guide	1996	I	MTO	S, NC	FC, US	MP, ST	MC(1)	SIM, DBR
Guide	1997	I	MTO	S, NC	FC, US	MP, ST	MC(2)	SIM, PDR, DBR
Guide and Srivastava	1997a	I	MTO	S, NC	FC, US	MP, ST	MC(3)	SIM, MMRP, PDR, ORS
Guide and Srivastava	1997b	I		S, NC		MP, ST	MC(4)	SIM, MMRP
Guide, Kraus, Srivastava	1997	I		S, NC	US	MP, ST	MC(5)	SIM, PDR, DRM
Guide, Srivastava, Kraus	1997	I		S, NC	US	MP, ST	MC(5)	SIM, PDR
Guide and Spencer	1997	I	MTO	S, NC	FC, US	MP, D*	MRP	RCCP, MBOM, MBOR
Guide, Srivastava, Spencer	1997	I	MTO	S, NC	FC, US		MIN Δ CAP	SIM, RCCP
Taleb, Gupta, and Brennan	1997a	DS	MTS	M, PC	IC, KS	MP, D	MIN #, MRP	RMRP
Taleb and Gupta	1997b	DS	MTS	M, PC	IC, KS	MP, D	MRP, Min H	RMRP, HR
Guide and Srivastava	1998	I	MTO	S, NC	FC, US	MP, ST	MC(6)	SIM, DRM
Guide, Srivastava, Kraus	1998	I	MTO	S, NC	FC, US	MP, ST	MC(5)	SIM, PDR
Kizilkaya and Gupta	1998	I	MTS	M, NC	IC	ST	MC(9)	SIM, DBR(FKS)

Reference	Year	Operations Focus	Production Strategy	Product-Related	Process-Related	Work Schedule Related	Performance Measurement/ Objective Criteria	Quantitative Methodology
Veerakamolmal and Gupta	1998	I	MTS	M, PC	AS	SP, D	MC(8)	HR
Guide, Jayaraman and Srivastava	1999	I	MTO	M, NC	FC, US	MP, ST	MC(7)	SIM, DRM
Neuendorf, Lee, Kiritsis, Xirouchakis	2001	DS		S, PC	IC, KS	MP, D	Min. #	PNets
Kongar and Gupta	2002	DS	DTO	M, PC	IC, KS	SP,D	Min. S+H, Max. M, Min. CD, Min NDIS, Max. Profit, Min CAP	IGP
Lambert and Gupta	2002	DS	DTO	M, PC	IC, KS	MP, D	Max. Profit	MIP
Lee, Xirouchakis, Zust	2002	DS		S, NC	FC, KS	MP, D	Min. P+H+D	IP
Kim, Kee, Xirouchakis, Zust	2003	DS		M, PC	IC, KS	D, MP	Min. S+D+H	HR, IP, LPR
Lee, Kim, Choi, Xirouchakis	2004	DS		S, M, PC, NC	IC, KS	D, MP	Min. P+S+D+H	IP
Kim, Lee, Xirouchakis	2006a	DS		M, PC	IC, KS	MP	Min. S+D+H	HR,LP,DP
Kim, Lee, Xirouchakis	2006b	DS		S, NC	FC, KS		Min S+D+H	LHR, LP
Kim, Jeon, Kim, Xirouchakis	2006e	DS		S, NC	FC, KS	D, MP	Min #	IP
Kongar and Gupta	2006	DS	DTO	M, PC	IC, KS	SP, S	Min. S+H, Max. M, Min. CD, Min NDIS, Max. Profit, Min CAP	FGP
Langella	2007	DS		M, PC	IC, KS	MP, D	Min P+S+H+D	HR
Barb-Guitierrez and Gupta	2008	DS		M, NC	IC, KS	D, MP	Min. S+O	RMRP

_____

Key:

Operation Focus:	Production Strategy:	Product-Related:	Process- Related:	Work Schedule-Related:

Operation Focus:
DS = Disassembly
RE = Remanufacturing/Repair
RA = Reassembly
I = Integrated

Production Strategy:
MTS = Make-to-Stock
MTO = Make-to-Order
ATO = Assembly-to-Order
DTO = Disassembly-to-Order

Product-Related:
S = Single Product
M = Multiple Products

PC = Product Commonality
NC = No Product Commonality

Process- Related:
IC = Infinite Capacity
FC = Finite Capacity

KS = Known sequence
AS = Adaptive sequence
US = Uncertain Sequence

Work Schedule-Related:
PO = Project Oriented
SP = Single Period
MP = Multiple Periods

D = Deterministic Task Times
D* = Task times are deterministic, but multiple BOMs are developed to account for varied component recovery and usage rates
ST = Stochastic Task Times

OBJECTIVE FUNCTIONS:
MRP = Right quantity – right time
Min # = Min. number of root items used to satisfy demand
Min H = Min holding cost = Min H
Min. S+H = Min. costs (set-up + holding cost)
Min. D = Min. disassembly costs
Min. D+H = Min. costs (disassembly + holding)
Min. S+D+H = Min. costs (set-up + disassembly. + holding)
Min. P+S+D+H = Min. costs (purchase + set-up + disassembly + holding)
Min. P+S+H+D = Min (purchase + separation + holding + disposal)
Min. E(P+D+DI) = Min. expected costs (purchase + disassembly + disposal)
Max. Profit = Max profit (revenue – disassembly – disposal)
MLL = Min lot sizes and lead times
CS = Completion to schedule
WIP = Min WIP
Max = Max throughput
Min. FT = Min flowtime =
Min. ΔCap = Min. actual – estimated capacity level deviation
MC = Multiple criteria
MC(1) = Minimize CS, Min. WIP, Max throughput, Min. FT
MC(2) = Min. (FT, Min. lateness,. % of parts expedited, % tardy), Max throughput
MC(3) = Min. WIP, tardiness, FT, Idle time, Max throughput
MC(4) = Min. (% stockout, safety stock level)
MC(5) = Min. (FT, tardiness, % tardy, root mean square tardiness)
MC(6) = Min. (FT, lateness, reassembly delay)
MC(7) = Min. (FT, root mean square tardiness, % tardy)
MC(8) = Min. (Machine idle time, makespan)
MC(9) = Min. (Completion time, shortages, and WIP)

OBJECTIVE FUNCTIONS CONT'D
Max. M = Max material sales
Min. NDIS = Min number of disposed items
Min. H = Min number of stored items
Min. CD = Min cost of disposal
Min. CAP = Min cost of preparation

_____

QUANTITATIVE METHODOLOGY:

MMRP = Modified Materials Requirements Planning
RMRP = Reverse Materials Requirements Planning
HR = Heuristic
LHR = Lagrangean Heuristic
LP = Linear programming
IP = Integer Programming
MIP = Mixed Integer Programming
B&B = Brand and Bound
NLP = Nonlinear Programming
GP = Goal Programming
Q = Queuing Theory
SIM = Computer Simulation
PNets = Petri Nets
DBR = Drum-Buffer-Rope
DBR(FKS) = Drum-Buffer-Rope with Flexible Kanban System
PDR = Priority Dispatching Rule
ORS = Order Release Strategy
DRM = Dispatching Release Mechanism
MBOR = Modified Bill of Resources
MBOM = Modified Bill of Materials
DP = Dynamic Programming
LPR = Linear Programming Relaxation
FGP = Fuzzy Goal Programming

_____
[1] Three series of runs were made each for a single, but increasingly complex, product structure.
[2] The process sequence is established for each new product before the disassembly operation begins.

NEW ASSOCIATION IN BIO-S-POLYMER PROCESS

Long Flory

School of Business, Virginia Commonwealth University
Snead Hall, 301 W. Main Street, Richmond, VA 23284

ABSTRACT Small firms generally do not use designed experiments and statistical analyses that many large companies use to improve sustainability. This paper provides an example to small firms who wish to develop formidable capability over its competitors. The paper illustrates how a small firm leveraged designed experiments and statistical analyses to slash its production costs, enhance its organizational learning, and turn its problems to its advantage. This demonstration may encourage small firms to embrace statistical thinking and practice that derives competitive edge.

PART 1   INTRODUCTION

ABS Bio, Inc. is a small biotechnology company producing two staple products, Bio-S-Polymer and H2-E. Bio-S-Polymer is an effective waste water treatment medium. The production process of Bio-S-Polymer is summarized in **Figure 1**. During the production, the reaction vessels are sealed to control inside temperature, humidity and pressure in the specific ranges. Each of the reaction vessels produces one cubic foot of Bio-S-Polymer after a fixed amount of Bio-Bases reacts with the three fuels (fuel 1, fuel 2 and fuel 3) to formulate special molecule-chains called Bio-S-Chains of Bio-S-Polymer. The more Bio-S-Chains there are in one cubic foot of Bio-S-Polymer, the higher is the quality of Bio-S-Polymer. The number of Bio-S-Chains in one cubic foot of Bio-S-Polymer is defined by the quantities of the three fuels (quantity of fuel 1 = e1, quantity of fuel 2 = e2, quantity of fuel 3 = e3).
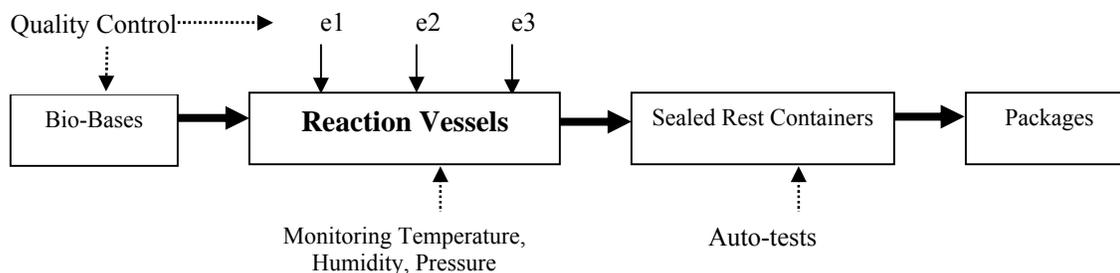
Figure 1: Bio-S-Polymer Production Process

In 2007, ABS Bio improved the reaction vessels of its Bio-S-Polymer process (Process-99). Unlike the old reaction vessels (99-Vessels), the new vessels (07-Vessels) reduce the variation of humidity and thus, increase the quality of Bio-S-Polymer. Unfortunately, 07-Vessels increase the production costs. To account for the increased production costs, the company implemented a 14% price increase to its Bio-S-Polymer. Yet, many existing customers were only willing to accept a price increase less than 8%, and ABS Bio lost a number of its customers. September 2008, ABS Bio teamed with Crystal Consulting, a business consulting firm, to seek ways to reduce the cost of the new Bio-S-Polymer process, Process-07.

Page 1 of 9

After preliminary analysis, the managers in ABS Bio believed that reducing production costs of Process-07 required a new design and that the best solution was to roll back 99-Vessels while improving the design of Process-07. However, the consultant from Crystal Consulting proposed a possible alternative by questioning the perceived association between the input fuels and the output Bio-S-Chains in Process-07. In Process-07, ABS Bio used the same relationship between the output and the input as they did in Process-99. The relationship in Process-99 between the number of Bio-S-Chains in one cubic foot of Bio-S-Polymer and the quantities of the three fuels (e1, e2 and e3) is described by the empirical equation (1), Bio-S-Equation.

$$\hat{Y} = 39.8 + 7.6\ e1 + 1.07\ e2 + 0.65e3 \qquad\qquad (1)$$

The consultant reasoned that Process-07 might change the relationship depicted by Bio-S-Equation. If the fuel-consumption is less in Process-07 than in Process-99, the production costs may be lowered considerably. ABS Bio accepted the proposal of the consultant, and commissioned a project team to conduct an experiment, Process-07 Experiment, to answer three key questions.

1. Does Bio-S-Equation best describe the relationship between the output Bio-S-Chains and the input e1, e2 and e3 in Process-07? (Hereinafter, "the output Bio-S-Chains" may present as "the output", and "the input e1, e2 and e3" as "the input".)

2. If the answer to question 1 is "No", what is the best empirical function that describes the relationship between the output and the input in Process-07?

3. Does the new relationship offer a reduction in the input, leading to a significant reduction in the production costs, so that the price of Bio-S-Polymer may meet the customers' expectation?

PART 2   DESIGNING PROCESS-07 EXPERIMENT

Part 2.1 Statement of Project Objectives

Establish an appropriate regression equation to describe the association between the output and the input in Process-07; examine whether the input can be reduced in achieving the quality standard of Process-07 and whether the reduction in the input can lower the price of Bio-S-Polymer as required by the customers. If all these can be done, new specifications and price policies will be established and implemented.

Part 2.2 Statement of Current Subject-Matter Knowledge

Bio-S-Equation was established via operational experience for Process-99. Since Process-07 reduces the variation of humidity inside the reaction vessels and improves the quality of B-S-Polymer, it is reasonable to perceive that Process-07 may establish a different relationship between the output and the input.

Part 2.3 Variables to Be Studied

Response Variable	**How Measured**
The number of Bio-S-Chains in one cubic foot of Bio-S-Polymer**:**	
The output Y	read auto-tests, use trillion as unit

Potential Predictor Variables	Value of Selection
1) The quantity of fuel 1 (e1)	see **Table 1,** use kg as unit
2) The quantity of fuel 2 (e2)	see **Table 1,** use kg as unit
3) The quantity of fuel 3 (e3)	see **Table 1,** use kg as unit

Background Variables	How to Control or Measure
1) Temperature	Controlled constantly at the specification
2) Pressure	Controlled constantly at the specification
3) Humidity	Controlled constantly at the specification
4) Quality of Bio-Bases	Controlled constantly at the specification
5) Quality of E1	Controlled constantly at the specification
6) Quality of E2	Controlled constantly at the specification
7) Quality of E3	Controlled constantly at the specification
8) Accuracy of testing equipment	Gauged to the same standard in each trial
9) Monitoring and testing methods	Automatic and consistent during the experiment
10) Operator	Two operators rotated, record operator's name
11) Process	One vessel controlled at standard conditions
12) Reaction duration	Production length: 145 minutes per trial

Because the production process is sealed from the outside environment, the time when trials were conducted does not have discernable effect on Y. So, time was not regarded as a background variable. The background variable, өOperator, may have discernable effect on the response variable Y. The team created a dummy variable EP (EP = 1 for one operator, EP = 0 for the other) for examining whether өOperator indeed had discernable effect on the sample output Y (see **Table 1**).

Part 2.4 Method of Observation and Randomization

The sample output Y (see **Table 1**) was observed in the twenty trials conducted in the twenty consecutive mornings, starting at 8:30am and lasting 145 minutes each morning. Randomly ordered by the computer, each of the twenty sets of e1, e2 and e3 (see **Table 1**) was used once. One of the two operators selected randomly by the computer operated the experimental Process-07 each morning.

Part 2.5 Generalization

The ranges of e1, e2 and e3 (see **Table 1**) include the possible values in the regular production. All the processing conditions in the experiment met Process-07 production standards.

Part 2.6 Design Matrix (see **Table 1**)

Part 2.7 Methods of Statistical Analyses

Any unusual observation of Y would be investigated and removed only when objective evidence indicated that the unusual observation did not represent the situation under study. The removal of an unusual observation should be recorded in the experiment documents. Graphical analyses of the sample data and residuals were conducted to examine visually the relationship between Y and e1, e2 and e3, assess the quality of the data and the validation of the assumptions, and probe possible ways to improve the-best-fit model. A thorough regression analysis was conducted to ensure that the final regression equation had a conceptual basis, fitted the sample data, and was free of any discernable deficiencies.

Table 1: Sample Data

e1	e2	e3	Y	EP
34	166	149	1431	1
58	110	148	2004	0
3	158	156	443	0
63	136	163	2120	1
19	106	163	773	0
55	122	170	1890	1
35	128	176	1377	0
34	141	178	1388	0
44	166	183	1683	0
31	173	187	1327	1
42	135	189	1542	1
61	123	191	2135	0
81	97	196	2654	1
75	129	196	2521	0
63	172	208	2223	1
46	96	210	1571	0
79	150	216	2752	0
3	167	172	481	1
25	108	219	1064	0
40	177	223	1628	0

PART 3 GRAPHICAL AND INFERENTIAL ANALYSES

Part 3.1 Graphical Analyses

Graphs 1 ~ 4 provide visual reviews of the sample data Y against each of e1, e2, e3 and EP. The sample output Y is strongly related to e1 with a positive linear association. No appreciated relationship exists between Y and e2, as well as e3 or EP. No indication of outliers is in the graphs.

Graph 3 (Y Against e3) and Graph 4 (Y Against EP)
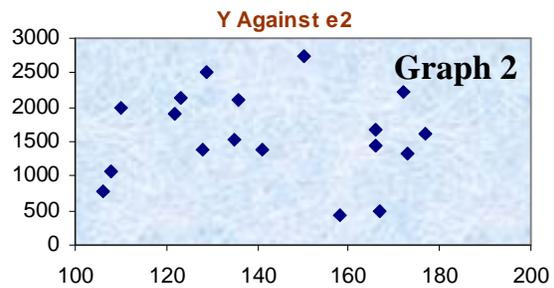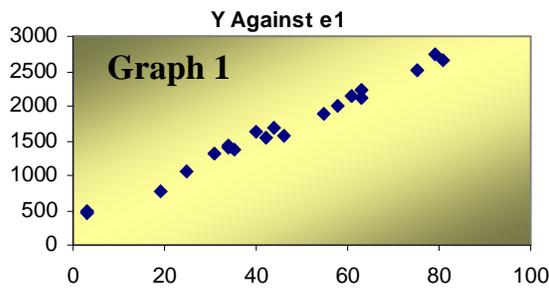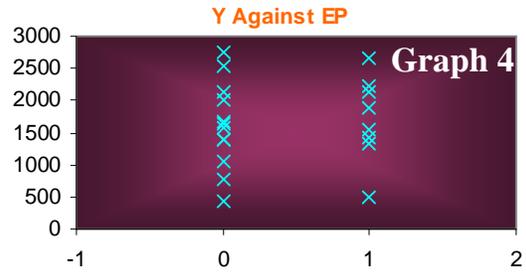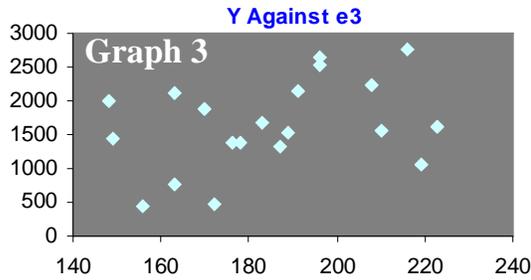
Part 3.2 Regression Analyses

The team started exploring the linear regression function with 11 terms – e1, e2, e3, EP, $(e1)^2$, $(e2)^2$, $(e3)^2$, e1*e2, e1*e3, e2*e3 and e1*e2*e3 – by using the Forward and Backward Stepwise procedure in Minitab. The procedure resulted in the least square equation, Function A (see **Table 2**), the evaluation to which follows.

Response is Y on 11 predictors, with N = 20 (Alpha-to-Enter: 0.05; Alpha-to-Remove: 0.05)
Function A: $\hat{Y}$ = 21.56 + 29.64 e1 + 2.23 e2

	T-values	**P-values of T-statistic**	Source	DF	SS	MS	F	P
e1	71.71	0.000	Regression	2	8173223	4086612	2663.70	0.000
e2	6.42	0.000	Residual Error	17	26081	1534		
R^2 = 99.68% R^2 (adj) = 99.64%			Total	19	8199305			

Source	DF	Seq SS		
e1	1	8109939	F(e1) = 8109939/1534 = 5286.79	P(e1) = 0.000
e2	1	63284	F(e2 | e1) = 63284/1534 = 41.25	P(e2 | e1) = 0.000

Table 2: Function A with e1 and e2

- Function A makes sense – in the ranges of e1 and e2 given in **Table 1**, if e1 or e2 has discernable effect on the output Y, the effect should be positive when everything else is held constant at the specific standard condition.

- The R^2 and adjusted-R^2 are almost perfect and identical (99.68% and 99.64%). The P-value of the F statistic is zero. So, Function A explains almost 100% of the variation in the sample output Y.

- Each of e1 and e2 has discernable incremental contribution to explaining the variation in the sample output Y after the effect of the other is accounted for. P-values of the T statistics are zero for both of the e1 and e2 coefficients, and P-values of the Partial F statistics, F (e1) and F (e2 | e1), are zero.

In order to provide convincing results, these questions need to be answered.

➢ Does e3 have any effect on the variation in the sample output Y?

➢ What is the individual effect of each e1 and e2 on the variation in the sample output Y?

➢ How much better is Function A than the other first-order linear functions involving e1, e2, e3 and EP?

To answer the questions, eight first-order linear equations were analyzed (see **Table 3**). The eight equations are designated as RE1, RE2, RE3, RE4, RE5, RE6, RE7 and RE8 respectively.

Regression Equation	MSE	F-value (F statistic)	P-value (F statistic)	T-value (T statistic)	P-value (T statistic)	Adj. R^2
$\hat{Y}$ =362+28.9e1 (RE1)	4965	1633.51	0.000	e1: 40.42	e1: 0.000	98.8%
$\hat{Y}$ =1722-0.59e2 (RE2)	439695	0.65	0.431	e2: -0.80	e2: 0.431	0.0%
$\hat{Y}$ =-224+10.2e3 (RE3)	398207	2.59	0.125	e3: 1.61	e3: 0.125	7.7%
$\hat{Y}$ =231+ 28.7e1+0.775e3 (RE4)	4942	821.06	0.000	e1: 37.86 e3: 1.04	e1: 0.000 e3: 0.313	98.9%
$\hat{Y}$ =406-4.60e2+10.2e3 (RE5)	404571	0.63	0.224	e2: -0.85 e3: 1.60	e2: 0.409 e3: 0.128	6.2%
$\hat{Y}$ =-56.6+29.5e1+2.19e2+0.501e3 (RE6)	1492	1826.43	0.000	e1: 67.78 e2: 6.35 e3: 1.22	e1: 0.000 e2: 0.000 e3: 0.243	99.7%
$\hat{Y}$ = 1612 + 97 EP (RE7)	453012	0.10	0.756	EP: 0.32	EP: 0.756	0.0%
$\hat{Y}$=5.6 +29.7e1+2.41e2-31.9 EP (RE8)	1351	2017.88	0.000	e1: 75.82 e2: 7.08 EP: -1.82	e1: 0.000 e2: 0.000 EP: 0.088	99.7%

Table 3: Eight First-order Linear Regression Equations

The statistics in **Table 3** provide the following insights on the relationship between the input and the output of Process-07 in the ranges of e1, e2 and e3 given in **Table 1.**

1. e1 by itself has discernable contribution to the variation in the sample output Y; for RE1, the P-value of the F statistic is zero, as well as the P-value of the T statistic of e1 coefficient. The adjusted R^2 of RE1 is very high 98.8%. e1 has discernable incremental effect on the sample output Y in the presence of e2 and/or e3; for RE4 and RE6, the P-values of the T statistics of e1 coefficients are zero.

2. In the presence of e2 and/or e3, e1 presents dominant influence on the sample output Y – For each of RE4 and RE6, the absolute value of the T statistic of e1 coefficient is significantly greater than that of either e2 or e3 coefficient.

3. Neither e2 nor e3 has discernable individual contribution to the variation in the sample output Y; for RE2 and RE3, both P-values of the F statistics are greater than 0.05, as well as the P-value of the T statistic of e2 or e3 coefficient. e3 does not have discernable incremental effect on the sample output Y in the presence of e1 and/or e2 because in RE4, RE5 and RE6, the P-values of the T statistics of e3 coefficients are greater than 0.05. Similarly, e2 does not have discernable incremental influence on the sample output Y in the presence of e3, but does after the effect of e1 is taken into account.

4. By the same token, EP has no discernable contribution to explaining the variation in the sample output Y either by itself or in the presence of e1 and e2, referring to RE7 and RE8.

Finally, Function A is obviously more efficient and effective to explain the relationship between the output and the input of Process-07 than any of the eight first-order functions in **Table 3**. Thus, the team selected Function A for the final evaluation.

Part 3.3 Examining Validation of Assumptions and Possible Improvement

Graph 5 displays the residuals of Function A against e1, e2, e3 and Y. **Graph 6** depicts the normal probability plot of the residuals of Function A.
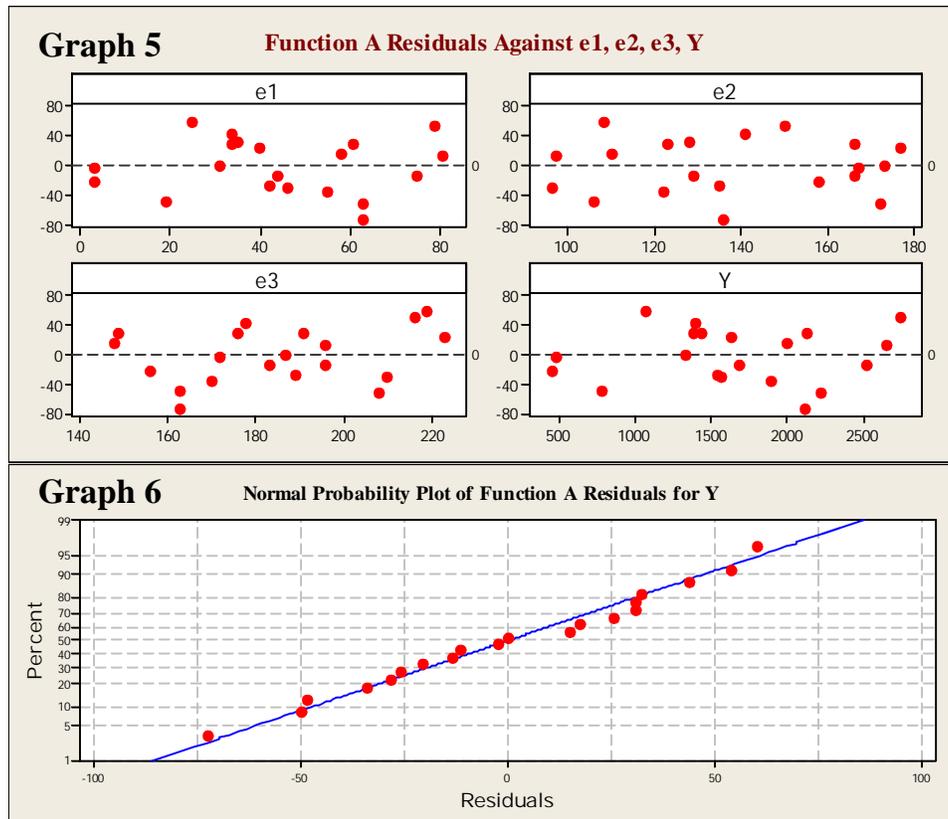
The analysis of **Graphs 5 ~ 6** is preceded along with the inferences for Process-07 Experiment.

- There seems no additional relationship between the sample data Y and e1, as well as e2 or e3 except the association described by Function A because the residuals against e1, e2 and e3 spread randomly in horizontal bands centered round zero in general.

- The residuals against Y randomly reside in a horizontal band centered round zero, and the sample errors associated with the sample data Y distribute normally. So the assumption of constant error variance seems valid, and the assumption of normally distributed random errors is satisfied.

- The graphs indicate no appreciable outliers in the sample data Y.

- The assumption of independent random errors associated with the sample data Y seems valid; the residuals against e1, e2 and Y do not present appreciable patterns.

PART 4   CONCLUSIONS

Process-07 Experiment has discovered that in the ranges of e1, e2 and e3 given in **Table 1,**
- Bio-S-Equation is not appropriate to describe the relationship between the output and the input in Process-07.
- Function A named as Process-07 Equation – equation (2) hereinafter – is the best empirical equation to describe the relationship between the input and the output in Process-07.

$$\hat{Y} = 21.56 + 29.64\ e1 + 2.23\ e2 \tag{2}$$

In Process-07 Equation, e1 has much more influence on the sample output Y than e2 does; the T-value of e1 coefficient is 71.71 versus that of e2 coefficient 6.42. The constant term 21.56 does not have practical meaning because Bio-Bases alone can not generate Bio-S-Chains. Process-07 Equation also reveals that in the ranges of e1, e2 and e3 given in **Table 1,**
- if e2 is held constant, the average number of Bio-S-Chains in one cubic foot of Bio-S-Polymer increases by about 29.64 trillions for every one kg increase of e1 (95% confidence).
- if e1 is held constant, the average number of Bio-S-Chains in one cubic foot of Bio-S-Polymer increases by about 2.23 trillions for every one kg increase of e2 (95% confidence).

In Process-07 production, Process-07 Equation can provide the estimate of not only the average but also the individual number of Bio-S-Chains in one cubic foot of Bio-S-Polymer for a specific set of input e1 and e2 from the ranges given in **Table 1.**

ABS Bio confirmed that the sample output Y from Process-07 Experiment met the product quality setup for Process-07 in terms of the combinations of e1, e2 and e3 given in **Table 1**.The comparison between Bio-S-Equation and Process-07 Equation provides these implications that are consistent with the fact of the quality improvement in Process-07.

- For the same sets of e1, e2 and e3 given in **Table 1**, the number of Bio-S-Chains in one cubic foot of Bio-S-Polymer produced by Process-07 is 1.33 ~ 2.99 times of that produced by Process-99 when everything else is held constant at the production standards.

- Every one kg increase of e1 in the range of e1 given in **Table 1** will result in about 22.04 trillions (22.04 = 29.64 – 7.6) more increase of the number of Bio-S-Chains in one cubic foot of Bio-S-Polymer in Process-07 than in Process-99 – when e2 and e3 are held constant at the levels given in **Table 1,** and everything else is held constant at the production standards.

- Every one kg increase of e2 in the range of e2 given in **Table 1** will result in about 1.16 trillions (1.16 = 2.23 – 1.07) more increase of the number of Bio-S-Chains in one cubic foot of Bio-S-Polymer in Process-07 than in Process-99 – when e1 and e3 are held constant at the levels given in **Table 1,** and everything else is held constant at the production standards.

Examining Process-07 Equation with the new data from the actual Process-07 production after Process-07 Experiment, ABS Bio has validated that Process-07 Equation best represents the relationship between the input and the output of Process-07, given the ranges of e1, e2 and e3 in **Table 1.**

PART 5   EXCEEDING PROJECT OBJECTIVES

The analyses given above indicate that in the ranges of e1, e2 and e3 given in **Table 1**, fuel 3 has no effect on the quality of Bio-S-Polymer in Process-07. Consequently, if the production runs within the ranges of e1, e2 and e3 given in **Table 1**, fuel 3 can be removed from the inputs of Process-07, and the total cost associated to e3 (about 16% of the total production costs) can be saved. The removal of fuel 3 leads to simpler production process and quality control, resulting in additional cost saving.

Using Process-07 Equation in production planning within the ranges of e1 and e2 given in **Table 1**, ABS Bio has reduced production costs of Process-07 about 20%, and therefore, has reduced the price of its Bio-S-Polymer up to 11%. ABS Bio exceeds the expectation of its customers. The company provides much higher quality of Bio-S-Polymer yet only 1% higher price than do its competitors. ABS Bio has used Process-07 Equation to establish new standards and marketing strategies for its Bio-S-Polymer since the regular production is within the ranges of e1 and e2 given in **Table 1**. Consequently, ABS Bio has not only won back the lost customers but also increased market share 3% and sales 17% despite the worldwide recession.

PART 6   FURTHER BENEFIT

1. Applying designed experiments and statistical analyses, ABS Bio has turned the risk from changing the reaction vessels in 2007 to great competitive advantage. The company has resolved the risk with only a fraction of the cost and the time required by a process redesign.

2. ABS Bio has developed a great appreciation for applying designed experiments and statistical analyses in problem solving.

3. The company has conducted a series of statistical experiments, using the other ranges of e1, e2 and e3, and has gained an in-depth knowledge about the relationship between the output and the input of Process-07. As a result, ABS Bio is more ready to meet the changes in market demand.

4. Through additional designed experiments and statistical analyses, ABS Bio has studied the effect of the temperature, humidity and pressure inside the reaction vessels of Process-07 on the quality of Bio-S-Polymer. The studies have revealed new ways to streamline the production process and continue reducing the production costs.

5. Learning from the Process-07 Experiment, ABS Bio has implemented a plan to excise good statistical quality control on Process-07. The plan includes training operators to improve their performance.

6. ABS Bio is on its way to develop an organizational culture of statistical thinking in problem solving and decision marking. The company has learned that statistical thinking improves the company's ability to anticipate market changes successfully and to gain advantage that is hard copied by its competitors.

Ohio Art: A Case Study in Global Outsourcing

James A. Pope, College of Business Administration, University of Toledo
jpope@utoledo.edu

Ohio Art was founded in Bryan, Ohio, in 1908. They have specialized since in making of toys for children. [5] In the late 1950's, they acquired the rights to a toy developed in France—the Etch A Sketch. [4] Ohio Art added the toy to its product line in 1960 at a price of US$3.99. Although the mechanism is fairly complex, the Etch A Sketch is easy to use. The user manipulates two knobs which control the x- and y-axis of a line drawn inside the toy on pane of glass covered with an aluminum powder. When the user wishes to start over, he or she simply turns the toy upside down and shakes it to erase the lines and start with a clean slate. Etch A Sketch quickly became an almost iconic toy, not only among children, but also with a niche of artists specializing in Etch A Sketch drawings. The Ohio Art web site, for example, shows portraits of their top management drawn on Etch A Sketches.[5] It was even the subject of the most popular Dilbert cartoon ever (3 April 1995). [2]

In the 1980s and 1990s, stores such as WalMart, Toys-R-Us and Target became the main retailers of toys. Their objectives were to be low cost sellers of children's toys. As a result, Ohio Art was under increasing pressure to keep down their costs and prices. The expectation was that the Etch A Sketch toy would sell for under US$10, less than half of its inflation adjusted price when it was introduced (US$23.69). [6] In the late 1990s, with the burden of U.S. labor costs and corresponding health care benefits, Ohio Art decided to move production of all its toys, including Etch A Sketch, off-shore to China. Although their financial reports do not break out results for individual toys, their 10-K reports show clearly that they were losing money steadily in the 1990s. [1]

They contracted with Kin Ki Industrial in Shenzhen, near Hong Kong. [6,4] Although they gained a labor cost advantage by moving production to China, it came with other costs, most hard to quantify.

There are several dimensions in which operations can work to support the organizational strategy. One, obviously, is cost. Because operations was unable to produce at a low enough cost, the firm chose to move production to China where the delivered cost of Etch A Sketch was 20 to 30 percent less than the cost of making it in Bryan. This was accomplished primarily by paying the workers US$0.24 per hour in China instead of US$9 in Ohio.[6]

Operations lost the ability to work in other dimensions, however. Because the toys are made in China and the bulk of toy sales is during the end-of-year holiday season, Ohio Art must forecast sales far in advance and place their orders months ahead of when they are needed. This means they have virtually no flexibility in changing the volume of production. For example, if a media personality of some type were seen using an Etch A Sketch in the fall months, demand might increase dramatically. If they were producing in Ohio, they could add over-time and shifts to increase production to meet the spike in demand. Likewise, if demand dropped, they could slow down production. With production in China, once an order has been placed, produced and put on a ship, that is what they will receive. They do not have the option of increasing or decreasing their orders.

Another dimension is quality. Although Ohio Art claims to be satisfied with the quality of the work coming from China, they would not catch any quality problems until the toys were delivered to them in Ohio. This could mean thousands of defective toys with no option to replace them in time for the holiday season. If they were made in Bryan, defects would be caught right away and they could take corrective actions.

Another cost that is hard to quantify is the increased risk in the logistics system. The toys are made in China, loaded in containers, and shipped to the U.S. via a major west coast port such as Los Angeles or Long Beach. They are then transshipped by truck or rail to Ohio. A real cost is the cost of carrying the inventory for the shipment time, which can stretch to months. The average time for shipments from China to reach U.S. shores (not their final destinations) is 45 days.[3] A less quantifiable risk is that the containers will not arrive or that they will be damaged enroute. Estimates of the numbers of containers lost at sea each year range from 2000 to 10,000. There are documented cases of containers full of toys, sporting goods and shoes being lost at sea and being washed up around the world. Other hazards are pirates and treacherous sea lanes. At the port, containers can be held up for a variety of reasons from congestion at the port to impoundment by the Customs Service.[7] In their 2004 10-K Report, the company stated that sales had been "…impacted by the West Coast dock strike." [1]

The company fairly quickly discovered a big risk in moving overseas—that of dealing with a vendor who is not completely honest. The New York *Times* did an exposé of Chinese toy manufacturers and featured Ohio Art in an article on 7 December 2003. It seems that the Kin Ki Industrial promised Ohio Art that their workers had work contracts, pensions, medical benefits, good food and comfortable dormitories on top of earning minimum wage or above. It turned out, according to the *Times*, that none of this was true. The workers were working seven days per week with no overtime, living in crowded conditions, being fed a scanty diet, and earning less than the Chinese minimum wage. The CEO of Ohio Art, William C. Killgallon, denied having knowledge of any of this and promised to visit China. The company lost a good deal of

good will and suffered a public relations disaster because they failed to monitor their vendor and simply accepted what they were told. [6]

The underlying problem is that many of the costs of global outsourcing are not quantifiable and do not appear in the company accounts. Labor costs obviously do appear in the accounts; but failure to take other costs which may not appear in the accounts into consideration, but which certainly affect the bottom line, can cause the outsourcing 'deal' to succeed or fail. Ohio Art is not alone. A 2008 Pricewaterhouse-Coopers survey of retail and consumer-goods companies revealed that a quarter of the companies could not quantify actual savings from outsourcing abroad. [3]

References
1. 10-K Reports for Ohio Art, Inc. retrieved from www.sec.gov

2. Adams, Scott, "20 Years of Dilbert," (Kansas City, MO: Andrews McMeel Publishing, LLC: 2008): 234.

3. Engardio, Pete, "China's Eroding Advantage," *Business Week*, June 15, 2009, p. 54-55.

4. http://dic.academic.ru/dic.nsf/enwiki/584001

5. http://www.ohioart.com

6. Kahn, Joseph, "Ruse in Toyland: Chinese Workers' Hidden Woe," New York *Times*, December 7, 2003.

7. Pope, James, "Dimensions of Supply Chain Security," *Southern Business Review*, Fall 2008, p. 21-27.

RISK MANAGEMENT:
A TOP PRIORITY FOR SUPPLY CHAIN MANAGERS

Richard W. Monroe, Wall College of Business, Coastal Carolina University, Conway, SC
rmonroe@coastal.edu
P. Richard Martin, Wall College of Business, Coastal Carolina University, Conway, SC

Abstract

In recent research by IBM, the Global Chief Supply Chain Officer Study [3], four hundred supply chain executives from organizations around the world were interviewed. The results of this research identified five major challenges for supply chain leaders:

- Cost containment
- Supply chain visibility
- Risk management
- Increasing customer demands, and
- Globalization

These five issues were identified as being "significant" or "very significant" in the way they impact companies' supply chains. This paper will focus on one of those challenges, risk management. We will review prior research to summarize the supply chain risks which have been identified and investigated. We will explore those primary supply chain risks further and discuss potential measures for reducing, mitigating and managing those risks.

Introduction

First we briefly explain the nature of supply chains and supply chain management. One source describes a supply chain or supply network as being composed of "different entities that are connected by the physical flow of materials" [6]. While the material flow is the motivation for designing a supply chain, other flows are naturally inherent in a supply chain. Information flow and financial flow are the other necessary elements to describe the full spectrum of supply chain flows.

The following definition for "supply chain management" (SCM) offers a succinct description of the critical elements:
"Supply chain management is the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders" [9].

From these descriptions we might surmise that significant risks will be associated with material (or product) flows and also with information flows. That means that the various supply chain linkages are potential sources of risk which may affect the material and information flows. The financial flow is also subject to risk which may take many forms such as exchange rate issues, credit worthiness of supply chain partners, and a variety of other issues.

In the following section we review a sample of the literature which focuses on supply chain risk. The literature selected is primarily from the most recent ten year period. We don't see this as a bias but rather a product of the state of research on this topic.

Literature Review

Common sources of supply chain risk which have been investigated in previous research include: location, logistics, order processing, purchasing, quality, supply lead time, supply availability, and demand [4][2][10].

A previous review by Tang [15] has listed and discussed the following sources of supply chain risk:
- Uncertain demand
- Uncertain supply yields
- Uncertain lead times
- Uncertain supply capacity
- Uncertain supply cost
- Uncertain price

The research also presents a series of "robust strategies for mitigating operational and disruption risks" [15].

Another publication suggests that risks take many forms including: – financial, "chaos", decision, and market risks [4]. The authors suggest that these risks result from a "lack of supply chain confidence" and that specifically there is a lack of confidence in the following supply chain elements:
- Order cycle time
- Order current status
- Demand forecasts given
- Suppliers' capability to deliver
- Manufacturing capacity
- Quality of the products
- Transportation reliability
- Services delivered [4].

The authors offer the following approaches to reduce risk. Risk can be mitigated by improving information access with greater accuracy and greater visibility throughout the supply chain. The basics of statistical process control can be used to identify "out-of-control" conditions in the supply chain and to provide alerts. Contingency plans and corrective actions can be provided to supply chain partners to achieve a more responsive, adaptive supply chain [4].

Mason-Jones and Towill [12] offer a generic model of supply chain uncertainty which is divided into four segments:
- Supply side
- Manufacturing process
- Demand side, and
- Control systems [12].

Clearly, the authors have included elements in this model which are consistent with a very broad view of risk.

In a very different approach to risk, Finch [7] investigated the size of supply chain partners as a factor that may increase risk for the buying firm in the relationship. His findings affirm the need for performing risk assessments and the need to exercise caution when selecting supply chain partners [7].

In a recent IBM study, 400 supply chain leaders were surveyed. Five major supply chain challenges were identified. Based solely on percentages, the top challenges are:

- Supply chain visibility (70% of respondents)
- Risk management (60%)
- Increasing customer demands (56%)
- Cost containment (55%), and
- Globalization (43%) [3].

When listed by priority the rankings change slightly. 'Cost containment' moves to the top position followed in order as listed below:

- Cost containment
- Supply chain visibility
- Risk management
- Increasing customer demands
- Globalization [3].

In either case, risk is prominently in the forefront of the minds of supply chain executives. "CFOs are not the only senior executives urgently concerned about risk; risk management ranks remarkably high on the supply chain agenda as well" [3].

These examples are a good representation of the ways that supply chain risk has been described in the literature. In particular it is a good representation of how risk has been broken into various elements related to supply chain management. In many of the examples, the dominant focus is on the risk that affects product flow. The full range of examples also indicates a growing concern for supply chain risk over the last ten years. These examples from the literature offer one perspective but in the next section we review some company examples.

Company Perspectives

There appears to be a dichotomy in the experiences and the approaches to supply chain risk management among companies. Some companies have gone through major supply chain disruptions resulting from a specific event and from that experience they have learned the importance of risk management. Other companies have smartly and proactively developed their plans to deal with potential supply chain risks and have executed those plans effectively when needed.

In the first group we can list Cisco Systems and Ericsson. In 2000, Cisco found themselves stuck with huge inventories after anticipating a certain demand level and then facing a significant decrease in market demand [5]. In 2000, Ericsson had a significant supply chain reduction due to a small fire at a supplier's factory [11]. In both of these cases the company was ill prepared and suffered a major disruption and/or significant additional costs. Ericsson's subsequent efforts for risk management have been documented by Norman and Jansson [13].

In the second group, Nokia and Publix Super Markets serve as examples. Nokia utilized the same supplier as Ericsson as mentioned above [11]. The difference is that Nokia had a contingency plan in the form of a backup supplier. The contingency plan is one example which indicates that Nokia did have a more realistic view of supply risks [11]. Publix Supermarkets is one of the companies listed among the AMR Top 25 Supply Chains for 2007 [1]. As described by AMR in summary comments about Publix, "Proactive disaster preparedness strategies hint at the

sophistication of its strategic thinking" [1]. The absence of major disruptions for both of these companies is the strongest evidence of their planning and consideration of supply chain risks.

There are some other excellent examples of companies and their approach to supply chain risks as shown in the following Table:

Table 1. Company Examples

Company	Issue(s)	Enabler	Author(s)
Benetton	Visibility and controls	EDI network	Christopher & Lee, 2004
Adaptec	Market risks and loss of market share	Internet technology	Christopher & Lee, 2004
Sainsbury (UK)	Access to POS data	Extranet	Christopher & Lee, 2004
Nokia	Respond to supplier disruption	Contingency planning & implementation team	Lee 2004

Additional companies have joined the ranks of companies in recent years that have adopted risk management practices to address a portion of their supply chain risks. Among these we would include Flextronics, Solectron and 3Com [11]. Cisco [11] and Ericsson [13] have also joined the list after learning from their painful supply chain experiences.

The following Table will further summarize and synthesize the views of risk presented in the literature:

Table 2. Views of Risk from Literature

View of Risk	Suggested Approach	Author(s)
Many forms – financial, "chaos", decision, and market risks OR "lack of supply chain confidence"	Increase supply chain confidence through "end-to-end visibility"	Christopher & Lee, 2004
Uncertain times, quantities and performance.	Robust strategies for supply, demand, product and information management	Tang, 2006
The risk elements are categorized as: supply, demand, the operation and the controls.	Enriched supply chain information pipeline	Mason-Jones & Towill, 1998
Do large companies increase their risk by partnering with small and medium size companies for critical supply chain elements	Risk assessment and planning for business continuity	Finch, 2004

Strategies for Risk Management

The strategies that we have extracted from the literature include "robust strategies" to deal with supply chain risk [15]. As suggested by Tang [15], strategies are needed to address supply management, demand management, product management, and information management.

Demand shifting, postponement, and collaborative forecasting are just a few examples of the more detailed strategies that emerge from those categories [15].

Another strategy involves utilizing technology and better communication to improve "end-to-end visibility" as a way to reduce uncertainty and risk [4]. Developing agility and doing so not as a single company but spreading the agile practices throughout the supply chain in an effort to synchronize the entire supply chain is another major strategy from Christopher and Lee [4].

These are just a few example strategies and we can see the main focus that dominates these perspectives. "Clearly not all supply chain risk is created through a lack of confidence amongst supply chain members" [4]. This leads us to a different view of supply chain risk as discussed in the following section.

Proposed Approach to Risk

Many of these strategies are focused on one specific aspect of SCM. We recommend that a more comprehensive view of risk and a broader range of strategies need to be developed to mitigate all forms of risk. We also share the concern of Stauffer [14] that supply chain managers may focus on large risks with low probability of occurrence while paying little attention to smaller risks which are very likely to occur.

In an effort to develop a more comprehensive view of supply chain risk we have used a combination of different perspectives. This leads us to a proposed framework as shown in the headings for the following Table:

Table 3. Proposed Framework

Risk Categories	High impact risk	Frequency for High	Low impact risk	Frequency for Low
Material flow				
Information flow				
Financial flow				
Relationships (relational flow)				

The four categories are taken from the "four supply chains" as published in Inside Supply Management in 2002 [16]. This framework affords a much broader view of risk and covers much more territory in the decision space that makes up the full spectrum of the supply chain. We envision that a company can utilize this framework to guide scenario analysis and strategic planning efforts to assess supply chain risk. At this stage this is a very preliminary proposed framework. Additional development work and a possible case study example are needed to flesh out the ideas in greater detail.

Future Research

Research about supply chain risk is growing but it is still in the "infancy" stage. Jüttner made a similar remark about the "infancy" of both "supply chain vulnerability" and "supply chain risk management" [8]. Given the "infancy" state of this research stream there are many topics that need to be investigated. Craighead et.al. [6] represent one of the more recent research efforts but they focus on actual disruptive events rather than the planning for a broad spectrum of risks as we suggest. From our earlier discussions we advocate that a more comprehensive view of risk needs to be taken in the course of research and also in the course of application. Taking our proposed framework further to evaluate the practicality and usefulness is the next logical step to follow.

REFERENCES

[1] AMR Research. 2007. Value Chain Strategies Report: The AMR Research Supply Chain Top 25 for 2007. www.amrresearch.com.

[2] Baramichai, M., Zimmers, E.W., Marangos, C.A. 2007. Agile supply chain transformation matrix: an integrated tool for creating an agile enterprise. *Supply Chain Management: An International Journal*, 12, 5, 334-348.

[3] Butner, Karen, Frear, Robert, Casey, Angie, Sundaram, Kamal, Kinser, Christine, Meyer, Barbara and others. 2009. *The Smarter Supply Chain of the Future: Global Chief Supply Chain Officer Study.* IBM Corporation, IBM Global Services.

[4] Christopher, Martin and Lee, Hau. 2004. Mitigating supply chain risk through improved confidence. *Journal of Physical Distribution and Logistics Management*, 34, 5, 388-396.

[5] Christopher, Martin. 2005. *Logistics and Supply Chain Management: Creating Value-Adding Networks*. Financial Times/Prentice Hall.

[6] Craighead, C.W., Blackhurst, J., Rungtusanatham, M.J., and Handfield, R.B. 2007. The severity of supply chain disruptions: Design characteristics and mitigation capabilities. *Decision Sciences,* 38, 1, 131-156.

[7] Finch, Peter. 2004. Supply chain risk management. *Supply Chain Management: An Inernational Journal*, 9,2, 183-196.

[8] Jüttner, Uta. 2005. Supply chain risk management: Understanding the business requirements from a practitioner perspective. *The International Journal of Logistics Management*, 16, 1, 120-141.

[9] Lambert, Douglas M., Cooper, Martha C., and Pugh, Janus D. 1998. Supply Chain Management: Implementation Issues and Research Opportunities. *The International Journal of Logistics Management*, 9:2, p. 1, 1998.

[10] Lee, Hau L. and Billington, Corey. 1993. Material management in decentralized supply chains. *Operations Research*, 41, 835-847.

[11] Lee, Hau L. 2004. The Triple-A Supply Chain. *Harvard Business Review*, October, 2004.

[12] Mason-Jones, Rachel and Towill, Denis R. 1998. Shrinking the Supply Chain Uncertainty Circle. *Control*, September, 1998, 17-22.

[13] Norman, A. and Jansson, U. 2004. Ericsson's proactive supply chain risk management approach after a serious sub-supplier accident. *Journal of Physical Distribution and Logistics Management*, 34, 5, 434-456.

[14] Stauffer, David. 2003. Risk: The weak link in your supply chain. Harvard Management Update.

[15] Tang, Christopher S. 2006. Perspectives in supply chain risk management. *International Journal of Production Economics*, 103, 2, 451-488.

[16] Yuva, J. and Duffy, R. 2002. The revenue stream flows from supply management. *Inside Supply Management*, 13, 10, 34-38.

DISTRIBUTOR SELECTION IN SUPPLY CHAIN MANAGEMENT - A ROUGH SET BASED APPROACH

Zhonghai Zou, School of Management, Shanghai University, Shanghai, China
Johnny C. Ho, Turner College of Business, Columbus State University, Columbus, GA 31907
Tzu-Liang (Bill) Tseng, Dept. of Industrial Engr., University of Texas at El Paso, El Paso, TX 79968
Guofang Song, School of Management, Shanghai University, Shanghai, China

ABSTRACT

Distributor's selection is an important issue in Supply Chain Management, particularly in the current competitive environment. The current research works provide only conceptual, descriptive, and simulation results focusing mainly on firms' resources and general marketing factors. The selection and evaluation of distributors generally incorporate qualitative information; however, analyzing qualitative information is difficult by standard statistical techniques. Consequently, a more suitable approach is desired. In this paper, a method based on Rough Set Theory, which has been recognized as a powerful tool in dealing with qualitative data in the literature, is introduced and modified for preferred distributor selection. We derived certain decision rules which are able to facilitate distributor selection and identified several significant features based on an empirical study conducted in China.

1. INTRODUCTION

Industry is now strongly recognizing that total management of the supply chain enhances the competitive edge of all "players" therein. As a result, Supply Chain Management (SCM) has received more attentions from both academicians and practitioners in the past decade. Many articles and books have been published for the methods and opinions about the application of supply chain management. Although there is no generally accepted notion of supply chain, at least it should contain the suppliers' suppliers and the customers' customers. Supply chain in this paper refers to a network of integrated and dependent process through which specifications are transformed to finished deliverables. Figure 1 depicts a conceptual framework for supply chain.
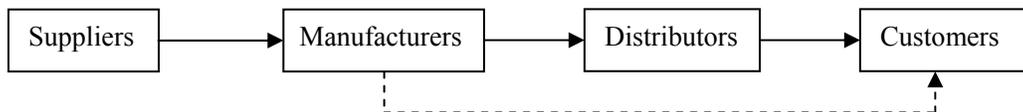
Note: The dash-line indicates those manufacturers which sell directly to their customers.

FIGURE 1: THE CONCEPTUAL FRAMEWORK FOR SUPPLY CHAIN

Supplier selection and evaluation play an important role in the supply chain process and are crucial to the success of manufacturing firms (Sevkli et al., 2008). There are many research done in the supplier selection area, and many methodologies have been applied in practice, including the cost-ratio method, linear or mixed integer programming, and multi-objective linear programming models (Ghodsypour and O'Brien, 1998; Yan et al., 2003; Oliveria and Lourenc¸ 2002). Although these methods have been widely used in the area of supplier selection, there are certain drawbacks associated with the implementation of these methods. More recently, Fuzzy Systems Theory (FST) has been successfully applied to supplier selection problems (Kahraman et al., 2003, 2004; Chan and Kumar, 2007), and Rough Set Theory (RST) has also been applied for preferred suppliers prediction (Tseng et al., 2006).

To date, numerous literatures have explored the issues of supplier selection. Nevertheless, little work has

been done in the selection of distributor, particularly via empirical studies. Only conceptual, descriptive and simulation results focused primarily on firms' resources and general marketing/selling factors were discussed (Abratt and Pitt, 1989; Shipley et al., 1989; Cavusgil et al., 1995, Yoeh and Calantone, 1995). It should be noted that distributor selection has not been studied deeply and the theoretical methods developed by academics have not been fully applied in industry. In this paper, we propose a rough set based methodology which is able to perform rule induction effectively. Moreover, the weight of each input feature is incorporated in the proposed approach so as to enhance quality of the derived rules.

The remainder of this paper is organized as follows. The next section provides a literature review on distributor research and introduces the standard rough set–based rule induction problem. Section 3 presents the basic rule identification algorithm to determine the reducts with both equal and unequal weight features. A case study is presented to show how the rule identification approach can be applied to distributor selection in Section 4. Section 5 concludes the paper with discussion of empirical findings.

2. LITERATURE REVIEW AND ROUGH SET-BASED RULE INDUCTION PROBLEM

2.1 Literature Review on Distributor Research

As mentioned above, there are few empirical studies for manufacturers' distributor selection. Ross (1973) studied the selection of the overseas distributor. The author concluded that whether or not the exporter will be able to achieve his goals depends to a great extent on how well he has carried out his analysis of which a firm will do the best possible job for him in a particular market. Lindqvist (1983) reviewed the research trends in distribution in Finland and found that the factors affecting the length of the distribution channel, the variables accounting for dimensions of retail trade in commune level centers, and the influence of the location and size of the automobile dealership on its profitability are at the heart of distribution research. Fram (1992) highlighted the importance of selecting the correct international distributors if a firm wishes to trade effectively in the worldwide market. The author described a study commissioned to explore the steps required to minimize the risk when selecting a distributor, e.g., use of end-user reference and suggestions.

Fonsson and Zineldin (2003) proposed a conceptual model including behavioral dimensions of supplier-dealer relationships and presented hypotheses as to how to achieve satisfactory inter-organizational relationships. Their results showed that good reputation and close relationship are key variables for the achievement of high satisfaction in a "high-trust and commitment relationship". Sharma et al. (2004) proposed a composite Distributor Performance Index (DPI) to evaluate distributors' performance. Based on a case study, Wang and Kess (2006) found that task-related and partner-related dimensions in partner selection of international joint ventures were useful in distributor relationship. A distributor relationship is a product-tied relationship, and product innovation can be used as an approach for performance improvement in distributor relationship. Lin and Chen (2008) derived four key constructs from the marketing, supply chain, and logistics literature to investigate their influences on the distributor selection.

2.2 Rough Set-Based Rule Induction

Rough Set Theory (RST) was originated by Pawlak (1982) and was developed to classify imprecise, uncertain, and incomplete information or knowledge expressed in terms of data acquired from experience; therefore, RST complements fuzzy set theory (Dubois and Prade, 1990). RST is suitable for processing qualitative information that is difficult to analyze by standard statistical techniques (Heckerman et al., 1997). It integrates learning-from-example techniques, extracts rules from a data set of interest, and discovers data regularities (Komorowski and Zytkow, 1997).

RST is a new mathematical approach to vagueness and uncertainty. The theory has found many real life applications and is considered as a very well suited new mathematical tool to deal with various decision problems. Many articles on rough set theory and decision support have been published recently. RST gives new insight into the decision process and offers new efficient algorithms. The original version of RST has proved to be particularly useful in the analysis of multi-attribute classification problems under inconsistency following from information granulation, i.e., objects having the same description but belonging to different classes.

Greco et al. (2000) extended the original version of RST in a number of directions in order to deal with problems of multi-criteria decision analysis (MCDA). Daubie et al. (2002) compared the rough set and decision tree approaches as techniques for classifying credit applicants. Mickee (2003) applied RST to deal with the problem of apparent indiscemibility between objects in a set. Wei and Zhang (2004) combined the fuzzy set and rough set. Kumar et al. (2005) explored the use of rough-set methods for marketing decision support systems in the retail business. Some other applications are summarized in Table 1.

The main theme of RST is concerned with measuring what may be described as the "ambiguity" inherent in the data. In RST, the essential distinction is made between objects that may definitely be classified into a certain category and those that may possibly be classified. Considering all decision classes yields what is referred to as the "quality of approximation" that measures the proportion of all objects for which definite classification may be achieved.

TABLE 1: ROUGH SET APPLICATION

Applications	Researchers	Description
Human resource management	Chien and Chen (2007)	Exploring and analyzing human resource data for personal selection and human capital enhancement.
Supplier prediction	Tseng et al. (2006)	Presenting a data-mining-based hybrid approach that consists of a novel rough-set algorithm for feature selection and enhanced multi-class support vector machines (SVMs) method for accurate prediction.
Marketing application	Beynon et al. (2001)	Identification of most important attributes and induction of decision rules from market data set.
Medical decision making	Kusiak et al. (2000)	Analysis of large data sets to identify key factors in a medical data set.
Fault diagnosis on diesel engine	Shen et al. (2000)	A new discretization method is developed for discretizing attributes without a priori knowledge.
Risk management	Dimitras et al. (1999)	Rough set based approach to rule extraction to discriminate between healthy and failing firms for risk management.

2.2.1 Information system

According to RST, information can be associated with every object in the universe and thus it can be expressed in a decision table (e.g., see Table 2), in which each row represents an object and each column represents an attribute. The attributes are generally classified into *conditions* and *decisions* (e.g., in Table

2, the four features – *F1*, *F2*, *F3*, and *F4* – define the conditions and *O* describes the decision).

TABLE 2: FIVE-OBJECT DATA SET

Object No.	F1	F2	F3	F4	O
1	1	0	2	0	0
2	1	0	0	1	1
3	0	0	3	1	0
4	1	1	2	0	2
5	0	0	1	0	0

Therefore, knowledge can be described in an information system, containing four components as follows:

$$S = (U, A, V, f) \qquad (1)$$

where, called the *universe*, is a nonempty set of all objects and *A* is the finite set of all the *attributes*. *V* is the set of all the attribute values such that

$$V = \bigcup_{a \in A} V_a \qquad (2)$$

where V_a is a finite attribute domain of attribute *a*. Finally, *f* denotes an information function such that, for every $a \in A$ and $u_i \in U$,

$$f(u_i, a) \in V_a \qquad (3)$$

Table 2 illustrates the information of five objects that are characterized with one decision attribute (*O*) and four condition attributes (*F1*, *F2*, *F3*, *F4*).

3. RULE IDENTIFICATION ALGORITHMS

The proposed conceptual framework to elicit decision rules consists of the following steps: problem definition, data preparation, data partition, reduct generation, and rule validation as shown in Figure 2.
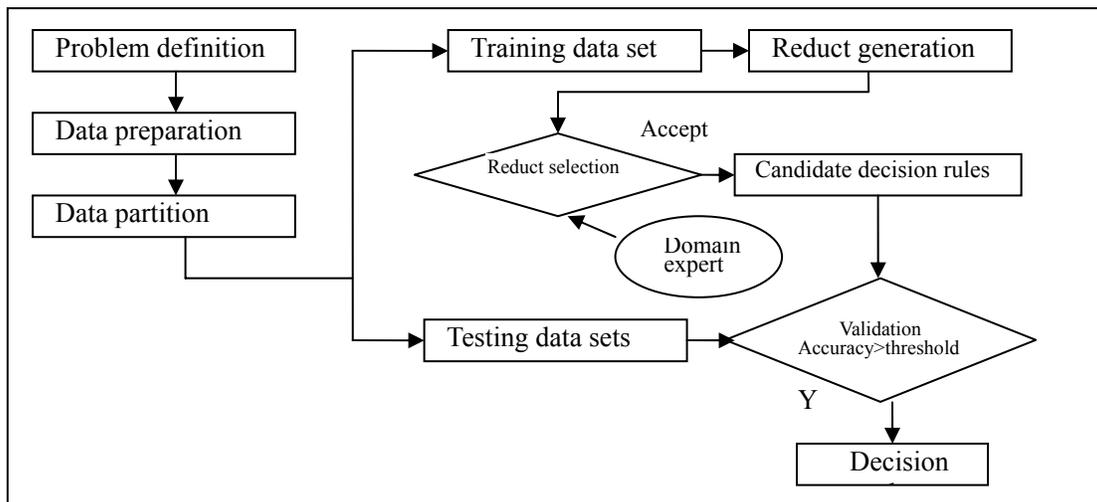
FIGURE 2: THE CONCEPTUAL FRAMEWORK OF ELICITING DECISION RULES

3.1 Problem Definition, Data Preparation and Data Partition

First, the data exploration process starts by identifying the right problems to solve and structuring the

corresponding objectives and the associated attributes, that is, to make it clear what we want. Then, the needed data should be collected for the objects and the attributes of the objects. More important, a series of data preprocessing tasks, including consistency checks to detect errors, removing noise or outliers where appropriate, and data completeness checks, should be done to ensure that the data are as accurate as possible. Next, the target dataset is randomly divided into the training data set and the testing data set. Kusiak (2001) suggested the splitting of the data using the bootstrapping method according to the following ratios: 0.632 for training set and 0.368 for testing set. The training data set is used to build the model and derive the rules. The testing data set is used to detect over fitting of the modeling tools.

3.2 Reduct Generation

The basic construct in RST is called a *reduct*. It is defined as a minimal sufficient subset of features $RED \subseteq A$ such that:
(a) Relation $R(RED) = R(A)$; that is, RED produces the same categorization of objects as the collection A of all features.
(b) For any $g \in RED$, $R(RED - \{g\}) \neq R(A)$; that is, a reduct is a minimal subset of features with respect to the property (a).

The term reduct was initially defined for sets rather than objects with input and output features or for decision tables with decision features (attributes) and outcomes. Reducts of the objects in a decision table have to be computed with consideration given to the value of the output feature. The original definition of reduct considers features only. In this paper, each reduct is viewed from four perspectives – feature, feature value, object, and rule perspective.

The reduct generation algorithm, based on Pawlak 1991, is given as follows:
  -Step 0. Initialize object number $i = 1$.
  -Step 1. Select object i and find a set of o-reduct with one feature only.
       If found, go to Step 3; otherwise go to Step 2.
  -Step 2. For object i, find an o-reduct with $m - 1$ features, where m is the number of input features. This
       step is accomplished by deleting one feature only at a time.
  -Step 3. Set $i = i + 1$. If all objects have been considered, stop; otherwise go to step 1.

For example, a subset of all reducts generated for the objects in Table 2 are shown in Table 3. The entry "x" in each reduct implies that the corresponding feature is not considered in determining the feature output of an object.

TABLE 3: REDUCTS OF OBJECTS IN TABLE 2

Object No.	Reduct No.	F1	F2	F3	F4	O
4	1	x	1	x	x	2
2	2	x	x	0	x	1
1	3	x	0	2	0	0
	4	1	0	2	x	0
	5	1	0	x	0	0
3	6	0	x	x	x	0
	7	x	x	3	x	0
5	8	0	x	x	x	0
	9	x	x	1	x	0

3.3 Reduct Selection and Rule Identification Algorithm

The nine reducts in Table 3 could be chose in a number of different ways. As we know that in the real world, the features (attributes) are not the same unique for depicting an object, some are more important, and some are less. In this section, we will choose them first with equal weights for every feature, then the weights were added, and the results were compared.

3.3.1 Equal weight features

When all the features are the same weight, we can choose the reducts based on the following steps:
   -Step 1: Select the features used from only a single reduct of the object(s).
   -Step 2: Select the features which are used more frequently and may be selected previously in order to get the most similar reducts from other objects.

Based on the steps above, we have selected reducts 1,2,4,6 and 8 from Table 3, as shown in Table 4. It should be noted that in Table 4 only three features $F1$, $F2$, and $F3$ out of four features are needed to unambiguously define the objects with output feature O. Based on the reducts in Table 4, a few decision rules can be derived. For example, a rule corresponding to object 4 is: IF input feature $F2 = 1$, THEN output feature $O = 2$.

TABLE 4: REDUCTS SELECTED BASED ON EQUAL FEATURES

Object No.	Reduct No.	F1	F2	F3	F4	O
4	1	x	1	x	x	2
2	2	x	x	0	x	1
1	4	1	0	2	x	0
3	6	0	x	x	x	0
5	8	0	x	x	x	0

TABLE 5: REDUCTS SELECTED BASED ON UNEQUAL FEATURES

Object No.	Reduct No.	F1	F2	F3	F4	O
4	1	x	1	x	x	2
2	2	x	x	0	x	1
1	3	x	0	2	0	0
3	7	x	x	3	x	0
5	9	x	x	1	x	0
Weight		0.7	0.9	1.0	0.8	

3.3.2 Unequal weight features

The features are frequently unequal in nature. In order to select the features which are decisive for the objects' attributes and the rules identification, we select the reducts based on the following steps:
Step 1: Select the features used from only a single reduct of the object(s), which is the same as that in equal weight features.
Step 2: Select the features whose weight is largest, if the largest weight feature is not used in the reducts, the select the second largest weight feature, or the third, and so on until all objects have the reducts.

Assuming the weight of $F1$ is 0.7, the weight of $F2$ is 0.9, the weight of $F3$ is 1.0, and the weight of $F4$ is 0.8, respectively. Based on the aforementioned procedures, the reducts selected are shown in Table 5.

In Table 5, *F2*, *F3* and *F4* can be used to describe the five objects. Comparing with Table 4, Table 5 selects the features with higher weight, and rejects the feature with lower weight (i.e., *F1*). In other words, with the weight incorporated, the higher weight features have priority to be selected.

3.4 The Rule-Validation Procedure

The following steps are applied to examine the objects in the testing data set to estimate the validity of the rules derived from the above algorithm:

Step 1: Compare each decision rule derived from the rule composing algorithm with each new object from the testing data set. Calculate the number of objects that match with the rule.

Step 2: Repeat the comparisons of the decision rules with the objects from the testing data set until no decision rule is left.

Step 3: Calculate the accuracy of each rule by using the total matched objects divided by the summation of the total correctly matched objects and the total incorrectly matched objects. If the accuracy of the rule is greater than the predefined threshold value of confidence, then go to step 4; otherwise, remove the rule. Note that an incorrectly matched object means that the object contains the identical known value of conditional attributes with the rule, yet the outcomes are different from the rule.

Step 4: Stop and output the results of validated rules.

3.5 An Example

An example depicted here is about the distributor's performance indexes, including payment delay, ability of cost control, technical ability, infrastructure and equipment, marketing capability, deliveries/shipment and order quantity. In these seven features, most of the content of the features are continuous. Consequently, the discretization to the continuous feature is required. For example, for the "payment delay", if the delay period of a distributor is less than 2 weeks, then we rank this feature of this distributor as "very low"; if the period is between 2 and 4 weeks, then it is "low" ; between 4 and 6 weeks, it is "middle"; more than 6 weeks, it is "high." Also, all the indexes ranked as very low, low, middle, and high, described by 0, 1, 2 and 3. The output feature (*O*) is the general rank of a distributor, described as bad (0), normal (1), and good (2), see Table 6. Table 7 shows that there are 12 objects with the features.

TABLE 6: PARTIAL INPUT FEATURE SET OF MEASURE FOR DISTRIBUTOR

Feature	Content	Description	Weight
Fl	Payment delay	Whether there is a long time delay for the payment to the manufacturer.	0.7
F2	Cost control	The percentage of affiliated total cost to the end price.	0.9
F3	Technical ability	Whether the distributor can access to the high level techniques.	0.8
F4	Infrastructure and equipment	Whether the distributor has intranet or internet, communication networks.	0.7
F5	Marketing capability	The brand of the distributor, the scale of coverage of the distributor.	1.0
F6	Deliveries/shipments	How many trucks does the distributor have and how many third parts logistic does it access?	0.6
F7	Order quality	The frequency/quantity of the distributor.	0.7

TABLE 7: DATA SET WITH 12 OBJECTS

Object No.	F1	F2	F3	F4	F5	F6	F7	O
1	0	1	0	2	3	3	1	2
2	0	0	1	3	0	2	0	0
3	1	1	2	2	3	1	2	2
4	1	2	1	0	0	2	1	1
5	1	0	1	1	2	2	1	0
6	0	1	1	1	3	3	2	2
7	2	2	3	2	3	1	0	2
8	2	0	1	1	0	0	2	0
9	1	2	3	2	3	3	1	2
10	1	0	1	2	2	1	0	0
11	1	1	2	1	0	1	1	1
12	0	1	1	1	3	2	2	2

Using the bootstrapping method with ratio 0.632 for training set and 0.368 for testing set, the first eight objects as in training set and the remaining four as in testing objects were selected. Based on the reduct generation algorithms, one feature reducts can be derived as shown in Table 8.

TABLE 8: ONE FEATURE REDUCTS OF DATA SET IN TABLE 7

Object	Reduct	F1 F2 F3 F4 F5 F6 F7 O	Object	Reduct	F1 F2 F3 F4 F5 F6 F7 O
1	1	x 1 x x x x x 2	6	13	x 1 x x x x x 2
	2	x x 0 x x x x 2		14	x x x x 3 x x 2
	3	x x x 2 x x x 2		15	x x x x x 3 x 2
	4	x x x x x 3 x 2	7	16	x x 3 x x x x 2
	5	x x x x 3 x x 2		17	x x x 2 x x x 2
2	6	x 0 x x x x x 0		28	x x x x 3 x x 2
	7	x x x 3 x x x 0		19	x x x x x 1 x 2
3	8	x 1 x x x x x 2	8	20	x x x x x 0 x 0
	9	x x 2 x x x x 2		21	x 0 x x x x x 0
	10	x x x 2 x x x 2	4	22	x x x 0 x x x 1
	11	x x x x 3 x x 2	5	23	x 0 x x x x x 0
	12	x x x x x 1 x 2			

3.5.1 Equal weight features for rule identification

Using the rule identification algorithm, the favored reducts from Table 8 are chosen and listed in Table 9.

TABLE 9: THE SELECTED REDUTS WITH EQUAL WEIGHT

Reduct No.	F1	F2	F3	F4	F5	F6	F7	O	Matched object
1	x	x	x	0	x	x	x	1	[4]
2	x	0	x	x	x	x	x	0	[2] [5] [8]
3	x	1	x	x	x	x	x	2	[1] [3] [6]
4	x	x	x	3	x	x	x	0	[2]
5	x	x	x	2	x	x	x	2	[1] [3] [7]

After examining the candidate rules through domain experts, three rules can be derived:
(1) IF "cost control ability" is "very low", THEN the performance is "bad";
(2) IF "cost control ability" is "low", THEN the performance is "good";
(3) IF "Infrastructure and equipment" is "normal", THEN the performance is "good".

Using testing data, the accuracy of the rules can be calculated, as shown in Table 10.

TABLE 10: THE TESTING RESULT OF EQUAL WEIGHT FEATURES

Rule No.	Total objects	Matched objects	Matched percentage
Rule 1	1	1	100%
Rule 2	2	1	50%
Rule 3	3	2	66.7%

3.5.2 Unequal weight features for the rule identification algorithm

According to the steps for choosing unequal weight features reducts, the selected reducts are illustrated in Table 11.

TABLE 11: THE SELECTED REDUTS WITH UNEQUAL WEIGHT FEATURES

Reduct No.	F1	F2	F3	F4	F5	F6	F7	O	Matched object
1	x	x	x	0	x	x	x	1	[4]
2	x	0	x	x	x	x	x	0	[2] [5] [8]
3	x	x	x	x	3	x	x	2	[1] [3] [6] [7]
Weight	0.7	0.9	0.8	0.7	1.0	0.6	0.7		

With support of the domain experts, two rules can be derived:
(1) IF "cost control ability" is "very low", THEN the performance is "bad";
(2) IF "Marketing capability" is "high", THEN the performance is "good".

Using testing data, the accuracy of the rules can be calculated, as shown in Table 12.

TABLE 12: THE TESTING RESULT OF UNEQUAL WEIGHT FEATURES

Rule No.	Total objects	Matched objects	Matched percentage
Rule 1	1	1	100%
Rule 2	2	2	100%

Comparing the rules generated from equal and unequal weight features; the rules reflecting the more decisive features of an object can be concluded in the unequal weight case. More attention should be paid on the features included in the selected rules.

4. CASE STUDIES

The distributor selection is an important issue in supply chain management, especially in the current competitive marketing environment. Although the distributors face increasing challenges in a competitive environment (Kalafatis, 2000; Mudambi and Aggarwal, 2003), the power of distributors' in marketing channels is getting stronger and stronger, which give much advantages in negotiation with vendors and buyers and makes it more crucial in selecting a good distributor for manufacturers.

Distributor selection involves evaluation and choice (Cavusgil et al., 1995). The evaluation task typically consists of identifying the attributes, criteria or factors relevant to the decision and then measuring or rating eligible distributors on each factor (Patton, 1996). The manufacturer's evaluation reflects an assessment of the value or rewards and risks inherent in the selection. In this study, a manufacturer produces a single product is our focus. It assumes that the manufacturer maintains stable product quality, stable and reliable product supply, and the manufacturer emphasizes much of the direct profit.

TABLE 13: THE WEIGHTED FEATURES FOR DISTRIBUTORS' SELECTION

Signal	Attribute	Description	Weight
F1	Financial strength	Distributors in good financial positions are likely to be well established and capable of selling many products for their manufacturing clients.	0.80
F2	Physical facilities	Adequate physical facilities, including modern technology and equipment may indicate a firm's capacity to carry out channel/supply chain task.	0.70
F3	Logistic capabilities	Capabilities in logistics provide an opportunity to achieve substantial cost savings while enhancing operational flexibility and creating value for customers.	0.65
F4	Sunk cost	Some cost that will never be gotten back such as the fee paid for the exclusive contract, the extra discount for the distributor and so on.	0.63
F5	Product line	Manufacturers typically prefer distributors who handle compatible and complementary products, rather than substitute products, especially avoiding distributors carrying directly competitive products.	0.54
F6	Market coverage	Adequate market coverage has been found necessary to gain an optimum volume of sales in each market, secure a reasonable market share and attain satisfactory market penetration, and therefore is important for manufacturers' distributor/channel member selection.	0.78
F7	Marketing experience	The market experience of a firm influences its competitive position, with experience helping the firm obtain better information, decrease uncertainty, and better handle managerial resources.	0.92
F8	Relationship intensity	Relationship intensity is defined as the degree of perceived reciprocity, closeness and friendliness in the relationship between the manufacturer and prospective distributor.	1.0
F9	Management ability	Management ability relates to management quality and operational competency. Many manufacturers feel that a supply chain member should only be considered if its management capabilities are good.	0.85

4.1 Attributes Identification

To determine the attributes for distributors' selection, we collected 15 attributes from the literature and

practitioners in manufacturing companies. Then, we posted the 15 attributes to nine experts – five coming from different universities and four from several well known companies. These experts chose nine attributes which they believe the attributes are critical. After receiving the responses from the experts, the top nine attributes for distributors' selection were determined. Later, the top nine attributes were posted and the nine experts were asked for providing a weight of each attribute, the average weight from all nine experts' responses was taken as the final weight of the attribute. The final result is given in Table 13.

4.2 Data Preparation

In order to derive the rules for distributors' selection, top ten manufacturers have been selected and the sales or marketing department of each company has been requested to provide the scores of the 9 features of their distributors. 345 distributors' score associated with 9 features have been received. After data cleaning operation, 285 objects are left for further investigation. According to the ratio 0.632 for training set and 0.368 for testing set, 180 objects were selected at randomly for training and 105 objects for testing. Each attribute (feature) has been classified into three levels: "Very low", "Middle", and "High", and represented by "0", "1", and "2". For instance, if $F8 = 0$, which means the relationship intensity is low; then $F3 = 2$, which means logistic capabilities is high. For the output feature O, we also classified it into good (2), normal (1), and bad (0). Table 14 is the typical data set for 15 distributors.

4.3 Computational Results

4.3.1 The result of equal weight features

For the equal weight features study, the RSES software v.2.2 (Warsaw University Rough Set Exploration System (RSES) version 2.2, Logic Group, Inst. Mathematics, Warsaw Univ., http://logic.mimuw.edu.pl/~rses/) was applied for data analysis. Figures 3 and 4 demonstrate partial results through the computation procedure. Using "object related discernibility" and the "exhaustive algorithm," 104 reducts have been derived. After the evaluation conducted by the domain experts, seven candidate rules are selected (see Table 15). Then the candidate rules' accuracy has been examined using testing data set. The results are shown in Table 16.

TABLE 14: THE TYPICAL DATA SET

Object	F1	F2	F3	F4	F5	F6	F7	F8	F9	O
1	2	2	2	0	0	2	2	2	2	2
2	1	1	1	0	1	2	2	2	1	2
3	1	1	0	0	0	0	1	2	1	1
4	2	2	2	2	1	2	2	0	2	1
5	1	1	1	0	1	2	2	2	1	2
6	1	0	0	1	0	0	1	1	1	1
7	0	0	0	1	0	0	0	1	0	0
8	1	2	2	2	2	1	1	1	1	1
9	2	1	2	2	0	2	2	2	1	2
10	1	2	1	1	1	1	1	2	1	2
11	0	0	0	0	1	0	1	2	1	1
12	2	2	2	2	2	2	2	0	2	0
13	1	1	1	0	0	1	1	2	2	2
14	2	1	1	2	2	2	2	0	1	0
15	1	1	0	2	1	1	1	0	1	0

TABLE 15: CANDIDATE RULES WITH EQUAL WEIGHT FEATURES

Reduct	F1	F2	F3	F4	F5	F6	F7	F8	F9	O	Supporting objects
1	0	x	x	x	x	x	x	x	x	0	21
2	x	x	2	x	x	x	x	x	x	2	14
3	x	x	x	x	x	1	x	x	x	1	38
4	x	x	x	x	x	x	1	x	x	1	40
5	x	x	x	x	x	x	2	x	2	2	77
6	x	x	x	x	x	x	x	2	x	2	80
7	x	x	x	x	x	x	x	0	x	0	43

TABLE 16: RULE VALIDATION TESTING RESULT WITH EQUAL WEIGHT FEATURES

Rules	Matched	Total
Rule 1 IF "Financial strength" is "Very low" THEN "Bad" distributor.	13 accuracy	46 28.3%
Rule 2 IF "Logistic capabilities" is "High" THEN "Good" distributor.	8 accuracy	39 20.5%
Rule 3 IF "Market coverage" is "Normal" THEN "Normal" distributor.	13 accuracy	56 23.2%
Rule 4 IF "Marketing experience" is "Normal" THEN "Normal" distributor.	46 accuracy	48 95.8%
Rule 5 IF "Marketing experience" is "High" and "Management ability" is "High" THEN "Good" distributor.	32 accuracy	36 88.9%
Rule 6 IF "Relationship intensity" is "High" THEN "Good" distributor.	50 accuracy	55 90.9%
Rule 7 IF "Relationship intensity" is "Very low" THEN "Bad" distributor.	24 accuracy	36 66.7%
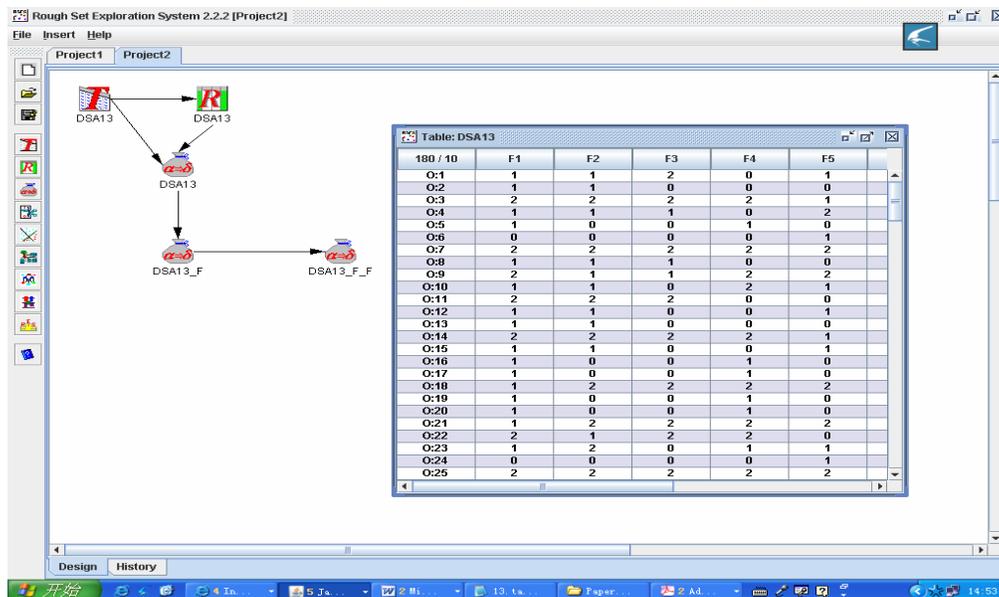
FIGURE 3: THE OBJECTS FOR ANALYSIS

FIGURE 4: THE REDUCTS OF THE DSA MODEL

4.3.2 The result of unequal weight features

For unequal weight features analysis, the "rough set-based decision support system" software (see Figure 5) was applied. With the help of the domain experts, five candidate rules are set as shown in Table 17.

TABLE 17: CANDIDATE RULES OF UNEQUAL WEIGHT FEATURES

Reduct	F1	F2	F3	F4	F5	F6	F7	F8	F9	O	Supporting objects
1	x	x	x	x	x	x	x	2	x	2	80
2	x	x	x	x	x	x	2	x	2	2	77
3	x	x	x	x	x	x	x	0	x	0	43
4	x	x	x	x	x	0	x	0	x	0	59
5	x	x	x	x	x	x	1	x	x	1	40
Weight	0.80	0.70	0.65	0.63	0.54	0.78	0.92	1.0	0.85		

Then the candidate rules' accuracy was examined using testing data set. The results are shown in Table 18.

4.3.3 Comparison between equal and unequal weight features

Compared the results in Tables 16 and 18, we find that the weight incorporated features rules identification can give out more accurate rules than that of equal ones. In addition, we discussed the derived rules with domain experts and found that these 5 rules in Table 18 are corresponding to the

distributors' selection in China, especially rule 1, which demonstrates the importance of "relationship". It also is a crucial part of the Chinese tradition. The results also demonstrate the important attributes of a distributor are its software, such as relationship intensity, marketing experience and management ability, rather than its hardware, such as financial strength, physical facilities or logistic capabilities.
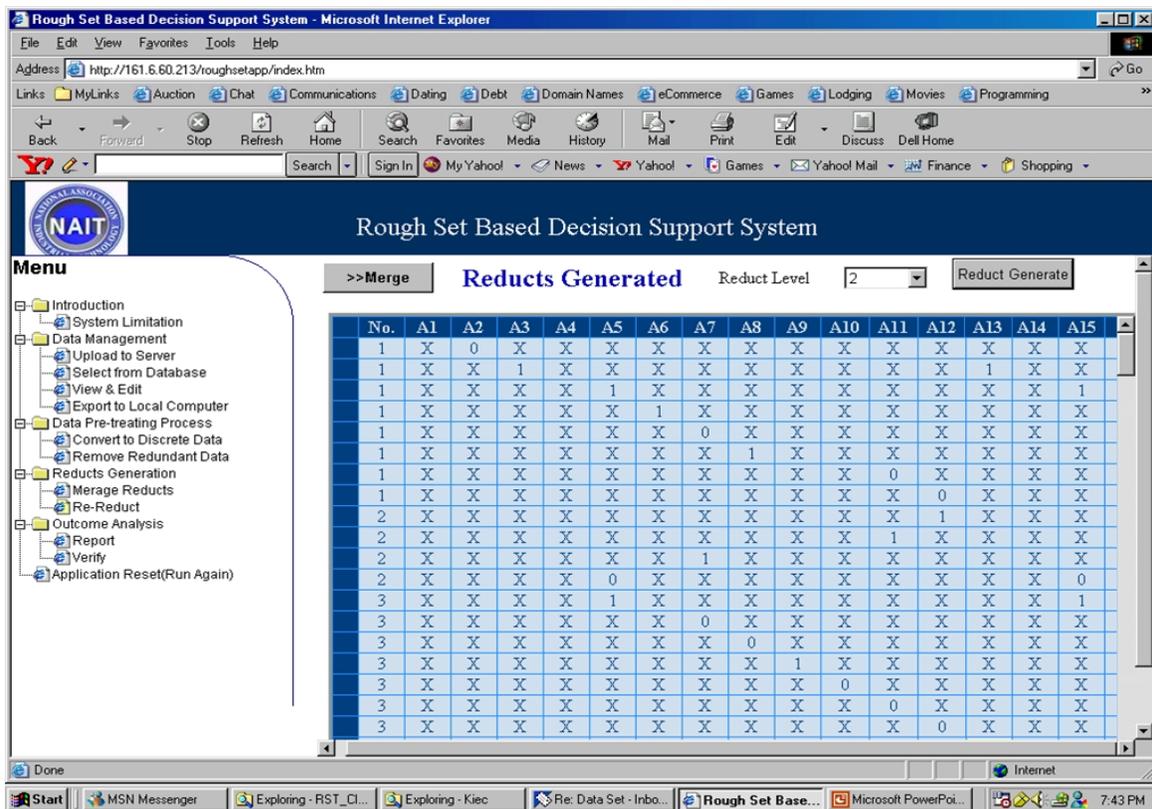
FIGURE 5: ROUGH SET-BASED DECISION SUPPORT SYSTEM

TABLE 18: RULE VALIDATION TESTING RESULT OF EQUAL WEIGHT FEATURES

Rules	Matched	Total
Rule 1 IF "Relationship intensity" is "High" THEN "Good" distributor	50 accuracy	55 90.9%
Rule 2 IF "Marketing experience" is "High" and "Management ability" is "High" THEN "Good" distributor	32 accuracy	36 88.9%
Rule 3 IF "Relationship intensity" is "Very low" THEN "Bad" distributor	24 accuracy	36 66.7%
Rule 4 IF "Marketing coverage" and "Relationship intensity" are both "Very low" THEN "Bad" distributor	24 accuracy	25 96%
Rule 5 IF "Marketing experience" is "Normal" THEN "Normal" distributor	46 accuracy	48 95.8%

5. CONCLUSIONS

In this paper, distributors' selection is analyzed based on the Rough Set Theory approach with both equal and unequal weight features. Through this method, several rules are generated for distributors' evaluation and selection. Our result not only shows the effectiveness of unequal weight incorporated rules identification, but also it shows the importance of the relationship intensity, marketing experience, and the management ability in selecting the distributors. These rules have been shown to be useful and convenient to conduct a selection process for the manufacturers. Moreover, the derived rules provide an important implication – all constituencies in the supply chain should maintain an intensity relationship with each other.

REFERENCES

[1] Abratt, R. and Pitt, L.F. "Selection and Motivation of Industrial Distributors: A Comparative Analysis." *European Journal of Marketing*, 1989, 23, 144-53.

[2] Beynon, M., Curry, B., and Morgan, P. "Knowledge Discovery in Marketing: An Approach through Rough Set Theory." *European Journal of Marketing*, 2001, 35, 915-935.

[3] Cavusgil, S.T., Yeoh, P., and Mitri, M. "Selecting Foreign Distributors: An Expert Systems Approach." *Industrial Marketing Management*, 1995, 24, 297-304.

[4] Chan, F.T.S. and Kumar, N. "Global Supplier Development Considering Risk Factors using Fuzzy Extended AHP-based Approach." *Omega*, 2007, 35, 417-431.

[5] Chien, C.-F. and Chen, L.-F. "Using Rough Set Theory to Recruit and Retain High-Potential Talents for Semiconductor Manufacturing." *IEEE Transactions on Semiconductor Manufacturing*, 2007, 20, 528-541.

[6] Daubie, M., Levecq, P., and Meskens, N. "A Comparison of the Rough Sets and Recursive Partitioning Induction Approaches: An Application to Commercial Loans." *International Transactions in Operational Research*, 2002, 9, 681-694.

[7] Dimitras, A.I., Slowinski, R., Susmaga, R., and Zopounidis, C. "Business Failure Prediction using Rough Sets." *European Journal of Operational Research*, 1999, 114, 263-280.

[8] Dubois, D. and Prade, H. "Rough Fuzzy Sets and Fuzzy Rough Sets." *International Journal of General Systems*, 1990, 17, 191-209.

[9] Fonsson, P. and Zineldin, M. "Achieving High Satisfaction in Supplier-Dealer Working Relationships." *Supply Chain Management: An International Journal*, 2003, 8, 224-240.

[10] Fram, E.H. "We can do a Better Job of Selecting International Distributors." *Journal of Business & Industrial Marketing*, 1992, 7, 61-70.

[11] Ghodsypour, S.H. and O'Brien, C. "A Decision Support System for Supplier Selection using an Integrated Analytical Hierarchy Pprocess and Linear Programming." *International Journal of Production Economics*, 1998, 56/57, 199-212.

[12] Greco, S., Matarazzo, B., and Slowinski, R. "Extension of the Rough Set Theory Approach to Multicriteria Decision Support." *INFOR*, 2000, 38, 161-196.

[13] Heckerman, D., Mannila, H., Pregibon, D., and Uthurusamy, R. *Proceedings of 3rd International Conference on Knowledge Discovery and Data Mining*. Menlo Park, CA: AAAI Press, 1997.

[14] Kahraman, C., Cebeci, U., and Ruan, D. "Multi-attribute Comparison of Catering Service Companies using Fuzzy AHP: The Case of Turkey." *International Journal of Production Economics*, 2004, 87, 171-184.

[15] Kahraman, C., Cebeci, U., and Ulukan, Z. "Multi Criteria Supplier Selection using Fuzzy AHP." *Logistics Information Management*, 2003, 16, 382-394.

[16] Kalafatis, S.P. "Buyer-Seller Relationships along Channels of Distribution." *Industrial Marketing Management*, 2000, 31, 215-228.

[17] Komorowski, J. and Zytkow, J. *Principles of Data Mining and Knowledge Discovery*. New York: Springer-Verlag, 1997.

[18] Kumar, A, Agrawal, D.P., Joshi, S.D. "Advertising Data Analysis using Rough Sets Model." *International Journal of Information Technology & Decision Making*, 2005, 4, 263-276.

[19] Kusiak, A. "Rough Set Theory: A Data Mining Tool for Semiconductor Manufacturing." *IEEE Transactions on Electronics Packaging Manufacturing*, 2001, 24, 44-50.

[20] Kusiak, A., Kern, J.A., Kernstine, K.H., and Tseng, T.-L. "Autonomous Decision-Making: A Data Mining Approach." *IEEE Transactions on Information Technology in Biomedicine*, 2000, 4, 274-284.

[21] Lin, F.-S. and Chen, C.-R. "Determinants of Manufacturers' Selection of Distributor." *Supply chain management: An International Journal*, 2008, 13, 356-365.

[22] Lindqvist, L.J. "Current Trends in Distribution Research in Finland." *International Journal of Physical & Logistics Management*, 1983, 13, 105-116.

[23] Mickee, T.E. "Rough Sets Bankruptcy Prediction Models versus Auditor Signaling Rates." *Journal of Forecasting*, 2003, 22, 569-586.

[24] Mudambi, S. and Aggarwal, R. "Industrial Distributors: Can they Survive in the New Economy?" *Industrial Marketing Management*, 2003, 32, 317-325.

[25] Oliveria, R.C. and Lourenco, J.C. "A Multicriteria Model for Assigning New Orders to Service Suppliers." *European Journal of Operational Research*, 2002, 139, 390-399.

[26] Patton, W.E. "Use of Human Judgment Models in Industrial Buyers' Vendor Selection Decisions." *Industrial Marketing Management*, 1996, 25, 135-149.

[27] Pawlak, Z. "Rough Sets." *International Journal of Computer and Information Sciences*, 1982, 11, 341-356.

[28] Pawlak, Z. *Rough Sets*, Kluwer Academic Publishers, Dordrecht, the Netherlands, 1991.

[29] Ross, R.E. "Selection of the Overseas Distributor: An Empirical Framework." *International Journal of Physical & Logistics Management*, 1973, 3, 83-90.

[30] Sevkli, M., Lenny Koh, S.C., Zaim, S., Demirbag, M., and Tatoglu, E. "Hybrid Analytical Hierarchy Process Model for Supplier Selection." *Industrial Management & Data System*, 2008, 108, 122-142.

[31] Sharma, D., Sahay, B.S., and Sachan, A. "Modeling Distributor Performance Index Using System Dynamics Approach." *Asia Pacific Journal of Marketing and Logistics*, 2004, 16, 37-67.

[32] Shen, L., Tay, F.E.H., Qu, L., and Shen, Y. "Fault Diagnosis using Rough Set Theory." *Computers in Industry*, 2000, 43, 61-72.

[33] Shipley, D.D., Cook, D., and Barnett, E. "Recruitment, Motivation, Training and Evaluation of Overseas Distributors." *European Journal of Marketing*, 1989, 23, 79-93.

[34] Tseng, T.-L., Huang, C.-C., Jiang, F., and Ho, J.C. "Applying a Hybrid Data-mining Approach to Prediction Problems: A Case of Preferred Suppliers Prediction." *International Journal of Production Research*, 2006, 44, 2935-2954.

[35] Wang, L. and Kess, P. "Partnership Motives and Partner Selection – Case studies of Finnish Distributor Relationships in China." *International Journal of Physical & Logistics Management*, 2006, 36, 466-478.

[36] Wei, L.-L. and Zhang, W.-X. "Probabilistic Rough Sets Characterized by Fuzzy Sets." *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems*, 2004, 12, 47-60.

[37] Yan, H., Yu, Z., and Cheng, T.C.E. "A Strategic Model for Supply Chain Design with Logical Constraints: Formulation and Solution." *Computers & Operations Research*, 2003, 30, 2135-2155.

[38] Yeoh, P. and Calantone, R.J. "An Application of the Analytical Hierarchy Process to International Marketing: Selection of a Foreign Distributor." *Journal of Global Marketing*, 1995, 8, 39-65.

CYBERSTALKING: AN EXPLORATORY STUDY OF LAW ENFORCEMENT IN ALLEGHENY COUNTY, PENNSYLVANIA

Karen L. Paullet, Robert Morris University, paullet@rmu.edu
Daniel R. Rota, Robert Morris University, rota@rmu.edu
John Turchek, Robert Morris University, turchek@rmu.edu
Thomas Swan, tswan@da.allegheny.pa.us

ABSTRACT

The increase use of the Internet has created an impact on the number of online harassing/cyberstalking cases. The primary functions of the Internet are to communicate and research information. The ease at which individuals can communicate electronically has led to a relatively new crime called cyberstalking. This exploratory study of 123 chiefs of police in Allegheny County, Pennsylvania in which 102 responded to the study, found that 37% of police departments had reported cases of cyberstalking in 2008. This study argues that cyberstalking and harassment will only decrease when the extent of the problem is fully understood and potential victims and law enforcement understand the protections necessary under the law.

Keywords: cyberstalking, stalking, law enforcement, online harassment, electronic communication

INTRODUCTION

The increased use of the Internet has created an impact on the number of online/harassing cyberstalking cases. The primary functions of the Internet are to communicate and research information. The Internet has become a medium for people to communicate locally or globally in the course of business, education and their social life. The Internet has made it easy for people to compete, meet a companion, or communicate with people on the other side of the world with the click of a mouse. In 2008, according to the Internet World Stats Report, 237,168,545 people use the Internet in the United States; as a result there is a concern for Internet safety (Internet World Stats, 2009).

Since the 1990s, stalking and harassing have become more common via the Internet. Until the early 1990's, if a person needed to find information on a given topic for research or a school project, hours could be spent in the library. Some people were lucky enough to have a set of encyclopedias in their homes where a limited amount of information could be found. Public records were always available to people, but one would have to drive to the local courthouse to locate the records. Going on a family road trip required the purchase of large road maps or trip tickets from the travel agency. In 2009, research, locating records, people, phone numbers, and directions, can occur with the click of a button without one ever having to leave their home. This accessibility to information through the use of technology has encouraged a relatively new phenomenon called cyberstalking.

The United States Department of Justice defines cyberstalking as the "use of the Internet, e-mail, or other electronic communication devices to stalk another person" (U.S. Attorney General Report, 1999, p.2). Offline stalking is a crime with which many people

are familiar. Stalking is a "repetitive pattern of unwanted, harassing or threatening behavior committed by one person against another" (Mechanic, 2000, p. 1). Stalking that involves the use of multiple individuals to stalk, harass or threaten a victim is known as gang stalking (Gang Stalking, 2006).   Although offline stalking acts have been reported since the 19th Century, cyberstalking is a crime that is just being examined and reported since the late 1990s. The U.S. Attorney General states, "stalking is an existing problem aggravated by a new technology" (U.S. Attorney General Report, 1999, p.2). Similarities have been noted between offline stalking and cyberstalking cases, including the fact that "the majority of cases involve stalking by former intimates, most victims are women, most stalkers are men and stalkers are generally motivated by the desire to control the victim" (U.S. Attorney General Report, 1999, p. 3). Using technology to stalk a victim can include, but is not limited to, the Internet, e-mail, text messaging, global positioning systems (GPS), digital cameras, video cameras and social network sites.   One of the differences between cyberstalking and offline stalking is that cyberstalkers face no geographic boundaries. The Internet makes it possible for a person to be stalked virtually anywhere in the world.

PURPOSE OF STUDY

Citizens should be able to feel safe when using the Internet without being stalked or harassed. But, the increased use of the Internet has caused a national increase in the number of online cyberstalking/harassment cases. The purpose of this research study is to explore the manner in which law enforcement agencies in Allegheny County, Pennsylvania are addressing reported cases of cyberstalking. This study argues that cyberstalking and harassment will only decrease when the extent of the problem is fully understood and potential victims and law enforcement understand the protections necessary under the law. This study explores the following research questions:

RQ1 – Do the number of available police officers impact the method used to handle cyberstalking complaints?
RQ2 – What is the current level of criminal charges on reported cases of? cyberstalking?
RQ3 – How many police departments in Allegheny County received cyberstalking complaints?

STALKING DEFINED

Offline stalking acts have been reported since the 19th Century. Cyberstalking is a new crime that is just being examined and reported since the late 1990's. Many similarities exist between stalking and cyberstalking. In order to understand cyberstalking it is necessary to define stalking. The U.S. Department of Justice defines stalking "as harassing and threatening behavior that an individual engages in repeatedly" (U.S. Department of Justice, 2001, p.1). These behaviors include, but are not limited to, following a person, repeated phone calls and phone messages, appearing outside a persons home or work, vandalism, taking an individuals mail or entering a persons home. The U.S. Department of Justice (2001) reports most stalking laws require the perpetrator

(the person committing the stalking) to make a credible threat of violence against the victim. Stalking, therefore, can be used to instill fear and/or intimidate the victim.

A person commits stalking if they cause another person to fear for their safety. "Stalking is a crime of power and control" (National Institute of Justice, 2002, p.1) As defined by Tjaden and Thoennes(1998), stalking is a course of conduct directed at a specific person that involves repeated (two or more occasions) visual or physical proximity, nonconsensual communication, or verbal, written or implied threats, or a combination thereof, that would cause a reasonable person fear.

CYBERSTALKING DEFINED

The Internet and use of telecommunications technologies have become easily accessible and are used for almost every facet of daily living throughout the world. Cyberstalking is "the use of the Internet, e-mail and other electronic communication devices to stalk another person" (U.S. Department of Justice, 2001, p.1). For this study, cyberstalking will be referred to as online stalking and is similar to offline stalking, which is being aggravated by new technologies. Cyberstalking "entails the same general characteristics as traditional stalking, but in being transposed into the virtual environment as it is fundamentally transformed" (Ogilvie, 2000, p.1). Stalking itself is not a new crime, but cyberstalking is a new way to commit the crime of stalking while using the Internet or other forms of electronic communication devices.

Stalkers, both online and offline, "are motivated by the desire to exert control over their victims and engage in similar types of behavior to accomplish this end" (U.S. Attorney General Report, 1999, p.3). The term cyberstalking can be used interchangeably with online harassment. "A cyberstalker does not present a direct threat to a victim, but follows the victim's online activity to gather information and make threats or other forms of verbal intimidation" (Jaishankar & Sankary, 2006, p.1). A potential stalker may not want to confront and threaten a person offline, but may have no problem threatening or harassing a victim through the Internet or other forms of electronic communications. One can become a target for a cyberstalker through the use of the Internet in many forms. The victim can be contacted by email, instant messaging (IM) programs, via chat rooms, social network sites or the stalker attempting to take over the victims computer by monitoring what they are doing while online. Bocij, Griffiths and McFarlane (2002) conclude that there are no genuinely reliable statistics that can be used to determine how common cyberstalking incidents occur.

Cyberstalkers can choose someone they know or a complete stranger with the use of a personal computer and the Internet. Basu and Jones (2007) remind us that growing up our parents told us not to talk to strangers, but one function of the Internet is to talk to strangers. The Internet, as a communication tool, has allowed people the freedom to search for information from anywhere and anyone in the world. Fullerton (2003) states that Internet Service Providers (ISP's), e-mail, web pages, websites, search engines, images, listservs, instant chat relay (ICR's) are all cyberstalking tools. Other forms of communication used to stalk a victim include cell phones; text messaging, short message services (SMS), global positioning systems (GPS), digital cameras, and spyware or fax machines. The information that is available about people on the Internet makes it easy for a cyberstalker to target a victim. With only a few keystrokes, a person can locate

information on an individual via the Internet. The types of information that can be found include e-mail addresses, home telephone numbers, bank accounts and credit card information and home addresses. Some services charge to obtain confidential information for any person that is willing to pay. Imagine a teacher posting a syllabus online to instruct students what date and time a particular class is in session. Someone that is a cyberstalker can use this small amount of information to follow the instructor to school or try to get inside the instructors home since they know when she will be in class. Thanks to search engines such as "Google," a cyberstalker can type a person's home or work address in and see where they live and work. Once the cyberstalker can physically see what the home or place of employment looks like the stalker can use the descriptions of the locations as a way to let the victim know they are being watched. "The fact that cyberstalking does not involve physical contact may create the misperception that it is more benign than physical stalking" (U.S. Attorney General Report, 1999, p.3) It is not uncommon for cyberstalkers to progress into offline stalkers. "If not stopped early on, some cyberstalkers can become so obsessed with a victim that they escalate their activities to the level of physical stalking (Hitchcock, 2006, p. 168). Gregorie (2001) indicates that people who do not have access to the Internet, or choose not to go online are not immune from cyber-based crimes. Databases of personal information available on the Internet can enable a person to find the necessary information to stalk or harass a victim.

Knowing the types of Internet technologies used by a cyberstalker can help with law enforcement training and setting the budget. "Understanding how offenders use the Internet to stalk victims in cyberspace can provide law enforcement officers with solutions when they encounter impediments investigating these types of cases" (D'Ovidio, 2003, p.1). A 1995 study, which involved the New York City Police Department's (NYPD) Computer Investigation and Technology Unit (CITU), used police records to study the extent of cyberstalking. The data used in the study was gathered from reports filed by the victim along with police reports showing the progression of investigation used in a reported case. The data was collected from closed cases in which the criminal used the Internet or computer to stalk or harass a victim between January 1996 and August 2000. (D'Ovidio & Doyle, 2003).

During the NYPD study, 42.8% of the cases investigated by CITU involved online harassment. There were 192 closed cases examined for the study. Of the 192 cases, 40% of the cases were closed with an arrest; while 11% of the cases did not show enough evidence that a crime was committed. The remaining cases were closed for reasons including an uncooperative victim, transfer of a case or CITU could not find a suspect. Email was used to stalk the victims in 72% of the cases examined, followed by instant messaging 13%, chat rooms 8% and message boards 4%.

EXISTING LAWS

Stalking laws within the 50 states are relatively recent; the first traditional stalking law was enacted in 1990 in California. California's legal definition of stalking is "any person who willfully, maliciously, and repeatedly follows or harasses another person and who makes a credible threat with the intent to place that person in reasonable fear of their safety" CAL. PENAL CODE § 646.9 (West 2009). Since California's enactment of the

first stalking law in 1990, all 50 states and the federal government have anti-stalking laws. Most stalking cases are prosecuted at the state and local levels. Each state's stalking laws will vary in their legal definitions and the degree of penalty for the offense.

As of March 2009, 45 states have cyberstalking or related laws in place. Two of the five states without cyberstalking laws have laws pending. In 1998, only 16 states had cyberstalking and harassment laws. Cyberstalking is covered in some of the 45 states existing stalking laws. Stalking laws that are written to include forms of stalking using electronic communication devices such as email, Internet or similar transmissions cover the crime of cyberstalking. If a state's current stalking law covers forms of electronic communications that are punishable by law, a separate cyberstalking law is not required. If the stalking laws within the 50 states do not cover any forms of electronic communications such as the Internet, then a separate law should be written. For example, the Pennsylvania stalking law states:

> (1) a person commits the crime of stalking when the person either engages in a course of conduct or repeatedly commits acts toward another person without proper authority, under circumstances which demonstrate either an intent to place such other person in reasonable fear of bodily injury or to cause substantial emotional distress to such other person, or
> (2) engages in a course of conduct or repeatedly communicates to another person under circumstances which demonstrate or communicate either an intent to place such other person in reasonable fear of bodily injury or to cause substantial emotional distress to such other person. 18 PA. CONS. STAT. ANN. § 2709.1 (a)(1) and (2) (West, 2009).

As used in the definition of stalking under Pennsylvania law, "communicates" is defined as:

> To convey a message without intent of legitimate communication or address by oral, nonverbal, written or electronic means, including telephone, electronic mail, Internet, facsimile, telex, wireless communication or similar transmission. 18 PA CONS. STAT. ANN. § 2709.1 (f) (West, 2009).

Under Title 18 of the United States Code, Federal Law covers threatening messages transmitted electronically in interstate and foreign commerce 18 U.S.C §875 (2009). This means that Federal law protects a person who is being threatened in Ohio via the Internet, from a person living in Florida. In these instances, law enforcement agencies will determine where the online stalking began in order to find the physical location of the stalker. If the state of origination is determined, most likely that state will have jurisdiction over prosecuting the case.

Gregorie (2001) states that cyberstalking is another phase of stalking or can be seen as stalking using technological tools. Therefore, strategies, interventions and laws that have been developed to respond to offline stalking can often be adapted to online stalking situations.

Cyberstalkers, if caught, can face criminal charges and can receive a felony, misdemeanor or summary offense for the crime. A felony is a serious crime, characterized under federal law and in many states the offense can be punishable by imprisonment in excess of one year or even death. A misdemeanor is a criminal act that carries a less severe punishment than felonies but more serious than summaries. "Misdemeanors in the U.S. generally have a maximum punishment of 12 months in jail" (Federal Defense Cases, 2007). A summary is a minor violation of the law prosecutable without a full trial. An example of a common summary would be a traffic ticket.

Walter, a 22 year-old auto mechanic, sends more than 100 emails during a two-week period to Sarah, his worse enemy at the auto dealership where he works. Each email is the same advertisement for the prescription drug Aviane, an oral contraceptive. Under Pennsylvania law, Walter can be charged with a summary charge of harassment, pursuant to Title 18, Subsection **2709(a)(3)** and **2709(c)(1)**. This subsection states that a person commits this crime if, with intent to annoy or harass the person engages in a course of conduct or repeatedly commits acts which serve no legitimate purpose. Under Pennsylvania law, the maximum penalty for a summary charge is ninety days in jail and a $300.00 fine.

After Walter is arrested and convicted, he sends Sarah one more email with the same Aviane advertisement. This time however, Walter adds the following text in the email: "You better take this stuff because I'm gonna f*&% you up after work." Under Pennsylvania law, Walter can be charged with a third degree misdemeanor charge of harassment, pursuant to Title 18, Subsection 2709(a)(4) and 2709(c)(2). This subsection states that a person commits this crime if he communicates to another person any lewd, lascivious, threatening, or obscene words. In Pennsylvania, a third degree misdemeanor is punishable by a maximum of one year in jail and a fine of $2,500.00.

If Walter continues to send his latest threatening email to Sarah, he can be charged with stalking under Pennsylvania law, Title 18, Subsection 2709.1, also a misdemeanor, but of the first degree. A person commits this crime if he engages in a course of conduct or repeatedly communicates to another person with intent to place the other person in reasonable fear of bodily injury or to cause substantial emotional distress to that person. Under Pennsylvania law, a first-degree misdemeanor is punishable by a maximum of five years in prison and a fine of $10,000.00.

If Walter is convicted of stalking, but continues to send the same or similar threatening emails to Sarah, and is subsequently arrested again for stalking, Walter will be charged with a felony of the third degree. If convicted in a Pennsylvania state court, Walter faces a maximum of seven years in prison and a fine of $15,000.00.

According to Griffiths, Sparrow, (1997) the main problem in obtaining online stalking convictions centers around credible threat, preservation of evidence and constitutional context. A credible threat is considered to be one that would cause a reasonable person fear for their life or safety of his or her family.

Victims of cyberstalking need to obtain copies of all electronic forms of communication received from the stalker. The electronic evidence that is obtained can lead to a computer and not an individual. For example, if the stalker is using a computer in a library to send messages to a victim, the electronic trail will lead back to the computer in the library. Potentially, hundreds of people could have used that computer

between when the stalking messages were sent and when the IP address was traced to the library.

METHODOLOGY

This study examined how chiefs of police in Allegheny County, Pennsylvania deal with reported cases of cyberstalking. A quantitative methodology was selected for this research project as a means to examine reported cases of cyberstalking and how cases were being processed by law enforcement agencies in Allegheny County, Pennsylvania in 2008. The data obtained from this survey may be used to assist law enforcement agencies in developing methods and training programs to assist officers in dealing with victims of cyberstalking. A survey instrument, developed by the Allegheny County District Attorney's Office, which is the chief law enforcement agency in the county, was used to gather data from the police departments.

During September 2008, an electronic survey was administered to the Chiefs of Police in Allegheny County, Pennsylvania, using Vovici EFM Continuum. Vovici EFM Continuum, is an electronic software tool used to distribute surveys and gather data. An electronic survey was determined to be an appropriate way to obtain information from the Chiefs since the 123 agencies are geographically dispersed throughout Allegheny County, Pennsylvania. The electronic survey was delivered to the chiefs of police through e-mail. The participants were asked to take the survey as part of research that was being gathered by the Allegheny County District Attorney's office.

The researcher and a Deputy District Attorney from the Allegheny County District Attorney's office in Pennsylvania created the chiefs of police survey. Due to the hours that police officers worked it was decided to keep the survey brief so that it would not detract from the daily activities of the chiefs. The purpose of the survey was to investigate whether police departments had trained officers in the area of cyberstalking, how they handled reported cases and if the cases resulted in criminal charges. The survey was designed to determine how police departments in Allegheny County, Pennsylvania investigate cyberstalking cases. The survey was a one-page document consisting of seven questions.

After the initial electronic survey was administered, reminder e-mails were sent to encourage participation from the agencies that did not complete the survey. After three reminder e-mails were sent to the chiefs requesting that they take the survey, the District Attorney's Office called the remaining agencies and administered the survey questions by phone. At the time the phone calls were administered 63 surveys had been returned electronically. A Deputy District Attorney phoned the remaining 60 police agencies that had not responded to the electronic survey. Thirty-nine additional agencies answered the survey by phone, to reach a total of 102 participants. The survey administered over the phone was completed during the first week of October between the hours of 9:00 a.m. and 4:00 p.m. The same survey questions that were sent electronically were solicited verbally to the chiefs over the phone.

SAMPLE

According to the U.S. Census Bureau (2008), the population of Allegheny County, Pennsylvania was 1,219,210 residents in 2008. The study was taken from the entire population of 123 police departments in September 2008, in Allegheny County. A total of 102 chiefs of police responded to the survey. For this study, of the 102 police departments that completed the survey, 27 were categorized as small agencies (5-10 officers), 52 were medium size agencies (11-25 officers) and 29 were large agencies (25-plus officers). The largest department of 700 officers is the City of Pittsburgh.

RESULTS

Cyberstalking was defined as threatening behavior or unwanted advances directed at another using the Internet and other forms of online and computer communications. The U.S. Department of Justice (2001) defines cyberstalking as the use of e-mail, or other electronic communication devices to stalk another person. Cyberstalkers can target their victims through threatening or harassing email, flaming (online verbal abuse), computer viruses, chat rooms, message boards, social network sites (such as MySpace), or tracing a persons Internet activities plus many more.

The chiefs' survey asked participants if their department employs a detective or officer that can investigate an incident of cyberstalking. Of the 102 police departments that responded to the survey, only 31 departments have a person within their agency that can investigate cyberstalking crimes while 71 departments do not have a person in-house that can handle cyberstalking cases.

Research Question 1 queried whether or not the number of available officer's impacted the method used to handle cyberstalking complaints. This question asked participants how their office handles cyberstalking cases. Differences in how the police departments handled reported cases of cyberstalking include, 29 police departments investigate the allegations yet did not file charges, 57 police departments investigate the allegations and filed charges, 78 police departments referred the case to an outside agency such as the county police, state police or FBI and 21 police departments referred the case to a school or academic institution. The data revealed that 3 small police departments, 20 medium size police departments and 6 large departments investigated allegations of cyberstalking but did not file charges. After investigating the allegations, a police department may not file charges because the case revealed no evidence or the officer may have referred the matter to a more suitable department to handle the case. Spitzberg and Hoobler (2002) state that to combat cyberstalking, law enforcement may need the very tools of electronic surveillance and intrusion that are currently the source of many citizens' fundamental fears of privacy invasion. The police departments that investigated the allegations and filed charges consisted of 13 small departments, 26 medium departments and 18 large departments. Of the large departments, 86% investigated the cases and filed charges without referring the case to an outside agency. The results show statistical significance with respect to the size of a police department and the method used to investigate cyberstalking cases (chi-square = 9.546, $df = 2$, p < .008).

Research Question 2 addressed the current level of criminal charges on reported cases of cyberstalking, while Research Question 3 sought to determine the number of police departments that received cyberstalking complaints. Of the 102 survey responses, 38 police departments received complaints in 2008, while 64 did not receive any complaints concerning the investigation of or filing of criminal charges against an individual for cyberstalking. A total of 7 small police departments, 21 medium sized police departments and 10 large police departments received cyberstalking complaints. The police departments that received cyberstalking complaints were asked to specify the number of complaints received. The complaints received by police departments consisted of 5 departments reporting 1 complaint, 9 departments with 2 complaints, 13 departments received 3 complaints and the remaining 11 departments received more than 3 complaints with 18 being the highest number of complaints. Among the 38 police departments a total of 134 complaints were reported. There was not a statistical significance between the size of the police departments and cyberstalking complaints. Only 13 of the 134 cases resulted in a conviction of a felony, misdemeanor or summary charges. The cases that resulted in a conviction consisted of 1 felony, 5 misdemeanors and 7 summaries.

DISCUSSION

The Internet and use of electronic communications technologies have become easily accessible and are used for almost every facet of daily living throughout the world. This study found that approximately 37% of police departments in Allegheny County received cyberstalking complaints in 2008. The first research objective examined whether or not the number of available officer's impacted the method used to handle cyberstalking complaints. The entire population, 123 police departments in Allegheny County was surveyed. A total of 102 departments responded to the survey where 71 departments indicated that they do not have a person on staff to handle cyberstalking cases while 31 departments have a trained officer on staff to handle cyberstalking cases. This could possibly be due to the size of the department or funding to train officers.

Police departments were classified as small (5-10 officers), medium (11-25) officers and large (25 plus officers). The police survey revealed a significant relationship with respect to the size of the police department and the method used to investigate the cases. The police methods included investigating the allegation without filing charges, investigate the allegation and file charges, referring the case to an outside agency such as the county police, state police, or FBI or refer the case to a school or academic institution. The large departments revealed that 86% investigated the cases and filed charges. Of the small and medium sized departments, 48%, investigate the cases and file charges.

The second research objective examined the current level of criminal charges on reported cases of cyberstalking, while the third research objective determined how many police departments received cyberstalking complaints. Of the 102 survey responses, 38 police departments received complaints in 2008. The police departments were asked to specify the number of complaints received and if those complaints resulted in a felony, misdemeanor or summary charge. A total of 134 complaints were received from 38 police departments in which only 13 resulted in charges to include 1 felony, 5 misdemeanors and 7 summaries. The remaining 121 cases that did not result in criminal

charges could have been because there was not a sufficient amount of evidence to support the cyberstalking allegation or law enforcements lack of training in regard to cyberstalking. The results indicate that 7 small, 21 medium sized, and 10 large police departments received cyberstalking complaints. A total of 25 police departments were classified as small, 49 were classified as medium and 28 were classified as large indicating there were almost twice the number of medium departments compared to the small and large departments.

ADDITIONAL FINDINGS

Additional findings were discovered as a result of the statistical analysis of the collected data. Thirty-one of the 102 police departments that responded to the police survey have an officer trained within their department that can investigate cases of cyberstalking. The other departments may not have an officer trained on computer crimes due to the size of the department or budgetary restraints. A total of 134 complaints were received from 38 police departments, yet only 13 cases resulted in criminal charges. Law enforcement agencies may not have an officer trained on how to handle cyberstalking cases or the reported cases of cyberstalking lack necessary evidence for the agencies to pursue the case. The law enforcement agencies may not be equipped to handle large volumes of cybercrimes resulting in victims not receiving the help they need. According to the U.S. Department of Justice (1999) some law enforcement agencies do not have the training or expertise to recognize the magnitude of the problem in their jurisdiction. Law enforcement agencies underestimate the magnitude of cyberstalking due to the disparity in reported cases across the country.

FUTURE RESEARCH

While this present study determined relevant issues in regard to cyberstalking, the study did not examine reasons why all of the police departments did not have an officer on staff trained to investigate cyberstalking cases and did not examine the types of cases that were being reported. Future research should focus on the types of stalking that occurred and if budgetary constraints played a part in the lack of officer training.
Additional research is recommended to focus on the types of complaints that are reported to determine the severity of the crime and what methods of technology were used by the stalker.

RECOMMENED APPROACH TO CYBERSTALKING PREVENTION

Based on our years of experience working in the District Attorney's Office, working with computer forensics, and prior research indicated in the literature review, the following list can help protect a person from being a victim of cyberstalking:

1. Never use your real name, nickname or any type of suggestive name while online.

2. When online, only type things you would actually say to someone face-to-face. Think about how what you say might be interpreted without eye contact, body language or voice.
3. THINK BEFORE YOU INK. Remember once you send an electronic message it can remain in cyberspace indefinitely.
4. Log off immediately if you experience contact from someone that is hostile, rude or inappropriate.
5. Save all communications from the stalker as evidence.
6. Report the incident to your ISP, law enforcement agency, school administration or an online help agency such as www.haltabuse.org or www.cyberangels.org

CONCLUSIONS

Studies are needed to improve our understanding of cyberstalking. The fast pace at which technology changes, as well as the inexpensive cost of technologies make it easier for a person to track and stalk a victim. Studies based on victim experiences need to be explored in depth so that the appropriate laws are written to protect victims of cyberstalking. A collaborative effort from victims, law enforcement and private and public sectors is needed in order to combat cyberstalking and develop an effective response to this problem.

REFERENCES

Basu, S., and Jones, R. (22, November 2007). Regulating Cyberstalking. *Journal of Information Law and Technology.* Retrieved on January 22, 2009 from http://gowarwick.ac.uk/jilt?2007_2/basu_jones/

Bocij, P., Griffiths, M., and McFarlane, L. (2002). Cyberstalking a new challenge for criminal law *Criminal Lawyer,* 122, 3-5.

D'Ovidio, R., and Doyle, J. (2003). *A study on cyberstalking: understanding Investigative hurdles. FBI Law Enforcement Journal, The/ Find articles at BNET.* Retrieved August 10, 2008 from http://findarticles.com/p/articles/mi_m2194?is_3?72/ai_99696472

Federal Defense Cases. (2007). Federal Defense Cases. Retrieved on October 28, 2008 from www.federaldefensecases.com/about/php

Fullerton, B. (2003, December 22). Features – cyberage stalking. *Law and technology for legal professionals.* Retrieved February 11, 2008 from http://www.llrx.com/node/1114/print

Gang Stalking: An overview. (2006, September 15). Retrieved on April 20, 2008 from http://educate-yourself.org/cn/gangstalkingoverview15sep.06.html

Gregorie, T.M. (2001). Cyberstalking: Dangers on the information superhighway. *National Center for Victims of Crime.* Retrieved May 19, 2009 from http://www.ncvc.org/src/help/cyberstalking.html

Hitchcock, J.A. (2006). Net crimes and misdemeanors: Outmaneuvering Web Spammers, and Con Artista. Medford, New Jersey: Information Today, Inc.

Internet World Stats (2007, November). Usage and population statistics. Retrieved January 19, 2008 from http://www.internetworldstats.com/stats14.htm

Jaishankar, K. and Sankary, U.V. (2006). Cyberstalking: A global menace in the information super highway. All India Criminology Conference. 16-18 2006. Madurai: India Madurai Kamaraj University.

Mechanic, M. (2000). Fact sheet on stalking. National Violence Against Women Prevention Research Center, University of Missouri at St. Louis. Retrieved January 19, 2007 from http://www.musc.edu/wawprevention.research/stalking/shtml

National Institute of Justice. (2002). Stalking. The Research and Evaluation Agency of the U.S. Department of Justice retrieved on September 16, 2007 from http://www.ojp.usdoj.gov/nij/topics/crime/stalking/welcome.htm

Ogilvie, E. (2000). The Internet and cyberstalking. Stalking: Stalking Criminal Justice Responses Conference, 7-8 December 2000. Sydney: Australian Institute of Criminology.

Tjaden, P. and Theonnes, N. (1998). Stalking in America: Findings from the National Violence Against Women Survey. Washington, DC: US Department of Justice, Centers for Disease Control and Prevention.

U.S. Department of Justice. (2001). *Stalking and domestic violence:* NCJ 186157, Washington, DC: U.S. Government Printing Office.

U. S. Attorney General Report (1999). Cyberstalking: A new challenge for law Enforcement and industry. {Electronic Version} Retrieved September 22, 2007 From http://www.usdoj.gov.criminal/cybercrime/cyberstalking.htm

United States Census Bureau (2009). Retrieved February 12, 2009 from http://quickfacts.census.gov/qfd/states/421/42003.html

United States Code Annotated. (2009). Thomson/West

THE CHANGING NATURE OF CAPITALISM AND
A QUESTION OF LAW IN THE UNITED STATES

Joel A. Waldman, James C. Heneghan, and Patrick J. Litzinger
Department of Economics and Legal Studies, Robert Morris University
6001 University Boulevard, Moon Township, PA 15108-1189
412-397-4050, 412-397-4200, 412-397-3438

ABSTRACT

As the Federal Government in the United States deals with questions about automobile, banking and other industries during the 2008-2009 recession, the changing nature of the mixed public-private economy in this country is being considered. This paper presents a careful study of Pennsylvania statutes and case law demonstrating how private companies can avoid certain liabilities by shielding themselves behind the legal concept of governmental immunity. This example of the sharing of government immunity with private companies in certain circumstances is presented as another facet of the debate concerning the mixing of capitalism and socialism in capitalistic economies.

INTRODUCTION

The economic downturn of 2008-2009 has people in the United States, as well as most countries in the world, questioning basic distinctions between capitalism and socialism. The question often heard in the United States today is: Are we becoming a socialist nation? In April, Joseph Stiglizt commented on legislation proposed by the Obama administration to infuse $500 billion, or more, dollars into the ailing banking industry. Stiglizt characterized the proposal as follows: "What the Obama administration is doing is far worse than nationalization; it is ersatz capitalism, the privatizing of gains and the socializing of losses." [1, p. 2]

In July, Robert Peston, the BBC's business editor, summarized the changing attitude in capitalistic economies as "moving away from the Anglo-American political consensus of the past 20 years that the markets are normally right, reversing the Thatcherite/Reaganite movement of rolling back the state and expanding the domain of the private sector...." His question was: "If markets are routinely wrong, what does that mean for how we organise our economies?" [2]

The economic systems of the United States and Great Britain, and many other countries, have always been "mixed capitalistic" systems, however. Private companies in "the Anglo-American" tradition have always looked to government – warily, expectantly, and even hopefully. To greater or lesser extents, governments in capitalistic economies have always regulated, inspected, redistributed, and legislated for their economies.

Private companies have always viewed price competition as dangerous and potentially disastrous. In a news article published in the New York Times on December 28, 1908, it was reported that the formation of the General Motors Company through the assumption of stock of the Olds Motor Works and the Buick Motor Company was the first step in what promoters of the new company hoped would "be a practical consolidation of all the more prominent makers of low-priced cars." In the era of fledgling anti-trust regulation in the United States, the same report concluded: "The basic idea behind the combination proposals has been the purchase of materials in quantities, effecting a considerable saving in the cost of production, the distribution of the field so as to avoid competition in the production of cars of each given price, apportioning to each concern the type which it shall produce, and the limitation of it to that type." [3]

Perhaps the question in most countries is: How do capitalism and socialism mix in the economic system. The ongoing adjustment takes a variety of forms in various countries. The questioning stimulated by the economic downturn of 2008-2009 is most often conducted at a very general, national level. The authors of this paper offer a more specific example of the ongoing historical adjustment in the United States. This paper examines Pennsylvania statutes and case law demonstrating how various entities can avoid liability by shielding themselves behind the legal concept of governmental immunity.

PENNSYLVANIA STATUTES

In Pennsylvania there are distinct statutes that encompass governmental immunity. Under the Sovereign Immunity Act, immunity is granted to the Commonwealth of Pennsylvania, its agencies and officials acting within the scope of their authority except as provided in the exceptions outlined in the legislation. [4] Additionally, the Political Subdivision Tort Claims Act protects against any monetary liability when a local agency or anyone thereof causes harm to person and/or property unless the conduct in question comes within one of the granted exceptions. Under statute, "a local agency" is defined as a governmental unit other than the Commonwealth government. An employee of a local agency may claim such immunity when the employee's course of conduct "was authorized or required by law, or that [the employee] in good faith reasonably believed the conduct was authorized or required by law." [5]

In Jones v Southeastern Pennsylvania Transporation Authority [6], it was pointed out by Supreme Court Justice Cappy that since the Sovereign Immunity and Tort Claims Acts involve the same issue of governmental immunity, the court will interpret them in the same manner. The court in Jones went on to state that the exceptions to the governmental immunity shield should be narrowly construed. Additionally, in Smith v City of Philadelphia [7], the Pennsylvania Supreme Court indicated the main reason behind governmental immunity is to protect the public's money from massive monetary awards in tort liability cases.

EMPLOYEE IMMUNITY

Some court cases have focused on parties attempting to claim immunity by trying to prove that the party is an employee of a governmental entity. In Helsel v Complete Care Services [8], a wrongful death lawsuit was brought by the estate of the deceased against an administrator of a county owned nursing home located in Cambria County, Pennsylvania. The facility was managed by Complete Care Services, L.P., a privately owned profit motivated Pennsylvania corporation. This corporation was in the business of providing nursing care and health services and described itself as "the leader in the privatization of county nursing homes". Complete Care tried to assert a governmental immunity defense. This assertion was based upon the premise that since this business entity was working on behalf of the county and looking out for its interests, it qualified as an employee of the "local agency" (Cambria County).

However, the Pennsylvania Commonwealth Court held that the nursing home operator was not an "employee" of the county, but instead was a private independent contractor. Furthermore, the court pointed out it was illogical to assert that it should be able to have a governmental immunity shield merely because this nursing home manager was acting in the interest of the government and on behalf of the government. The court stated "contracts between public county entities and private actors should not constitute bridges (emphasis added) by which immunities intended to protect public funds are extended to private actions". [8] Finally, the court noted that simply because the county would have been entitled to immunity if it had managed the nursing home does not mean that the private contractor performing the management would be entitled to such immunity.

QUASI GOVERNMENTAL AGENCIES

At the same time, there has been a long line of cases involving volunteer fire companies and their attempt to be considered a "local agency" for purposes of governmental immunity. In Regester v Longwood Ambulance Co., Inc. [9], the estate of the deceased of George E. Regester III sued Longwood Ambulance Company, Inc., which provided fire protection services and ambulance service, for negligently failing to arrive at deceased's residence in a timely fashion and from preventing his death due to cardiac and respiratory problems. The Commonwealth Court held that a volunteer fire company is a local agency having governmental immunity. The decision pointed out that "local agency status is awarded to volunteer fire companies not because they are otherwise deemed agents of the local government unit under traditional concepts of principal-agency law but rather are traditionally 'accorded local agency status because of the duties performed by fire fighters are of public character' ". In the decision, the court cited the Pennsylvania Supreme Court case of Guinn v Alburtis Fire Co., [10], which held that if a volunteer fire company was established by law and recognized under the law as the fire company for a political entity then it would be considered to be a "local agency". Regester was appealed to the Pennsylvania Supreme Court, but the appeal on this issue was not granted.

Likewise, the Pennsylvania Supreme Court in Sphere Drake Insurance Company v Philadelphia Gas Works and Philadelphia Facility Management Corporation [11], held that a non-profit corporation that was the manager and operator for a Philadelphia run gas facility was a "local agency" that had immunity. The decision was based upon the fact that the city's control over the non-profit corporation was extensive. Factors that the court examined highlighting this control were the following: the city created this entity and appointed the corporate board members, the city exercised a great deal of control over it, the corporation's only revenue stream came from the city, the reason for its existence was to help the city, the breaking up of the corporation would result in its assets being vested in the city, the city indemnified the people employed at the company and these employees were eligible to participate in benefits provided to other city employees.

BUSINESS CONTRACTORS UNDER GOVERNMENTAL CONTRACTS

Other court cases involve attempts by contractors attempting to use the immunity defense when working in conjunction with government contracts. Once classic case in this area is Ference v Booth & Flinn Co. [12] Booth & Flinn Co., the defendant, was a road contractor that had entered into a contract in 1944 with the state highway department of the Commonwealth of Pennsylvania to extend Ohio River Boulevard in Allegheny County, PA. The terms of the contract specified a requirement to create a 50 foot wide divided highway near a hillside located close to the Ohio River. In order to accomplish this, there was a need to excavate at the bottom of the hillside. While doing so, Beaver Road, located at the top of this hill, was severely damaged and necessitated its closure. The plaintiffs, Ohio River Motor Coach Company, operated a bus line between Aliquippa and Pittsburgh and had been permitted to use that portion of Beaver Road in its transportation route. As a result of Beaver Road's closing, the plaintiffs lost passengers and incurred additional mileage to get around its shutdown. The plaintiffs brought suit against the defendant, a road contractor, for economic loss.

The defendant, an independent contractor, attempted to avoid liability by arguing that when a contractor performs work on behalf of a state entity following the language and specifications of its contract, it has not committed a tort and should be immune from liability for any damages that have occurred. In Ference, there was no dispute that the defendant performed its excavation work in a non-tortuous manner. However, the plaintiffs countered by stating that the Defendant did not clear Beaver Road within a reasonable time frame. The Pennsylvania Supreme Court held that the defendant was not liable for economic loss to the plaintiffs as it had sovereign immunity protection. The Court based this holding on the finding that the defendant was carrying out the specifications of the contract with the Commonwealth

of Pennsylvania's entity, the State Highway Department, when the excavation occurred and it was not tortuous when doing this or in its eventual clearing of the roadway.

In 1956, the Pennsylvania Supreme Court again dealt with a similar issue that arose in Ference, when it decided Valley Forge Gardens, Inc. v James D. Morrissey, Inc. [13] The defendant, like in Ference, was a road contractor that had entered into a contract with a Pennsylvania entity, the State Highway and Bridge Authority, to construct a portion of the "Philadelphia Expressway". Very importantly, under the terms of the construction contract, the defendant was required to build a fill, which eroded and caused the dirt and silt to enter a stream that deposited the debris in plaintiff's cemetery ponds. The plaintiff sustained financial loss from dredging the ponds and constructing the property site in such a manner to prevent this from reoccurring. The plaintiff, accordingly, sought monetary damages from defendant to cover it from such expense.

In this case, the court found that the defendant, also in an independent contractor like in Ference, had proven that its work was done in accordance with the government construction contract specifications and, thus, defendant was not negligent in its work performance. In this case, Justice Jones specifically cited the remarks of Chief Justice Drew in Ference, stating "it is hornbook law that the immunity from suit of the sovereign state does not extend to independent contractors doing work for the state. But it is equally true that where a contractor performs his work in accordance with the plans and specifications and is guilty of neither a negligent nor a willful tort, he is not liable for any damage that might result". The Pennsylvania Supreme Court in Valley Forge pointed out that every state in the United States which decided this issue followed the same legal outcome (the Court noted cases in the states of Illinois, Kansas, Iowa, Minnesota, California, Indiana, Kentucky, New York, North Carolina, Tennessee, Virginia). Interestingly, the Court pointed out it was clearly a matter of "semantics" that the "contractor who performs work for it [the state] in conformity with a contract and without negligence…may not plead such immunity. But, if the contractor, in privity with the state or its instrumentality, performs the contract work which the state is privileged to have done, the privilege operates to relieve the contractor from liability to third persons except for negligence or willful tort in performance of the work." Finally, the Court noted that this outcome is essential or otherwise the contractor would be subject to unknown monetary damage claims by adjoining landowners.

In May 2000, the Pennsylvania Supreme Court in Conner v Quality Coach, Inc. [14] again sat in judgment on the issue at hand. Bruce Conner, whose legs were paralyzed and who had only some movement ability in his arms and hands, obtained a specially equipped van through the Office of Vocational Rehabilitation (hereinafter "OVR"). This motor vehicle had a "throttle/brake control" which contained a "palmer cuff with D-ring on Velcro" that helped to hold the driver's hand on the control. OVR had asked for bids on this type of specially equipped van and accepted one from Quality Coach, Inc., the latter of which had obtained advice on this special equipment from Moss Rehabilitation Driving School. Quality Coach, Inc. purchased the above special device from Creative Controls, Inc. and installed it in the van according to the contract requirements with OVR. Subsequently, Mr. Conner was involved in a serious accident while driving this van and sued a number of parties, including Quality Coach, Inc., Moss Rehabilitation Driving School and Creative Controls, Inc. The basis for the lawsuit claimed that the device in question was defective.

In Conner, the Pennsylvania Supreme Court cited, but distinguished the U.S. Supreme Court case of Boyle v United Technologies, [15] Boyle involved a U.S. Marine's estate suing the Sikorsky Division of United Technologies, alleging that there was a defective design in one of its manufactured helicopters that caused the marine's death. United Technologies raised the defense of a "federal government contractor", attempting to shield itself behind U.S. governmental immunity. The basis for this defense centered on the contractor manufacturing and supplying military equipment according to specifications present in the U.S. Military contract. Justice Scalia, although reluctant to supplant state tort law with "federal common law"

did so, not just because of "federal interests" present in the procurement of U.S. military equipment, but also as a result of the belief that the U.S. governmental immunity would be weakened if federal contractors, fearing legal liability, passed on additional costs to supply such equipment to the federal government. Justice Scalia stated, "it makes little sense to insulate the government against financial liability for the judgment that a particular feature of military equipment is necessary when the government produces the equipment itself, but not when it contracts for the production". The holding in <u>Boyle</u> was that a federal government contractor could use a U.S. government immunity defense for defective designs in U.S. military equipment when: 1). the U.S. government had placed "reasonably precise" specifications in the contract (2). the equipment followed these specifications and (3). the federal contractor had put the U.S. government on notice of any danger it had found in the equipment's use that had not been known by the U.S. government.

In <u>Conner</u> the Pennsylvania Supreme Court cited the precedent cases of <u>Ference</u> and <u>Valley Forge</u> as cases standing for the legal principle that a public works contractor is insulated from liability provided there was no negligence by such contractor, that there has been governmental control and guidance over such party's work and this contractor had followed the contract's specifications when performing the work. The <u>Conner</u> court explained that federal law in this area prior to the <u>Boyle</u> case seemed to mirror <u>Ference/Valley Forge</u>, but was then extended and broadened by <u>Boyle</u>. As Justice Saylor pointed out in <u>Conner</u>, "The threshold question in this appeal may be framed as follows: Should this court, like the United States Supreme Court in <u>Boyle</u>, undertake to declare a new, substantive rule of law insulating from exposure to product liability law government contractors who lay no claim to actual agency for the Commonwealth, may have actually participated in the design of the portion of the product alleged to be defective, and/or are alleged to have been negligent in the design aspect? Obviously, as a matter of federal preemption, this court is bound by <u>Boyle</u> concerning immunity from state tort law conferred by a contractor's status as a <u>federal</u> government contractor. The present case, however, does not involve a federal contractor – OVR is a Commonwealth agency".

The Pennsylvania Supreme Court held in <u>Conner</u> that since there is no Pennsylvania common law supporting sovereign immunity, the sole basis for such immunity is under statutory authority. Accordingly, the court reasoned the issue was whether legislators intended to include contractors working for a governmental authority in the language of the state's sovereign immunity statute. The court in <u>Conner</u> declined to find such coverage for all contractors, noting the clear straightforward language of the statute could not support such inclusion and pointing out that the legislative branch never chose to pass a separate state statute granting such immunity to these contractors. Finally, in refusing to follow <u>Boyle</u>, the <u>Connor</u> court indicated that even if the Commonwealth would gain economic advantage in government purchases by shielding contractors with governmental immunity this could be outweighed by other factors such as a state government procurement official not being adequately concerned with public safety issues thinking that the state was protected from such financial costs arising therefrom.

Therefore, in <u>Conner</u>, the Pennsylvania Supreme Court refused to extend immunity to contractors working under government contracts when these contractors were liable under tort law. The court in its decision distinguished <u>Ference/Valley Forge</u> principles noting that the present case was not a public works project and that Quality Coach, Inc. did not carefully follow the specifications of a governmental contract under governmental supervision, but instead involved itself in the decision making process concerning the "throttle/brake control". Accordingly, the court refused to extend government immunity for tortuous conduct including strict liability for defective products to contractors working with the government. However, the court in <u>Conner</u> did state "we do not here foreclose the possibility that state government contractors who have <u>strictly adhered</u> to government-generated specifications under <u>close government supervision</u> might avail themselves of the <u>Ference/Valley Forge</u> construct in defense of <u>product liability claims</u>, since these are not the facts before us". (Emphasis added).

Finally, the case of Coolbaugh v Com., Dept. of Transp. [16] involved a plaintiff, Joyce Coolbaugh, sustaining a horrendous permanent spinal injury when her automobile "hydroplaned" on Interstate Route 81 in Pennsylvania. She sued the Pennsylvania Department of Transportation (PennDot) for failing to construct and maintain the highway in such a manner to allow for proper and adequate water drainage on it. At the trial level, PennDot settled with the plaintiffs, but had filed a complaint against Slusser Brothers, a road contractor, joining it in the lawsuit. PennDot asserted in this complaint that Slusser Brothers had been negligent in its road work on Interstate Route 81 and did not follow the specifications of the construction contract it had with PennDot. In turn, the contractor denied these allegations and contended that since it had followed all of the contract specifications in a workman like manner, it was entitled to immunity under the Pennsylvania Sovereign Immunity Statute.

The appeal of this case to the Pennsylvania Superior Court centered on whether the trial court's summary judgment motion for the contractor against the plaintiffs was proper. Justice Johnson in the opinion pointed out that under Conner v Quality Coach, Inc. the Pennsylvania Supreme Court failed to grant immunity to a contractor working under a contract it had with a government entity when such contractor was liable for defectively manufacturing a product. Justice Johnson then analyzed the Ference and Valley Forge cases and stated that the Pennsylvania Supreme Court in these cases found the contractors not liable because of their lack of tortuous conduct in following the specifications of the government contract.

In light of the above, the Pennsylvania Superior Court in Coolbaugh held that a contractor can only assert an immunity defense if the contractor had followed the specifications of the government contract *and* was not liable for negligence. (See also Lobozzo v Adam Eidemiller, Inc. [17]) As Justice Johnson stated in Coolbaugh *"fulfillment of the contract specifications does not necessarily satisfy the standard of care owed to the plaintiff in a negligence action"*.

Accordingly, the court reversed the trial court's decision in granting the summary judgment for the contractor, Slusser Brother, on the basis that the court record showed that there was an open issue of whether or not factually, the contractor was negligent when performing the roadwork.

CONCLUSION

In Pennsylvania, the Sovereign Immunity Act and the Political Subdivision Tort Claims Act, as their names indicate, provide governmental entities immunity from claims against certain conduct. These acts, also in some cases, provide that same immunity to contractors who are retained by a governmental entity to provide certain services and/or products. However, the immunity, although it applies to all the governmental entities performing the specific conduct that is protected, does not apply to all contractors performing for a governmental entity. One must, inter alia, determine the application of any immunity by obtaining the contract specifications, decide if the contract was followed by the contractor and evaluate whether the contract specifications would lead to the contractor performing negligently under this contract.

This sharing of government immunity with private companies in certain circumstances is an interesting example of the mixing of capitalism and socialism. It is an example suggesting a broader and more robust context to current discussions of the inroads socialism is making in heretofore "capitalistic" countries.

REFERENCES

[1] Stiglitz, Joseph E., "Obama's Ersatz Capitalism" The New York Times, April 1, 2009, retrieved at http://www.nytimes.com/2009/04/01/opinion/01stiglitz.html?_r=1&scp=2&sq=stiglitz&st=cse August 1, 2009.

[2] Peston, Robert, "If markets don't work, what will?" Author's Blog at BBC website, retrieved at http://www.bbc.co.uk/blogs/thereporters/robertpeston/2009/07/if_markets_dont_work_what_will.html , July 28, 2009.

[3] The New York Times, "General Motors Co. Starts Rumor Anew", December 28, 1908, accessed at http://www.nytimes.com/, July 28, 2009.

[4] Heicklen v Hoffman, 2000. Atlantic Report, 2nd Edition, Volume 761, Page 207.

[5] Grimm v Borough of Norristown, 2002. Federal Supplement, 2nd Edition, Volume 226, Page 606.

[6] Jones v Southeastern Pennsylvania Transporation Authority, 2001. Atlantic Reporter, 2nd Edition, Volume 772, Page 435.

[7] Smith v City of Philadelphia, 1986. Atlantic Reporter, 2nd Edition, Volume 516, Page 306.

[8] Helsel v Complete Care Services, L.P., 2002. Atlantic Reporter, 2nd Edition, Volume 797, Page 1051.

[9] Regester v Longwood Ambulance Co., Inc., 2000. Atlantic Reporter, 2nd Edition, Volume 751, Page 694.

[10] Guinn v Alburtis Fire Co., 1992. Atlantic Reporter, 2nd Edition, Volume 531, Page 218.

[11] Sphere Drake Insurance Company v Philadelphia Gas Works and Philadelphia Facility Management Corporation, 2001. Atlantic Reporter, 2nd Edition, Volume 781, Page 510.

[12] Ference v Booth & Flinn Co., 1952. Atlantic Reporter, 2nd Edition, Volume 88, Page 413.

[13] Valley Forge Gardens, Inc. v James D. Morrissey, Inc., 1956. Atlantic Reporter, 2nd Edition, Volume 123, Page 888.

[14] Conner v Quality Coach, Inc., 2000. Atlantic Reporter, 2nd Edition, Volume 750, Page 823.

[15] Boyle v United Technologies, 1988. United States Reports, Volume 487, Page 500.

[16] Coolbaugh v Com., Dept. of Transp., 2003. Atlantic Reporter, 2nd Edition Volume 816, Page 307.

[17] Lobozzo v Adam Eidemiller, Inc., 1970. Atlantic Reporter, 2nd Edition, Volume 262, Page 432.

IMPROVING THE STATE OF THE ECONOMY:
WHAT THE STIMULUS MIGHT MEAN

Robert T. Barrett, South Carolina State University, Orangeburg, SC, 29117, 803-536-8186
rbarret1@scsu.edu
Lilly M. Lancaster, University of South Carolina Upstate, Spartanburg, SC, 864-503-5597,
llancaster@uscupstate.edu
Harry Miley, South Carolina State University, Orangeburg, SC, 29117, 803-536-8186, hmiley@scsu.edu

ABSTRACT

Several stimulus plans, designed to boost the sluggish US economy, have been implemented over the past few months. The purpose of this paper is to: (1) briefly discuss the three major efforts at stimulating the US economy and   (2) describe their anticipated impacts, especially the impact of the ARRA in South Carolina. Of course, the jury is still out on the long term implications of the plans.

INTRODUCTION

The job market, financial institutions and the housing industry are all casualties of the recession that started in 2008. Or,   are they symptoms? Or,   are they causes? The unemployment rate has risen steadily over the recessionary period. Major banks and other financial institutions have either failed or have been bailed out. Housing foreclosures are at an all time high [1]. The nightly news is filled with segments about how the recession is impacting businesses, especially manufacturing, healthcare and education, government entities and individuals.   It is likely that every citizen in the United States has been effected by the current economic situation.   Members of the international community are also experiencing changes in their economies, partly due to the US situation.

Three major efforts have been made in 2008 and 2009 to boost the US economy. The first was the Bush Stimulus Package signed into law in early 2008. This program consisted primarily of tax rebates to individuals and was targeted toward stimulating consumer spending.   The second wave consisted primarily of federal bailouts of failing companies which began during the last quarter of the Bush presidency and continued into the early days of the Obama administration. These programs were primarily targeted to large financial institutions on Wall Street. These bailouts have drawn the ire of many citizens, especially when some of these companies continue to pay huge bonuses and severance packages to CEOs. The third major effort is the American Recovery and Reinvestment Act of 2009 (ARRA) signed into law by Obama. At the current time, government agencies, businesses and the general public are just beginning to understand how this Act will be implemented.

The purpose of this paper is to briefly discuss the three major efforts at stimulating the US economy and their impacts, especially the impact of the ARRA in South Carolina.

THE BUSH STIMULUS PACKAGE OF 2008

On February 13, 2008, President George Bush signed into law a $168 billion economic rescue package. The stimulus package included tax rebates of from $300 to $1,200 for many American households. Businesses received tax breaks to invest in new plants and equipment. This government stimulus package was designed to infuse cash into the sluggish economy. An Associated Press poll surveyed Americans concerning how they would use the rebate. Nineteen percent of those surveyed said they planned to spend their rebate checks. Forty-five percent said they would pay bills. Thirty-two percent said they

planned to invest the money. As some had predicted, this stimulus package did little to help the economy that spiraled toward a recession in the next few months following the issuance of the rebates. [2]

BAILOUTS

As Lehman Brothers and Merrill Lynch failed, the federal government sought to head off failures of other large corporations through the infusion of cash. The $85 billion dollar bailout of AIG was typical of the effort. These bailouts bring with them stiff requirements and regulations and will require federal oversight to ensure compliance [3]. From fall 2008 through August 3, 2009, the Troubled Asset Relief Program [TARP] has doled out over $157 Billion in 663 allocations to financial institutions. TARP also sponsored the Automotive Industry Finance Program that supplied over $78 Billion to that industry [4]. Some of the more well known companies that have received bailout money are noted in Table 1. We note that Ford did not take bailout money and outperformed Toyota in some summer months.

Table 1: Federal Bailouts in Billions of Dollars

Company	Amount
Bank of America	45
Citigroup	45
JP Morgan	25
Wells Fargo	25
General Motors	10.4
Goldman Sachs	10
Morgan Stanley	10
GMAC	5
Chrysler	4

THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009

The American Recovery and Reinvestment Act (ARRA) of 2009 was created by the 111th Congress of the United States of America. The conference report was approved on Friday, February 13, 2009. The entire 490 page document, as signed by the President, may be viewed at the website frwebgate.access.gpo.gov. ARRA has been described by some as a new and innovative strategic plan to boost the economy of the United States. Its purpose, goals, measurement methods, implementation process and timeline for reaching the goals are fully described and documented [5, 6]. Conservatives claim that government funded programs increase our national debt, decrease the value of the dollar, and seldom stimulate the economy as hoped.

The ARRA was met with and continues to generate a considerable amount of criticism. Most of the opposition to the bill comes from the conservative right and Republican Party. In general, the criticisms are that the bill is too large, that it is not just a stimulus bill but has widespread, un-stimulative spending components that are just liberal spending programs, and doesn't have enough true stimulus spending. In fact, over $300 billion of the bill is for tax cuts. These cuts and the magnitude of the cuts was placed in the bill to generate Republican support for the bill. Criticism continues today that the stimulus portions of the bill are slow and ineffective. In addition, conservatives claim that government funded programs increase our national debt, decrease the value of the dollar, and seldom stimulate the economy as hoped. While these criticisms may ultimately prove valid, it is generally premature to truly judge the effectiveness of the bill's impact at this time.

Overall, the purpose of the ARRA is to restart the American economy while preparing the country for the 21st century. Science and technology improvements throughout the public and private sector are

significant, especially those centering upon renewable energy and infrastructure improvements. Science and technology will also be of value in the removal of waste and inefficiencies from current systems, specifically medicine and education. Specific goals include:

- Creating more than 3.5 million jobs over the next two years. Ninety percent of the jobs will be in the private sector.
- Increasing the country's renewable energy capacity over the next three years.
- Making college affordable to more Americans.
- Modernizing and weatherizing federal space and energy efficient homes.
- Creating tax credits and cuts, both to working households and through the Child Tax Credit.
- Creating a system of accountability within the federal government that will encourage transparency of expenditures and project successes as well as create opportunities to uncover waste and inefficiencies.

The oversight of the process is the responsibility of the newly formed Recovery Board. The Board Chairman is appointed by the President. The Board has ten Inspector Generals whose duties are defined in the Act. Quarterly and annual reports will be submitted by the Board who may also make recommendations to agencies receiving funding on how to use funding more effectively. The website Recovery.com serves as a mandatory communication channel with the general public and must be used by the Recovery Board.

Leading economists have assisted the Board in developing a "simple, conservative and accurate model for measuring progress." Charts and graphs, especially on the Recovery.com website, will be available for public view to monitor progress. The website will also post information about grants. The Board is further charged with making quick and unannounced reports to both the President and Congress if there are problems in the implementation of projects that need immediate attention.

To assist the Board in its responsibilities data will be collected in all areas of the federal government where funds are disbursed as well as from funding recipients.

Examples of current announcements of funding include:

- $ 1 billion to Housing and Urban Development (HUD) to improve public housing.
- $200 million available through the National Science Foundation (NSF) to repair and renovate academic research facilities.
- $300 million available through the National Science Foundation (NSF) to strengthen the country's research infrastructure.
- $800 million to biofuel research.
- $2 billion to stabilize neighborhoods hit by foreclosures.
- Expansion to 7(a) loans through the Small Business Administration (SBA).

SOUTH CAROLINA ALLOCATIONS

As of July 2009, South Carolina had been allocated almost $4.6 billion (not including the value of tax cuts) from the ARRA. As seen in Table 2, all of these funds have not been made available to date and even less funds have actually been spent in South Carolina. Table 2 shows that, of the $4.6 billion allocation, approximately $1.8 billion (or 42%) is for social related programs such as education, health, housing, and public safety and another 1.8 billion is set aside for energy and weatherizing projects. Of the total $2.4 billion is allocated for infrastructure investments such as highways and bridges, water and sewer, military and other government construction.

Perhaps more importantly, Table 2 shows that only about 10% of the funds that have been allocated to the state have actually been spent as of July 31, 2009. The state has established a monitoring system for the Stimulus program and is being coordinated by the Comptroller General's Office. The website is located at http://stimulus.sc.gov/ . At this time, the website does not have detailed information on spending but as indicated above, it is still very early in the process.

Table 2. Total Allocation to South Carolina by Agency

Agency	Allocated*	Made Available*	Paid Out to Date* (1)
Department of Health and Human Services	$486,478	$488,019	$318,428
Department of Agriculture	$19,694	$69,210	$59,667
Department of Education	$1,197,100	$926,327	$38,538
Department of Justice	$38,845	$60,459	$25,154
Department of Housing and Urban Development	$117,174	$89,858	$13,510
Department of Energy	$1,756,292	$54,721	$7,996
Department of Labor	$73,426	$65,848	$3,926
Department of Transportation	$504,236	$253,345	$617
Department of Treasury	$0	$600	$600
National Science Foundation	$0	$6,146	$466
Environmental Protection Agency	$66,708	$9,208	$15
Railroad Retirement Board	$1,574	$0	$0
US Army Corps of Engineers	$8,210	$0	$0
National Endowment for the Arts	$0	$512	$0
Corporation for National and Community Service	$304	$406	$0
Department of Veterans Affairs	$10,665	$0	$0
General Services Administration	$3,791	$0	$0
Social Security Administration	$214,870	$0	$0
Department of the Interior	$3,835	$0	$0
Department of Commerce	$185	$727	$0
Department of Defense	$84,785	$0	$0
Total	$4,588,171	$2,025,387	$468,915

* In Thousands
(1) As of July 31, 2009
Source: www.Recovery.com

Source: http://www.recovery.gov/?q=content/allocation-programs&state=SC

The impacts of the ARRA on South Carolina's economy are difficult to measure but at the time of this writing, the positive impacts on the unemployment rate have not been seen. As seen below, the unemployment rate has gone from 6.5% in June 2008 to over 12% in June 2009. Many economists fear that it may go higher before it starts to recede.

Figure 1. South Carolina Unemployment Rate

unemployment rate
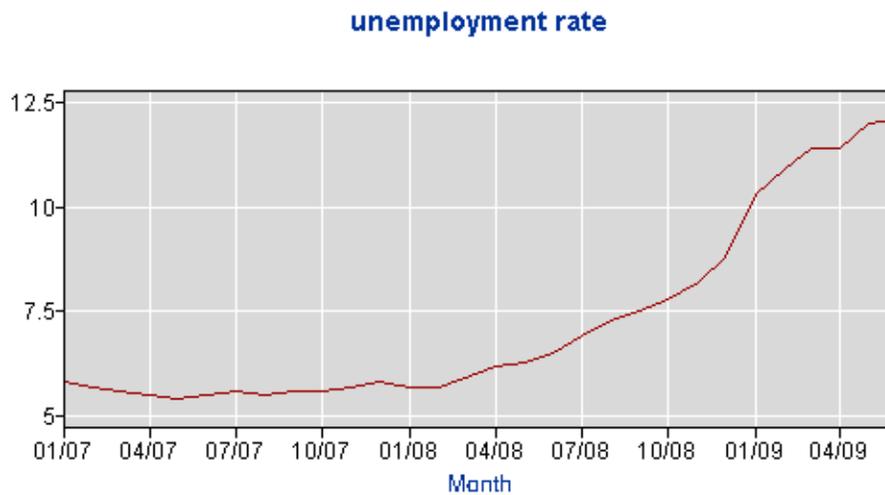
Source: US Bureau of Labor Statistics.

REFERENCES

[1] Abate, Tom, "It's official: U.S. in recession all of 2008," *San Francisco Chronicle*, A-1, Tuesday, December 2, 2008.
http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2008/12/02/MNTL14FCBU.DTL

[2] "Bush signs stimulus package into law; Rebates of $300 to $1,200 go out beginning in May," AP Report, Feb. 13, 2008. http://www.msnbc.msn.com/id/23143814/

[3] "Global Banking Reshaped," FT.com, Financial Times, May 13, 2009,
http://www.ft.com/cms/698e638e-e39a-11dc-8799-0000779fd2ac.html?ftcamp=auddev/sem_traffic/google_p4p/us_indepth/financial_crisis/seg_id=03394

[4] US Treasury Department, http://www.financialstability.gov/latest/reportsanddocs.html

[5] www.frwebgate.access.gpo.gov

[6] www.grants.gov

[7] www.recovery.gov

AN EXPLORATORY STUDY OF THE CORPORATE CHARACTER ETHICAL VALUE MATRIX (CC-EVM)

Edward D. Showalter, Randolph-Macon College, Ashland, VA 23005. (804) 752-3716
eshowalt@rmc.edu

ABSTRACT

This paper continues previous work on the 2x3 Corporate Character Ethical Value Matrix – CC-EVM. A sample of 230 employees at a regional medical facility provided responses to impressions of individual and organizational values as well as measures of job satisfaction, commitment and organizational contentment. Results show more significance with organizational measures than with individual measures.

INTRODUCTION

Earlier work presented a theory entitled the Corporate Character Ethical Value Matrix. The theory presented combines work from the trust and organizational citizenship literature to develop a six cell (two-type by three-target) matrix of instrumental values. While interviews and some qualitative analysis lend face validity to the theory much remains to be done to adequately support the theory for future research or training purposes.   This paper presents results of an initial exploratory survey designed to test elements of the CC-EVM. While these results are by no means conclusive they do provide guidance for future research.

This paper will review the development of the theory, present the method used in this exploratory study and the results of the study and discuss future research directions and applications for the CC-EVM theory.

Definition of an ethical value

This work draws on Rokeach's (1973) work on values. "A value is an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence" (Rokeach,1973, p. 5). Terminal values are those concerning end-states of existence or quantifiable goals. Instrumental values concern modes of conduct or behavior to reach goals. To value making a profit is a terminal value, while to value making that profit through superior performance is an instrumental value.

In short, values are guides to behavior, as well as standards by which to judge behavior. This study defines an **ethical value** as: **an instrumental value serving as a guide or standard for ethical behavior**.

THEORY: THE CORPORATE CHARACTER ETHICAL VALUE MATRIX (CC-EVM)

Corporate character as defined here is a value structure that guides individual behavior in an organizational context. The corporate character value structure consists of instrumental ethical values or areas of behavior arranged in a two dimensional matrix we will refer to as the Corporate Character Ethical Value Matrix, or CC-EVM. The two dimensions of the CC-EVM are **types** of behaviors and **targets** of behaviors. The CC-EVM theory defines two ethical behavior types and three ethical behavior targets creating six areas for ethical behavior.

The Type Dimension – Continuance and Proactive Values

Based on a distinction between helpful and non harmful behavior, Hosmer (1995), the CC-EVM theory presented in this study categorizes ethical behaviors in two types, either **proactive (helpful)**, seeking to improve the status quo; or **continuance (non-harmful)**, seeking only to maintain the status quo. If support exists for the CC-EVM theory, the existence of a proactive behavior (doing the right thing) or the absence of a continuance behavior (avoiding improper behavior) would explain both positive and negative modifications in the status quo.

It is critical to note that the categorization of a specific behavior may be context or role specific. If an individual's job requires a behavior, the CC-EVM theory defines that behavior as continuance in that failure to perform that behavior has negative consequences. If the behavior is positive and not required by the individual's job, that behavior is proactive. This dichotomy between continuance and proactive behaviors is similar in nature to that discussed in organizational citizenship behavior (OCB) literature(LePine, Erez, & Johnson, 2002).

The Target Dimension – Task, Consideration-Specific and Consideration-General Values

The other dimension of the CC-EVM is behavior **targets**. Ethical behavior-types classify behavior as preventing harm or doing good, ethical behavior-targets classify behavior as preventing harm or doing good **to what or whom**. The CC-EVM first divides targets of behavior into two major categories along the lines of the task vs. relationship dichotomy established by the Michigan and Ohio State studies (Yukl, 2005). **Task** targets concern behaviors toward achieving the formal goals of the organization. Behaviors which target tasks are generally measurable and clearly defined. The ethical element of task-targeted behaviors comes from the indirect effect of the task-behavior on relationships, and not a direct consequence of the task.

All business ethics deal with relationships (Arthur, 1984). To avoid confusion in terminology, the term "**consideration**" replaces the use of the term "relationship" as a category of behavior-targets. The organizational citizenship literature provides an additional distinction along the target dimension between local and distant consideration. Becker & Vance (1993) referred to local and distant altruism: (1)local-altruism is citizenship behavior directed at individuals with whom the acting individual has direct or face-to-face interaction, (2)distant-altruism is citizenship behavior directed at more general groups of individuals outside direct interaction. By similar logic, consideration behaviors act upon either specific or general relationships. Specific relationships involve identifiable parties whereas in general relationships individuals may be unidentified or identified with groups or vague associations. The final result of this categorization then, is a 2 x 3 matrix of values serving as types of, or guides to, ethical behaviors. The matrix contains six values organized as a value structure.

Schwartz (2002)(2005)(Schwartz, Dunfee, & Kline, 2005) draws upon ethical values suggested by Josephson(1997) (Josephson Institute of Ethics, 2008) to suggest that there are six basic values that should be incorporated in a business's code of ethics. These values according to Schwartz et. al. are:

1. Trustworthiness (including notions of honesty, integrity, reliability, and loyalty);
2. Respect (including notions of respect for human rights);
3. Responsibility (including notions of accountability);
4. Fairness (including notions of process, impartiality and equity);
5. Caring (including notions of avoiding unnecessary harm);
6. Citizenship (including notions of obeying laws and protecting the environment). (Schwartz, 2002, pp. 29-30)

These six values or moral standards are argued to be "universal in nature, in that they can be considered of fundamental importance regardless of time, circumstance, cultural beliefs, or religious convictions." (Schwartz, 2002, p. 30) These six values are used as labels for the CC-EVM cells, although the definitions are slightly modified from the Schwartz versions. Figure 1 shows the CC-EVM with the six labels in place. The following section will outline why the labels are places as they are.

Figure 1: The Corporate Character Ethical Values Matrix (CC-EVM)

Targets Types	Task	Consideration-specific	Consideration-general
Continuance (Non-Harmful)	*Trustworthiness*	*Respect*	*Justice & Fairness*
Proactive (Helpful)	*Responsibility*	*Caring*	*Citizenship & Civic Virtue*

VARIABLES WITHIN THE CC-EVM

Trustworthiness: Continuance type -- Task target

As a value or guide to behavior, trustworthiness deals with behaviors that are expected and demonstrate relevant competence at handling tasks or dealing with information, as required by the individual's occupation. Again, this is context specific – in general one may consider either a brain surgeon or auto mechanic to be "trustworthy" but we might not "trust" the surgeon to work on our car or vice versa. This label then refers to having the ability, competence and meeting the organizational and stakeholder expectations in relation to a task.

Responsibility: Proactive type –- Task target

The CC-EVM theory asserts that an individual who highly values responsibility will seek to do their job well – that is to exceed expectations. The CC-EVM‟s definition of responsibility also includes task behaviors that are beyond the individual's job description, but benefit the organization. This second element of the definition is similar to the conceptualization of extra-role behaviors (Bateman & Organ, 1983).

Respect: Continuance type -- Consideration-Specific target

The respect value dimension guides behaviors preventing the deterioration of existing relationships. Many of these behaviors equate with social etiquette (e.g., acknowledging someone's entrance into a

room, a cordial greeting, shaking hands). Only in the absence of these behaviors do individuals feel others are not showing respect. In the CC-EVM definition, respect is a granted rather than an earned concept.

Caring: Proactive type -- Consideration-Specific target

McAllister's (1995) affective based trust "reciprocal interpersonal care and concern"(p. 25) coincides with the CC-EVM's definition of caring. This concept is similar to the "caring" ethical climate dimension found by Victor and Cullen (1988). Wimbush and Shepard (1994) defined that dimension as follows: "In an ethical climate dominated by the "caring" dimension, employees would have a sincere interest for the well-being of each other, as well as others within and outside of the organization, who might be affected by their ethical decisions" (Wimbush & Shepard, 1994, p. 638).

The concept narrows here to include only those with whom the individual has a specific relationship. Interest in general others would align with the citizenship dimension. Caring behaviors go beyond social etiquette, extending into honest concern for improving relationships.

Fairness: Continuance type -- Consideration-General target

Behaviors linked to fairness seek equitable distribution of opportunities and/or outcomes. Unlike respect, fairness does not require that all the parties be identifiable – one can demonstrate fairness to a group of people without knowing them directly. As with trustworthiness and respect, it is the absence of fairness that causes the status quo to deteriorate.

Citizenship: Proactive type -- Consideration-General target

Both civic and organizational citizenship fit within the citizenship value definition presented here. Citizenship functions as caring extended to generalized others. Citizenship, of the six CC-EVM constructs, is the value most concerned with the overall greatest good, or utilitarian ethic.

Previous interview research related to the model identified certain potential difficulties for quantitative research related to the theory.
- The context or role specific nature of maintenance vs. proactive behaviors creates a difficulty in measuring the values that underlie the specific behaviors.

- Survey items describing behaviors need to be quite generic to avoid context specific factors, or the sample needs to be sufficiently homogeneous in terms of context and role to allow responses to be meaningfully categorized and interpreted.

- A given behavior may be guided by multiple areas of the value structure.

With this in mind, a simplified survey was developed for exploratory research to see if sufficient differentiation existed between the areas in the matrix to justify continued research.

METHOD

- Sample - 410 workers at a regional medical facility

       –   253 responses: 230 usable (56% response rate)

Web Survey – Five parts

1. Agreement to participate with informed consent
2. Attitudes toward organizations including organizational contentment (21 items : Showalter, Lowry & Ewalt, 2006) and Organizational Commitment (8 items: Meyer and Allen, 1997)
3. Attitudes about their jobs in general (8 items: van Saane, Sluiter, Verbeek, & Frings-Dresen, 2003)
4. Evaluation of values related to ethical behavior about self and others in the organization (12 items: Showalter 2009)
5. Demographics (age, gender, level in the organization, tenure in the organization)

The basis for the Organizational Contentment construct relies on a forward-looking perspective, linking goals and potential outcomes. Likened to *the light at the end of the tunnel*, Organizational Contentment is defined as the perceived future actualization of one's personal level of expectations within an organization. (citation removed for review purposes)

The CC-EVM areas of the matrix were assessed with 12 questions, two each (one based on perceptions of individual values and one based on perceptions of organizational values) for each of the six values in the matrix. (see Appendix A)

ANALYSIS

Several correlation matrices and regressions were run to investigate the relationships between and among the variables. A notable result is that for individual perceptions of the values of the CC-EVM (table 1) there was no significant correlation with either of the contentment variables, however there was for each of the organization perceptions of the CC-EVM (table1). Although not presented in the data shown in this paper, each of the 12 items in the CC-EVM measure correlated significantly with all the other items in the measure.

Further regression analysis is presented in tables 3 & 4. A summary of these findings is below:
For individual Values:

- An individual Value of Responsibility positively impacts Job In General scores.

    – Possible interpretation: I am dedicated to exceeding expectations, and perhaps then more optimistic about my job.

- An individual value of Respect is higher among younger people.

    – Possible interpretation: Younger people may be more concerned with maintaining positive relationships, while with age comes a recognition that relationships may become secondary to other things.

For organizational Values:

- At the continuance levels relationship values seem to be more important except for discontentment which is more affected by task concerns.

    – Possible interpretation: Meeting task expectations is assumed, the other variables improve my attitude, but if task expectations are missing, I am discontent.

- While at the proactive levels task seems to be more important

    – Possible interpretation: Improving relationships may be valued but emphasis is on the task – perhaps caring and consideration values are considered outside the workplace.

The fact that the items of the CC-EVM all significantly correlate with each other raises some serious concerns regarding the usefulness of the model for research as discriminant validity among the items is called into question. Nevertheless, the CC-EVM items as a whole do seem to function in similar ways in their relationship to contentment – specifically of note is that the values being important to individuals do not correlate with contentment or discontentment, but those reported as important to firms all correlate significantly with both. This result is of interest in what is says about how ethics influences contentment. In essence, the results may imply that it is not what the individual believes but what the firm believes (manifested in the behavior of its people) that determines my level of contentment or discontentment. Because the sample was somewhat homogeneous, we can expect that the individual values may also be somewhat homogeneous, although their perception of how the firm demonstrates its values may be different. Future research across a broader set of job categories may yield different results.

In preparing and presenting the regression results, multiple regression models were run so that for each of the dimensions the items along that dimension were included as the independent variables with the scale or demographic variable as the dependent variable. For Tables 3 and 4 an "x" indicates that the model as a whole (r^2) was insignificant and each of the individual variables within the model were also insignificant. Listed independent variables indicate that the variable is both significant and explained the most variance in the overall result. Of the 30 regressions run to prepare Table 3 only three developed significant regression models, although of the same number for Table 4 24 significant models emerged. Again, this reinforces the previous observation that the organizational level values have are more related to the contentment, commitment and JIG measures. Notably, while a relationship between age and individual attitudes toward respect (relationship specific/continuance) emerged, no significant relationships emerged between the organizational level values and the measured demographics, but significant relationships emerged with every organizational attitude measure. Proactive values seemed to be more influential variables, with the responsibility (proactive/task) variable having the greatest overall influence.

CONCLUSION

The CC-EVM provides a perspective for viewing business ethics and behavior, but at present the measures used are insufficient to fully support the model. It is clear that for this sample, individual's impressions of values what are important to them and what they perceive are the values of the firm they work for function differently with the perceived values of the firm having a much greater relationship to organizational attitudes and job satisfaction. More research and better measures are needed to more fully explore this relationship.

Measuring the values is quite difficult. The matrix helps define the domains, but the relative intensity of the values within each domain remains elusive. This research takes a clear step toward testing and measuring the values with the CC-EVM. Future research should include multiple items for each of the domains within the matrix as well as the more general items used in this study.

SELECTED REFERENCES

[1]   Arthur, H. B. (1984). Making Business Ethics Useful. *Strategic Management Journal , 5* (4), 319-333.

[2]   Bateman, T. S., & Organ, D. W. (1983). Job Satisfaction and the Good Soldier: The relationship Between Affect and employee "Citizenship". *Academy of Management Journa , 26* (4), 587-595.

[3]   Becker, T. E., & Vance, R. J. (1993). Construct Validity of Three Types of Organizational Citizenship Behavior. *Journal of Management , 19* (3), 663-682.

[4]   Butler, J. K., & S., C. R. (1984). A Behavioral Decision Theory Approach to Modeling Dyadic Trust in Superiors and Subordinates. *Psychological Reports , 55*, 19-28.

[5]   Castaldo, S., Perrini, F., Misani, N., & Tencati, A. (2009). The Missing Link Between Corporate Social Responsibility and Consumer Trust: The Case of Fair Trade Products. *Journal of Business Ethics* (84), 1-15.

[6]   Freeman, R., & Gilbert, D. (1988). *Corporate Strategy and the Search for Ethics.* Englewood Cliffs: Prentice Hall.

[7]   Hosmer, L. T. (1995). Trust: the Connecting Link Between Organizational Theory and Philosophical Ethics. *Academy of Management Review , 20*, 379-403.

[8]   Hunt, S. D., Wood, V. R., & Chonko, L. B. (1989, July). Corporate Ethical Values and Organizational Commitment in Marketing. *Journal of Marketing* , 79-90.

[9]   Josephson Institute of Ethics. (2008, 12 30). *Character Counts Coalition Members* . Retrieved 12 30, 2008, from Character Counts Coalition: http://charactercounts.org/overview/members.php

[10]   Josephson Institute of Ethics. (2008). Josephson Institute of Ethics – Six Pillars of Character. Retrieved 10 9, 2008, from Josephson Institute of Ethics : http://josephsoninstitute.org/sixpillars.html

[11]   Josephson, M. (1997). *Ethics in the Workplace: Resourse Reading Materials.* Marina del Rey, CA: Josephson Institute of Ethics.

[12]   Kabanoff, B., Waldersee, R., & Cohen, M. (1995). Espoused Values and Organizational Change Themes. *Academy of Management Journal , 38* (4), 1075-1104.

[13]   LePine, J. A., Erez, A., & Johnson, D. E. (2002). The Nature and Dimensionality of Organizational Citizenship Behavior: A Critical Review and Meta-Analysis. *Journal of Applied Psychology , 87* (1), 52-65.

[14]   Loe, T. W., Ferrell, L., & Mansfield, P. (2000). A Review of Empirical Studies Assessing Ethical Decision Making in Business. *Journal of Business Ethics , 25*, 185-204.

[15]   Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An Integrative Model of Organizational Trust. *Academy of Management Review , 20*, 709-734.

[16]   McAllister, D. J. (1995). Affect-and Cognition-Based Trust as Foundations for Interpersonal Cooperation in Organizations. *Academy of Management Journal , 38* (1), 24-59.

[17]   Mowday, R. T., Steers, R. M., & Porter, L. W. (1979). The Measurement of Organizational Commitment. *Journal of Vocational Behavior , 14*, 224-247.

[18]   Nicholson, N. (1994). Ethics in Organizations: A Framework for Theory and Research. *Journal of Business Ethics , 13*, 581-596.

[19]   Rempel, J. K., Holmes, J. G., & & Zanna, M. P. (1985). Trust in Close Relationships. *Journal of Personality and Social Psychology , 49*, 95-112.

[20]   Rokeach, M. (1973). *The nature of human values.* New York: Free Press.

[21]   Schwartz, M. S. (2002). A Code of Ethics for Corporate Ethics. *Journal of Business Ethics , 41*, 27-43.

[22]   Schwartz, M. S. (2005). Universal Moral Values for Corporate Codes of Ethics. *Journal of Business Ethics , 59*, 27-44.

[23]   Schwartz, M. S., Dunfee, T. W., & Kline, M. J. (2005). Tone at the Top: An Ethics Code for Directors? *Journal of Business Ethics , 58*, 79-100.

[24]   Van Buren III, H. J. (2008). Fairness and the Main Management Theories of the Twentieth Century: A Historical Review. *Journal of Business Ethics , 82*, 633-644.

[25]   Van Dyne, L., Graham, J. W., & Dienesch, R. M. (1994). Organizational Citizenship Behavior: Construct Redefinition, Measurement and Validation. *Academy of Management Journal , 37* (4), 765-802.

[26]   Victor, B., & Cullen, j. B. (1988). The Organizational Bases of Ethical Work Climates. *Administrative Science Quarterly , 33*, 101-125.

[27]   Webley, S., & Werner, A. (2008). Corporate Codes of Ethics: Necessary But Not Sufficient. *Business Ethics: A European Review , 17* (4), 405-415.

[28]   Wimbush, J. C., & Shepard, J. M. (1994). Toward an Understanding of Ethical Climate: Its Relationship to Ethical Behavior and Supervisory Influence. *Journal of Business Ethics , 13*, 637-647.

[29]   Yukl, G. (2005). *Leadership In Organizations.* New York: Prentice Hall.

APPENDIX 1

Listed below are a series of statements that represent possible feelings that individuals might have about the company or organization for which they work. With respect to your own feelings about the particular organization for which you are now working please indicate the degree of your agreement or disagreement with each statement by selecting one of the five alternatives beside each statement. (Answers are in a five point Likert Scale form ranging from Strongly Disagree to Strongly Agree)

- For me, it is important that I do my job in a way that meets expectations.
- For me, it is important that I do my job in a way that exceeds expectations.
- For me at work it is important that I behave in a way that maintains positive relationships with people that I know.
- For me at work it is important that I behave in a way that improves relationships with people that I know.
- For me at work it is important that I behave in a way that maintains positive interactions with and situations for people and groups that I don't know directly.
- For me at work it is important that I behave in a way that improves interactions with and situations for people that I don't know directly.
- For people in my organization, it is important that they do their job in a way that meets expectations.
- For people in my organization, it is important that they do their job in a way that exceeds expectations.
- For people in my organization it is important that they behave in a way that maintains positive relationships with people that they know.
- For people in my organization it is important that they behave in a way that improves relationships with people that they know.
- For people in my organization it is important that they behave in a way that maintains positive interactions with and situations for people that they don't know directly.
- For people in my organization it is important that they behave in a way that improves interactions with and situations for people that they don't know directly.

Contentment Scale ($\alpha = .799$)
- My job has importance in my life
- I look forward to going to work on a daily basis
- My job provides a sense of fulfillment
- I enjoy interactions with my co-workers
- The time and effort that I put into my job is worthwhile

Discontentment Scale ($\alpha = .760$)
- My boss stands in my way
- It is hard to be hopeful about the future because people in my organization have such bad attitudes
- I dread going to work every day
- I feel as if I am just going through the motions in my job
- I've pretty much given up trying to make suggestions for improvements in my organization

Table 1: Correlation Matrix with Individual Value Questions

		5CONTENTMENT	5DISCONTENT	Itrust	Iresponsible	Irespect	Icare	Ifair	Icitizenship
5CONTENTMENT	Pearson Correlation								
	Sig. (2-tailed)	n=230							
5DISCONTENT	Pearson Correlation	-0.5919							
	Sig. (2-tailed)	0.000	n=230						
Itrust	Pearson Correlation	-0.0229	-0.0298						
	Sig. (2-tailed)	0.734	0.658	n=223					
Iresponsible	Pearson Correlation	0.1095	-0.0509	0.5049					
	Sig. (2-tailed)	0.104	0.450	0.000	n=222				
Irespect	Pearson Correlation	0.0392	0.0285	0.5712	0.7209				
	Sig. (2-tailed)	0.562	0.674	0.000	0.000	n=221			
Icare	Pearson Correlation	0.0653	-0.0123	0.5354	0.7134	0.8704			
	Sig. (2-tailed)	0.333	0.856	0.000	0.000	0.000	n=222		
Ifair	Pearson Correlation	0.0114	0.0560	0.5645	0.6983	0.8513	0.8676		
	Sig. (2-tailed)	0.867	0.410	0.000	0.000	0.000	0.000	n=219	
Icitizenship	Pearson Correlation	0.0489	0.0111	0.4892	0.7079	0.7880	0.8330	0.8724	
	Sig. (2-tailed)	0.469	0.869	0.000	0.000	0.000	0.000	0.000	n=222

Table 2: Correlation Matrix with Organizational Value Questions

		5CONTENTMENT	5DISCONTENT	Otrust	Oresponsible	Orespect	Ocare	Ofair	Ocitizenship
5CONTENTMENT	Pearson Correlation								
	Sig. (2-tailed)	n=230							
5DISCONTENT	Pearson Correlation	-0.5919							
	Sig. (2-tailed)	0.000	n=230						
Otrust	Pearson Correlation	0.1798	-0.2267						
	Sig. (2-tailed)	0.007	0.001	n=223					
Oresponsible	Pearson Correlation	0.2692	-0.2792	0.6144					
	Sig. (2-tailed)	0.000	0.000	0.000	n=222				
Orespect	Pearson Correlation	0.2632	-0.2072	0.5891	0.6847				
	Sig. (2-tailed)	0.000	0.002	0.000	0.000	n=223			
Ocare	Pearson Correlation	0.2502	-0.2455	0.5368	0.6320	0.8740			
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	n=220		
Ofair	Pearson Correlation	0.2039	-0.1863	0.5032	0.6119	0.8081	0.8680		
	Sig. (2-tailed)	0.002	0.006	0.000	0.000	0.000	0.000	n=220	
Ocitizenship	Pearson Correlation	0.2314	-0.2134	0.5120	0.6327	0.8098	0.8625	0.9446	
	Sig. (2-tailed)	0.001	0.001	0.000	0.000	0.000	0.000	0.000	n=220

Table 3: Regression Analysis Results Individual Values

Individual

	Task	Relationship Specific	Relationship General
Continuance	**Trustworthiness**	**Respect**	**Fairness**
Proactive	**Responsibility**	**Caring**	**Citizenship**

Relationship General (Continuance):

Contentment	x	
Discontentment	x	
Commitment	x	
JIG	x	
Age	0.016	Respect (-)
Gender	x	

Relationship General (Proactive):

Contentment	x	
Discontentment	x	
Commitment	x	
JIG	0.086	Responsible (+)
Age	x	
Gender	x	

	Task	Relationship Specific	Relationship General
Contentment	x	x	x
Discontentment	x	x	x
Commitment	x	x	x
JIG	0.071 Responsibility (+)	x	x
Age	x	0.047 Respect (-) insig	x
Gender	x	x	x

Reported Significance based on F Statistic

insig indicates that while the model as a whole is significant the individual t statistic is not.

Table 4: Regression Analysis Results Organizational Values

Organizational

	Task	Relationship Specific	Relationship General
Continuance	**Trustworthiness**	**Respect**	**Fairness**
Proactive	**Responsibility**	**Caring**	**Citizenship**

Contentment	0.003	respect (+)
Discontentment	0.005	Trust (-)
Commitment	0.006	respect (+) and fairness (+) both insig
JIG	0.011	respect (+) and fairness (+) both insig
Age	x	
Gender	x	
Contentment	0.000	responsibility (+)
Discontentment	0.000	responsibility (-)
Commitment	0.001	responsibility (+) and caring (+) both insig
JIG	0.000	responsibility (+)
Age	x	
Gender	x	

Contentment	0.002 Responsibility (+)	.000 respect (+) insig	.002 Citizenship (+)
Discontentment	0.000 Responsibility (-)	.001 caring (-)	.006 Citizenship (-)
Commitment	0.004 Responsibility (+)	.001 caring (+) insig	.002 Citizenship (+) insig
JIG	0.000 Responsibility (+)	.001 caring (+) insig	.005 Citizenship (+) insig
Age	x	x	x
Gender	x	x	x

Reported Significance based on F Statistic

insig indicates that while the model as a whole is significant the individual t statistic is not.

THE ETHICAL IDELOGY OF STUDENTS: ARE THERE DIFFERENCES BETWEEN BUSINESS AND NON-BUSINESS STUDENTS?

John Angelidis, Ph.D., St. John's University, New York, NY
Nabil Ibrahim, Ph.D., Augusta State University, Augusta, GA
Faramarz Parsa, Ph.D., University of West Georgia, Carrollton, GA
Igor Tomic, Ph.D.. St. John's University, New York, NY

ABSTRACT

This paper examines students' ethical judgment based on Forsyth's two dimensions – idealism and relativism. Further, it investigates whether there are differences between business and non-business students with respect to these two dimensions. A survey of 178 students revealed significant differences between the two groups of students with respect to both ethical dimensions. Implications for educators and educators are discussed, and suggestions for future research are presented.

INTRODUCTION

The ethical standards and attitudes of managers and business students have been among the principal issues confronting business and society for many years. Of particular interest to educators, practitioners, and regulators is the extent to which corporations are responsive to the expectations of shareholders and society. While businesses have always been responsible for maximizing long-term value for the shareholders, they are increasingly expected to recognize the importance of their responsibilities toward society and to faithfully adhere to certain ethical standards.

Widespread media accounts of recent illegal and fraudulent actions involving some of the largest corporations and financial institutions have shaken the public's confidence and diminished investors' trust in the soundness of corporate decisions and the integrity and competence of business executives. As a result, numerous calls for reform and closer scrutiny of business ethics are being made by many, including business practitioners and researchers.

REVIEW OF THE LITERATURE

A sizeable academic literature has investigated students' attitudes toward business ethics. The research has come from many disciplines, and has focused on a wide range of issues. Business leaders and organizational theorists have long recognized the importance of including these prospective leaders and executives in ethics research. Their perceptions may be a harbinger of attitudes in the business community. In their research, Glenn and Van Loo (1993) noted that there were indications that business students were making less ethical choices in the 1980s than in the 1960s. More recently, Webster and Harmon (2002) compared today's college students with college students of the 1960s and found "a continuing societal movement toward Machiavellian behavior" (p. 435).

One important stream of research has compared the ethical perceptions of business and non-business majors. Overall, empirical studies have produced conflicting results. More than three decades ago, Hawkins and Cocanougher (1972) examined students' reactions to ethical matters in business. Their study revealed that those majoring in business were more tolerant of questionable business practices than were non-business students. More recent studies have confirmed these earlier findings. For example, St. Pierre, Nelson, and Gabbin (1990) found that accounting students scored lower on a test of moral reasoning than psychology students. In a survey of individual subscribers to *Business Ethics Quarterly*, Hosmer (1999) reported that, compared to non-business students, accounting and finance students were more likely to view business ethics as generally unimportant. Smyth and Davis (2004) concluded that

among two-year college students, business students were more unethical in their behavior and attitudes than non-business majors. Crown and Spiller (1998) found that business students are more tolerant of unethical behavior than are non-business students. McCabe and Trevino (1993) reported that college students intending careers in business cheat more often than those who were planning non-business careers. In his survey of students at a small college, Baird (1980) found that business school majors were more likely to cheat on tests than liberal arts or education majors. In addition, business school students were less likely to disapprove of cheating behavior. Similarly, Roig and Ballew (1994) concluded that business students had a more tolerant attitude about cheating. Sparks and Johlke (1996) found that students not majoring in business believed that salespeople behaved unethically more than business students; they "hold stricter ethical standards than business majors" (p. 885).

Although the preponderance of these investigations reported significant differences between the two groups, some studies produced different results. For example, Beltramini, Peterson, and Kozmestsky (1984) concluded that "somewhat surprisingly, the ethical concerns of the students surveyed were not substantially different across academic classifications or academic major" (p.199). Similarly, Arlow (1991) reported no systematic differences in the ethical perceptions of students depending on their major.

Given these conflicting results, a meta-analysis of 30 such studies found mixed results: 20% were significant, 57% were non-significant, and 23% were mixed. Also, in their review of eight studies examining differences and similarities between business and non-business students, Ford and Richardson (1994) reported that four studies did not find any significant differences, while the other four provided results which were both significant and contradictory. Borkowski and Ugras (1998) conducted a meta-analysis of several hundred studies carried out between 1985 and 1994. Their results were similarly inconclusive and they concluded that this relationship "is still difficult to interpret" (p. 1117).

Ethical Judgment

In his pathbreaking work, Forsyth (1980) identified two distinct dimensions that play an important role in ethical evaluation and behavior – idealism and relativism. These two aspects explain a significant amount of the variance in what different individuals perceive as right and wrong. He defined the former as the degree to which a person focuses on the inherent rightness or wrongness of an action and assumes ''that desirable consequences can, with the 'right' action, always be obtained'' (p. 176). Relativism is defined as "the extent to which an individual rejects universal moral rules in making ethical judgments" (p. 175). In a later study, Forsyth (1992) wrote that idealists "feel that harming others is always avoidable, and they would rather not choose between the lesser of two evils which will lead to negative consequences for other people". On the other hand, relativists "generally feel that moral actions depend upon the nature of the situation and the individuals involved, and when judging others they weigh the circumstances more than the ethical principle that was violated" (p. 462). Idealism and relativism are two distinct concepts; an individual may be high or low on either dimension; that is, a person can be high on both scales or even low on both scales.

These two constructs have been extensively used in the business ethics literature. For example, they have been found to be quite useful in the study of consumer ethics in China (Zhao, 2008), ethical decisions of small business managers (Marta et al., 2008), the moral ideology of African Americans (Swaidan et al., 2008), ethical sensitivity (Sparks and Hunt, 1998), and the ethical ideology and judgment of Portuguese accountants (Marques and Azevedo-Pereira, 2009).

While many studies have attempted to determine whether there were differences in ethical attitudes and behavior between business and non-business students, significant gaps in the literature remain. It is important to note that these studies have used a multitude of instruments and methodologies in a wide variety of settings to measure their subjects' ethical attitudes. One area which has been largely overlooked

and, therefore, warrants further investigation is whether there are differences between business and non-business students with respect to Forsyth's idealism-relativism dichotomy. The current study attempts to partially fill this void. Specifically, its purposes are twofold. First, to examine students' ethical judgment based on Forsyth's two dimensions. Second, to ascertain whether differences between business and non-business students do exist with respect to these two dimensions.

METHODOLOGY

A total of 182 graduating undergraduate students were surveyed. All were volunteers who were briefed on the importance of the study and told that all the questionnaires were anonymous. Although participation during class time was voluntary, only six students refused to participate in the study. Of the 182 completed questionnaires, four did not disclose whether they were business or non-business students and were, therefore, excluded from the analysis.

In addition to demographic variables, the questionnaire included a section designed to assess the students' ethical judgment based on the Ethics Position Questionnaire (EPQ) developed by Forsyth (1980). The EPQ consists of two scales, each containing ten items; one scale is designed to measure idealism and the other to measure relativism. Different versions of these two scales have been widely used in ethics research (e.g., Singhapakdi, Vitell, and Franke 1999; Marta et al., 2008; Zhao, 2008).

Forsyth stated that "the two scales that make up the EPQ were found to have adequate internal consistency, were reliable over time, were not correlated with social desirability " (1980, p. 175). Others have subjected these scales to considerable empirical verification and found them to be both valid and reliable (see, e.g., Rawwas, 1996; Lee and Sirgy, 1999; Vitell, Singhapakdi, and Thomas, 2001).

Respondents were requested to indicate on a five-point Likert scale (1= Strongly Disagree, 5 = Strongly Agree) the extent to which they disagreed or agreed with the EPQ items. Examples of typical idealism items are: "The dignity and welfare of people should be the most important concern in any society" and "One should never psychologically or physically harm another person." Each respondent's score was computed by calculating the mean of the scores to the ten items measuring idealism. A high score indicates that the respondent adheres to high idealism and vice versa. A reliability assessment of this scale indicates that it is internally consistent ($\alpha = 0.87$). Examples of typical relativist items are: "What is ethical varies from one situation and society to another" and "No rule concerning lying can be formulated; whether a lie is permissible or not permissible totally depends upon the situation." The relativism score of each respondent was calculated by averaging the scores to ten items. A high relativism value indicates that the respondent tends to rely less on universal moral rules and vice versa. Cronbach's alpha coefficient for this scale was 0.79, suggesting that it, too, is highly reliable.

RESULTS

A total of 82 business and 96 non-business students participated in the study. Fifty-nine percent of the students were male. The average age was 25 years. Overall, they had 5.3 years of work experience. The average scores from the entire sample for idealism and relativism were 4.11 and 2.74, respectively.

The analysis of the results was conducted in several stages. First, since the means of the two groups' scores on each of the two dimensions are different, a multivariate analysis of variance (MANOVA) procedure was considered to be the most appropriate analytic technique for exploring differences in scores between the business and non-business students. This procedure compensates for variable intercorrelation and provides an omnibus test of any multivariate effect. Each student's average scores for idealism and relativism were treated as the two dependent variables in the analysis, while academic major (business/non-business) constituted the independent variable. The MANOVA revealed significant

differences between the two groups ($F = 28.66$, $p < .008$). That is, overall, the two groups had different scores for the eight items.

Next, to understand the underlying contributions of the variables to the significant multivariate effect, each dependent variable was tested using a one-way analysis of variance (ANOVA) with the two groups of students treated as our two levels of the independent variable. Overall, the business students' idealism scores (mean = 3.94) were significantly lower than those of the non-business students' (mean = 4.26). On the other hand, the business students' mean score for relativism (mean = 2.87) was significantly higher than the non-business students' mean score (mean = 2.63). As shown in Table 1, the two ANOVAs found significant differences between the two groups of students. Whereas, compared to business students, the scores of their non-business counterparts were significantly higher for the "idealistic" dimension ($F = 4.54$, $p = .03$), their scores for the "relativistic" component were lower ($F = 6.25$, $p = .01$).

TABLE 1: ANOVA RESULTS FOR DIFFERENCES
BETWEEN BUSINESS AND NON-BUSINESS STUDENTS

| | Group Means [a] | | | |
| | Business ($n = 82$) | Non-Business ($n = 96$) | | |
Dependent Variables			*F*	*p*
Idealism	3.94 (0.96)	4.26 (1.03)	4.54	0.03
Relativism	2.87 (0.66)	2.63 (0.62)	6.25	0.01

[a] Figures in parentheses are standard deviations.

DISCUSSION

Surprisingly little attention has been given to measuring students' ethical judgment based on Forsyth's idealism-relativism dichotomy. A particularly critical subject concerns similarities and differences between business and non-business students with respect to these two dimensions. This study led to several insights about this relationship with important implications for educators and practitioners.

Taken as a whole, these results corroborate previous research showing that business students are more tolerant than non-business students of questionable business practices. The implications of these results for educators are that these differences might reflect the type of education business students are (or are not) receiving and/or the values they bring to those classes. As these students move into positions of future corporate leadership, they could play a major role in elevating or reducing corporate ethical standards. This paper's findings will be disturbing to advocates of business ethics particularly since other studies report that, compared to non-business students, business students are more willing to cheat, especially once they move into the business world (Kidder, 1995; McCabe, 1992). The results seem to offer proponents of greater emphasis on societal issues and ethical conduct in business education support for their normative suggestions. For example, Hathaway (1990) contends that business students should be trained in understanding the responsibility of business to its larger social system. Only then can they "become better managers...and lead a corporation or two toward the kind of responsible

behavior sorely needed in this troubled world" (p. 61). Indeed, some authors have argued that, if business schools themselves are to act as socially responsible organizations, they have a moral obligation to foster an awareness of the broader implications of business decisions (Gandz and Hayes, 1988).

For business practitioners, these results evoke a greater urgency for the need to advance organizational ethics. Several organizational variables help shape ethical behavior. Businesses legitimize the consideration of ethics as an integral part of decision making by providing strong guidance and continuously reminding managers of what is ethical. Some rely exclusively on codes of ethics to reduce ambiguity, promote ethical practices, and establish a strong ethical environment. As today's business students enter the corporate world, this study suggests that business leaders must recognize that ethical standards alone are necessary but insufficient. "A company must make the standards understood, and ensure their proper dissemination within the organizational structure" (Palmer and Zakhem, 2001, p. 83). Codes are more effective when they are supported by formalized training programs that promote ethical conduct. According to Valentine and Fleischman (2007), "ethics codes and training signify that the company is institutionalizing an ethical culture by improving individual moral development" (p. 167). Today many businesses and professional societies are setting up seminars and workshops in ethics training.

Nevertheless, Ambrose and Schminke (1999) argued that "the greatest influence on an individual's ethical behavior may be the ethical behavior of one's immediate supervisor" (p. 469). Often "there is a gap between the existence of explicit ethical values and principles … and the attitudes and behaviour of the organisation" (Webley and Werner, 2008, p. 45). A number of studies (e.g., Fisher and Baron, 1982; Greenberg and Scott, 1996) have concluded that employees often feel justified in engaging in unethical behaviors when they believe that their leaders have acted unethically toward them. There must be a high degree of commitment to business ethics from top management. They set the tone; they are the role models in terms of words and actions. Managers must embrace ethics and continually reaffirm their support for ethical conduct (Aguilar, 1994). Perceptions of poor leader ethics might promote unethical behaviors among subordinates in at least two ways. First, subordinates that perceive the behaviors of leaders to be unethical might act unethically themselves in order to retaliate. Second, the behaviors of leaders often set precedents for employee behaviors (Kemper, 1966). The employees will believe that unethical behaviors are tolerated in their organization and may, therefore, act less ethically than they otherwise would.

The influence of an organization's culture on employee ethics can also be understood in terms of Schneider, Goldstein, and Smith (1995) attraction-selection-attrition framework. They argue that organizational cultures proliferate by attracting individuals that fit with the existing culture and by eliminating members that do not. Thus, if an organization's culture consists of norms that support ethical behavior, ethical individuals will be attracted to that organization whereas unethical individuals will not. Conversely, an organization with an unethical culture might attract individuals that have unethical tendencies while driving ethical employees away.

Although this study offers an improved understanding of differences between business and non-business students, caveats must be offered regarding the conclusions generated by this research. First, additional research with larger national samples from each group would be necessary to confirm these findings. As Shaub (1994) points out, an individual's ethical perspective could be influenced by geographical and cultural location. Another caveat concerns the respondents' somewhat limited full-time work experience. An additional limitation concerns the generalizability of these results. A study such as this one is based largely on aggregate measures. However, it opens a line of inquiry on whether these results are valid when only those majoring in a particular discipline (e.g., accounting, management, etc.) are surveyed. This would ensure a greater homogeneity within the group being studied. Finally, a comparison of

business students and practitioners would be another productive avenue. For example, it would be useful to examine differences between future managers, younger managers, and managers with more extensive work experience. This type of analysis would yield insight into the perceptions of these three generations' attitudes toward codes of ethics.

In conclusion, the findings of this study provide helpful insights into an area of growing concern to society and all types of organizations. The numerous managerial ambiguities that are inherent in business decisions are further complicated by growing societal demands on corporations and increased awareness of the ethical dimension of decision making. This issue is likely to gain increased attention by educators and practitioners in the coming years.

REFERENCES

Aguilar, F.: 1994, *Managing Corporate Ethics: Learning from America's Ethical Companies How to Supercharge Business Performance* (Oxford University Press, New York, NY).

Ambrose, M. and S. Schminke: 1999, 'Sex Differences in Business Ethics: The Importance of Perceptions', *Journal of Managerial Issues* **11**(4), 454-464.

Arlow, P.: 1991, 'Personal Characteristics in College Students' Evaluations of Business Ethics and Corporate Social Responsibility', *Journal of Business Ethics* **10**(1), 63-69.

Baird, J.: 1980, 'Current Trends in College Cheating', *Psychology in the Schools* **17**(4), 515-522.

Beltramini, R.F., R. Peterson, and G. Kozmetsky: 1984, 'Concerns of College Students Regarding Business Ethics', *Journal of Business Ethics* **3**(3), 195-200.

Borkowski, S., and Y. Ugras: 1998, 'Business Students and Ethics: A Meta-Analysis', *Journal of Business Ethics*, **17**(11), 1117-1127.

Crown, D. F, and M. S. Spiller: 1998, 'Learning from the Literature on Collegiate Cheating: A Review of Empirical Research', *Journal of Business Ethics*, **17**(6), 683-700.

Fisher, J.D. and R. Baron: 1982, 'An Equity-Based Model of Vandalism', *Population and Environment* **5**(3), 182-200.

Forsyth, D.: 1980, 'A Taxonomy of Ethical Ideologies', *Journal of Personality and Social Psychology* **39**(1), 175–184.

Forsyth, D.: 1992, 'Judging the Morality of Business Practices: The Influence of Personal Moral Philosophies', *Journal of Business Ethics* **11**(5–6), 461–470.

Gandz, J. and N. Hayes: 1988, 'Teaching Business Ethics', *Journal of Business Ethics* **7**(9), 657-669.

Greenberg, J., and K. Scott: 1996 'Why Do Workers Bite the Hand that Feeds Them? Employee Theft as a Social Exchange Process', In B.M. Staw & L.L. Cummings (eds.), *Research in Organizational Behavior* (JAI Press, Greenwich, CT), 111-156.

Hathaway, J. W.: 1990, 'Students Teach Business a Lesson', *Business and Society Review* **72** (Winter), 58-61.

Hawkins, D. I. and A. B. Cacanougher: 1972, 'Students Evaluations of the Ethics of Marketing Practices: The Role of Marketing Evaluation; *Journal of Marketing* **36**(2), 61-64.

Hosmer, L. T.: 1999, 'Somebody Out There Doesn't Like Us: A Study of the Position and Respect of Business Ethics at Schools of Business Administration', *Journal of Business Ethics* **22**(2), 91-106.

Kemper, T.D.: 1966, 'Representative Roles and the Legitimization of Deviance, *Social Problems* **13**, 288-98.

Kidder, S.: 1995, How Good People Make Tough Choices: Resolving the Dilemmas of Ethical Living (William Morrow, New York, NY).

Lee, D. and M. J. Sirgy: 1999, 'The Effects of Moral Philosophy and Ethnocentrism on Quality-of-Life Orientation: A Cross-Cultural Comparison', *Journal of Business Ethics* **18**(1), 73-89.

Marques, P. and J. Azevedo-Pereira: 2009, 'Ethical Ideology and Ethical Judgments in the Portuguese Accounting Profession', *Journal of Business Ethics* **86**(2), 227–242

Marta, J., A. Singhapadki, A. and K. Kraft: 2008, 'Personal Characteristics Underlying Ethical Decisions in Marketing Situations: A Survey of Small Business Managers', *Journal of Small Business*

Management **46**(4), 589-606.

McCabe, D.: 1992, 'The Influence of Situational Ethics Among College Students', *Journal of Sociological Inquiry* **62**(3), 365-374.

Palmer, D. and Zakhem, A.: 2001, 'Bridging the Gap between Theory and Practice: Using the 1991 Federal Sentencing Guidelines as a Paradigm for Ethics Training', *Journal of Business Ethics* **29**(1/2), 77-84.

Rawwas, M.: 1996, 'Consumer Ethics: An Empirical Investigation of the Ethical Beliefs of Austrian Consumers', *Journal of Business Ethics* **15**(9), 1009-1019.

Roig, M. and C. Ballew: 1994, 'Attitudes toward cheating of self and others by college students and professors', Psychological Record **44**(1), 3-12.

Schneider, B., H. Goldstein, and D. Smith: 1995, The ASA Framework: An Update', *Personnel Psychology* **48**(4), 747-779.

Shaub, M.: 1994, 'An Analysis of the Association of Traditional Demographic Variables with the Moral Reasoning of Auditing Students and Auditors', *Journal of Accounting Education* **12**(1), p. 1-26.

Singhapakdi, A., S. Vitell and G. Franke: 1999, 'Antecedents, Consequences, and Mediating Effects of Perceived Moral Intensity and Personal Moral Philosophies', *Journal of the Academy of Marketing Science* **27**(1), 19–36.

Smyth, M. L. and J. R. Davis: 2004, 'Perceptions of Dishonesty among Two-Year College Students: Academic Versus Business Situations', *Journal of Business Ethics* **51** (1), 63–74.

Sparks, J. and S. D. Hunt: 1998, 'Marketing Researcher Ethical Sensitivity: Conceptualization, Measurement, and Exploratory Investigation', *Journal of Marketing* **62**(2), 92–109.

Sparks, J. and M. Johlke: 1996, 'Factors Influencing Student Perceptions of Unethical Behavior by Personal Salespeople: An Experimental Investigation', *Journal of Business Ethics* **15**(8), 871-887.

St. Pierre, E. K. and E. S. Nelson and A. L Gabbin: 1990, 'A Study of the Ethical Development of Accounting Majors in Relation to Other Business and Nonbusiness Disciplines', *The Accounting Educators' Journal* **3** (Summer), 23-35.

Swaidan, Z., M. Rawwas and S. Vitell: 2008. 'Culture and Moral Ideologies of African Americans', *Journal of Marketing Theory and Practice*, **16**(2), 127-137.

Valentine, S., and G. Fleischman: 2007, 'Ethics Programs, Perceived Corporate Social Responsibility and Job Satisfaction', *Journal of Business Ethics* **77**(2), 159-172.

Vitell, **S**., A. Singhapakdi and J. Thomas: 2001, 'Consumer Ethics: An Application and Empirical Testing of the Hunt-Vitell Theory of Ethics', *Journal of Consumer Marketing*, **18**(2), 153-178.

Webley**,** S. and A. Werner: 2008, 'Corporate Codes of Ethics: Necessary but not Sufficient', *Business Ethics: A European Review* **17**(4), 405-415.

Webster, H. A. and R. L Harmon: 2002, 'Comparing levels of Machiavellianism of today's college students with college students of the 1960s', *Teaching Business Ethics* **6**(4), 435-445.

Zhao, B.: 2008, *'*Consumer Ethics: An Empirical Investigation of the Ethical Beliefs in Mainland China', *The Business Review, Cambridge* **10**(1), 223-228.

The Ivory Tower: A Look at the Ethical and Social Responsibility of the University System

Cammie Hunt Oxendine, UNC Pembroke,
1 University Drive, Pembroke NC 28372

ABSTRACT

Many universities tout that they are "in business to serve their communities" and they are good ethical stewards to their stakeholders. This paper will address the issue of whether or not universities are upholding their social responsibility contracts with their internal and external stakeholders. Moreover, this paper will detail the importance of universities to practice corporate social responsibility as a mixture of ethics and strategy. During this chaotic economic time, American universities are being called upon to be proactive in meeting the needs of their internal and external stakeholders.

INTRODUCTION

Throughout the past two decades, there has been a lot of public disappointment expressed against nearly all things that include the government. Most citizens view public American universities as part of government since they receive some funding from the government. According to Thomas (2000), the public was disenchanted with universities, and university leaders such as Ernest Boyer insisted that universities make a change. Boyer (as cited in Thomas, 2000) expressed his concern as follows:

> What I find most disturbing…is a growing feeling in this country that higher education is, in fact, part of the problem rather than the solution. Going still further, that it's become a private benefit, not a public good. Increasingly, the campus is being viewed as a place where students get credentialed and faculty get tenured, while the overall work for the academy does not seem particularly relevant to the nation's most pressing civic social, economic, and moral problems. (p.64)

Over the years, the term "Ivory Tower" has been used to denote colleges and universities as places where academic elitism exist. According to Cummings (1998), universities are being considered as ivory towers that are not cognizant of the needs of society and therefore do not deserve public support. The purpose of this paper is to examine if American universities are guilty of not upholding their ethical and social responsibility to society.

HISTORICAL CONTEXT OF THE AMERICAN UNIVERSITY

Over the course of America's history, American colleges and universities have undergone several changes. The American institutions of higher learning were derived from European models. From the German universities came the idea of university research conducted by the specialized professor with the help of students. The strong emphasis on the teaching of undergraduate students and the broad conception of education that embraced the moral, emotional, and intellectual development of the student came from England's university system (Bok, 1982). In both of these countries, the academic institutions were detached from the public and were considered very elite institutions.

However, even though the American universities did follow these two models, Americans viewed higher education as the vehicle to provide the knowledge and trained manpower that the developing society needed. During the eighteenth century, the goal of the universities was to produce community leaders and their studies centered mainly on the humanities (McComiskey, 2005). Studying the humanities allowed the graduates to become better informed community leaders. According to Duderstadt (1999), the Federal Ordinance of 1785 defined the public role of the university as that of sustaining a young democracy. As America grew, so did the need for more trained manpower to help develop the vast natural resources of the land and there was increased attention to offer education to the working class. Thus, Congress passed the Morrill Act of 1862. According to Bok (1982), this act gave grants of land to each state for:

> the endowment, support, and maintenance of at least one college where the leading object shall be…to teach such branches of learning as are related to agriculture and the mechanical arts, in such manner as the legislatures of the state may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life. (p.62)

The land-grant universities were the beginnings of the state university system that helped make higher education more accessible to all citizens of America. Furthermore, as America has continued to go through many changes, the Federal Government has continued to develop new programs to help the institutions of higher learning keep pace. The GI Bill, the Higher Education Acts, and federal financial aid programs have all helped to expand the role of higher education so that those who want to receive a college education have the possibility to do so (Duderstadt, 1999).

Social Responsibility

As America has evolved, one aspect of the culture is that the citizens who are educated and well-to-do should contribute to the common good; this aspect includes corporations as well as universities (Coles, 1993). Modern corporate social responsibility began taking shape in the United States during the second half of the 20th century. For the purpose of this paper, there are many definitions for corporate social responsibility; however, according to Kok, van der Wiele, McKenna, & Brown (2001):

> Corporate social responsibility is the obligation of the firm to use its resources in ways to benefit society, through committed participation as a member of society, taking into account the society at large, and improving welfare of society at large independently of direct gains of the company. (p. 287)

Moreover, Friedman (as cited in Argandona, 1998) suggests the theory of social responsibility fluctuates between two extremes; one that diminishes the need for the firm to obtain the greatest possible profit for its shareholders and the other that expands the firm's responsibility to include a wide range of individuals that have an interest or "stake" in the firm. Argandona states that stakeholders can include shareholders, employees, customers, competitors, and society. As one studies social responsibility, it appears that the stakeholder view is based more on a utilitarian ethical point of view. Velasquez (2006) states that "utilitarianism holds that actions and policies should be evaluated on the basis of the benefits and costs they will impose on society" (p. 61).

The research of Hill, Stephens, and Smith (2003) provided several different categories that gave insight into how socially responsible firms view their duty to their various stakeholders. The first step these socially responsible firms take is to create a culture of high ethical standards that include all aspects of organizational life. These firms also value diversity among their workforce and this allows them to recruit better workers. Furthermore, socially responsible firms have a "must do" approach in regards to community service. The firms invest their resources in the local neighborhoods where they work and live and allow their employees to volunteer on company time to help others (Marens, 2004: Muijen, 2004). Moreover, they develop innovative uses of technology to help improve the lives of the firms' stakeholders and to help protect the environment.

AMERICAN UNIVERSITIES AND SOCIALLY RESPONSIBILITY

The American university system has enjoyed much success as a result of the strong bond between the university system and society. There are several stakeholder groups connected with the university system: students, faculty, staff, administrators, alumni, trustees, the communities where they are located and, some argue, the world (Hill, 2004). As there are many different stakeholders, Hill suggests there are also many diverse needs and expectations that these stakeholders try to place on the university system.

Over the years, the university system has taken on the responsibility of teaching the importance of firms being socially responsible; however, as they are teaching the theories and concepts are they actually

performing appropriate and ethical behaviors for the good of their stakeholders? In essence to be socially responsible, universities would need to establish a social contract between the university and the society it serves. If this is the case, then to what extent should universities draw their agendas from and be responsible to the communities that founded them?

Consequently, another issue that ties in with universities and their social responsibility is that of accountability. According to Romzek (as cited in Huisman & Currie, 2004), "accountability is the answerability for performance or the obligation to report to others, to explain, to justify, to answer questions about how resources have been used and to what effect" (p. 530). In the past the universities had an "internally-oriented system of accountability" (p. 535). Currently, there is a shift and universities have more of an explicit, externally oriented system of accountability. According to Huisman and Currie, this shift has occurred because of the strain on national and state budgets as a consequence of the high costs of higher education. Consequently, Huisman & Currie suggest the general public developed the opinion that higher education was not delivering value for the money it received. Thus, universities are seeking to gain greater public approval for their quality. Hence, are universities responsible and accountable to their stakeholders?

ACADEMIC FREEDOM

One of the greatest sources of power and influence for university professors lies within the context of academic freedom. This concept allows professors, students, and institutions of higher learning to pursue their scholarly work without undue or unreasonable interference from outsiders. For the most part, it allows the freedom to choose a research focus, to determine what topics to teach in the classroom, how and when to present research studies to colleagues, and publishing research studies. The Supreme Court of the United States said that academic freedom means a university can "determine for itself on academic grounds: who may teach, what may be taught, how it should be taught, and who may be admitted to study" (*Regents of the University of California v. Bakke*, 1978).

American universities are viewed as leaders of society and many feel that it is their responsibility to use their academic freedom to lead the nation during this knowledge-intensive age. According to Duderstadt (1999), the United States is entering a new age of knowledge and the key resource that will enable the country to remain prosperous is educated people and their ideas. Therefore, "as society becomes ever more knowledge-intensive, it becomes ever more dependent on those social institutions, such as the university, that create knowledge, educate people, and provide those people with learning resources throughout their lives" (p. 38). As history has progressed, it seems as if more and more universities are being asked to respond to the needs of society.

Furthermore as O'Connell (1998) notes, "in its most authentic sense, academic freedom is freedom for something, namely the advancement of truth. It is truth that yields its own claim on what we teach. And truth is the ultimate value in what we do in the university" (p. 1618). Academic freedom in and of itself does not have a direct impact on universities being socially responsible; however, according to O'Connell, it is how they decide to use their academic freedom that decides how socially responsible they are:

> And we must never forget that the right of academic freedom for the truth that we so enjoy bears with it an academic responsibility to the truth. Anything less than responsibility to the truth is not freedom at all but slavery to the blindness, the doubt, the lack of leadership that motivated us to become teachers in the first place. Our "influence" is one determined by our commitment to the truth and our ability to communicate that commitment in a convincing, compelling way. (p.1618)

In order for university faculty members to make contributions to their stakeholders through the use of academic freedom, they must be at level three of Kohlberg's theory of moral development. According to Velasquez (2006), at this stage faculty members would have the ability to see things from a point of view that impartially takes their stakeholder's interests into account. In light of using their academic freedom in this manner, the faculty member at this stage would be able to justify their actions on the" basis of moral principles that are impartial and reasonable and that therefore can appeal to any reasonable person" (p.27).

Furthermore, there may be instances where in an attempt to apply the utilitarian view academic freedom may be compromised. If the universities begin to demand that their professors tailor their research and teaching to particular areas as demanded by their external stakeholders, then academic freedom will no longer exist. Finally, if academic freedom becomes dependent upon the needs of the external stakeholders then it would also jeopardize the tenants of social responsibility because the needs of the internal stakeholders would be overlooked.

GRADE INFLATION

One of the most complex phenomena that universities face is grading. College grading faces both external social forces and internal changes of the participants (Hu, 2005a). According to Edwards (2000), grade inflation on American university campuses has been in existence for over 30 years and the causes and effects have been consistently documented. As Hu (2005b) states, "grade inflation is an upward shift in students' grade point averages without a similar rise in achievement" (p.4). One of the main reasons that university admissions officers give for grade inflation is the increasing quality of students attending post-secondary institutions. However, research indicates that the quality of students attending universities now is lower than their predecessors. Scores for the two college admissions exams, Scholastic Aptitude Test (SAT) and American College Testing (ACT), have been declining over the past thirty years indicating that the quality of the students is declining. It would seem that since the quality of students is declining then the GPA's for university students would also be declining; however, GPA's have been on a steady increase (Edwards, 2000).

Another common reason that is given for grade inflation deals with changes in administrative and institutional practices. During the 1960s and 1970s, universities had very rigorous academic programs that required students to study foreign languages, higher level mathematics, and science (Ravitch, 2004). As universities have grown and added degree programs many feel that the same academic rigor no longer exists. Also, universities have adopted many new institutional practices such as late withdrawal, pass/fail options, and removal of first-attempt grades from transcripts that help to conceal how students are actually performing in the university setting (Edwards, 2000).

As universities compete for state budget monies, they are actually competing for money based on their enrollment growth and they risk losing money if their enrollment declines. Furthermore, as the money received by the state is then allocated to the departments based on their credit-hour production there could be undue influence to inflate grades. In this scenario, departments and professors are trying to increase or maintain their enrollments so their existence is justified. For some students, when deciding on a major they look at the departments with the higher GPAs and decide that is the area they want to major in. Also, as students try to maintain their GPAs they will try to enroll in classes that are taught by professors who are known to be low graders. And due to very lenient late withdrawal policies, if they feel that they may not earn a high grade with a certain professor they will drop the course and take it with someone else (Edwards, 2000).

According to Edwards (2000), "student evaluations of faculty are among the most frequently cited and pernicious contributors to grade inflation" (p. 539). Renner (1981) explains that by having students evaluate faculty the quality of higher education is diminished because students are encouraged to evaluate their professors based on anticipated grades and other factors. Faculty come to realize that by giving low grades their evaluation ratings by students will go down and thereby their class sizes will be reduced and this could eventually result in the loss of their job.

In essence, grade inflation among American universities is promoting lower academic standards and students are not given an accurate view of their academic achievements and abilities (Lenkowsky, 2001). Looking at a candidate's GPA and trying to determine their ability level are misleading employers. Other agencies are having to step to the plate and become gatekeepers between the universities and certifications that are needed for professions. Society is becoming increasingly less tolerant of college graduates who fall below the minimum standards.

According to Edwards (2000), the American university undergraduate degree will soon be viewed as high school diplomas are today. Consequently, some universities will start to administer exit examinations to help raise the value of their degree; however, even that process will face a lot of scrutiny (Ravitch, 2004). If the trend of grade inflation keeps pace, it will only be a matter of time before business and industry will disregard college degrees when making hiring and promotion decisions and will rely instead on their own in-house evaluations according to Edwards.

Furthermore, as the issue of grade inflation continues to draw attention to the American university system it appears as if the universities are not upholding their ethical and social responsibility to society. To graduate students and send them out to employers with ability and knowledge levels that are below what their grades indicate is a clear violation of the ethic of care. In Velasquez (2006) ethic of care is defined as "an ethic that emphasizes caring for the concrete well being of those near to us" (p. 102). Consequently, the universities are also violating the communitarian ethic. "A communitarian ethic is an ethic that sees concrete communities and communal relationships as having a fundamental value that should be preserved and maintained" (p. 103). Employers, as major stakeholder to universities are their source of labor. However, if the universities are producing a misleading product, a student with high grades and no ability, then the university has failed to maintain the positive value that has been placed upon them by their communities. Finally, universities should not use the egalitarianism approach with grades. Not all students have equal abilities to attain knowledge and not all have attained the same amount of knowledge when they graduate; thus, grades should not be distributed as if the students are equal.

LIBERAL ARTS EDUCATION

From its earliest beginnings, the American university system was set up to provide a traditional education grounded in the humanities. According to Hollway (2005), more than 90 percent of the universities in America require a general education core that is grounded in the liberal arts. Traditionally, it has been viewed that the purpose of a liberal arts education is to shape the values of students. With this type of core curriculum, students are exposed to philosophy, history, the fine arts, and literature with the goal of increasing the student's humanitarian values. However, Hollway's research indicates that the impact of a liberal arts education on student's value change is inconclusive in proving that universities are achieving this goal.

Though the university was initially set up to provide a liberal arts education, the new demographics of students is changing what was once the perceived goal. The influx of non-traditional students entering

the university system are no longer interested in a liberal arts background but want to receive technical training and knowledge (McComiskey, 2005). McComiskey suggests the debate revolves around the institutional stakeholders who feel that the universities should change the content of the general education core curriculum so that the needs of the ever-changing society are met (Hollway, 2005). As McComiskey points out:

> Demand for college education has increased in the past two decades, especially among working adults for whom credentials have been identified, correctly, as the new condition of market survival in an increasingly uncertain situation. While during earlier decades a college degree was valued for its cultural capital, this new population of students valued their degrees for the market capital, the credentials, they could provide. (p. 103)

Critics who oppose the idea of universities doing away with the traditional liberal arts education argue that doing so is caving to the demands of society (Scott, 2006). However, by keeping the curriculum status quo "humanities departments" have become "service departments" since the traditional humanities fields are not deemed as having a specific function in the marketplace. It is the responsibility of American universities to provide a global education so that students will understand the burdens and benefits of a global community. As Sullivan (2000) indicates by insisting on a liberal arts education, American universities are creating a paradox with so many of the "world's best universities" in the midst of urban decay and social neglect. Graduates are not being equipped with the knowledge they need to make an impact on society.

Consequently, by deciding to do away with a liberal arts education and provide more of a global education, American universities will be making this decision based on utilitarianism. According to Velasquez (2006), "utilitarianism is a general term for any view that holds that actions and policies should be evaluated on the basis of the benefits and costs they will impose on society. In any situation, the "right" action or policy is the one that will produce the greatest net benefits or the lowest net costs" (p.61). Since the economy is now a global economy and most business decisions are based on a global view, in order to be socially responsible to their stakeholders universities must change the face of liberal arts educate and educate students on the global community.

RACIAL INEQUALITY/DIVERSITY

Students

For centuries, Blacks, American Indians, and other minority groups have struggled with the burdens of inequality that they must carry due to the color of their skin. It was not until the "Civil Rights" era of the mid-1960s that American universities began enrolling minority groups with a sense of urgency (Giroux, 2006). It was during this time that the practice of "preferential admissions" began in an effort to increase minority numbers on a university's campus. According to Bok (1982), minority students would be admitted with lower admission test scores and lower grades than White applicants who were not admitted. In essence, universities were going a step further than affirmative action and were admitting students who did not appear to be as qualified as those applicants who were rejected. University admissions offices would decide on a case-by-case basis to admit a number of minority students who had lower test scores and grades than White applicants as long as they appeared to be qualified and motivated to do the work. According to Bok (1982), these types of admissions policies were not unprecedented for universities:

> Colleges have extended preferential treatment for years to other groups of students, such as exceptional athletes or children of alumni, and these practices rarely arouse controversy. But

efforts to enlarge the enrollment of minority students have provoked an angry outcry from people who feel that universities are acting unfairly by favoring minority applicants. (p. 93)

The vast amount of literature available on American universities contains a lot of information on the subject of preferential admissions; however, most of the authors admit to little understanding of how admissions processes work. Some authors actually divulge their biases either in favor of or opposition of and then ignore decisive arguments from their opponents (Bok, 1984). This type of conflict in the literature has only made it even trickier for universities to gain a positive momentum in establishing their admissions criteria.

The opponents of preferential admissions argue that universities are causing White students who are rejected from their first-choice university to suffer an injustice. The argument that is widely held is that these White students were not a part of the past discrimination injustices against minorities and they should not have to pay for past mistakes of earlier generations (Bok, 1984; Giroux, 2006). Consequently, those who support preferential admissions usually admit that for the most part this admissions practice does eliminate better-qualified Whites so that they can amend past injustices against minorities. However, they contend that the practice only imposes a temporary injustice and the price is worth paying so that greater equality will be achieved in the long run (Bok, 1984; Giroux, 2006).

Furthermore, the literature suggests that there is a greater social reason that deems preferential admissions a necessity for American universities. As Bok (1984) remarks:

> In a country where racial problems and misunderstandings are so prominent, all students stand to benefit from the chance to live and work with classmates of other races who can offer differing attitudes and experiences that will challenge and inform others and increase the understanding and tolerance of everyone concerned. (p. 98-99)

As mentioned earlier, the practice of preferential admissions does raise questions about the ethicality of those decisions. The utilitarianism theory supports the practice of preferential admissions. For three hundred years, the United States was built on policies and programs that promoted racial exclusion and segregation (Fullinwider, 1997). These polices helped make the rich "richer" and the poor "poorer". Preferential admissions have helped ensure that people who were previously excluded from higher education and the better paying jobs now have the same opportunities afforded to them. Thus, preferential admissions policies take into account the need of those previously excluded parties and give them special opportunities that benefit the public welfare greater than the costs.

Since one of the original duties of the American university was to prepare students to become leaders of their communities, students have to be introduced to a diverse population while they are in college and equipped with the tools to battle racial bias. According to Hogan and Mallott (2005), "racial prejudice is expressed more covertly in American society today than it was before the civil rights movement of the 1960s" (p. 115). Consequently, racism on a university campus is typically characterized as a form of resentment about the social, political, and educational gains of minorities according to Hogan and Mallott. When universities first began the practice of preferential admissions they did not take into account this new type of racism that would surface on their campus. The universities were not prepared for the challenges they would face in educating a diverse group of college students. Therefore, they had to develop a number of educational interventions that would help improve the relationships among the diverse student body (Engberg, 2004). Research by Engberg and Hogan and Mallott showed that many universities developed multicultural curriculum, diversity workshops and training, peer-based interventions, and service-based interventions to prepare their students not only for the new demographic makeup of the American university system but also for the constantly changing demographic makeup of

corporate America. Thus, by fulfilling the need of their students to appreciate diversity while in higher education, universities also are preparing the future leaders of corporate America to recognize the need for diversity and how it will make for a better more competitive society.

Faculty

Just as the American university has had to respond to charges of racism with its admittance polices for students, there has been more criticism with the issue of racism that exists among hiring university faculty members. According to Bok (1984):

> Among the ethnic groups recognized by the federal government, only Asian-Americans have found their way to university faculties in numbers that equal or exceed their percentage in the population as a whole. Blacks, Hispanics, and American Indians are all represented on the faculties of major universities in proportions far lower than their percentages in the total population or in the student bodies of these institutions. (p. 104)

The process of hiring faculty is a very different than the process of admitting students. According to Bok the number of people who hold doctorate degrees is very low regardless of the ethnicity involved, the number of minorities with doctorate degrees is minuscule. Often times the lure of careers in law, business, or medicine, which provides much higher incomes than academia, will attract the minority students who are pursuing higher education degrees. Consequently, the labor pool of qualified minority faculty members is decreased.

For most universities the mission is to provide the highest quality of instruction and research. Consequently, they search for faculty members who have established records of teaching and scholarship. Therefore, they are less likely to use a system of preferential hiring such as the preferential admissions system that is used to admit some minority students. If search committees pass over the candidates with the best credentials in order to hire a minority so their numbers will improve, they are essentially overlooking the primary goal of the university system. Furthermore, if this is the action they take they will "generally be acting with a clear probability of diminishing the quality of teaching and research" (Bok, 1984, p. 111). In order to maintain their mission, whether they are a teaching institution or a research institution, universities will have to focus on hiring the most qualified faculty members.

By not utilizing a system of preferential hiring for faculty members, universities are using the contributive principle of distributive justice. This principle maintains that "the more a person contributes to a society's pool of economic goods, for example, the more that person is entitled to take from that pool; the less an individual contributes, the less that individual should get" (Velasquez, 2006, p.91). Consequently, since universities are looking for faculty members with the best credentials, they are looking for those who have contributed to society not just by their teaching but also by their research. However, when the university system uses preferential admissions for students they will be in turn helping create more minorities who will be able to make these same contributions to society; thus, helping create more diverse faculties.

The second issue in regards to the hiring of minority faculty that universities must address is the environment towards these minority faculty members on their campus. As Patton (2004) found, "many faculty of color face isolation, racial and gender-based antagonisms, the devaluation of their research interests and achievements, insufficient mentoring and support mechanism, and ambivalence about their academic authority" (p. 194). Since universities are making the effort to hire qualified minority faculty members they must also take the time to develop a culture on their campuses that fosters the diversity among the faculty members. It is important that the university environment not "mirror the same attitudes

and generalities about cultural / racial differences that plague larger society" (p. 194). Furthermore, if universities are going to uphold their social contract then they should exist as the ideal marketplace for diversity where value is placed on difference.

MORAL DEVELOPMENT/TEACHING ETHICS TO STUDENTS

One of the most critical problems facing society today is what appears to be a decline in ethical standards. People seem to no longer trust the integrity of business or political leaders. If there are such moral deficiencies then it is caused by the actions and decisions of individuals who are in a position of influence. According to Keohane (2006), universities maintain the mission to educate leaders for our nation and the world. If universities act on this part of their mission in a responsible manner then they will actively engage in the moral development of their students. Universities have the perfect strategic position to help shape the moral development of students.

Many universities have already begun work in this critical area of student development. In an attempt to meet the demands of external stakeholders, such as their communities, and meet the moral development needs of their students universities have begun programs in civic engagement. There is a growing belief among universities that civic responsibility depends on moral values and institutions of higher education should educate their students on the two as one (Colby, Ehrlich, Beaumont & Stephens, 2003). For the purpose of this discussion, Ehrlich's (2000) definition of civic engagement will be used:

> Civic engagement means working to make a difference in the civic life of our communities and developing the combination of knowledge, skills, values and motivation to make that difference. It means promoting the quality of life in a community, through both political and non-political processes. (Preface, vi)

In order to meet the goal of preparing students for civil engagement and moral maturity, there are three dimensions that universities must address. The first area that must be addressed is that students must understand the significance and levels of moral judgment and they must understand civic and political concepts. "Many college students are grappling with issues of epistemology-'What is true?' and 'How can you know?'-as well as with questions of ethical relativism" (Colby et al., 2003, p. 43) Universities can and should aid students in developing answers to these questions. Furthermore, students should learn the critical role they will play in society once they graduate.

Secondly, students must be motivated to act on their social and moral concerns. Finally, they must also have a sense of "political efficacy, that is, a sense that what they think and do civically and politically matters" (Colby et al., 2003, p. 43). As universities prepare to reach their students through moral and civic education, there are three areas where they can focus: the curriculum, extracurricular activities, and the campus culture.

The Curriculum

According to Bok (1982), American universities in the nineteenth century considered moral development of their students an important part of their mission. Graduating seniors were required take courses on moral philosophy that would allow them to develop a common moral code that would be passed from one generation to the next. Bok states this knowledge not only impacted the students for their own advancement it also allowed the students to have an even larger impact on society.

Over the years, as changes occurred within the societal framework of universities it became rare for universities to require students to study moral philosophy. As the social sciences divided from philosophy, departments began to place emphasis on the scientific nature of their work and students were not engaged in courses that would allow them to develop their powers of moral reasoning (Schneider, 2000). Schneider suggests a lot of discussions were held in faculty meetings that emphasized the teaching of professional responsibility in the various academia professional schools; however, in practice most universities were ignoring moral education for their students (Bok, 1982). According to Bok, by the mid-twentieth century, there were few reminders about the earlier efforts of universities to teach moral development:

> Catalogs continued to speak of moral development as a prominent aim of the institution, but there was scant evidence of any serious effort to purse this objective. In the selection of faculty, the traditional emphasis on character had given way almost completely to the demands for scholarly excellence and academic freedom. Presidential lectures on moral issues had likewise disappeared without any visible replacement, a casualty of the search for value-free learning and the reluctance to engage in any form of teaching that could be criticized as doctrinaire. (p. 121)

Consequently, by the 1970s, due to events that were happening that were changing the face or image of America the external stakeholders of the universities began exerting pressure on them to help aid with the decline in ethical standards. Items such as the Watergate scandal that showed how far the ethical standards of leaders had eroded were making news. Also, multinational corporations were being accused of unethical business deals with foreign officials and the medical profession was involved with issues such as abortion and the rights of terminally ill patients (Bok, 1982). In an effort to renew their social contract with their stakeholders, universities began to look for new innovative ways to include moral education in their curriculum. Administrators felt that it would be more beneficial to students if the curriculum was developed so that students would be enlightened on how to reason carefully and make decisions about ethical issues. Therefore, the classes would be more discussion based than lecture based. Consequently, the students would participate in active discussions on how they perceived ethical issues this would lead them to identify competing arguments and then give them the chance to evaluate the different views and draw their conclusions (Thomas, 2000).

The best-known approach that universities are using to combine moral and civic education is service-learning. This pedagogical approach links disciplinary study and community service together and allows students to see first-hand how they are helping shape society and making a difference (Colby et al., 2003; O'Connor 2006; Thomas, 2000). One of the problems according to Colby et al. faced by many universities who want to implement the service-learning concept into their curriculum is the lack of faculty who have the knowledge and pedagogical expertise needed to include moral and civic learning into their courses. Therefore, universities are forming partnerships with organizations such as Campus Compact to help provide faculty with the knowledge they need. The research conducted by Colby indicates that when universities include moral and civic goals into their curriculum they are not making a trade-off with other academic goals. On the contrary, Colby et al. concluded that:

> We are convinced that the two strands of undergraduate education, disciplinary or "academic" and moral and civic, are most powerful when creatively combined. Part of the value of broadening the goals of higher education is that linking academic material to students' lives and personal concerns and passions will lead to deeper understanding and more memorable learning of the course's academic content. (p.45)

Extracurricular Programs

Even after developing their curriculum to include moral and civic development many universities still felt the need to develop extracurricular programs that would give students even more opportunities for moral and civic involvement. Universities understand that much of the knowledge students need upon graduation they have to actually receive outside of the classroom. According to Sullivan (2000), many universities develop leadership programs that combine service activities and moral reasoning seminars and some even include that distinction on a student's transcript. Also, universities are rich with disciplinary, religious and political organizations that are able to incorporate the moral and civic development of students into their programs.

Culture

Finally, the culture that exists at a university will help aid in the moral development of students. University culture is complex as there are many facets that can send out conflicting messages. Since conflicts at universities normally become very public, a lot of attention is placed on how the university leaders respond. If they respond in an ethical manner it helps develop a sense of sound moral judgment at the institution (Colby et al., 2003). Also, universities should create obvious and unique cultures that are considered "open" and not "closed'.

American universities have no choice but to continue to maintain moral and civic development of their students as a vital part of their mission. Citizens seem to be losing trust in the American political system, the legal system, and corporate America. It is up to the universities to engage students in studying the many contemporary moral issues and help them develop a moral framework.

CONCLUSION

American universities are not ignoring their ethical and social responsibilities, but perhaps they could be taking them more seriously internally and externally. The universities are addressing the needs of their internal stakeholders through development of "learning opportunities that help faculty, staff, and students understand the responsibilities of individuals and organizations to the larger society" (Hill, 2004, p.94) such as the curriculum that develops service-learning. On the other hand, there is still the challenge of universities changing from faculty-centered to learner-centered institutions. Universities need to continue to work on becoming more responsive to what students need to learn rather than simply what faculties wish to teach (Duderstadt, 1999). Also, American universities need to take a closer, more objective look at the problem of grade inflation. Reports of grade inflation are causing many critics of the university system to denounce the value of a college degree.

Furthermore, in order to advance their social responsibility to their internal and external stakeholders they must make a tie to their mission that incorporates ethical and social responsibility. One area where universities need to tie their mission to social responsibility is the area of student admissions and faculty hiring as it relates to diversity. External stakeholders should not have to guess as to why their local campuses are not diversified. Also, in an effort to reach their external stakeholders, they must overcome the intellectual divide that is seen as a barrier between the internal and external stakeholders. In fact, many universities, which are considered "oases for the educated elite," (Hill, 2004, p. 98) are actually located within some of the poorest neighborhoods of America. Consequently, Hill suggests in these locations and others there are often physical barriers to entry, gates, fences, and uniformed guards that keep the local community outside the ivory tower. However, even if there is no physical barrier to entry, many external stakeholders face emotional barriers because they have little in common with or experience in institutions of higher education.

Therefore, in order for universities to accurately respond to the needs of their internal and external stakeholders; they must know what those needs are. Communication with both sets of stakeholders will allow for the collaboration that is needed to tie the university's social responsibility to their mission. However, regardless of the quality of their goals, plans, or actions, the possibility that any university will solve all of the intractable problems such as poverty or discrimination within a stakeholder community is miniscule. Hill (2004) notes, "A company, no matter how laudable its intentions, will never be good enough. The more ambitious its social agenda, the more elusive its success will be" (p. 99). In conclusion, American universities can never do enough in regards to upholding their social contract with their internal and external stakeholders. However, American universities must break down the barrier of the "ivory tower" and construct their agendas from the utilitarian view so that their internal and external stakeholders will benefit from the greater good they have to offer from within their system.

REFERENCES

[1]Argandoña, A. (1998). The stakeholder theory and the common good. *Journal of Business Ethics*, *17*, 1093-1102.

[2]Bok, D. (1982). *Beyond the ivory tower*. Cambridge, MA: Harvard University Press.

[3]Colby, A., Ehrlich, T., Beaumont, E., & Stephens, J. (2003, November/December). Educating undergraduates for responsible citizenship. *Change*, 41-48.

[4]Coles, R. (1993). *The call of service*. Boston: Houghton-Mifflin.

[5]Cummings, W. K. (1998). The service university movement in the U.S.: Searching for momentum. *Higher Education*, *35*, 69-90.

[6]Duderstadt, J. J. (1999, Winter). New roles for the 21st-century university. *Issues in Science and Technology*, 37-44.

[7]Edwards, C. H. (2000). Grade inflations: The effects on educational quality and personal well being. *Education*, *120*(3), 538-546.

[8]Engberg, M. E. (2004, Winter). Improving intergroup relations in higher education: A critical examination of the influence of educational interventions on racial bias. *Review of Educational Research*, *74*(4), 473-524.

[9]Fullinwider, R. K. (1997). The life and death of racial preferences. *Philosophical Studies, 85*, 163-180.

[10]Giroux, S. S. (2006, Fall). Playing in the dark: Racial repression and the new campus crusade for diversity. *College Literature, 33*(4), 93-112.

[11]Hogan, D. E. & Mallott, M. (2005, March/April). Changing racial prejudice through diversity education. *Journal of College Student Development*, *46*(2), 115-125.

[12] Hill, R. P. (2004). The socially-responsible university: Talking the talk while walking the walk in the college of business. J*ournal of Academic Ethics*, *2*, 89-100.

[13] Hill, R. P., Stephens, D. L., & Smith, I. (2003). Corporate social responsibility: An examination of individual firm behavior. *Business and Society Review, 108*, 339-362.

[14] Hollway, M. C. (2005). A comparison of the impact of two liberal arts general education core curricula on student humanitarian values. *The Journal of General Education*, *54*(3). 237-266.

[15] Hu, S. (2005a). Correlates in college grades. *ASHE Higher Education Report*, *30*(6), 9-14.

[16] Hu, S. (2005b). Grading problems in higher education. *ASHE Higher Education Report*, *30*(6), 1-7.

[17] Huisman, J. & Currie, J. (2004). Accountability in higher education: Bridge over troubled water? *Higher Education*, *48*, 529-551.

[18] Keohane, N. O. (2006). *Higher ground: Ethics and leadership in the modern university*. Durham, NC: Duke University Press.

[19] Lenkowsky, L. (1989, Fall). College today: The student's perspective. *Academic Questions*, 39-44.

[20] Marens, R. (2004). Wobbling on a one-legged stool: The decline of American pluralism and the academic treatment of corporate social responsibility. *Journal of Academic Ethics*, *2*, 63-87.

[21] McComiskey, B. (2005). Revisioning interdisciplinary humanities education: Crisis, change, and rhetoric. *Interdisciplinary Humanities*, *22*(2), 100-110.

[22] Muijen, H. S. C. A. (2004). Corporate social responsibility starts at university. *Journal of Business Ethics, 53*, 235-246.

[23] O'Connell, D. M. (1998). From the universities to the marketplace: The business ethics journey. *Journal of Business Ethics*, *17*, 1617-1622.

[24] O'Connor, J. S. (2006, September/October). Civic engagement in higher education. *Change*, 52-58.

[25] Patton, T. O. (2004). Reflections of a black woman professor: Racism and sexism in academia. *The Howard Journal of Communications*, *15*, 185-200.

[26] Ravitch, D. (2005, Summer). The scars and trophies of a reformer. *Academic Questions*, 7-19.

[27] Renner, R. R. (1981). Comparing professors: How student ratings contribute to the decline in quality of higher education. *Phi Delta Kappan, 63,* 128-130.

[28] Scott, J. C. (2006, January/February). The mission of the university: Medieval to postmodern transformations. *The Journal of Higher Education, 77*(1), 1-39.

[29] Schneider, C. G. (2000). Educational missions and civic responsibility: Toward the engaged academy. In T. Ehrlich (Ed.), *Civic Responsibility and Higher Education* (pp. 98-123). Phoenix, AZ: American Council on Education Oryx Press.

[30] Sullivan, W. M. (2000). Institutional identity and social responsibility in higher education. In T. Ehrlich (Ed.), *Civic Responsibility and Higher Education* (pp. 19-36). Phoenix, AZ: American Council on Education Oryx Press.

[31] Thomas, N. L. (2000). The college and university as citizen. In T. Ehrlich (Ed.), *Civic Responsibility and Higher Education* (pp. 63-97). Phoenix, AZ: American Council on Education Oryx Press.

[32] Velasquez, M. G. (2006). *Business ethics: Concepts and cases* (6th ed.). Upper Saddle River, NJ: Pearson-Prentice Hall.

THE LONG-TERM DECLINE IN SMOKING IN THE U.S.

Robert T. Barrett, College of Business and Applied Professional Sciences, South Carolina State
University, Orangeburg, SC, 803-536-8186, rbarret1@scsu.edu
Robert E. Pugh, School of Business, Francis Marion University, Florence, SC, 29501
843-661-1414, rpugh@fmarion.edu
Neil Riley, School of Business, Francis Marion University, Florence, SC, 29501
843-661-1415, nriley@fmarion.edu

ABSTRACT

Earlier research [1] investigated the impact of state excise tax increases on the incidence of smoking. The research is extended proposing a more robust modeling approach.

INTRODUCTION

In the U.S. smoking has been well established as a major health risk since the early 1960's. In the nearly 50-years since this risk was recognized, numerous studies have confirmed this health risk by identifying primary risks such as lung cancer and heart disease and by establishing that smoking contributes to the development of a variety of other serious diseases. Americans have responded to these warnings about smoking by reducing smoking significantly since the 1960s. However, the human costs of smoking remains high. Recently it was estimated that tobacco use, primarily smoking, remains "one of the biggest causes of preventable and premature deaths in the U.S., claiming the lives of more than 440,000 people each year" [3]. Given the cost in human life associated with smoking, we should ask when will smoking be eliminated or virtually eliminated.

In the 40-year period 1965-2005 the percentage of U.S. adults, 18 and older, who smoked declined dramatically—from about 42.0 percent in 1965 to about 20.8 percent in 2005. This decline began just after the 1964 Surgeon General's report on the health risks of tobacco. This report created a strong public awareness of the risk of smoking and triggered the beginning of the decrease in smoking rates. Figure 1 shows the decline during the 1965-2005 period. As shown the rate of decline during the period was relatively constant. In addition to the public awareness of the health risks of smoking, other factors contributed to the decline including the increased excise tax on cigarettes causing smoking to be expensive, a variety of smoke-free laws and regulations for both public places and work places, and the increased availability of smoking cessation medications and programs [3]. This cluster of factors—health concerns, taxes, the smoke-free movement, and cessation methods—worked together to reduce the proportion of the population smoking.
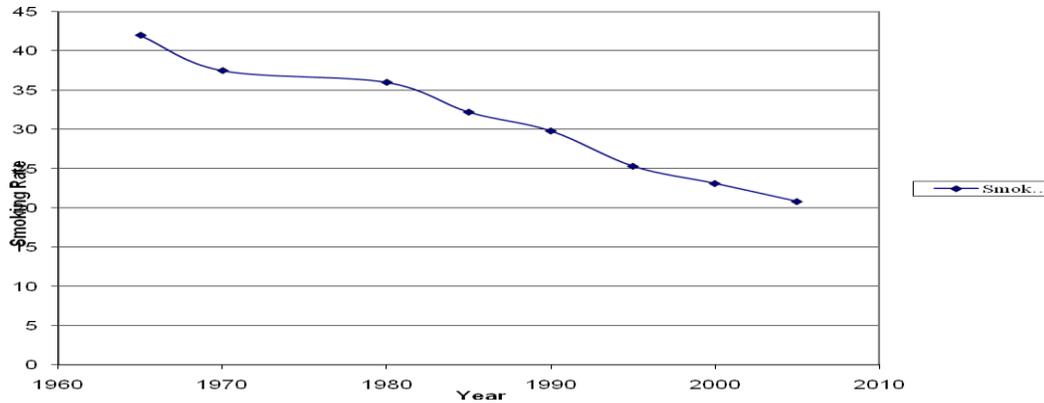
Figure 1. Smoking Rates in the United States, 1965 – 2005.

There are substantial differences in the proportion of the population that smoke from state to state and from region to region. For example, in 2005 Kentucky, Tennessee, and West Virginia had the highest rates of smoking with 28.7, 26.8, and 26.6 percent, respectively, of their adult populations. At the other end of the range, Connecticut, California, and Utah had 2005 rates of 16.5, 15.2, and 11.5 percent, respectively. In terms of the four Census Bureau regions, the West Region had the lowest percent of smokers in 2005 with 19.2, but the Northeast Region was only slightly higher with 19.8 percent, and the Midwest Region only a bit higher with 20.4 percent. The South Region had the highest proportion smoking in 2005 with 23.1 percent [2]. There are anomalies within region such as the three west coast states of California, Oregon, and Washington having smoking rates of 15.2, 18.5, and 17.6 percent, respectively, compared to the region's rate of 19.2 percent. Also in the South Region, Kentucky, Tennessee, and West Virginia have rates of 28.7, 26.8, and 26.6 percent, respectively, compared to the South Region rate of 23.1 percent.

States vary considerably in their decline in smoking over the 1965-2005 period. The level of a state's excise tax on cigarettes is clearly a factor in explaining a state's decline. However, other variables such as economic factors, demographic factors, and variations in tobacco industry marketing and promotion within a state are possible explanatory variables for the rate of decline in smoking [2].

PROPOSED APPROACH TO MODELING SMOKING DECLINE

A modeling approach is developed here that will be applied in future research. It is proposed that the following steps be taken to increase understanding of the factors related to the decline in smoking among states. The approach taken will apply regression modeling techniques using the full 50 states and in some cases smaller groups of states.

First, a regression analysis will be applied to estimate the explanatory power of the level of state excise tax on the decline in smoking during the 1998-2007 period. In this analysis the 50 states will be used and the dependent variable will be the average annual percentage decline in smoking during the 10-year period. The explanatory variable will be the average per pack state excise tax during the period. In this step a secondary analysis will be done to determine the set of states for which the excise tax level is a strong versus weak predictor of the decline in smoking.

Second, economic explanatory variables will be added to the regression model or models from the first step. Possible state economic variables will include average per capita income,

unemployment rate, and proportion of jobs in the agriculture sector over the 1998-2008 period. Analyzing the explanatory power of these variables likely will lead to other possible explanatory variables.

Third, the model resulting from the previous steps will be further developed by introducing some state demographic variables. Variables examined will include educational attainment (possibly the percent of adults that have not completed high school or the percent of adults that have completed a bachelor's degree), proportion of population that is non-white, and proportion of families in poverty.

Fourth, to the extent reliable data can be obtained, programs that encourage or discourage smoking can possibly be incorporated into the model. For example, some states use a proportion of the revenue from tobacco sales to make smoking cessation programs available to the public. Tobacco companies conduct marketing campaigns aimed at encouraging the use of tobacco products. At this point it is not known if reliable data at the state level are available in this area, but it is worth investigating.

Fifth and last, the best models developed in this process will be interpreted in terms of what they reveal about the factors associated with states reducing the level of smoking. In addition it may prove interesting to forecast the time frame over which the U.S. will be able to reduce smoking to one half its 2005 level of 20.8 percent or to about 10.0 percent. That is, repeat the reduction in the percentage of people smoking to one half its level as was accomplished in the 1965-2005 period. This is a secondary purpose but it is of general interest and puts the problem of smoking and its associated health costs in perspective.

REFERENCES

[1] Barrett, R. T., R. E. Pugh, and N. E. Riley, "South Carolina's Cigarette Tax Increase Decision," *Southeast Decision Sciences Institute Proceedings*, February 2008 [CD].

[2] "State-Specific Prevalence and Trends in Adult Cigarette Smoking—United States, 1998-2007," *Morbidity and Mortality Weekly Report*, March 13, 2009.

[3] www.injuryboard.com, "Smoking rates in the U.S. Decline below 20 Percent," November 14, 2009.

NG911: WHEN TECHNOLOGY DRIVES PUBLIC POLICY

Elaine Seeman, 342 Slay Hall, East Carolina University, Greenville, NC 27858

James Holloway, 330 Slay Hall, East Carolina University, Greenville, NC 27858

ABSTRACT

As telecommunications technology has advanced, citizens have assumed that their communications devices are capable of soliciting emergency assistance. Text, video and calls from Voice over IP (VOIP) phones are increasingly popular; however, procuring 911 help via these modes has not been widely implemented. As the technology of 911 becomes more complicated and more expensive, federal and state agencies have begun to recognize the need for centralized planning. This paper examines federal and state policies and plans to assess the convergence of technology, policies and regulation.

INTRODUCTION

In 1996, the FCC mandated that all 911 calls from wireless and wireline phones be locatable within a defined distance (FCC report and order and further notice of proposed rulemaking, 1996, July 26). For the past twelve years, wireless carriers and PSAPS (Public Safety Answering Points) have struggled to meet this mandate. Only recently have the majority of PSAPS been able to locate wireless 911 calls; problems related to the delay in meeting the 1996 mandate included: the lack of a singular cellular wireless standard, diverse methods of locating calls based on differing standards, varying levels of technical understanding and jurisdiction among PSAPS, and the issuing of an unfunded mandate by the FCC (Seeman, 2002). Delays in implementing wireless 911 prompted the FCC to study the deployment of 91 services. The Hatfield report focused on technical and operational issues and suggested that a national 911 office act as a champion at the national level (Moore, 2008).

Much progress has been made in locating wireless and wireline 911 calls but the emergence of VOIP has created new challenges for the public safety community. Text, video and photos sent from cellular phones have become the modus operandi for young adults. Users assume that they can procure 911 assistance through the same communications channels that they use daily. However, modernizing systems to meet user expectations will require huge investments in new technologies.

Implementing these new technologies, which are collectively known as Next Generation 911 (NG911), will also require changes in 911 operation, governance and funding. Most experts agree that NG911 can best be implemented through the use of Internet Protocol (IP) networks and standards. According to a recent report prepared for the members and committees of Congress, "An IP-based emergency communications network will facilitate interoperability and system resilience, improve connections between 911 call centers, emergency responders, and alert and warning systems; provide more robust capacity; and offer flexibility to receive calls for help in any format" (Moore, 2008).

Developing such a system is ambitious, necessary and complicated; it will require cooperative coordination on federal domestic security, emergency management, communications and 911 policies and state public safety and communications policies. Particularly, state policy coordination demands operational and technical or system-wide integration of the state 911 regulatory framework and county

and municipal emergency call services, emergency management and geographical information system programs.

This paper is part of a research stream related to 911 law, public policy and technology implementation. Recently two entities, a state 911 Board and the research arm of the National Emergency Number Association (NENA) have asked the authors to examine the need for state and national planning in the light of NG911. This paper, which is the initial step in responding to their requests, will proceed as follows: First we discuss federal legislation and resulting national planning and grant initiatives. Then we explore guidelines and assistance developed by national public safety organizations. Next we talk about state planning efforts and legislation. Finally, we discuss local resistance and the cost of not moving forward with NG911.

FEDERAL LEGISLATION, PLANNING AND GRANTS

Federal legislative and administrative regulatory activities governing the 9-1-1 system determine the roles, obligations and responsibilities of telecommunications and other industries and state policy-makers and agencies involved in developing and deploying technologies, establishing and maintaining state 9-1-1 systems and managing municipal and county emergency call services.

In a number of legislative acts since 2004, Congress has addressed the affect of emerging technologies on the ability to respond to 911 calls. In response to suggestions recommended in the 2002 Hatfield Report, and others, Congress passed The Ensuring Needed Help Arrives Near Callers Employing (ENHANCE) 911 Act of 2004 (P.L. 108-494). The ENHANCE 911 Act created the E-911 Implementation Coordination Office (ICO) to serve as a federal 911 champion and to oversee a grants program for the implementation of and operation of E911 (ENHANCE 911 Act, 2004). This Act focused on compliance, rural coverage, and the appropriate use of fees levied by states for 911.

The New and Emerging Technologies (NET) 911 Improvement Act of 2008 (P. L. 110-283) specifically addressed Voice Over Internet Protocol (VOIP) access to 911 call centers and called for the ICO to coordinate a national plan for migration to an IP-enabled 911 network. This act also extended FCC oversight and regulatory authority to include VOIP service providers. Previously, only wireline and wireless carriers had to comply with 911 connectivity requirements. The FCC addressed parity of access and related capabilities for VOIP call in Report and Order WC Docket No., 08-171 (2008).

The National Plan as defined in the NET 911 Act has not yet been developed. However, based on and past Congressional support and legislation, Moore (2008) suggests four objectives that a National Plan should address. These include:

- **Equality of service and access to 911-** All 911 calls must receive the same level of information and responsiveness regardless of call location, originating communications device or the physical capability of the caller.
- **Mechanisms to improve PSAP funding and to monitor fee collection and disbursements.** Congress has tasked the FCC with monitoring and reporting on the both the collection of state 911 fees as well as on the disbursement of those fees to PSAPs and carriers. The purpose of this reporting is to assure that funds collected for 911 are used only for their attended purpose. In addition, by administering Federal 911 grants, the ICO can guide the funding of 911 improvements and withhold grant funding from any state that disburses 911 funds for non-allowable uses.

- **Federal Leadership in Improving 911 Capabilities.** A Department of Transportation (DOT) Working Group is constructing the architecture to demonstrate how an NG9-1-1 system would operate and why it offers improved capabilities over the current voice-based system. Other agencies such as the National Institute for Standards and Technology (NIST), the National Telecommunications and Information Agency (NTIA), the Department of Homeland Security, and the FCC are developing standards that will enable a next generation network for emergency communications to operate effectively (Weiser et al., 2008).
- **Transition to IP-Enabled 911 Systems.** Based on the developing standards, architecture and National Plan described above IP-Enabled 911 systems are becoming close to realization. However, attainment depends on a successful migration away from the existing voice-based infrastructure to a network architecture that can be best provided at the state or regional rather than local level (Hatfield et al., 2008).

NATIONAL ORGANIZATIONS

Professional organizations of emergency response call-takers have been active in developing standards, supporting legislation and in educating their membership about NG911 and resultant changes to come. The National Emergency Number Association (NENA) and the Association Public Safety Communication Officials (APCO) have partnered with federal agencies and commercial entities to develop functional and interface standards for NG911 (NENA Functional, 2007) In addition, NENA has developed database management recommendations to insure data quality (Intrado, 2008). In an effort to have their opinions heard, the NENA Next Generation Partner Program published a policy paper with recommendations for both state and federal policy makers (NENA, Next Generation Partner Program).

STATE PLANNING

Until the advent of cellular phones, 911 was usually local and under the jurisdiction of a police department or county sheriff. When the FCC mandated enhanced 911 functionality to include wireless callers, states got involved (FCC report and order and further notice of proposed rulemaking, 1996, July 26). Weiser et al. (2008) found that those states with some kind of statewide 911 oversight were able to support PSAPs through training, funding, equipment approval and bulk purchasing, increased support for the technology, and a higher level of interoperability.

To implement NG911, state oversight will be required to construct the necessary infrastructure; most PSAPs use equipment that cannot be upgraded to VOIP NG911 standards. The cost saving of consolidating equipment and software for GIS mapping and caller databases from multiple (often hundreds) of sites to a single IP-based network with one computer hosting GIS mapping and a single database is considerable.

Federal legislation strongly encourages each state to develop a plan for moving toward Next Generation 911. Indeed some federal matching grant opportunities are contingent on the state having developed a state plan. At this juncture, states appears to be struggling. Each State Plan is unique as evidenced by three recent presentations (Florida, Indiana and Tennessee) to the NC State Wireless Board. What is not unique however, is the plan to consolidate services through an IP-based 911 network.

LOCAL RESISTANCE

To local emergency agencies, consolidation is often viewed as a dirty phrase. PSAPs resist consolidation due both to fear of job loss and also due to the fear of loss of control. Resistance to change is always a factor when implementing new technology; for local PSAPs, NG911 changes everything and it is scary for them. However Weiser et al, (2008) suggest that an IP-based NG9-1-1 system offers opportunities to the PSAPs for improved call routing, personnel efficiencies and 24/7 backup, and economies of scale and scope. (Weiser et al, 2008). Clearly the advantages of NG911 need to be emphasized. The ramifications of not adopting NG911 also must be considered.

A less effective 9-1-1 system means that police, fire and emergency services may arrive a few minutes late. These late arrivals expose citizens to greater personal injuries and personal and real property damages and commercial and business losses. Logically, this exposure (attributed to less effective emergency call services or 911 systems) has a cumulative economic cost shared by industry, consumers and public social programs. Consequently, any convergence that includes cooperative coordination of federal domestic security, emergency management, communications and 9-1-1 policies and state public safety and communications policies must now consider the economic, social, political and other losses of less effective state 9-1-1 systems.

CONCLUSION

The convergence of technology, policy and regulation to further emergency call services, public safety and homeland security is really about what 9-1-1, Enhanced (E) 9-1-1 and Next Generation (NG) 9-1-1 has yet to do for the American public and private sectors. An IP-based 911 network would use the capabilities of modern communication devices to get help more quickly and efficiently. If Virginia Tech students had been able to silently text for 911 help, lives could have been saved. If a cell phone user could send pictures of the individual abducting a child, lives could be changed. Accomplishing this will require planning and cooperation.

REFERENCES

The Ensuring Needed Help Arrives Near Callers Employing (ENHANCE) 911 Act of 2004, P.L. 108-494, Sec 104, "Sec. 158, "b"; 118 STAT. 3987-3988

FCC report and order and further notice of proposed rulemaking. (1996, July 26). FCC 96-264. Retrieved May 6, 2009 from FCC E911 Web page: http://www.fcc.gov/911/enhanced/releases.html#ro

FCC report and order and further notice of proposed rulemaking. (2008, October 21). FCC 08-249. Retrieved May 7, 2009 from http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-249A1.pdf

Hatfield, D., Bernthal, B. and Weiser, P. (2008) Health of the US 9-1-1 System. Sponsored by the 9-1-1 Industry Alliance. Retrieved April 2, 2009 from http://www.911alliance.org/9IA_Health_ofUS_911%20_2_.pdf

Intrado, Inc. (2008), Comprehensive Statewide E9-1-1 Telecommunications Plan presented to North Carolina 911 Board on October 29, 2008

Moore, L. K. (2008) Emergency Communications: The Future of 911. Congressional Research Service November 21, 2008

NENA Functional and Interface Standards of Next Generation 9-1-1 Version 1.0 (i3) NENA 08-002 Version 1.0 December 18, 2007. Retrieved April 10, 2009 from http://www.nena.org/media/File/08-002V2120071218.pdf

NENA, Next Generation Partner Program, A Policy Maker Blueprint for Transitioning to the Next Generation 9-1-1 System: Issues and Recommendations for State and Federal Policy Makers to Enable NG9-1-1. Retrieved April 13, 2009 from http://www.nena.org/media/File/NG9-1-1PolicyMakerBlueprintTransitionGuide-Final_.pdf

Seeman,E. (2002). A gap Analysis of Wireless E-911 Services in North Carolina. Doctoral Dissertation Indiana State University, Terre Haute, In. (UMI Number 3103008)

The New and Emerging Technologies (NET) 911 Improvement Act of 2008, P. L. 110-283, Sec. 102, STAT. 2623

Weiser, P. J., Hatfield, D. & Bernthal, B (2008) Journal on Telecommunications & High Technology Law, Spring, 2008, 6 J. on Telecomm. & High Tech. L. 213

What Constitutes Significant Results When Working with Large Data Sets?

Robert L. Andrews, Virginia Commonwealth University
Department of Management, Richmond, VA. 23284-4000
804-828-7101, rlandrew@vcu.edu

Jonathan A. Andrews

ABSTRACT

This paper discusses issues arising from determining if significant results exist when working with large data sets. A procedure is proposed for determining practically significant results. The paper also discusses the value of failing to find significant results.

INTRODUCTION AND OVERVIEW

The electronic collection of data can provide an enormous amount of data. A *New York Times* article [4] states, "In field after field, computing and the Web are creating new realms of data to explore — sensor signals, surveillance tapes, social network chatter, public records and more. And the digital data surge only promises to accelerate, rising fivefold by 2012, according to a projection by IDC, a research firm."

The analysis of data sets with such large sample sizes changes from the analysis of data that consist of a relatively small sample size selected from a process or large population. When analyzing data from a sample that is relatively small, the customary procedure is to test for statistical significance using a significance level α. However, one knows that statistically significant results can be obtained for very little departure from the null hypothesis if the sample size is very large. This departure from the null is referred to as the effect size, but this is a topic that is generally not given much attention in typical statistics courses.

The ubiquitous source of information on the web, Wikipedia [6], defines statistically significant as follows: "In statistics, a result is called statistically significant if it is unlikely to have occurred by chance. 'A statistically significant difference' simply means there is statistical evidence that there is a difference; it does not mean the difference is necessarily large, important, or significant in the common meaning of the word." This definition infers that there is a difference in the meaning of significant between the world of statistics and common every day language. To define this difference in the understanding of significance, the term practically significant is often used to show a contrast to statistically significant. Another web source, Wiki.answers [5], defines practically significant as follows: "There is statistical significance, an arbitrary limit whereby an observed difference could reasonably be assumed to be due to some factor other than pure chance. Then there is practical significance, an arbitrary limit whereby an observed difference is of some practical use in the real world." Unfortunately some may think that this infers that statistics is not of practical use in the real world. Statistical significance is clearly important, but to be of value in the context of a particular problem one needs to also make sure that there is practical significance.

As has been pointed out, it is possible to have statistical significance when the result does not support practical significance. At the same time one can observe a result that would be practically significant if it was truly representative of the phenomenon being studied. However, the result may not be statistically significant, meaning that the magnitude of the difference from the null hypothesis was too likely to have

happened by chance to say that the data support a statistically significant result. Of course, this is not very likely with a very large data set.

LARGE DATA SET ISSUES

Many organizations are able to obtain large sets of data through automated recording of transactional data for processes that are a part of their regular operations. Similarly, computers are able to automatically record all types of data from experiments. The availability of computers has greatly reduced the cost of obtaining data. Hence, when setting up data collection procedures, the general rule now becomes to make sure that data are recorded for anything that might potentially be of future use. With limited amounts of data the challenge is to obtain good data that are representative of the phenomenon being studied and then to use these data to make inferences about the characteristics of the phenomenon. Other challenges exist with large data sets. There is so much information recorded in large data sets that finding information of real value can sometimes become like finding the proverbial needle in the haystack. The availability of data and the computational tools to analyze them have been the catalyst for new areas/disciplines of analysis taking the names of Exploratory Data Analysis, Data Mining, Business Intelligence, and most recently Analytics or Business Analytics. Davenport and Harris [2, page 7] defined analytics as "the extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive decision and actions." This definition emphasizes that the analysis is taking place for a situation where decisions are being made and actions are being carried out based on these decisions.

Statistical significance can be determined with no real knowledge of the phenomenon. However, determining practical significance requires knowledge of the phenomenon and the anticipated consequence of associated decisions. To be effective for decision making, analysis needs to determine both statistical and practical significance.

The goal of most hypothesis testing is to obtain a significant result. When one does not find a significant result the language that is often used is "fail to reject the null." This indicates that the investigation failed to find a significant result and may as a result be judged as a failure and of no real value. However, if the sample size is large then the result has provided some clear information about the phenomenon. The lack of significance for a relationship means that this relationship need not be considered in decision making.

Murphy and Myors [3, page 35] address some of the above issues about determining significance. They state, "most dictionary definitions of 'significant' include synonyms such as 'important' or 'weighty.' However, these tests do not directly assess the size or importance of treatment effects. Tests of the traditional null hypothesis are more likely to tell about the sensitivity of the study than about the phenomenon being studied. With large samples, statistical tests of the traditional null hypothesis become so sensitive that they can detect the slightest difference between a sample result and the specific value that characterized the null hypothesis, even if the difference is negligibly small. With small samples, on the other hand, it is difficult to establish that anything has a statistically significant effect." In an attempt to rectify the cited difficulty with testing the traditional null hypothesis, they propose testing a minimum-effect hypothesis to detect if the data support that there is some effect beyond what would be considered as being of no real importance. They also state that, "The main advantage of the traditional null hypothesis is that it is simple and objective. If researchers reject the hypothesis that treatments have no effect, they are left with the alternative that they have some effect. On the other hand, testing minimum-effect hypotheses requires value judgments, and requires that some consensus be reached in a particular field of inquiry."

Following the arguments presented about determining significance and large data sets, it should be clear that testing for statistical significance alone is not an adequate analysis procedure. The analyst needs to

use knowledge of the phenomenon in conjunction with statistical knowledge and analysis results to determine if the data indicate the existence of significant results. A significant effect is one that would be practically significant to the degree that knowledge of an effect with this magnitude would be of value in decision making.

SUGGESTED METHODS FOR DETECTING PRACTICAL SIGNIFICANCE

Traditional procedures for hypothesis testing provide three different methods for testing for statistical significance using some value of α for the level of statistical significance. These three procedures consist of using critical values for the test statistic, p-values based on the test statistic value or a confidence interval for a parameter of interest. Andrews [1] discussed hypothesis testing for location parameters. He specifically cited situations where one is testing to determine if

1. the phenomenon mean equals some specified value,
2. the phenomenon proportion equals some specified value,
3. the difference in two phenomenon means equals some specified value,
4. two phenomenon proportions are equal, or
5. the phenomenon regression coefficient equals some specified value.

In all of these situations the analyst can create a $100(1-\alpha)\%$ confidence interval for the parameter of interest or difference in two parameters. Based on knowledge of the situation, decision makers can use this confidence interval and conclude whether practical significance exits or not. Practical significance is concluded if knowing that the parameter had any of the values in the range presented by the confidence interval would have an impact on decision making. However, if there was at least some set of values in the interval for the parameter that would not really have any impact on decision making then the conclusion would be that the results were not practically significant.   This decision can be reached in one of two ways. One way would be to decide after the analysis if all of the values in the confidence interval have some practical impact. The other would involve decision maker input prior to or apart from knowing the analysis results. The decision maker can establish a range of values of the parameter that would have no effect on decision making and range that would have an effect. There would be a demarcation value or values separating these two regions. In this case one could conclude practical significance only if all of the values in the confidence interval were in the range for practical significance. If any part of the "no effect" range is inside the confidence interval then one would conclude no practical significance.

The other two hypothesis testing methods use a test statistic. When testing for statistical significance, the analyst can use α and the probability distribution for the test statistic when the null is true to establish a critical value or values that define a rejection region that is in either one or two tails of the distribution. If the observed test statistic calculated from the data is in the rejection region then a statistically significant result exists.   For practical significance, the demarcation value or values determined by subjective knowledge of the situation as described above will be used rather than a null hypothesized value for the parameter. For situations with a single range for practically significant parameter values corresponding to a one-sided rejection region, the demarcation value for the region would be used as the null hypothesized to calculate the test statistic and the direction of the one-sided test would be in the direction of the practically significant values relative to the demarcation value. Then a one-sided test can be conducted using either the critical value or p-value decision rule. If there is an upper and lower range for practically significant parameter values, then the test should be performed using the demarcation value that is closer to the observed statistic. For the critical value method of testing in this situation, the rejection region would be in the direction of the practically significant values relative to the demarcation value and the tail probability area would be $\alpha/2$. For the p-value method of testing, the tail area for the test statistic would be doubled to obtain a two-sided p-value.

The described procedures effectively test simultaneously for both practical and statistical significance. The procedures use a standard significance level α and knowledge about what would constitute an effect of practical value in decision making.

VALUE OF FAILURE TO CONCLUDE THAT A SIGNIFICANT RESULT EXISTS

As was indicated earlier, failure to reject the null and conclude that a significant result does not exist is often viewed as a failure for the testing procedure and of no value. If the sample size is small then failure to observe a significant result may just indicate that there was not enough power in the testing procedure to detect a significant result. However, if the result was obtained from a large data set then that essentially assures that the procedure would have the necessary power. Hence, in many decision making situations where a large data set is available, failing to find a significant result is clearly of value, if the data set is truly indicative of the phenomenon of interest. Often the reason that the analysis was performed was to confirm beliefs currently held by the decision makers. Without data, the decision makers would still tend to use their beliefs when making decisions about the phenomenon. Suppose that the decision makers believe that a certain controllable variable has a significant impact on an outcome variable. Without data to support that any such impact is really negligible and of no practical significance, decision makers would attempt to manipulate the controllable variable thinking that they are having impact on the outcome. But with the knowledge that this variable was not significant, they would no longer pursue any future attempts to manipulate the variable with the false sense of improvement.

CONCLUSION

Analysis of large data sets presents different issues from smaller data sets. One needs to consider both statistical and practical significance when working with large data sets. Considering both allows one to avoid taking action on something that is statistically significant but has no practical significance, and would be a waste of effort. Conversely it also allows one to avoid taking action on something that is practically significant but is not statistically significant, and thereby actual a random occurrence of no value to act on. We have presented a procedure that simultaneously tests for statistical and practical significance. We have also discussed how failure to detect a significant difference for a large data set provides different information than reaching this conclusion for a small data set.

REFERENCES

[1]   Andrews, Robert L., "Suggestions for Hypothesis Testing for Location Parameters," Proceedings, Southeast Region of the Decision Sciences Institute, February, 2004, pp. 177-179
[2]   Davenport, Thomas C. and Harris, Jeanne G., Competing on Analytics, Harvard Business School Press, Boston, MA, 2007.
[3]   Murphy, Kevin R. and Myors, Brett, Statistical Power Analysis: A Simple and General Model for Traditional and Modern Hypothesis Tests, Second Edition, Lawrence Erlbaum Associates, Mahwah, NJ, 2004.
[4]   New York Times, (5/13/2009)
       http://www.nytimes.com/2009/08/06/technology/06stats.html?_r=1&emc=eta1
[5]   Wiki.answers, (5/13/2009) http://wiki.answers.com/Q/What_is_practical_significance
[6]   Wikipedia, (5/13/2009) http://en.wikipedia.org/wiki/Statistical_significance

WHAT IS A BETTER PREDICTOR OF ACADEMIC SUCCESS IN AN MBA PROGRAM: WORK EXPERIENCE OR THE GMAT?

Michael H. Deis, School of Business, Clayton State University, Morrow, Georgia 30260, (678)466-4541, MichaelDeis@clayton.edu

Reza Kheirandish, School of Business, Clayton State University, Morrow, GA 30260, (678)466-4532, rkheiran@clayton.edu

ABSTRACT

The goal of this study was to determine if work experience might be a better predictor of success in the MBA program than a Graduate Management Admission Test (GMAT) score by examining how successful students have been in an MBA program in a suburban metropolitan university. Success in the MBA program was measured by overall GPA for students completing the program. The study also examined the benefits of offering a GMAT Waiver to individuals with significant and leadership experience. Other characteristics, such as age, gender, race, undergraduate GPA and undergraduate upper division GPA were also studied. Preliminary results indicated that significant leadership and administrative work experience were a better predictor than GMAT scores in predicting the overall success of students enrolled in an MBA program. There appeared to be very little correlation between GMAT scores and the overall GPA that students received in the program. The study should be beneficial to universities considering the criteria on which to place the most emphasis when making admissions decisions. Included in the paper will be a discussion of alternatives to offering the GMAT.

REVIEW OF THE LITERATURE

In a part-time program such as the one being studied in this paper, students are often older and have more significant leadership and management work experience than students admitted to a traditional MBA program. To maximize the number of admittances and improve the retention and graduation rates, it is important that those involved with the administration of MBA programs understand the likely predictors of graduate student performance to be able to make quality admission choices (Sulaiman and Mohezar, 2006).

More and more schools have recognized that the GMAT, including the GMAT Analytical Writing Assessment (AWA), should be waived for individuals with significant work experience (Braunstein, 2009). Fish and Wilson (2009) indicated that there also are other differences in factors, such as age, in predicting graduate performance in a part-time MBA compared to a one-year MBA program. This should

1

be of particular interest to Clayton State University (CSU), because its 20 month program is geared towards working professionals.

Sulaiman and Mohezar (2006) stated that the majority of graduate department admission committees compare total work experience and undergraduate GPA when making an admittance decision. The article by Sulaiman and Mohezar (2006) gave six hypothesis, one of which stated: "H_1: Work experience will predict student performance." They concluded that, "Those with longer previous work experience may more readily see the relevance of the management concepts taught. Thus, they would likely perform better than those with less work experience".

Some leading schools, such as Northwestern University's Kellogg School of Management, now base their enrollment on undergraduate academic records and work experience (Jones, 2005). As Kellogg's Julie Jones indicated in a 2005 Business Week article, it does not make a lot of sense to require the Chief Financial Officer of an organization, who had an undergraduate GPA of 3.7 as an accounting major, to take the GMAT. Jones (2005) added that Kellogg places a major emphasis on the value and range of work experience that applicants can bring to the program. Many executive MBA programs now waive the GMAT exam (Gloeckler, 2005). In fact, in 2005, only 12 of Business Week's top 25 MBA programs required the GMAT. About one-third of the applicants for the North Carolina Kenan-Flagler Business School opted for a GMAT waiver instead of taking the GMAT (Gloeckler, 2005).

Among the issues that need to be addressed are the standards for granting a GMAT waiver (i.e., not requiring the GMAT) and the requirement of the Analytical Writing Assessment (AWA) when a GMAT waiver is granted. In an MBA program for working professionals, such as the one at CSU, work experience might be a better predictor of success in the MBA program than the GMAT score or undergraduate work experience (Adams, 2000). Adams (2000) also indicated that work experience appears to be a better predictor of success for MBA students than even the GMAT or undergraduate GPA. He reached this conclusion by using ANOVA analysis and pointed out that the percentage of MBA having significant work experience has risen over time.

It must be noted that, based on conflicting evidence about the GMAT as a predictor of success in MBA programs, the AACSB has stopped requiring GMAT scores for admissions into many types of MBA programs.

In addition, previous research has also shown that some characteristics such as race and gender might affect the predictive validity of GMAT (Gropper, 2007). David Gropper was the assistant dean and executive director of Auburn's MBA program when Auburn's MBA was ranked 26th of the nation's public institutions (Granger, 2005). He found that other factors, such as substantial career advancement, are better predictors of success in MBA programs. He also indicated that factors such as loyalty, stability, and time management may be better predictors of success in business and therefore in a non-traditional MBA program.

In another significant article, Rogers and Rjntner (2001) stated that the GMAT Analytical Writing Assessment (AWA) gave no indication of a writer's needs, and that the actual essays did not represent the type of content that MBA students usually had in their writing assignments. Rogers and Rjntner (2001) also pointed out that business school assignments usually concentrate on relevant business topics such as employees, co-workers, consumers, investors, and the macro community, whereas the AWA is more of an analytical writing associated with the academic environment.

As shown in Table 1 (GMAC, 2008), as the age of applicants increases, the mean GMAT scores decrease, indicating that age is apparently an important factor. Many individuals in the CSU MBA program are over the age of 40.

2

Table 1: Comparison of different age groups on the GMAT

Age	Mean GMAT Score
28 – 30 years old	551
31 – 34 years old	539
35 – 39 years old	516
40 – 49 years old	485

(See GMAC, 2008, Table 5)

Further, research indicated that there are usually significant differences, in terms of gender and subgroups, relevant to how well the different groups score on the GMAT.   The data in Table 2, shown below, must then be considered.

Table 2: Comparison of different age groups on the GMAT in 2007 – 2008

U.S. Subgroup	U. S. Mean Total Score Men	U.S. Mean Total Score Women
White (non-Hispanic)	560	521
African American	453	418

(See GMAC, 2008, Table 6)

Based on the above review of the literature, there appears to be evidentiary ground for not using or giving less weight to the GMAT variable when considering admitting decisions.   There also appears to be evidentiary evidence indicating that other factors, such as race and gender, should be considered when reviewing the success of students in an MBA program.   The literature appears to support the hypothesis.

DESCRIPTION OF DATA

Since Clayton State University began its MBA program with an on-campus cohort in the fall, 2007, 112 applicants have been admitted to the program. Sixty-one of those students completed their studies by the end of the summer term, 2009. Of those, 31 graduated in the spring, 2009, and another 30 graduated in the summer, 2009. Cohort 1 began in the fall, 2007, with 35 students, and the GMAT was required. Thirty-one students graduated in the spring, and three of those students had a 4.0 overall GPA for the entire MBA program. The mean age of students in that cohort was 37.

Cohort 2, another on-campus cohort, began in the spring, 2008, with 24 students, and 17 completed their studies in the summer, 2009. Of that group, two students had an overall MBA GPA of 4.0   The mean age of that group was 31.

Cohort 3, an off-campus cohort, also began in the spring, 2008, with 14 students. One withdrew because of the death of her husband, but 13 completed their studies in the summer of 2009. The mean age of that group was 43. Of those 13, the GMAT was waived for 12 of them based on their work experience. The waivers were granted to individuals who had significantly increasing managerial responsibilities at a highly responsible level within an organization or to individuals who own their own businesses. Six of the 12 students receiving GMAT waivers completed their studies in the summer, 2009, with a 4.0 overall

3

GPA in the MBA Program. Comparative Descriptive Data for the three cohorts is indicated in Table 3 below.

Table 3: Comparative Data for Students Completing Studies by Summer, 2009

Area	Cohort 1	Cohort 2	Cohort 3	Combined Cohorts
Number of Students	31	17	13	61
Mean Overall MBA GPA	3.68	3.72	3.88	3.73
Overall Undergraduate GPA	3.17	3.19	2.8*	3.1*
Upper Division Undergraduate GPA	3.41	3.38	2.85*	3.29*
GMAT Mean	449	431	470**	444**
Race (# of white students)	19	9	10	38
Gender (# of female students)	23	12	5	40
Age (at the start of MBA program)	37	31	43	37

*Undergraduate overall and upper level GPA for one student was not available
**In cohort 3, GMAT scores for all students with GMAT waiver except one were not available. The GMAT score for that student was older than 5 years old and therefore was not considered for the analysis but is used in calculating the mean.

ANALYSIS

Using a sample of the 61 recent graduates, the authors did a statistical analysis to determine (a) if work experience was a better predictor of success in the MBA program than GMAT scores and (b) what other variables might predict success in the program. The authors thus studied the effects of characteristics such as gender, race, and age on success, as measured by overall graduate GPA.

For cohorts 2 and 3, which began at the same time, took the courses in the same sequence, followed the same curriculum, and were taught by the same faculty, the only difference was that GMAT scores were required for cohort 2 and GMAT waivers were available for students in cohort 3. This will permit the authors to compare the two cohorts using two sample tests of our hypothesis. One would prefer to look at the regression analysis of the effect of GMAT on MBA overall GPA by adding GMAT waiver dummy variable and slope dummy. However, due to absence of GMAT score for those who used GMAT waiver, that analysis is not possible. Hence, the authors used the t-Test function in Microsoft Excel to compare the mean of the two samples: The one with GMAT waiver and the one without. Here is the hypothesis:

$$\begin{cases} Ho: \ \mu_1 \leq \mu_2 \\ Ha: \ \mu_1 > \mu_2 \end{cases} \tag{1}$$

where μ_1 is the MBA GPA mean for the MBA students with GMAT waiver and μ_2 is the MBA GPA mean for the MBA students without GMAT waiver. The p-value for the test is very small (0.000238) which means we strongly reject the null hypothesis that those with GMAT waiver do worse than those without GMAT waiver. This also indicates that we have strong evidence that those with GMAT waiver do significantly better than those without GMAT waiver.

4

After finding out that the group of students with GMAT waiver did better in their MBA studies - as measured by overall MBA GPA – authors tried to answer the following question: For the students without GMAT waiver, did GMAT score predict their success and was there any difference in their success based on their overall undergraduate GPA, age, race, or gender? To answer this question authors ran the following regression:

$$MBA\ GPA = \beta_0 + \beta_1\ GMATTotalScore + \beta_2\ UndergradGPA + \beta_3\ AgeatStart + \beta_4\ White + \beta_5\ Female\ (2)$$

where variables White and Female are two dummy variables with values equal to one when the student's race and gender are white and female, respectively, and zero otherwise. The results of this regression analysis are reported in Table 4:

Table 4: Determinants of Students' MBA GPA

Regression: MBA GPA	β_0	β_1	β_2	β_3	β_4	β_5
	constant	GMAT Total Score	Undergrad GPA	Age at start	white	female
Coefficient	3.15566	-0.00003	0.14513	-0.00227	0.16960	0.10584
std error of coef	0.32729	0.00051	0.09791	0.00353	0.07066	0.07699
t-ratio	9.6418	-0.0531	1.4823	-0.6438	2.4003	1.3747
Significance	0.00%	95.79%	14.55%	52.31%	2.08%	17.63%
beta-weight		-0.0079	0.2284	-0.0868	0.3316	0.1889
standard error of regression		0.227936757				
R^2		28.83%				
adjusted R^2		20.56%				
number of observations		49				
residual degrees of freedom		43				
t-statistic for computing						
95%-confidence intervals		2.0167				

The adjusted R^2 indicates that about 20% of the variation in dependent variables can be explained by variations in independent variables. The coefficients for all variables except race (dummy variable White) are insignificant. When authors examined simple regression model with only GMAT score as independent variable the adjusted R^2 was only 3% and coefficient for GMAT score was insignificant. This suggests little or no connection between GMAT scores and success in MBA program as measured by MBA GPA.

A closer look at scatter plot of MBA GPA vs. GMAT scores also suggests that there is no connection between MBA success and GMAT scores (Figure 1). There is no evidence that MBA GPA as a measure of success and GMAT are linearly related. Figure 2 depicts the plot of residuals of the regression model against the predicted values of MBA GPA.

5

Figure 1: Scatter plot of MBA GPA vs. GMAT scores
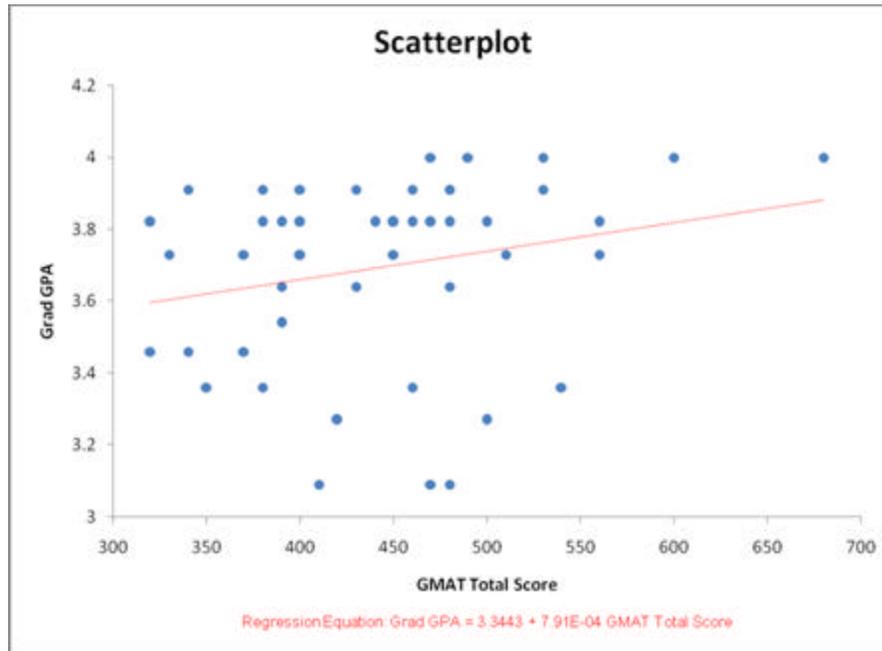
Figure 2: Scatter plot of MBA GPA vs. GMAT scores
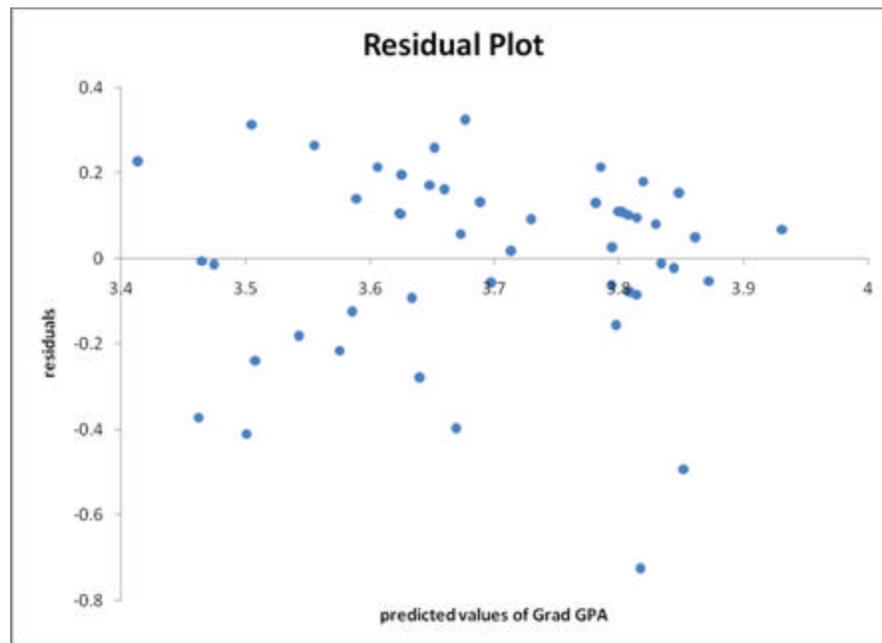
SUMMARY AND REFLECTION

Although the study involves a small number of individuals, it appears that work experience is a better predictor of the overall GPA in an MBA program than the GMAT exam. The CSU study confirms this, as did the study by Gropper (2007). The CSU study confirmed that there appears to be evidentiary grounds for not using or giving less weight to the GMAT variable when considering admitting decisions. This initial study appears to indicate this university must thoroughly consider the positive effects of considering work experience as it relates to overall performance in an MBA program.

The university must still, however, have a means of knowing the skills of students with significant work experience. One possible solution would be to offer a provisional acceptance for those qualifying for GMAT waivers, and to then require an in-depth writing assignment in the first course that the students took in an MBA program. By offering provisional entry, MBA candidates will be given the chance to prove they can perform at the MBA level. Since the GMAT is possibly not as good a predictor as work experience, having an in-depth writing assessment in the first MBA course would still identify any writing weaknesses that students might have. MBA students take learning seriously and actively seek tutorial help when needed. By having the in-depth writing assignment, students could still be evaluated on their writing skills and given additional help.

REFERENCES

Adams, A., Hancock, T. (2000). Work experience as a predictor of MBA performance. *College Student Journal*, 34 (2).

Braunstein, A. (2009). Predicting performance in an MBA program. http://www.iaes.org/conferences/past/philadelphia_52/prelim_program/a20-1/braunstein

Fish, L. A., and Wilson, F., S. (2009). Predicting performance of MBA students: Comparing the part-time MBA program and the one year program, *College Student Journal*, 43 (1).

GMAC (2008). Profile of Graduate Management Admission Test candidates: Five-year summary (2003 – 2008). Graduate Management Admission Council, 1600 Tysons Blvd, Suite 1400, McLean, VA 22102.

Granger, David M. (2005). Auburn MBA program ranked 26th among public institutions by Forbes. Auburn News. 9/6/05. http://www.ocm.auburn.edu/news_releases/forbesmba

Gropper, Daniel M. (2007). Does the GMAT matter for executive MBA students? Some empirical evidence. *Academy of Management Learning & Education*, 6(2), 205 – 216.

Jones, Julie C. (2005). Looking beyond the GMAT. *Business Week*. August. http://www.businessweek.com/magazine/content/05_32/b3946112

Rogers, P., & Rjntner, J. (2001). Analytical tools to facilitate transitions into new writing contexts: A communicative perspective. *The Journal of Business Communication.* 38(2), April, 112 – 152.

Sulaiman, A., and Mohezar, S. (2006). Student success factors: Identifying key predictors. *Journal of Education for Business*. July/August, 2006, 328 – 333.

7

Identifying the edges of a convex hull

Francisco J. López[1] and Art M. Duval[2]

1. francisco.lopez@maconstate.edu. School of Business

100 College Station Dr, Macon, GA 31206

2. artduval@math.utep.edu. Department of Mathematical Sciences

University of Texas at El Paso, El Paso TX 79968

Abstract. We present three new algorithms for identifying all one-dimension faces of convex hulls. They emerge from theoretical and geometric characteristics of the hulls. The computational efficiency of these procedures is compared to the best currently available algorithm (to the best knowledge of the authors) that solves the same problem. Two of the methods are efficient, and can be further accelerated with speed-up techniques, as we verified on one of them.

Key words. computational geometry, computing methodologies and applications, convex hulls, polyhedra

1. Introduction.

An important research field involving convex hulls (or other types of hulls) refers to the identification of their faces; *e.g.,* Wets and Witzgall (1967); Dulá, Helgason, and Venugopal (1998); Erickson (1999), or Ottmann, Schuierer, and Soundaralakshimi (2001). This problem is not to be confused with that of identifying the facets and faces of convex polyhedral cones or polytopes (convex cones or convex polytopes) that result from systems of equalities and/or inequalities, and which are closely related (via duality or polarity) to the problem of interest in this article. In other words, we are finding the edges of polytopes defined by their vertices, not by their facets. Research on convex cones or convex polytopes is abundant, but this area is out of the scope of this work. For more information on the relationships between hulls and convex polyhedra see Wets and Witzgall (1967); Bremner, Fukuda, and Marzetta (1998); and Fukuda (2004, 2005).

1

This article introduces three new approaches that find all 1-faces (the edges) of the convex hull of a set of points. A k-face of a hull is a "face of dimension k" (Wets and Witzgall (1967)).

2. Definitions and assumptions.

Let $\mathcal{P} = \{p^1, p^2, \ldots, p^n\}$ be a set of n points in m-dimensional space. The convex hull of $\mathcal{P}$, con($\mathcal{P}$), is the set of all convex combinations of the points in $\mathcal{P}$: con($\mathcal{P}$) = $\{z \in \Re^m | z = \sum_{i=1}^{n} p^i \lambda_i; \ 0 \leq \lambda_i \in \Re;$ and $\sum_{i=1}^{n} \lambda_i = 1\}$ (Rockafellar (1970)). For the purpose of this work, points and vectors are synonyms. We assume there are no duplicated points in $\mathcal{P}$ and each point is an extreme point of con($\mathcal{P}$). It is possible to identify the extreme points of a convex hull with the traditional approach or with more efficient algorithms available in the literature; *e.g.*, Dulá and López (2006).

The symbols β, ϵ, and γ are scalars, while π, x, y, u, and u^{ij} are vectors where π is in $\Re^m$ and x, y, $u = (1, 1, \ldots, 1)^T$, and u^{ij} are in $\Re^n$ (u^{ij} is a vector with ones, like u, except that the i-th and j-th coordinates are zeros), with $1 \leq i \leq n$, $1 \leq j \leq n$, and $i \neq j$. The i-th coordinate of point π is denoted π_i.

P is the $m \times n$ matrix with columns $p^1, p^2, \ldots, p^n$; *i.e.*, $P = [p^1 p^2 \ldots p^n]$. The two extreme points at the end of an edge are "*adjacent.*" We employ Matrix A with dimension $n \times n$ in our algorithms to indicate whether p^i and p^j are adjacent. If $i < j$, the element a_{ij} in the i-th row and j-th column of A equals 1 if p^i and p^j are adjacent, and equals 0 otherwise.

$\mathcal{H}(\pi, \beta)$, is a hyperplane with defining vector (normal) π and level value β. A supporting hyperplane of con($\mathcal{P}$) is a hyperplane $\mathcal{H}(\pi, \beta)$ such that $\pi^T p^i \leq \beta$ for all $p^i \in \mathcal{P}$ and $\pi^T p^j = \beta$ for at least one point $p^j \in \mathcal{P}$. This means that $\mathcal{H}(\pi, \beta)$ touches con($\mathcal{P}$) at least at one point and keeps the entire hull in one of the closed halfspaces that it defines.

Points $p^i \in \mathcal{P}$ and $p^j \in \mathcal{P}$ are adjacent if and only if there is a supporting hyperplane of con($\mathcal{P}$), $\mathcal{H}(\tilde{\pi}, \tilde{\beta})$, such that $\tilde{\pi}^T p^i = \tilde{\pi}^T p^j = \tilde{\beta}$, and $\tilde{\pi}^T p^k < \tilde{\beta}$ for every point $p^k \in \mathcal{P}$ different from p^i and p^j. This hyperplane contains p^i and p^j but does not contain any other point from $\mathcal{P}$. Figure 1 illustrates these concepts.

3. Background.

Most of the research on faces/facets of hulls focuses on identifying their extreme points; *e.g.*, Rosen, Xue, and Phillips (1992); Dulá and Helgason (1996); or Dulá, Helgason, and Venugopal (1998). Work on identifying higher dimensional faces is mostly about finding the facets (top-dimensional faces), or on finding *all* the higher dimensional faces; see Seidel

2
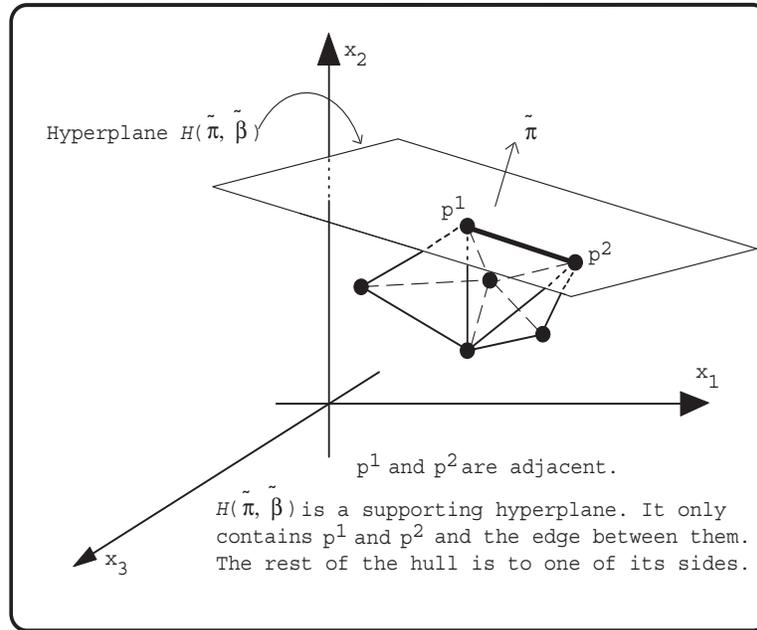
Figure 1: A convex hull and example of an edge and a supporting hyperplane.

(1997). An exception is an article by Wets and Witzgall (1967), who provide two algorithms for positive hulls that can be used to find the edges of convex hulls. Both procedures require transforming the convex hull into a positive hull by adding a new dimension and assigning to each point the same constant, different from zero, as the new coordinate (see Figure 2). Then, the positive hull of the points (vectors) in the expanded dimension is employed because there is a one-to-one relation between the faces of the two hulls: any k-face of the positive hull corresponds to one and only one $(k-1)$-face of the convex hull and vice versa. Extreme rays of the positive hull correspond to extreme points of the convex hull and 2-faces of the positive hull correspond to edges of the convex hull.

The algorithms by Wets and Witzgall (1967) are useful to find k-faces of positive hulls in general, $1 \leq k \leq m-1$, not only 2-faces. Their first algorithm is based on the idea that, without loss of generality, the points $\hat{p}^1, \ldots, \hat{p}^k$ in $\hat{\mathcal{P}} = \{\hat{p}^1, \ldots, \hat{p}^n\}$ (*hats* indicate points in the expanded dimension $\Re^{m+1}$) *subdetermine* a face of the positive hull of $\hat{\mathcal{P}}$ if and only if the linear hull of $\{\hat{p}^1, \ldots, \hat{p}^k\}$ is the lineality space of the positive hull of $\hat{\mathcal{P}} \cup \{-\hat{p}^1, \ldots, -\hat{p}^k\}$. The second algorithm characterizes the faces of a convex hull in terms of sign patterns of matrices representing the hull. Wets and Witzgall (1967) explain that the latter is expected to be computationally more efficient since it does not have to start from scratch for each decision, but they also warn of the risk of cycling in the presence of degeneracies if degeneracy

3
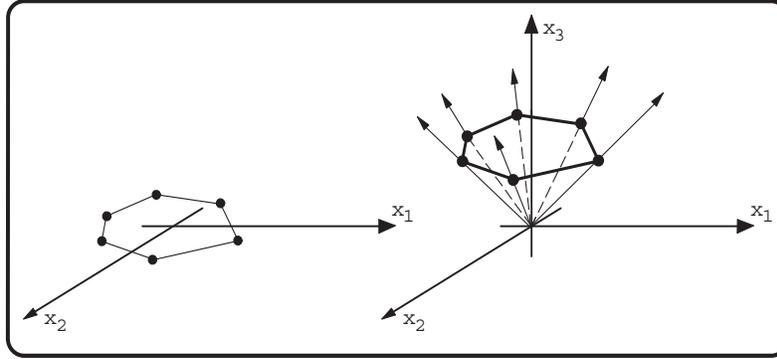
Figure 2: Transforming a convex hull in $\Re^2$ into a positive hull in $\Re^3$.

provisions and zero tolerances are not chosen and handled correctly.

4. Three new algorithms for finding the edges of a convex hull.

4.1. The "Repelling-Support" idea. Recall that the definition of adjacency states that two points in $\mathcal{P}$ are adjacent (or determine an edge) if and only if there is a supporting hyperplane of $\mathrm{con}(\mathcal{P})$ that contains both points and keeps (strictly) all other points of $\mathcal{P}$ to one of its sides. This is depicted in Figure 1. The idea is to use a linear program (LP), which we label $LP1(ij)$, to try to find such a supporting hyperplane as follows.

$$
\begin{array}{lllllll}
\max & & & & \epsilon & & \\
S.T. & \pi^T p^k & - & \beta & & = & 0; & \text{if } k = i \text{ or if } k = j, \\
& \pi^T p^k & - & \beta & + \epsilon & \leq & 0; & \text{if } k \neq i, j, \\
& & & & \epsilon & \leq & 1, \\
& \pi, & & \beta, & \epsilon, & & \text{free in sign.}
\end{array}
$$

The corresponding dual, named $D1(ij)$, is:

$$
\begin{array}{llll}
\min & & \gamma & \\
S.T. & Py & = & 0, \\
& -u^T y & = & 0, \\
& u^{ij^T} y & + \gamma & = 1,
\end{array}
$$

$y_i, y_j,$ free in sign; $y_k \geq 0$ for all $k \neq i, j;$ $\gamma \geq 0.$

4
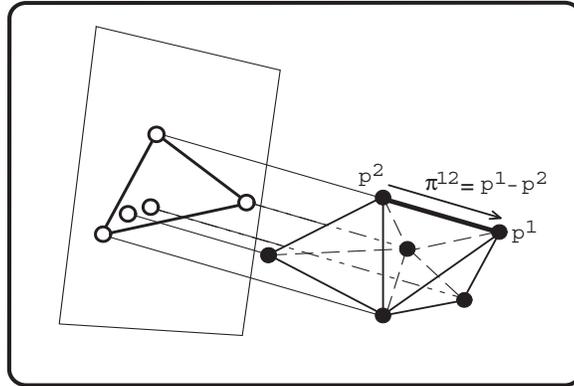
Figure 3: Projection of a set of points onto a selected hyperplane.

4.1.1. The "Repelling-Support" algorithm. Let $LP1(i,j), i \neq j$, be the "Repelling-Support" LP formulation and $D1(i,j)$ be its dual LP, and let a star, "*", indicate optimality.

<u>"Repelling-Support" pseudo-code for adjacency</u>

Input: m, n, P;   Output: A.

Initialization: $A = 0$.

> For $i = 1$, to $n - 1$,
> > For $j = i + 1$, to n,
> > > Solve $D1(i,j)$,
> > > $a_{ij} = \gamma^*$,
> > Next j,
> Next i,

STOP. The matrix A is such that $a_{ij} = 1, i < j$, if and only if p^i and p^j are adjacent.

Solving an LP with "few" rows and "many" columns is faster than solving one with "many" rows and "few" columns. Since n is usually significantly greater than m, we solve $D1(i,j)$ instead of $LP1(i,j)$.

4.2. The "projection" idea. This approach projects the points in $\mathcal{P}$ onto hyperplanes properly selected in order to identify the edges of $\text{con}(\mathcal{P})$. An example of such projection appears in Figure 3, where all projections occur following the direction $\pi^{12} = p^1 - p^2$.

Let $\pi^{ij}, i \neq j$, be the vector $p^i - p^j$ and recall $\mathcal{H}(\pi^{ij}, \beta)$ is the hyperplane defined by π^{ij} with level value β. For any point $p \in \Re^m$, let $\overline{p}$ be the projection of point p on hyperplane

5

$\mathcal{H}(\pi^{ij}, 0) : \overline{p} = p - \lambda_p \pi^{ij}$, where

$$\lambda_p = \frac{\pi^{ij^T} p}{\pi^{ij^T} \pi^{ij}} \in \Re.$$

We will use the notational shortcuts

$$\overline{p}^i := \overline{p^i} \quad \text{and} \quad \overline{\mathcal{P}} := \{\overline{p} : p \in \mathcal{P}\}.$$

Since $\overline{p}^i = \overline{p}^j$, it follows that $\overline{p}^i$ is extreme in the projected hull if and only if $\overline{p}^j$ is also extreme. To determine if $\overline{p}^i$ is an extreme point of $\text{con}(\overline{\mathcal{P}})$, it suffices to solve a phase I LP (Wets and Witzgall (1967)). We call our formulation $LP2(i, j)$ and it is as follows.

$$\begin{array}{rlrl} \max & & 0 & \\ \text{S.T.} & & \overline{P}x & = \overline{p^i}, \\ & x_1 + \ldots + x_n & = & 1, \\ & x_i = x_j = 0; & x \geq 0, & \end{array}$$

where $\overline{P}$ is the matrix whose columns are the points in $\overline{\mathcal{P}}$.

4.2.1. The "Projection" algorithm. Let $LP2(i, j)$ be the LP that determines whether $\overline{p}^i$ is extreme when projections occur onto $\mathcal{H}(\pi^{ij}, 0)$.

<div align="center">"Projection" pseudo-code for adjacency</div>

Input: m, n, P;   Output: A.

Initialization: $A = 0$.

For $i = 1$, to $n - 1$,

      For $j = i + 1$, to n,
         $\overline{\mathcal{P}} = \emptyset; \overline{P} = 0$,
         $\pi^{ij} = p^i - p^j$,
         For $k = 1$, to n,
            $\overline{p}^k = p^k - \left(\frac{\pi^{ij^T} p^k}{\pi^{ij^T} \pi^{ij}}\right)\pi^{ij}$,
            $\overline{\mathcal{P}} = \overline{\mathcal{P}} \cup \{\overline{p}^k\}$,
         Next k,
         $\overline{P} \leftarrow \overline{\mathcal{P}}$,
         Solve $LP2(i, j)$,
         If $LP2(i, j)$ is not feasible, then $a_{ij} = 1$,
            Else, continue
         End if,
      Next j,

  Next i

STOP. The matrix A is such that $a_{ij} = 1, i < j$, if and only if p^i and p^j are adjacent.

<div align="center">6</div>
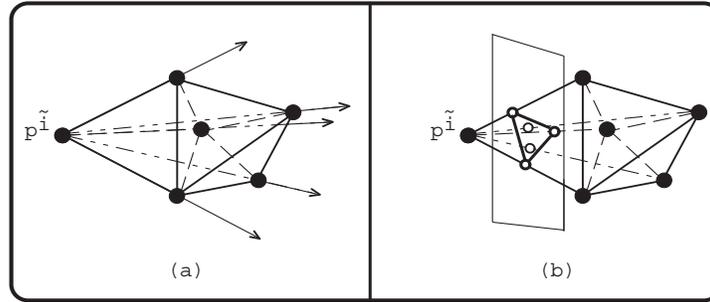
Figure 4: Origin translation, resulting positive hull, and intersection of hyperplane with hull.

4.3. The "Conical or Truncation" idea. Two ideas to find the edges of a convex hull emerge from translating the origin to a point in $\mathcal{P}$. Figure 4(a) illustrates how the extreme vectors of the positive hull after translating the origin to $p^{\tilde{i}}$ correspond to edges of the convex hull. Also, if a hyperplane cuts off $p^{\tilde{i}}$ from all the remaining points, Figure 4(b), the intersection of the hyperplane with the convex hull is another convex hull whose extreme points correspond to edges of the whole convex hull. An approach based on the first idea (the "conical" approach) is both easier to implement and computationally more efficient.

For the purpose of our algorithm it suffices to iteratively check the feasibility of the following LP (phase I LP), which we call $LP3(ij)$.

$$
\begin{array}{lrcl}
\max & 0 & & \\
S.T. & P^i x & = & b, \\
& x_i = x_j = 0; & x \geq & 0,
\end{array}
$$

where $b = p^j - p^i$, $i \neq j$, $1 \leq i \leq n$, $1 \leq j \leq n$, and P^i is the matrix which columns are the vectors in $\mathcal{P}^i = \{p^1 - p^i, p^2 - p^i, \ldots, p^n - p^i\}$ (the origin is translated to p^i).

4.3.1. The "Conical" algorithm.

<u>"Conical" pseudo-code for adjacency</u>

Input: m, n, P;   Output: A.

Initialization: $A = 0$.

For $i = 1$, to $n - 1$,

    Initialization: $\mathcal{P}^i = \emptyset$; $P^i = 0$,

    For $k = 1$, to n,

        $\mathcal{P}^i = \mathcal{P}^i \cup \{p^k - p^i\}$,

    Next k,

7

$$P^i \leftarrow \mathcal{P}^i,$$

For $j = i + 1$, to n,
$\quad b = p^j - p^i$,
$\quad$ Solve $LP3(i, j)$,
$\quad$ If $LP3(i, j)$ is not feasible, then $a_{ij} = 1$,
$\qquad$ Else, continue,
$\quad$ End if,
Next j,

Next i,

STOP. The matrix A is such that $a_{ij} = 1, i < j$, if and only p^i and p^j are adjacent.

<u>Note on speeding up the algorithms</u>. It is important to be aware of techniques that accelerate algorithms, like preprocessors, LP warm-starts, Restricted Basis Entry (RBE) (Ali (1993)), the algorithm by Dulá and López (2006) in the case of the Conical algorithm, and more. For illustration purposes we accelerated the Conical approach with algorithm "PolyFrame", by Dulá and López (2006). We implemented PolyFrame directly, but the algorithms can be further accelerated with preprocessors and other techniques. The impact is significant CPU times reductions. In the remainder of this work "Naive-Conical" and "Frame-Conical" refer to the naive (or "pure") and the PolyFrame implementations, respectively.

5. Computational results and Conclusions.

Figures 5 and 6 illustrate the behavior of CPU times of the algorithms, including the Frame-Conical approach, depending on cardinality and dimension changes, respectively.

To summarize, this article describes three algorithms that identify the edges (or 1-dimension faces) of finitely generated convex hulls. We provide LP formulations that detect important characteristics of the corresponding convex hulls. We test the algorithms computationally to verify their effectiveness and to compare them to an algorithm proposed by Wets and Witzgall (1967) that solves the same problem. The latter is, to the best of the authors' knowledge, the best currently available algorithm for this purpose, but we, as Wets and Witzgall (1967), also experienced problems with this approach since we did not implement special handling of degeneracy or zero tolerances. The missing data in our figures are due to the impossibility of recording the corresponding times.

8
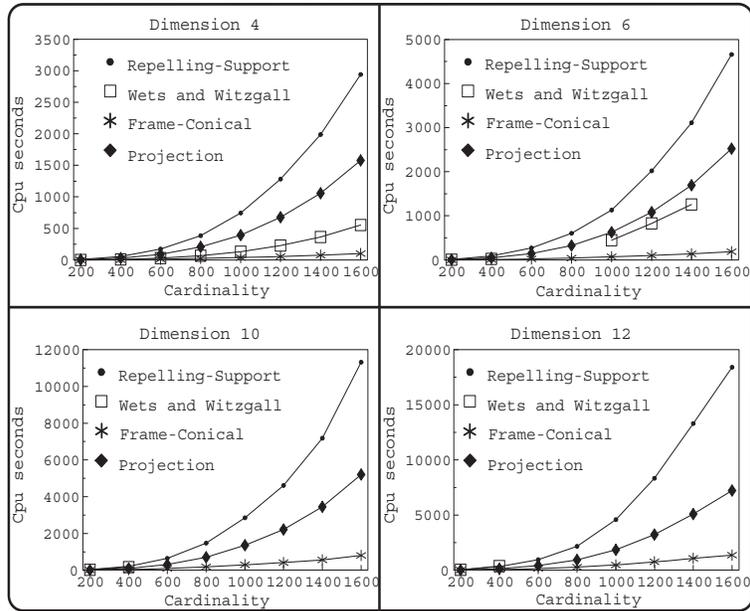
Figure 5: Effect of cardinality on CPU times.

Two of the algorithms (the Projection and the Conical methods) emerge as the best performers, especially for large problems. In the case of small problems (mainly in low dimensions) the approach by Wets and Witzgall is the fastest, perhaps for the benefit of not having to start from scratch each iteration. We also illustrate how to boost the performance of the Conical approach with an algorithm by Dulá and López (2006). All three algorithms, as well as the improved Conical approach, are subject to further improvements by using preprocessors and accelerators.

9
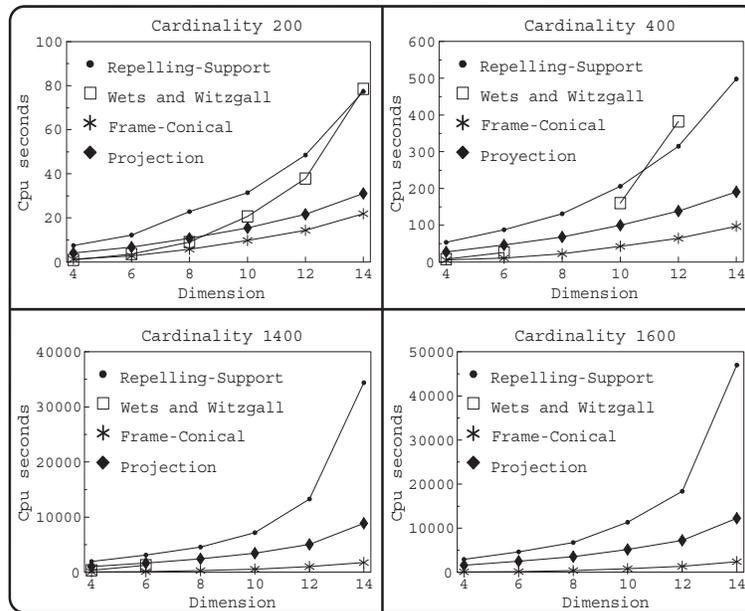
Figure 6: Effect of dimension on CPU times.

References

I. ALI, *Streamlined computation for data envelopment analysis*, Europ. J. of Oper. Res., 64 (1993), pp. 61-67.

D. BREMNER, K. FUKUDA, AND A. MARZETTA, *Primal-dual methods for vertex and facet enumeration*, Discrete Comput. Geom., 20 (1998), pp. 333-357.

J.H. DULÁ AND R.V. HELGASON, *A new procedure for identifying the frame of the convex hull of a finite collection of points in multidimensional space*, Europ. J. of Oper. Res., 92 (1996), pp. 352-367.

J.H. DULÁ, R.V. HELGASON, AND N. VENUGOPAL, *An algorithm for identifying the frame of a pointed finite conical hull*, INFORMS J. Comput., 10 (1998), pp 323-330.

J.H. DULÁ AND F.J. LÓPEZ, *Algorithms for the frame of a finitely generated unbounded polyhedron*, INFORMS J. Comput., 18-1 (2006), pp 97-110.

J. ERICKSON, *New lower bounds for convex hull problems in odd dimensions*, SIAM J. Comput., 28-4 (1999), pp. 1198-1214.

K. FUKUDA, Frequently Asked Questions in Polyhedral Computation, http://www.ifor.math.ethz.ch/~fukuda/polyfaq/polyfaq.html, version June 18, 2004.

10

K. Fukuda, Introduction, cdd/cdd+ Reference Manual,
ftp://ftp.ifor.math.ethz.ch/pub/fukuda/cdd/cddman/node2.html, version August 18,
2005.

T. Ottmann, S. Schuierer, and S. Soundaralakshimi, *Enumerating extreme points in higher dimension*, Nordic J. on Comput., 8 (2001), pp 179-192.

R.T. Rockafellar, *Convex Analysis*, Princeton University Press, Princeton, New Jersey, 1970.

J.B. Rosen, G.L. Xue, and A.T. Phillips, Efficient computation of extreme points of convex hulls in $\Re^d$, in *Advances in Optimization and Parallel Computing*, P.M. Pardalos, ed., North Holland, Amsterdam, The Netherlands, 1992, pp. 267-292.

R. Seidel, Convex hull computations, in *Handbook of Discrete and Computational Geometry*, J.E. Goodman and J. O'Rourke, eds., CRC Press, Boca Raton, Florida, 1997, pp. 361-375.

R.J.-B. Wets and C. Witzgall, *Algorithms for frames and lineality spaces of cones*, J. of Res. National Bureau of Standards – B. Math. and Mathematical Physics 71B (1967), pp. 1-7.

11

HEURISTICS FOR TWO-MACHINE FLOWSHOP SCHEDULING WITH SETUP TIMES AND AN AVAILABILITY CONSTRAINT

Wei Cheng
Health Monitor Network, Parmus, NJ

John Karlof
Department of Mathematics and Statistics
University of North Carolina Wilmington
karlof@uncw.edu

ABSTRACT

This paper studies the two-machine flowshop scheduling problem with anticipatory setup times and an availability constraint imposed on only one of the machines where interrupted jobs can resume their operations. We present a heuristic algorithm developed by Wang and Cheng to minimize makespan and use simulation to estimate its actual error bound. Wang and Cheng showed the worst-case error bounds are no larger than $\frac{2}{3}$ but, did not consider the average error bound.

1 INTRODUCTION

The problem of minimizing the makespan (the total completion time) of machine scheduling problems with availability constraints,(i.e. where one or more machines are unavailable for specified lengths of time, such as for routine maintenance), has attracted much research attention over the years. The two machine flowshop scheduling problem with availability contraints was first studied by Lee [3] in 1997. Under the job resumable assumption, he proved that the problem is NP hard even when an unavailability constraint is imposed on only one machine. Lee developed two heuristics to solve the problem. The first heuristic solved the problem when the unavailability constraint is imposed on the first machine and has a worst case error bound of $\frac{1}{2}$ while the second heuristic solved the problem when the unavailability constraint is imposed on the second machine and has a worst case error bound of $\frac{1}{3}$.

Definition 1 *Suppose C_H is the makespan of a machine scheduling problem obtained from heuristic H and $C^\star$ is the optimal makespan. Then the error bound for heuristic H is $\frac{C_H - C^\star}{C^\star}$.*

Also considering the resumable case, Chang and Wang [5] developed an improved heuristic with a worst case error bound of $\frac{1}{3}$ when the unavailability constraint is placed only on the

1

first machine. Breit [1] presented an improved heuristic with a worst case error bound of $\frac{1}{4}$ for the problem with an availability constraint only on the second machine. Chang and Wang [2] considered a special case of the problem when availability constraints are placed on both machines consecutively. The heuristic they developed had a worst case error bound of $\frac{2}{3}$.

In all the above mentioned flowshop scheduling models, setup times are not considered; that is, setup times are assumed to be included in the processing times. However, in many industrial settings, it is necessary to treat setup times as separated from processing times (for example [4, 6]). The two machine flowshop scheduling problem with anticipatory setup times when an availability contraint is imposed on one machine was studied by Wang and Chang [7]. They present two heuristics with worst case error bounds no larger than $\frac{2}{3}$ for solving the problem when the availability constraint is imposed on machines 1 and 2 respectively.

The purpose of this paper is to estimate by simulation the actual error bounds of the algorithms presented in [7]. In section 2, we introduce the notation and present the parallel machine scheduling problem with the unavailable time on machine 1 and in section 3, we present the algorithm from [7] for this case and fill in the details of the proofs in [7]. The algorithm and proof for the case when the availability constraint is imposed on machine 2 is similar, thus those are omitted. In section 5, we program both algorithms in JAVA and present estimates of the actual error bounds using simulation.

2 PROBLEM STATEMENT AND NOTATION

Problem Statement: Given a two machine flowshop scheduling problem with job set up times, the resumable assumption (a job or set up may be stopped and then resumed from the stopping point), and a fixed interval of unavailability time on one of the machines, find the permutation of the jobs that minimizes the makespan.

The following notation will be used throughout this paper:
- S = $\{J_1, ..., J_n\}$: a set of n jobs;

- M_1, M_2 : machine 1 and machine 2;

- $\Delta_l = t_l - s_l$:the length of the unavailable interval on M_l , where M_l is unavailable from time s_l to t_l, $0 \leq s_l \leq t_l$, l = 1, 2;

- s_i^1, s_i^2 :setup times of J_i on M_1 and M_2 , respectively, where $s_i > 0, s_i > 0$;

- a_i, b_i :processing times of J_i on M_1 and M_2 , respectively, where $a_i > 0, b_i > 0$;

- π: = $[J_{\pi(1)},...,J_{\pi(n)}]$:a permutation schedule, where $J_{\pi(i)}$ is the ith job in π ;

- $\pi^\star$:an optimal schedule;

- C_{H_x}:the makespan yielded by heuristic H_x;

- $C^{\star}$:the optimal makespan.

Example 1 <u>*Unavailability time on machine 1*</u> *with* $\Delta_1 = 5, s_1 = 10, t_1 = 15, n = 3$. *Let* $s_1^1 = 3, a_1 = 4, s_2^1 = 5, a_2 = 4, s_3^1 = 4, a_3 = 5,\ s_1^2 = 2, b_1 = 6, s_2^2 = 4, b_2 = 8, s_3^2 = 2, b_3 = 3$, *A schedule* $\pi = [J_1, J_2, J_3]$ *is shown in Fig. 1.*
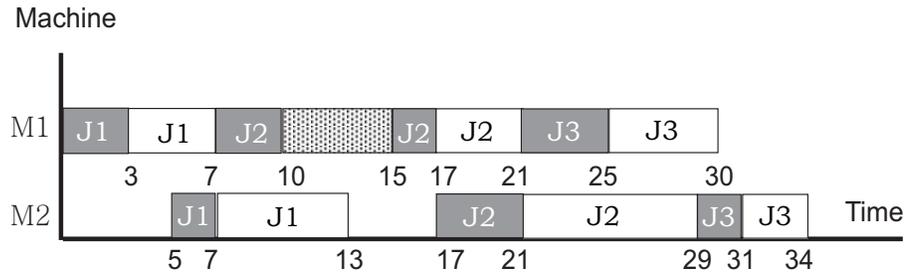

Figure 1: A schedule for example 1 with the makespan = 34

3 ALGORITHM FOR THE UNAVAILABLE INTERVAL ON M_1

In this section we develop a heuristic by Wang and Cheng [7] and evaluate its worst-case error bound. The basic idea of the heuristic is to combine a few simple heuristic rules and then improve the schedules by re-arranging the order of some special jobs with large setup times or large processing times on M_2.

3.1 YHA algorithm (π_1)

The Yoshida and Hitomi algorithm (YHA) [8] optimally solves the flowshop scheduling problem with setup times. It works in the following manner: Divide S into two disjoint subsets A and B, where $A = \{J_i | s_i^1 + a_i\text{-}s_i^2 \le b_i\}$ and $B = \{J_i | s_i^1 + a_i\text{-}s_i^2 > b_i\}$. Sequence the jobs in A in nondecreasing order of $s_i^1 + a_i\text{-}s_i^2$ and the jobs in B in nonincreasing order of b_i. Arrange the ordered subset A first, followed by the ordered subset B.

Let $s_1^1 = 9,\ a_1 = 3,\ s_2^1 = 2,\ a_2 = 4,\ s_3^1 = 3, a_3 = 2,\ s_1^2 = 7,\ b_1 = 4,\ s_2^2 = 1,\ b_2 = 7,\ s_3^2 = 2,\ b_3 = 3,$ $s_1 = 20$, and $t_1 = 25$.

Job number	Set A	Set B
1	None	$s_1^1 + a_1 - s_1^2 = 9 + 3 - 7 = 5 > 4$
2	$s_2^1 + a_2 - s_2^2 = 2 + 4 - 1 = 5 < 7$	None
3	$s_3^1 + a_3 - s_3^2 = 3 + 2 - 2 = 3 < 3$	None

Table 1: Values considered in π_1

Thus $\pi_1 = \{J_3, J_2, J_1\}$. See Figure 2(a).

3.2 Decreasing ratio (π_2)

Sequence the jobs in nonincreasing order of $(s_i^2 + b_i)/(s_i^1 + a_i)$.

Job number	$(s_i^2 + b_i)/(s_i^1 + a_i)$
1	$(s_1^2 + b_1)/(s_1^1 + a_1) = 11/12$
2	$(s_2^2 + b_2)/(s_2^1 + a_2) = 8/6$
3	$(s_3^2 + b_3)/(s_3^1 + a_3) = 5/5$

Table 2: Values considered in π_2

Then $\pi_2 = \{J_2, J_3, J_1\}$. See Figure 2(b).

3.3 Largest job p, q on machine 2 (π_3)

Determine jobs J_p and J_q such that

$$s_p^2 + b_p \geq s_q^2 + b_q \geq \max\{s_i^2 + b_i | J_i \in S \setminus \{J_p, J_q\}\}.$$

Job number	$s_i^2 + b_i$
1	$s_1^2 + b_1 = 7 + 4 = 11$
2	$s_2^2 + b_2 = 1 + 7 = 8$
3	$s_3^2 + b_3 = 2 + 3 = 5$

Table 3: Values considered in π_3

For π_3 put job J_p first and keep the other $n-1$ jobs in the same order as π_2. Then $\pi_3 = \{J_1, J_2, J_3\}$. See Figure 2(c).

3.4 Random sequences π_4 and π_5

Test if $(s_p^1 + a_p) + (s_q^1 + a_q) \leq s_1$ if not then no π_4, π_5. Otherwise make two sequences
π_4: Choose J_p and J_q as the first two jobs. The remaining $n-2$ jobs are sequenced randomly:
$\pi_4 = \{J_1, J_2, J_3\}$. See Figure 2(c).
π_5: Choose J_q and J_p as the first two jobs. The remaining $n-2$ jobs are sequenced randomly:
$\pi_5 = \{J_2, J_1, J_3\}$. See Figure 2(d).

3.5 Heuristic H1:

(1) Find jobs J_p and J_q such that

$$s_p^2 + b_p \geq s_q^2 + b_q \geq \max\{s_i^2 + b_i | J_i \in S \setminus \{J_p, J_q\}\}.$$

(2) Sequence the jobs by YHA. The schedule is π_1 and the corresponding makespan is $C_{\max}(\pi_1)$.
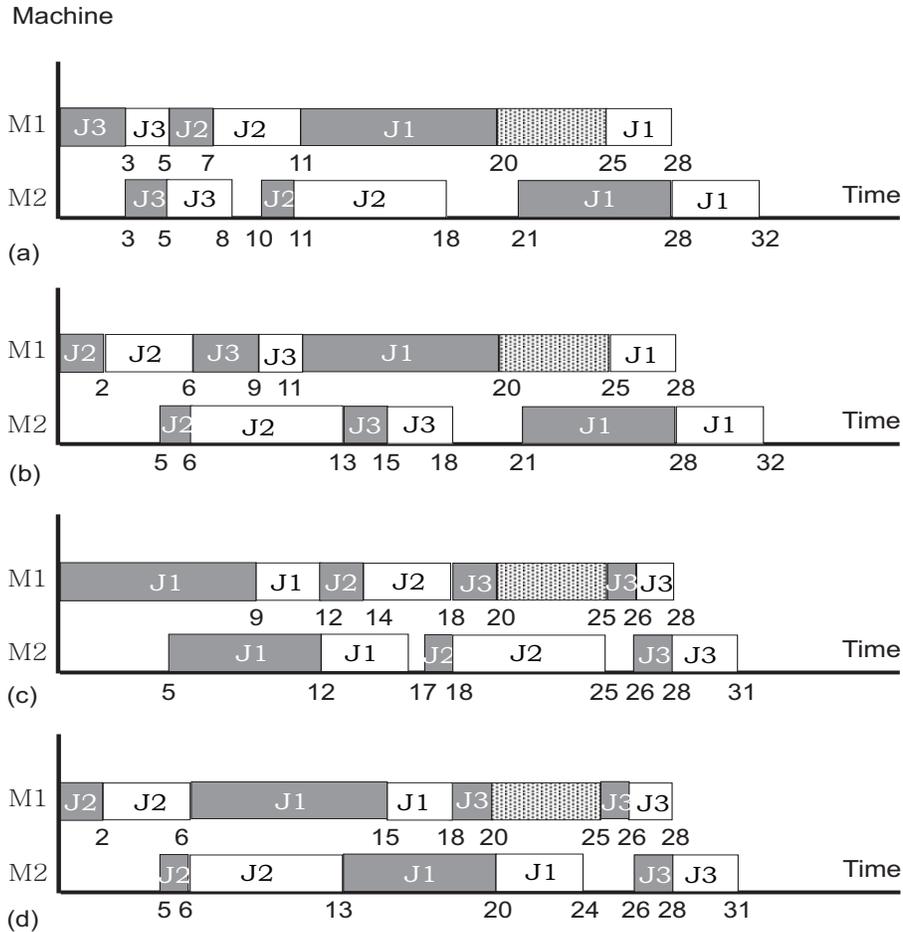
Figure 2: (a) π_1; (b) π_2; (c) π_3 and π_4; (d) π_5

(3) Sequence the jobs in nonincreasing order of $(s_i^2 + b_i)/(s_i^1 + a_i)$. The schedule is π_2 and the corresponding makespan is $C_{\max}(\pi_2)$.

(4) Place job J_p in the first position and keep the other $n-1$ jobs in the same positions as those in step (3). The schedule is π_3 and the corresponding makespan is $C_{\max}(\pi_3)$.

(5) If $(s_p^1 + a_p) + (s_q^1 + a_q) \leq s_1$, then sequence jobs J_p, J_q as the first two jobs. The remaining $n-2$ jobs are sequenced randomly. The schedule is π_4 and the corresponding makespan is $C_{\max}(\pi_4)$.

(6) If $(s_p^1 + a_p) + (s_q^1 + a_q) \leq s_1$, then sequence jobs J_q, J_p as the first two jobs. The remaining $n-2$ jobs are sequenced randomly. The schedule is π_5 and the corresponding makespan is $C_{\max}(\pi_5)$.

(7) Select the schedule with the minimum makespan from the above five schedules. Let C_{H1} $= \min\{C_{\max}(\pi_1), C_{\max}(\pi_2), C_{\max}(\pi_3), C_{\max}(\pi_4), C_{\max}(\pi_5)\}$.

In the following, we analyze the error bound of heuristic H1.

Definition 2 *Let π be any schedule. We define the critical job $J_{\pi(k)}$ as the last job such that its starting time on M_2 is equal to its finishing time on M_1.*

Lemma 1 *For schedule π_2 defined in Step (3) of heuristic H1, we assume that the completion time of the critical job $J_{\pi_2(k)}$ on M_1 is t, and let $J_{\pi(v)}$ be the last job that finishes no later than time t on M_1 in a schedule π. The following inequality holds:*

$$C_{\max}(\pi_2) \le C_{\max}(\pi) + b_{\pi_2(k)} + s^2_{\pi(v+1)}.$$

Proof. There is no idle time on machine 2 after the critical job, so if there is no critical job then $C_{\max}(\pi_2) = \sum_{i=1}^{n}(s^2_{\pi_2(i)} + b_{\pi_2(i)}) = C^{\star}$. So, we will always assume there is a critical job for each of the schedules π_i and we have for π_2,

$$C_{\max}(\pi_2) = t + b_{\pi_2(k)} + \sum_{j=k+1}^{n} (s^2_{\pi_2(j)} + b_{\pi_2(j)}). \tag{1}$$

Under the assumption of lemma 1, $J_{\pi(v)}$ is the last job that finishes no later than time t on M_1 in a schedule π. We have

$$\sum_{j=1}^{v}(s^1_{\pi(j)} + a_{\pi(j)}) \le \sum_{j=1}^{k}(s^1_{\pi_2(j)} + a_{\pi_2(j)}),$$

and because $\sum_{j=1}^{n}(s^1_{\pi(j)} + a_{\pi(j)}) = \sum_{j=1}^{n}(s^1_{\pi_2(j)} + a_{\pi_2(j)})$,
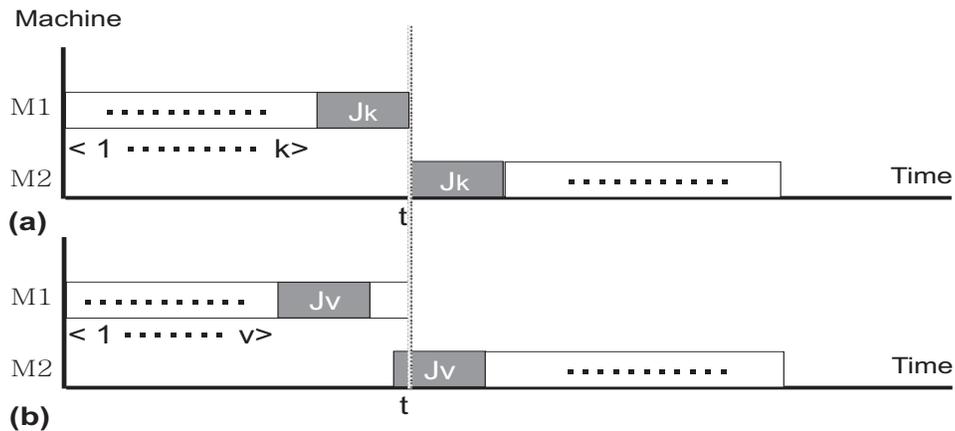
Figure 3: illustrations of (2), (a)Order π_2; (b)Order π;

$$\sum_{j=v+1}^{n} (s^1_{\pi(j)} + a_{\pi(j)}) \ge \sum_{j=k+1}^{n} (s^1_{\pi_2(j)} + a_{\pi_2(j)}). \tag{2}$$

Since all the jobs are sequenced in nonincreasing order of $(s^2_{\pi_2(j)} + b_{\pi_2(j)})/(s^1_{\pi_2(j)} + b_{\pi_2(j)})$ in π_2, and because after critical job k on M_1, there is no idle time, we have

$$\sum_{j=k+1}^{n} (s^2_{\pi_2(j)} + b_{\pi_2(j)}) > \sum_{j=k+1}^{n} (s^1_{\pi_2(j)} + a_{\pi_2(j)}). \tag{3}$$

From (2) and (3),

$$\sum_{j=v+1}^{n} (s^2_{\pi(j)} + b_{\pi(j)}) \geq \sum_{j=k+1}^{n} (s^2_{\pi_2(j)} + b_{\pi_2(j)}). \tag{4}$$

For schedule π, we have

$$C_{\max}(\pi) \geq t + \sum_{j=v+1}^{n} (s^2_{\pi_2(j)} + b_{\pi_2(j)}) - s^2_{\pi(v+1)}. \tag{5}$$

Therefore, from (1), (4) and (5), we have

$$
\begin{aligned}
C_{\max}(\pi_2) &= t + b_{\pi_2(k)} + \sum_{j=k+1}^{n} (s^2_{\pi_2(j)} + b_{\pi_2(j)}) \\
&\leq t + b_{\pi_2(k)} + \sum_{j=v+1}^{n} (s^1_{\pi(j)} + a_{\pi(j)}) \\
&\leq C_{\max}(\pi) + b_{\pi_2(k)} + s^2_{\pi(v+1)}.
\end{aligned}
$$

Theorem 1 $(C_{H1} - C^\star)/C^\star \leq 2/3$.

Proof. If $\sum_{i=1}^{n}(s^1_i + a_i) \leq s_1$, it is obvious that $C_{\max}(\pi_1) = C^\star$ from the Yoshida and Hitomi algorithm(YHA)[14]. So we assume $\sum_{i=1}^{n}(s^1_i + a_i) > s_1$.

Since all the jobs are resumable and π_1 is the best scedule without unavailable time, we have $C_{\max}(\pi_1) \leq C^\star + \Delta_1$. So if $\Delta_1 \leq 2C^\star/3$, then we are finished. So, in the following, we assume $\Delta_1 > 2C^\star/3$.

Because $\Delta_1 > 2C^\star/3$ and $\sum_{i=1}^{n}(s^1_i + a_i) + \Delta_1 < C^\star$, we have $\sum_{i=1}^{n}(s^1_i + a_i) < C^\star/3$. Let $S' = \{J_i | s^2_i + b_i > C^\star/3, i = 1, 2, ..., n\}$. It is obvious $| S' | \leq 2$.

Case 1:$| S' |= 0$

For an optimal schedule $\pi^\star$, according to lemma 1, we have $C_{\max}(\pi_2) \leq C^\star + b_{\pi_2(k)} + s^2_{\pi^\star(v+1)} \leq 5C^\star/3$.

Case 2:$| S' |= 1$ (Jobs k and v are still as defined in lemma 1.)

In this case, $S' = \{J_p\}$. If $s_p^2 \leq C^\star/3$ and $b_p \leq C^\star/3$, then $b_{\pi_2(k)} \leq C^\star/3$ and $s_{\pi^\star(v+1)}^2 \leq C^\star/3$ and from lemma 1 $C_{\max}(\pi_2) \leq C^\star + C^\star/3 + C^\star/3 \leq 5C^\star/3$. Otherwise, if $s_p^2 > C^\star/3$ or $b_p > C^\star/3$, we consider schedule π_3 obtained in step (4) of heuristic H1 and let the critical job of π_3 be $J_{\pi_3(u)}$. First we suppose that $s_p^1 + a_p \leq s_1$. Now, if $\sum_{i=1}^u (s_{\pi_3(i)}^1 + a_{\pi_3(i)}) \leq s_1$, see figure 4, then
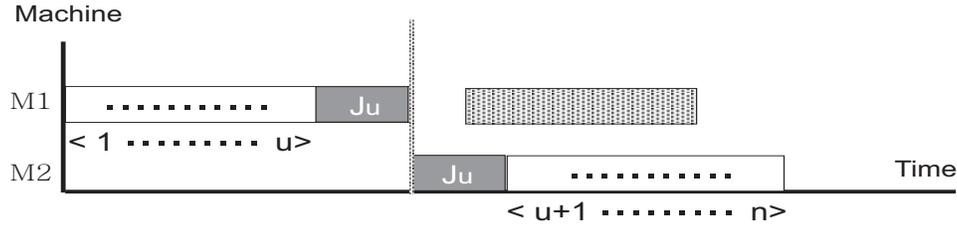
Figure 4: Illustrations of π_3; J_u on M_2 equal to $b_{\pi_3(u)}$.

$$
\begin{aligned}
C_{\max}(\pi_3) &= \sum_{i=1}^u (s_{\pi_3(i)}^1 + a_{\pi_3(i)}) + \left(\sum_{i=u+1}^n (s_{\pi_3(i)}^2 + b_{\pi_3(i)}) + b_{\pi_3(u)} \right) \\
&\leq C^\star/3 + C^\star \\
&= 4C^\star/3
\end{aligned}
$$

otherwise, let $\sum_{i=1}^u (s_{\pi_3(i)}^1 + a_{\pi_3(i)}) > s_1$, J_p is the first job in π_3 and $s_p^1 + a_p \leq s_1$, then $u > 1$, see figure 5. Thus, we have
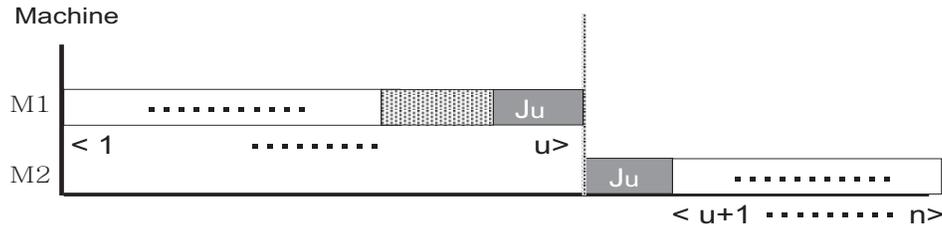
Figure 5: Illustration of equation with π_3; J_u on M_2 equal to $b_{\pi_3(u)}$.

$$
\begin{aligned}
C_{\max}(\pi_3) &= \left(\sum_{i=1}^u (s_{\pi_3(i)}^1 + a_{\pi_3(i)}) + \Delta_1 \right) + \left(\sum_{i=u+1}^n (s_{\pi_3(i)}^2 + b_{\pi_3(i)}) + b_{\pi_3(u)} \right) \\
&\leq C^\star + 2C^\star/3 \\
&= 5C^\star/3.
\end{aligned}
$$

For subcase $s_p^1 + a_p > s_1$, we have $s_p^1 + a_p + \Delta_1 + b_p \leq C^\star$. If the critical job does not exist or job J_p is the critical job, then we have, see figure 6:
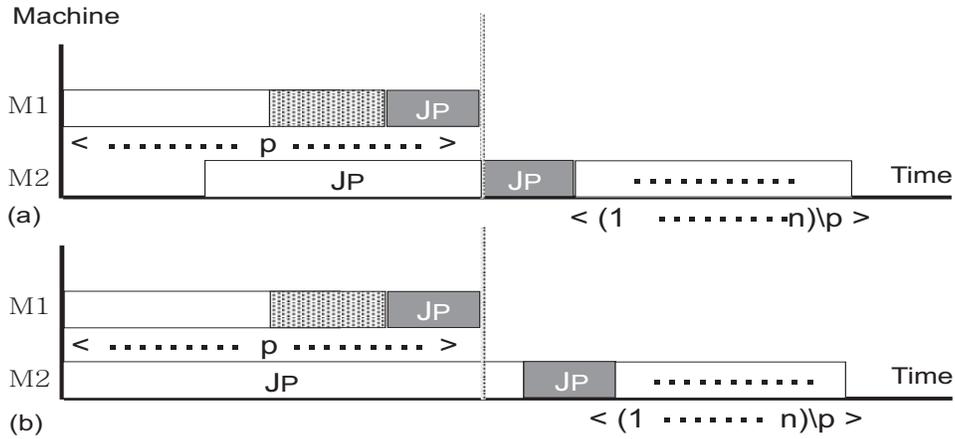
Figure 6: Compare $\max\{s_p^1 + a_p + \Delta_1, s_p^2\}$. $s_p^1 + a_p + \Delta_1$ in (a), s_p^2 in (b).

$$
\begin{aligned}
C_{\max}(\pi_3) &= \max\{s_p^1 + a_p + \Delta_1, s_p^2\} + b_p + \sum_{J_i \in S \setminus J_p} (s_{\pi_3(i)}^2 + b_{\pi_3(i)}) \\
&\leq C^\star + 2C^\star/3 \\
&= 5C^\star/3.
\end{aligned}
$$

Otherwise, for the critical job $J_{\pi_3(u)}$, $u > 1$, see figure 7, we have
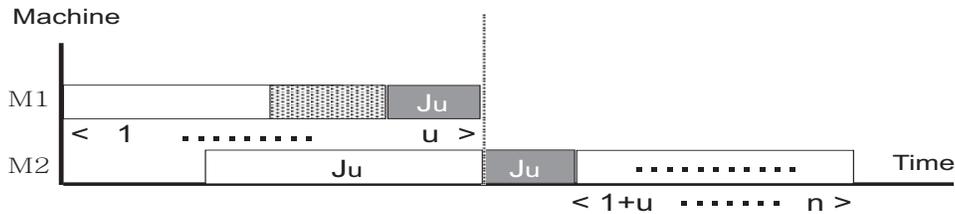
Figure 7: Illustration of π_3; J_u on machine 2 equal to $b_{\pi_3(u)}$.

$$
\begin{aligned}
C_{\max}(\pi_3) &= \left(\sum_{i=1}^{u}(s_{\pi_3(i)}^1 + a_{\pi_3(i)}) + \Delta_1\right) + b_{\pi_3(u)} + \sum_{i=u+1}^{n} (s_{\pi_3(i)}^2 + b_{\pi_3(i)}) \\
&\leq C^\star + 2C^\star/3 \\
&= 5C^\star/3.
\end{aligned}
$$

Case 3:$\mid S' \mid = 2$

In this case, we show that the error bound of schedule π_4 obtained in step (5) is no more than $C^\star/3$.

Suppose $J_{\pi_4(u)}$ is the critical job for π_4, then if $u > 2$, see figure 8, we have and because
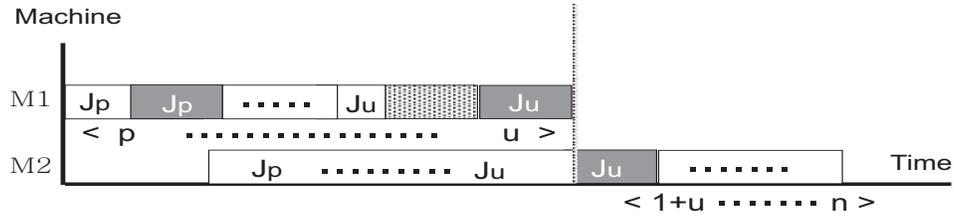
Figure 8: Illustration of π_4.

$|S'| = 2$ and $u > 2$ that means $\sum_{i=1}^{u}(s^1_{\pi_4(i)} + a_{\pi_4(i)}) + \Delta_1 < C^\star$ and

$$
\begin{aligned}
C_{\max}(\pi_4) &= \sum_{i=1}^{u}(s^1_{\pi_4(i)} + a_{\pi_4(i)}) + \Delta_1 + \left(\sum_{i=u+1}^{n}(s^2_{\pi_4(i)} + b_{\pi_4(i)}) + b_{\pi_4(u)}\right) \\
&\leq C^\star + C^\star/3 = 4C^\star/3.
\end{aligned}
$$

If $u = 2$, then we have the following contradiction: $\sum_{i=1}^{n}(s^1_i + a_i) \leq C^\star - \Delta_1 < C^\star - 2C^\star/3 = C^\star/3$ But $C^\star/3 > \sum_{i=1}^{n}(s^1_i + a_i) > (s^1_p + a_p) + (s^1_q + a_q) \geq min\{s^2_p + b_p, s^2_q + b_q\} > C^\star/3$.

If $u = 1$, then see figure 9, we have
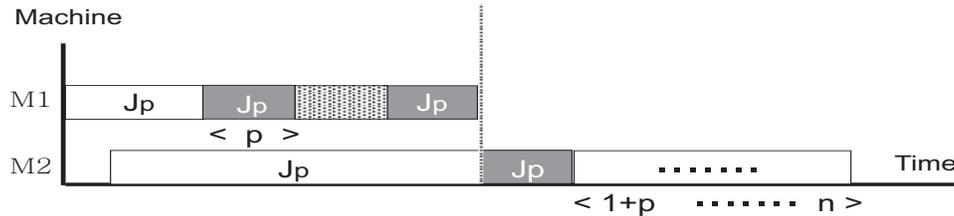
Figure 9: Illustration of π_4 and π_5.

$$
\begin{aligned}
C_{\max}(\pi_4) &= (s^1_p + a_p) + \left(b_p + \sum_{i=2}^{n}(s^2_{\pi_4(i)} + b_{\pi_4(i)})\right) \\
&\leq C^\star/3 + C^\star = 4C^\star/3
\end{aligned}
$$

Similarly for π_5. This completes the proof of theorem 1.

From the proof of theorem 1, we see that steps (1)...(5) of heuristic H1 can produce a solution with an error bound of no more than $2C^\star/3$, and schedule π_4 in step (5), π_5 in step (6) can produce a solution with an error bound of no more than $C^\star/3$ in some special situations.

Although we do not know whether the bound is tight or not, [7] contains a (not very realistic) example to show that the worst case error bound is no smaller than $C^\star/2$.

Number of jobs, n	Optimal solution percentage of H1	Average error bound	Largest error bound
6	77%	.025	.045
7	88%	.012	.054
8	85%	.029	.054
9	84%	.019	.044
10	78%	.031	.048
11	84%	.029	.046
12	75%	.032	.050

Table 4: Computational results for heuristic 1

4   COMPUTATIONAL RESULTS

In this paper, we provided the details only for heuristic H1 that applies to the case where the unavailable time is on machine 1. The paper [7] also contains heuristic H2 that applies to the case where the unavailable time is on machine 2. We present our computational results for both H1 and H2 in tables 4 and 5 respectively. Both heuristics have a worst case error bound no larger than $2C^{\star}/3$. In order to determine how tight this error bound is, we implemented both heuristics using the programming language JAVA. We simulated randomly generated job shops with $n = 6, 7, \ldots, 12$. All jobs' setup times and processing times were random integers between 1 and 10. The unavailable time was determined by choosing a random number, l between .1 and .15 and another random number between, k between .2 and .25. Then, the unavailable time for machine 1 was the interval:

$$\left[\lfloor l \cdot \sum_{i=1}^{n}(s_i^1 + a_i) \rfloor, \lfloor k \cdot \sum_{i=1}^{n}(s_i^1 + a_i) \rfloor \right] \text{ where } \lfloor \ \rfloor \text{ is the floor function.}$$

A similar interval was used for machine 2. We experimented with various sized intervals for the unavailable times and the intervals choosen seemed the most reasonable. We calclulated 100 simulations for each value of n. The value of $C^{\star}$ was determined by considering the makespan for all permutations of the jobs and choosing the best one.

5   CONCLUSIONS

In this paper we studied the two-machine flowshop scheduling problem with anticipatory setup times, resumable setup times and processing times, and an availability constraint imposed on one of the machines. Wang and Chang [7] presented two heuristics for this problem when the availability constraint was imposed on machines 1 and 2 respectively. We presented heuristic H1 including detailed proofs whose details are not found in [7] to show that the worst case error bound of the heuristic was $\frac{2}{3}$. We also presented a simulation study testing the heuristics and determined that:

Number of jobs, n	Optimal solution percentage of H2	Average error bound	Largest error bound
6	80%	.031	.042
7	89%	.012	.054
8	82%	.045	.079
9	85%	.055	.066
10	77%	.026	.047
11	84%	.042	.089
12	72%	.050	.075

Table 5: Computational results for heuristic 2

- heuristics 1 and 2 found the optimal solution an average of 82% and 81% percent of the time;

- the average average error bound for heuristic 1 was .025 while the average largest error bound was .049;

- the average average error bound for heuristic 2 was .037 while the average largest error bound was .065.

The main conclusion is that these heuristics perform much better than their worst case error bound of .666 suggests.

References

[1] Breit J., An improved approximation algorithm for two-machine flow shop scheduling with an availability constraint, Information Processing Letters 2004;90:273–8.

[2] Cheng TCE., Wang G., Two-machine flowshop scheduling with consecutive availability constraints. Information Processing Letters 1999;71:49–54.

[3] Lee C-Y. Minimizing the makespan in the two-machine flowshop scheduling problem with an availability constraint. Operations Research Letters 1997;20:129–39.

[4] Rajedran C., Ziegler H. Heuristics for scheduling in a flow shop with setup processing and removal times separated. Production Planning and Control 1997;8:568–76.

[5] Schmidt G. Scheduling with limited availability. European Journal of Operational Research 2000;121:1–15.

[6] Sule D., Huang K., Sequencing on two and three machines with setup, processing and removal times separated. International Journal of Production Research 1983;21:723–32.

[7] Wang, X., Chang, E., Heuristics for two machine flowshop scheduling with setup times and an unavailability constraint, Computers and Operations Research 2007; 34:152–162.

[8] Yoshida, T., Hitomi, K., Optimal two-stage production scheduling with setup times separated, AIIE Transactions 1979;11:261–263.

Forum on the Use of Automated Systems and Technology for Managing Homework, Testing and/or Tutoring in Quantitative Classes

Session Organizer and Moderator
Robert L. Andrews, Virginia Commonwealth University, Department of Management, Richmond, VA. 23284-4000, 804-828-7101, randrews@vcu.edu

Participants and Contributors
Hope Baker, Kennesaw State University, hbaker@kennesaw.edu
Joan Donohue, University of South Carolina, donohue@moore.sc.edu
Reza Kheirandish, Clayton State University, rkheiran@clayton.edu

ABSTRACT

Panel led open discussion of experiences with the use of automated systems and technology for subject areas that include statistics, economics and management science. Panelists have experience with clickers, Tablet PCs, Blackboard, WebCT, Respondus, Camtasia, Mimio, Adobe Captivate, LiveScribe smartpen, Sympodium, ALEKS, Aplia and MyStatLab. They will share their level of satisfaction with products and technologies along with perceptions of student satisfaction and issues that are important for a faculty member to consider relative to using such a system or technology.

SESSION OVERVIEW

In the face of budget cuts most faculty have experienced increased workloads and are seeking ways to be more productive. At the same time students are becoming more accustomed to using technology. Experience and research has shown that students who do homework regularly learn more and as a result have better grades. Ideally someone could sit with the student while he/she does their work and provide immediate feedback telling the student whether the completed work was correct or not. If the student was stuck and did not know how to proceed, a helpful hint could be given. If that was not successful then an explanation of the correct way to solve a problem of this nature Today several of the textbook publishers are providing automated systems for managing homework and providing tutoring in quantitative areas. These systems provide immediate feedback to the student along with assistance and can be used whenever the student has time or chooses to study. Examples of these systems for statistics classes include Aplia from Cengage, MyStatLab from Prentice-Hall, Hawkes Learning Systems: Statistics, and McGraw-Hill has ALEKS and its new product Connect Business Statistics.

In addition to the publisher supplied systems that are generally linked to the textbook for the course, there are other systems for course management such as Blackboard and WebCT that are available at most institutions. Faculty can use these tools to create quizzes/tests/assignments that can be taken with the computer and graded automatically. Also they can be used to provide students with files that may contain lecture materials stored in PowerPoint, Word, Excel or PDF files. Faculty can use tools like Camtasia to create recordings of lectures or other instructions that can be saved and made available to the class. Tablet PCs can be used during lectures to

record written notes and annotations to PowerPoints or other presentation materials, then these files can be made available.

Collectively, the four session leaders have varying degrees of experience with clickers, Tablet PCs, Blackboard, WebCT, Respondus, Camtasia, Mimio, Adobe Captivate, LiveScribe smartpen, Sympodium, ALEKS, Aplia and MyStatLab as instructors of statistics, economics and management science classes. The panel will present their experiences in using the technology enabled tools to improve the quality of their quantitative classes. Several of these are certainly applicable in classes other than quantitative courses. After their initial presentations, the moderator will engage the audience in an open discussion of issues and experiences with the use of the technologies and automated systems. The presentations and discussions will include the level of faculty satisfaction with the respective products and the perceptions of student satisfaction. A major goal of the session is to discuss the issues that are important for a faculty member to consider relative to making the decision about using one of the discussed systems.

Learn to Excel with Word and Get the Word on Excel

Session Organizer and Co-presenter
Wilma M. Andrews, Virginia Commonwealth University, School of Business,
Richmond, VA. 23284-4000, 804-827-0956, wandrews@vcu.edu

Contributor and Co-presenter
Robert L. Andrews, Virginia Commonwealth University, Department of Management,
804-827-0956, randrews@vcu.edu

ABSTRACT

This will be an interactive session designed to be of value for those who are just making or considering making the transition to Word or Excel in Microsoft Office 2007 and for those who are using 2007 and want to learn more about it capabilities. Microsoft claims that 2007 was designed to help the user find everything without it being hidden at some level below the surface, but most of us have not always been able to find things so easily in the new version. This session will present some of the new features for Word and Excel in 2007 as well as demonstrate how to find and or do some tasks of potential interest to business faculty.

SESSION OVERVIEW

Even though Office 2007 has been out a couple of years, many schools and business have not jumped to adopt it. Hence there are users who are just now in the process of making the transition. Also many of those who have adopted have merely learned how to do the things that they do on a regular basis and have not really learned how to take advantage of features that may be beneficial to them. The purpose of this session is to provide information that can be worthwhile for both groups.

The session will begin by asking each person in the audience to tell what they do professionally, how they are currently using Word and/or Excel, how they think they may be using either in the future, and what they would like to learn from the session. The audience feedback will allow the session leaders to adapt their presentation to best meet the needs of the audience and to ensure that the audience is engaged. Audience members will be encouraged to share their own tips or tricks with the others in attendance. The session leaders will share from their years of experience using and teaching Word and Excel in Office 2007.

A primary goal of the changes Microsoft has made in Office 2007 was to make the four Office programs (Word, Excel, Access and PowerPoint) have a more common look and functionality. Hence an overview will be given of the new Microsoft Office 2007 Ribbon user interface. The session will move to specific features of Word and Excel. This includes details of how to use the Office Button - pdf creation, blogging capabilities, properties, etc. The Options features, many of which were located at Tools in earlier version, will also be discussed. Handouts will be provided summarizing the tasks at the Ribbon tabs and some of the application Options features. Handouts will also include some Internet URLs of sites that may prove helpful to those

transitioning from Office 2003 and new Office 2007 users. The presenters will be illustrating live in Office 2007.

This overview will hopefully broaden some audience member's awareness of the features or functionalities in Office 2007. The knowledge from this session will help users excel in using Word and get the word on how to better use Excel in the 2007 applications.

RECRUITING FOR RETENTION:
Hospitality Programs

Denis P. Rudd Ed.D.
Robert Morris University
Pittsburgh Pennsylvania

Abstract

Colleges and universities must take into account the impact the dwindling economy will have on college recruitment and attempt to recruit students for retention. Student retention is fundamental to the ability of a university or college to carry out its mission, a high rate of student attrition is not only a financial problem for students, but a symbolic failure of the school to achieve its mission. Innovation is the key to successfully retaining students and preventing high attrition rates. Most of the Hospitality schools use a three-pronged approach, the first focusing on academic support solutions and the second focusing on student resource initiatives, finally on financial support. Attrition is an expensive loss that colleges and universities can no longer afford. Within the past 20 years, most colleges and universities had added retention programs to their strategic planning efforts.

Introduction

In today's uncertain economy even colleges and universities must buckle down and find what works for today's students and the educational institutions they attend. Attrition rates at institutions of higher education are extremely high. (Geraghty,1996). Most estimates for student retention range from 45 -60%. Minority and socioeconomically challenged students appear to be especially susceptible to withdrawing from school. Brower (1992) notes that65% of the Hispanic students, 55% of the African American students and 61 % of the students from the lowest socioeconomic quartile never graduate.

A large proportion of hospitality students at present must work one or more jobs to help pay for college or university expenses while attempting to balance curricular and program demands. Most hospitality programs also require the completion of externships, internships, cooperative education placements, and/or practicum as a part of their degree requirements. These program requirements as many as 1600 hours that must be completed prior to graduation and make hospitality programs unique from many other disciplines.

 Financial burdens on academic institutions mean that innovative ways must be found to appeal to students, to encourage them to undertake educational endeavors that will further their own career and financial goals. It does no good to enroll 1,000 students and have only 500 complete their degrees. Attrition costs US educational institutions billions each year. Colleges and universities must do a better job of retaining students.

There are many ways to ensure student retention. One of the most important is to streamline recruiting efforts so retention becomes a part of recruitment efforts. What does this mean? It means that colleges must actively plan for the retention of students. Defending against attrition is of paramount importance, more so now than at any time in the history of US colleges and universities. As money grows tighter potential students are carefully weighing the advantages and disadvantages of a college education against their own financial burdens. It is up to the institutions to *obtain* new students and *retain existing* ones. Educational institutions must aggressively recruit students who are most likely to complete degrees and they must actively create and promote hospitality and programs and facilities which are most likely to result in student retention.

There is no doubt that it costs more to recruit new students than it does to retain already existing students and yet at many universities and colleges the focus remains on recruitment rather than on retention. Many college and university administrators do not view retention as a source of increased funding but the truth of the matter is that if colleges and universities could retain even half of the students they loose through attrition budgetary increases would be assured with very little increase in spending.

Fostering Retention

There are several ways to foster retention including; developing outreach and bridge programs, orientation and student life classes/programs, academic and social/psychological counseling, participation in academic and social activities, increased on campus housing, and faculty advising (Astin, 1993). Factors that influence retention must be considered when developing a retention plan.

Teaching, learning support, facilities, etc.

Academic integration

Prior qualifications

Goal Commitment

Individual attributes

Dropout decisions

Institutional Commitment

Family attributes e.g. mother's education

Debt, counselling, medical, personal, family events, etc.

Social integration
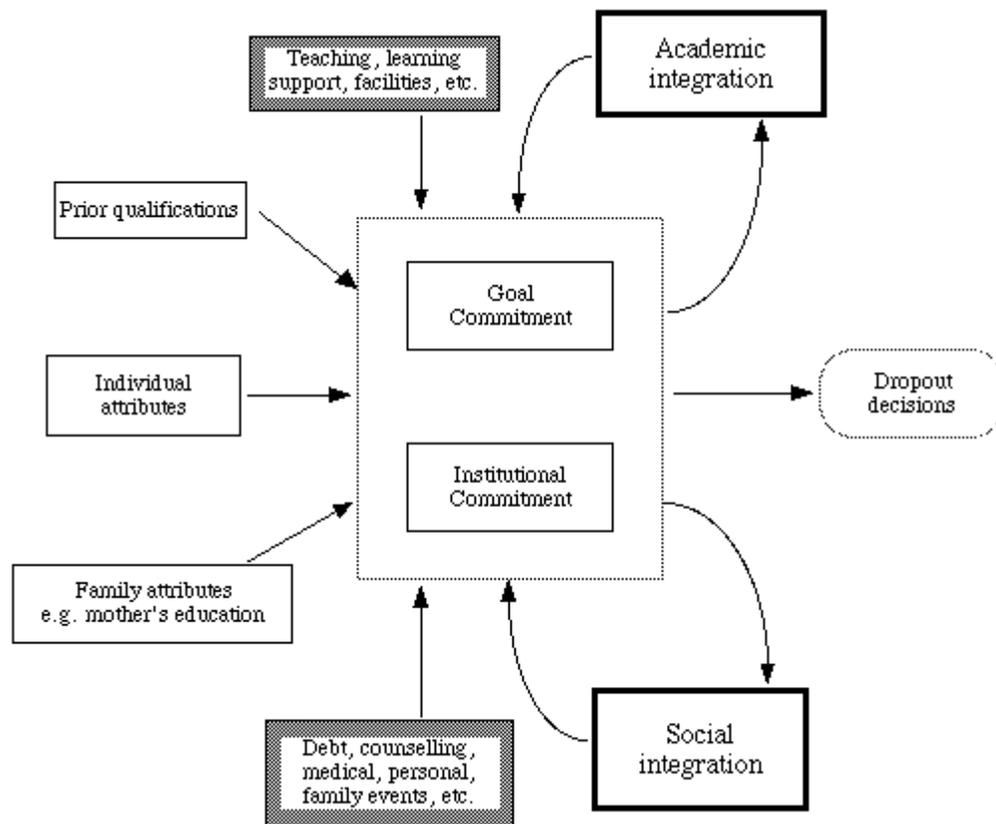
(Draper, 2002)

From the model above you can see that there are many factors that influence whether or not a student will be retained, including; academic integration, social integration, dropout decisions, family attributes, individual attributes, prior qualifications, financial considerations, and teaching/learning support. Since there are so many factors that influence student retention it behooves colleges and universities to develop programs and practices that address as many of these factors as possible.

Outreach and bridge programs are extremely effective methods that colleges and universities can use to cultivate student retention. Such programs act as a bridge between high school and college; preparing students for their freshman year. A prime example of such a bridge program is the Summer Bridge program at the University of California, San Diego. The program was established 30 years ago and "…is a four-week academic and residential experience designed to prepare incoming freshmen, especially those from educationally disadvantaged backgrounds, to successfully transition to UCSD. Approximately 150 UCSD freshmen participate in the program each summer during which they learn and hone important academic, cognitive, social, and leadership skills that will serve them well during their critical first year in college, and beyond." (Dabney, 2003) The cohorts who graduate from UCSD within 5 years who took part in the program have a remarkable 81% graduation rate. The key to success in such programs is to make sure that they are not simply addressing the remedial needs of students but that they contain content that ensures students enter college with a clear understanding of the difficulties they may experience academically, socially and psychologically and what programs/people they can access when they encounter problems.

Orientation and student life programs can help universities and colleges retain students by helping students learn about university life which can be very different from the environment they are used to at

home. It has long been known that students in the sciences and engineering are particularly prone to attrition (Astin, 1993). Kettering University is an example of a university that has recognized this special group of students who are more prone to attrition and instituted a pilot program to stem the tide of students who were leaving without attaining a degree. Their "pilot orientation class ran fall 2006 and spring 2007 for the entire term to provide academic, co-op and non-academic assistance to students. This assistance included up-to-date information on how to prepare for cooperative education assignments; how to interact and communicate with companies and staff; instruction on incorporating better time management skills; more details on health and counseling services available while on campus, and where to go when a student needs help." (Erwin, 2007) The program proved extremely successful with 100% of students retained into their freshman year. The Data is not yet available regarding graduation rates.

Increased on campus housing affects retention rates positively. Many universities and colleges require freshman to stay in campus housing for at least the freshman year and studies have shown (Astin, 1993, Reynolds, 2007) that staying on campus leads to better student retention the following year(s).

Faculty advising and the type and duration of student/faculty contact have a direct positive impact on student retention (Astin, 1993, Vivian, 2005). Advising has instantaneous and enduring benefits for individual students. Advising can motivate students to stay in programs during difficult times by providing one on one meaningful out of class contact with faculty. It provides faculty members with the opportunity to encourage, and advise students on academic and career choices fostering a sense of connection that can support a student's stay in an academic program.
Robert Morris University hospitality program provides a combination of professional and faculty student advisement. During the admission process the hospitality program director is involved with the students acceptance, class advisement and selection, first semester orientation. During the semester the program advisor, faculty advisor and program director monitor the progress of freshmen and transfer students.

It is critically important that faculty communicate extensively with their students, making sure that they encourage students and build self-esteem. Faculty who support students provide positive reinforcement and the motivation for student's to persist in college. Despite the importance of advising in relationship to student retention, there is little to no training provided to faculty. This is one area that can be improved in many colleges and universities (Habley and Crockett, 1988).

The relationship between faculty, classes and students particular University experiences are consistent with the assumption that these are key factors that influence student's specific hospitality program experience. Students who have a positive hospitality program experience are more likely to be satisfied with University and hospitality program than students who do not have a positive program experience.

Recruiting Retention

Retention is paramount in higher education. If the key elements for student persistent are the students linking with the institution, it would not only be at the University, college or department level First year student but also at the program level. A study by Prof. William J. of the University of Connecticut in 2004 selected determine the effectiveness of faculty program advising and special programs for career focused individuals in the hospitality field, for retention. Though unique positioning of the institution as a career focused institution, differentiates it from other institutions in the educational field. The results showed that first year students in rolled in hospitality programs persisted at a higher rate than their predecessors and at a rate higher than other students in rolled in different programs at the institution. The entire population our first year students was included in the study and a retention rate for the hospitality programs exceed the goals set by the University.(Day, 2004)

Students are concerned about various issues pertaining to their college experience. Students are considered by many educational administrators to be the customers of a hospitality program or university. If students are truly customers, schools must continually seek ways to make sure its customers are satisfied. Hospitality programs must be willing to listen to their students and prioritize the needs of their students in order guarantee long term success and growth. Hospitality Schools must continue to gather input from students and make every effort to implement their suggestions. Schools can no longer play a guessing game in determining student needs.

Students most likely to complete 4 year degrees typically have the following traits in common; the single largest predictor of persistence is high school GPA followed closely by high SAT Mathematical and Verbal scores, socioeconomic status (father's and mother's educational levels and parental income), and a high leadership self-rating are also important indicators of persistence (Astin, 1993).

Given these traits it would behoove academic institutions to develop plans for the aggressive recruitment of students who are most likely to complete a four year degree program. Financially, retention of students throughout a 4 year degree program means the continued success of colleges and universities in these trying financial times.

Bibliography

Astin, Alexander. <u>What Matters in College.</u> San Francisco, CA: Jossey-Bass, 1993.

Day, William. <u>Retention efforts for first-year hospitality students at a career focused institution.</u>(PhD dissertation). United States-Connecticut: the University of Connecticut; 2004. Publication number: AAT T3165987

Dabney, Michael. **"**UCSD Summer Bridge Program honored for excellence, innovation in student retention." June 27, 2003. <u>http://sea.ucsd.edu/media/articles/ucsdbridge.htm</u>

Draper,S.W. "Tinto's Model of Student Retention." May 14, 2002. <u>http://www.psy.gla.ac.uk/~steve/localed/tinto.html</u>

Habley, W. & Crockett, D. (1988). The third ACT national survey of academic advising. In W. R. Habley (Ed.), the status and future of academic advising: Problems and promise (pp. 11-76). Iowa City, IA: American College Testing Program.

Reynolds, Gary L. "The impact of facilities on recruitment and retention of students." New Directions for Institutional Research. <u>Volume 2007 Issue 135</u>, 63 – 80

Vivian, C. (Summer 2005). Advising the at-risk college student. The Educational Forum 69, 336-351.

Gender Equality in Private College Athletics: Is Title IX Having an Impact?

John Frazier, Southern Wesleyan University, 907 Wesleyan Drive, Central, SC 29630

Royce Caines, Southern Wesleyan University, 907 Wesleyan Drive, Central, SC 29630

ABSTRACT

In 1972, the United States Congress passed Title IX of the Omnibus Education Act requiring in essence that institutions provide equality in opportunities for both male and female students at higher education institutions if the institution received any federal funding. Subsequently, the Office of Civil Rights and various court cases have tried to interpret the meaning of the law and have tried to give guidance as to how institutions should work to implement Title IX legislation.

The focus of this study is to evaluate whether differences exist in expenditures on male and female athletics in a sample of institutions that report data to the U.S. Department of Education. For total expenditure per athlete, the null hypothesis of no difference in average expenditure between male and female athletes is supported. Football information was removed from the data due to the typically unusual efforts made to promote the sport as a revenue generating entity within many of the institutions. Also there is no equivalent women's sport.
Results indicate there are no significant differences when football is excluded from the data so at least for this group of institutions, it can be inferred there is relatively equal expenditures for both male and female athletes.

Further analysis was done to compare expenditures for basketball by gender. A paired t-test showed an average expenditure difference of $ 4, 428.29 per athlete; however, the difference was not significantly different from zero, thus the null hypothesis of no difference was supported. At least for the schools in the data set (private baccalaureate schools that field both men and women basketball teams), there is no significant difference in expenditure per athlete.

BACKGROUND OF THE STUDY

Data for this study came from the U.S. Department of Education Office of Postsecondary Education Equity in Athletics Disclosure Act. This particular data set was limited to 578 private four year schools. However, further analysis of the data cut the usable data set to 300 schools. This study is a spin-off from a larger study on the cost of athletics which focused on economies of scale in athletic departments [3]. As a result of that study, the authors wished to also investigate any issues related to inequality of expenditures by gender.

Title IX was signed into law in 1972 so colleges have been operating under the provisions for thirty-five years. Progress has been made in women's sports since that time as colleges have tried to meet the provisions and avoid court cases that are costly and embarrassing. While many articles and books have been written on the topic, few researchers have attempted to quantitatively measure the current status of the issue.

REVIEW OF RELEVANT LITERATURE

There have been many articles and books written about gender equity in collegiate athletics since Title IX was passed in 1972. Many of these articles have focused on why Title IX was important and several have focused on case studies or legal issues related to the implementation of Title IX. For example, Rhode and Walker [5] recently did a thorough review of legal issues and also explored the impact that Title IX has had in securing equal opportunities for women coaches. Mumford [4] provided guidance to two-year schools on strategies that two-year schools could use to guide their efforts to achieve gender equity.
A major problem for schools that are seriously trying to implement Title IX involves football. If a school has a football team, that sport takes a large budget to operate and typically awards a large number of scholarships for males. Thus schools that have football teams typically have a more difficult time in showing more equity. For example, a 2002 report from the National Women's Law Center [2] showed that Women's sports in NCAA Division I institutions receive only 34 percent of the overall athletics budget at those schools. However, football receives 32 percent of the total athletics budget so if football is omitted, then the male and female expenditures are equal. While few would argue that football can be ignored as an issue, it does affect those schools who field teams for a variety of reasons.

Reports and studies that focus on total numbers fail to consider (perhaps rightfully) the impact of football. For example a 1998 report by the Women's Sports Foundation [1] focused on a Gender Equity Compliance Quotient formula that found that NCAA member institutions typically had compliance scores that ranged from .6173 for Division I schools to .7653 for Division III schools.

DATA AND METHODOLOGY

The data for this study is limited to reports from 578 private baccalaureate institutions that report data to the U.S. Department of Education under the Postsecondary Education Equity in Athletics Disclosure Act. A review of the data cut the usable data set to 300 institutions. Two hypothesis tests were completed. The first focused on total expenditures per athlete by gender. The second focused on comparisons between men's and women's basketball. The data set included institutions who are members of both the NAIA and NCAA governing bodies for collegiate sports and no effort was made to distinguish between the two different groups.

Football expenditures were deleted from the expenditure data and this could be a major point of disagreement with the study. Not all of the institutions included in the study fielded football teams and for reasons beyond this study, the researchers decided that football is in many ways a separate issue that need to be addressed by athletic governing bodies.

Paired t-tests were completed for each of the null hypotheses. In each instance, the data for expenditures for males was used to compare to (pair) the expenditures for females.

RESULTS

The results of the statistical analysis failed to provide sufficient differenced to reject the null hypotheses. In each case, the results were statistically insignificant at generally accepted levels of significance. For average total operating expenditure per athlete, there was a mean difference of $ 37.86; however, that number was statistically insignificant, Table 1.

TABLE 1. PAIRED T-TEST FOR AVERAGE EXPENDITURE PER ATHLETE BY GENDER.

	Mean	Df	t-value	p-value
Paired Difference	37.86	299	.324	.746

Similarly, for average expenditure by gender for basketball teams, the results failed to support a significant difference. The average difference in expenditures was over $ 4,000 ($4, 428.29); however, that number was again statistically insignificant, Table 2.

TABLE 2. PAIRED T-TEST FOR AVERAGE EXPENDITURE FOR AVERAGE EXPENDITURE PER ATHLETE FOR BASKETBALL OPERATIONS BY GENDER.

	Mean	Df	t-value	p-value
Paired Difference	4428.29	298	1.364	.487

Thus for both measures of gender equality, this data set did not yield support for significant differences in expenditures between male and female athletics. However, it should be noted again that football has been excluded from the data set and that would likely change the results if included for those schools that field football teams.

Summary and Conclusions

The focus of this study was to examine whether expenditures are significantly different for male and female athletic programs at a selected set of private baccalaureate institutions. This study is different as it addresses only private schools. Since all the schools do not field football teams and since football is unique in it's cost structure and other issues, the football expenditures were excluded from the study which could be a source of disagreement with methodology.

No evidence was found to indicate that the schools were failing to provide similar opportunity for males and females as measured by expenditures on the programs. Please note that this does not mean individual schools are all providing equal expenditures. Rather there is no indication that the group of schools as a whole show preferential treatment of male athletic programs over female athletic programs.

REFERENCES

[1] _____ "Gender Equity Compliance Quotient", Women's Sports Foundation. July 28, 1998.

[2] _____ "The Battle for Gender Equity in Athletics: Title IX at Thirty", A Report of the National Women's Law Center, June 2002.

[3] Frazier, John, Existence of Economies of Scale within Athletic Departments at Private Four Year Institutions. Unpublished PhD dissertation, Anderson University, 2007.

[4] Mumford, Vincent E. "Promoting Equity and Access in 2-Year College Intercollegiate Athletic Programs", *Community College Journal of Research and Practice,* 30:213-222, 2006.

[5] Rhode, Deborah L. and Christopher J. Walker, "Gender Equity in College Athletics: Women Coaches as a Case Study", *Stanford Journal of Civil Rights and Civil Liberties*, IV:1, pp. 1-50, March 2008.

[6] Shulman, James L. and William G. Bowen, <u>The Game of Life</u>, Princeton University Press, Princeton, New Jersey, 2001.

INCREASED COMPETITION ON THE LPGA TOUR: PROOF OF THE HYPOTHESIS?

C. Barry Pfitzner, Department of Economics and Business,
Randolph-Macon College, Ashland, VA 23005, bpfitzne@rmc.edu

ABSTRACT

This paper documents a serendipity finding from an analysis of the determinants of success on the Ladies Professional Golf Association (LPGA) Tour. The percentage of the variance in scoring average across players on the LPGA tour that is explained by the variance in Greens-In-Regulation (*GIR*) has fallen from about 80% to near 50% in the span of the last five years. Investigation into the cause(s) of this phenomenon entertained several competing hypotheses, ultimately concluding that an increased level of competition on the LPGA tour is the determining factor in the fall in the explanatory power of a regression of scoring average on *GIR*. Regression results and F-tests serve as documentation and explanation for the fall in the power of *GIR* in predicting scoring average.

INTRODUCTION

Professional golf tours keep a variety of performance statistics presumed to measure important skills related to success. One dominant statistic is greens in regulation (*GIR*)—the percentage of golf holes for which the player reaches the surface of the green in at least two fewer strokes than the par score for that hole. Other major statistics include driving distance (*DD*), driving accuracy (*DA*) which measures the percentage of drives in the fairway of the hole being played, sand saves (*SS*) which measures the percentage with which a player takes two or fewer strokes to hole the ball from greenside bunkers, putts per round (*PPR*), and putts per green reached in regulation (*PPG*). Each of those measures, *GIR*, *DD, DA, SS, PPR* (or *PPG*), are related in theory to scoring and scoring is clearly related to monetary success.

The purpose of this paper is to provide empirical estimates of the effect of a single variable, *GIR,* on scoring average and to investigate why the predictive power of *GIR* has fallen in recent years for the LPGA tour.

LITERATURE REVIEW

There are several strains of research on professional golf performance based on the statistics compiled by the PGA and LPGA tours.   One of the first studies of the statistical determinants of success in professional golf was by Davidson and Templin [2]. Utilizing data from the 1983 PGA (119 of the top 125 money winners) in a multiple regression framework, Davidson and Templin found that greens in regulation (*GIR*), putting (*PPR*), and a combined driving efficiency measure were capable of explaining 86% of the variation in scoring average for the PGA tour, with *GIR* the most important single variable. When the dependent variable was earnings, putting was slightly more important statistically than the other explanatory variables, based on standardized beta coefficients. Shmanske [8], also using a multiple regression framework for data from the 1986 PGA tour (the top 60 money winners), finds that putting and driving distance are the two most important skills in determining success on the PGA tour. When player money winnings per event are the dependent variable, he finds no significant role for *GIR* as an explanatory variable. Shmanske also attempts to estimate the greatest payoff for practice, and finds the greatest payoff is for putting practice. Belkin et al. [1] utilize PGA statistics for three years (1986-88) in correlation and step-wise regression frameworks. Their research confirms the importance of *GIR* and putts per round (*PPR*) as dominant variables in determining scoring average, with lesser, but statistically

important roles for driving distance, driving accuracy and sand saves. They conclude that their research confirms the importance of tour statistics in predicting scoring average.

A paper by Englehardt [4] concludes that the rankings of the top 10 money winners are *not* significantly correlated with *GIR* for 1993 and 1994 PGA seasons, and cites an increasingly important role for "total driving," which is the sum of the ranks in driving distance and driving accuracy. This study utilizes, however, a sample size of only 10. Moy and Liaw [5] find evidence that conflicts with that from Englehardt for the same PGA year. They find statistically important roles for driving distance, driving accuracy, *GIR*, and putting in determining earnings on the PGA tour for the 1993 season. The latter study utilizes a multiple regression framework and a much larger sample size than Englehardt. Moy and Liaw's work also includes analysis of the LPGA and the Senior PGA tours and they offer the general conclusion that a well rounded game is necessary for success in professional golf. Nero [6] using data from the 1996 PGA tour finds statistically important roles for driving distance, driving accuracy, putting, and sand saves in determining money won. Interestingly, Nero does not include *GIR* in his analysis. Nero also estimates a frontier earnings function in an attempt to identify the most efficient golfers—that is those golfers who earn more than that predicted by the regression equation.

Dorsal and Rotunda [3] using data from the top 42 players on 1990 PGA tour found that *GIR* was the most important variable determining scoring average, and that driving accuracy was more important than driving distance. Their analysis included simple correlation analysis and multiple regression techniques. They also used scoring average, top 10 finishes, and money winnings as dependent variables. Pfitzner and Rishel [7] document the determinants of scoring average and money winnings on the LPGA tour in 2004. Among other conclusions, their finding indicate that driving distance and driving accuracy are approximately equally important in determining scoring average and money winnings for the LPGA.

METHODOLOGY

The research methods for this paper are regression analysis and simple tests for equality of variances.

The general regression model may be represented as:

$$SA_i = \beta_o + \beta_1 GIR_i + \varepsilon_i \quad , \tag{1}$$

where,
SA = Scoring average (strokes per round)
GIR = greens in regulation (percentage of greens reached in regulation or fewer strokes)

and the *i* subscript refers to the ith observation (here the individual player)

DATA AND RESULTS

Summary Statistics on the LPGA Tour

Table I represents the summary statistics for the 2004 LPGA tour. The mean scoring average across all 164 players for 2004 was 72.88 strokes per round. Annika Sorenstam led the tour in scoring average with 68.7 strokes per round (minimum). Sorenstam also led in total money winnings ($2.5 million) and money per event. The average money winnings per player for the year was approximately $230,000 (this distribution is heavily skewed, of course), and player winnings per event averaged a little over $10,000. The mean driving distance on the LPGA tour in 2004 was approximately 250 yards, and the drives of these tour players found the fairway about 70% of the time. Perhaps surprisingly, in 2004 LPGA tour

players were able to hole out from greenside bunkers in two or fewer strokes only thirty-five percent of the time. The tour also keeps putts per green-in-regulation (*PPG*). This latter statistic may be a better measure of overall putting efficacy, but it turns out that players who hit more greens have fewer putts per green in regulation (because they likely hit it closer on average).

Table I: Summary Statistics for the 2004 LPGA Tour

Variable	Mean	Standard Deviation	Minimum	Maximum
Scoring Average (SA)	72.88	1.42	68.7	77.64
Money Winnings per Event (M/E)	$10,369.85	$15,426.45	$139.19	$141,372.61
Greens in Regulation (GIR)	63.89%	5.17%	48.9%	78.8%
Driving Distance (DD)	249.81	9.04	224	270.2
Driving Accuracy (DA)	70.16%	6.43%	48.2%	83.6%
Putts per Round (PPR)	30.13	0.58	28.75	31.68
Sand Save Percentage (SS)	35.29%	7.23%	18.2%	60.6%
Putts per GIR (PPGIR)	1.84	0.04	1.74	1.97
Money Winnings (M)	$233,406.84	$331,782.62	$1,819.00	$2,544,707.00
Number of Events (E)	21.05	4.20	10	31

(n = 164)

Table II: Summary Statistics for the 2008 LPGA Tour

Variable	Mean	Standard Deviation	Minimum	Maximum
Scoring Average (SA)	72.93	1.28	69.70	79.44
Money Winnings per Event (M/E)	$13,549.30	$16,787.57	$0.00	$125,599.68
Greens in Regulation (GIR)	62.80%	4.12%	41.9%	71.6%
Driving Distance (DD)	246.58	9.55	221.5	269.3
Driving Accuracy (DA)	67.55%	5.84%	49.2%	79.80%
Putts per Round (PPR)	29.23	1.06	26.95	31.95
Sand Save Percentage (SS)	37.70%	8.42%	14.3%	60.0%
Putts per GIR (PPGIR)	1.83	0.04	1.74	1.94
Money Winnings (M)	$327,676.60	$420,767.88	$0.00	$2,763,193.00
Number of Events (E)	21.70	4.68	10	30

(n = 161)

For 2008, scoring average was almost exactly the same as in 2004, and greens in regulation actually fell by about one percentage point. Of more interest (as will be explained later), the standard deviations (the square root of the variance) of both scoring average and *GIR* were lower in 2008 than was the case in 2004. By 2008, Lorena Ochoa had taken over the top spot in both scoring average and money winnings.

Some Regression Results

This section reports regression results of scoring average on *GIR* with visual and statistical evidence of the decline in *GIR* as an explanation of scoring average.

Figures 1 and 2 show the results of regressions of scoring average on greens in regulation. Note that in 2004, the adjusted R^2 is .76, meaning that three quarters of the variance in scoring average is explained by *GIR*, and only four years later the adjusted R^2 is only .52. Visually, the "fit" for the 2004 data is

considerably better. Note further that the general spread in *GIR* is smaller for 2008. Put differently, it appears that the variance in *GIR* across players has decreased.
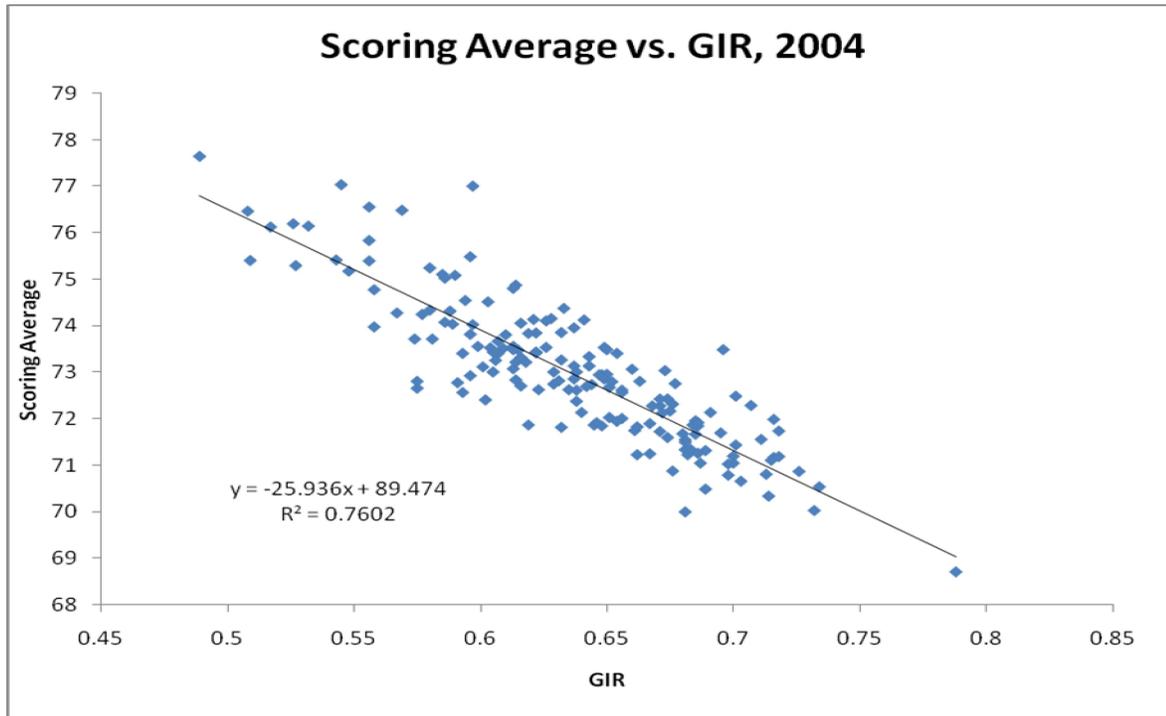

**Figure 1: Scoring Average as a Function of *GIR*, 2004**
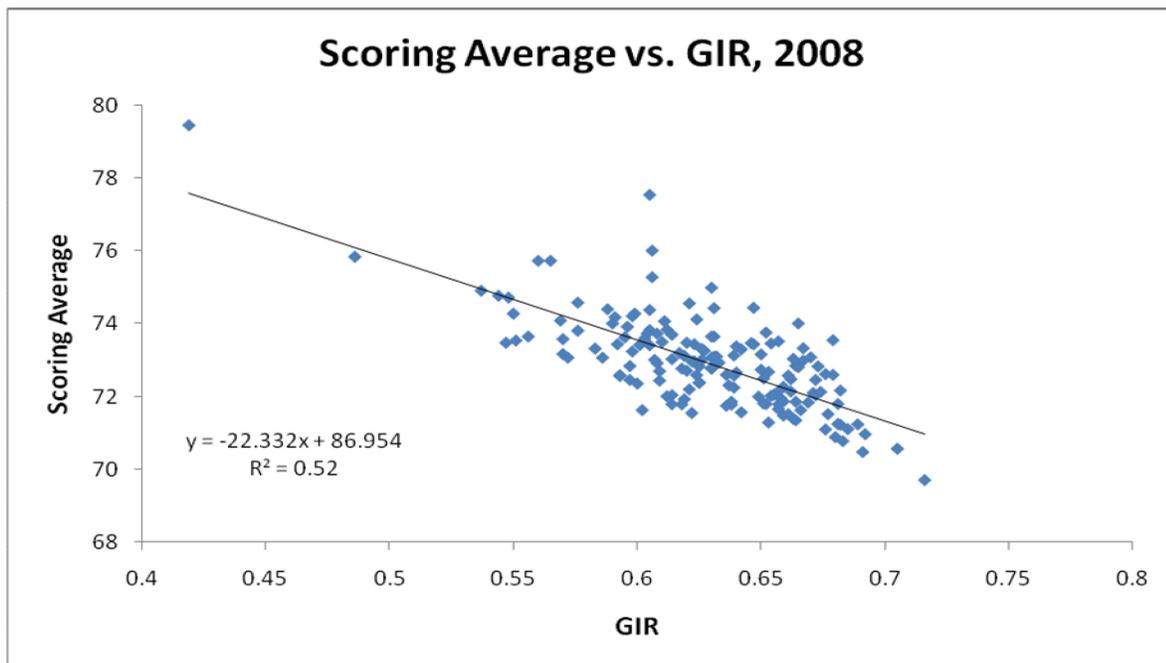
Figure 2: Scoring Average as a Function of *GIR*, 2008

Explaining the Results

Previous research indicates that *GIR* are a much less important determinant of scoring average on the PGA tour (men's tour) than is the case for the LPGA. The corresponding $\overline{R}^2$ for the men's tour regression of scoring average on *GIR* is consistently near .25 over recent years. This comparison may be interpreted as *GIR* being roughly three times more important is explaining scoring average on the LPGA tour ($\overline{R}^2 = .76$, for the LPGA in 2004) than on the PGA tour. The fall in $\overline{R}^2$ to approximately .52 by 2008 on the LPGA may suggest that in some way the LPGA is becoming more like the PGA tour.

The first hypothesis entertained was hole position. It is not in dispute that hole positions are more difficult on the PGA tour than on the LPGA tour. On the men's tour, it is often advantageous for players to miss the green in a position where it is easier to make par (or birdie), than to hit the green in regulation where a three-putt is a likely outcome. Theory would suggest that if hole positions had become more difficult in recent years on the LPGA tour, that would be a potential explanation of the fall in $\overline{R}^2$ between 2004 and 2008. Though the LPGA does not archive the hole positions for tournaments on their website (nor does the PGA), I was able to interview LPGA players, caddies, and even an LPGA official in charge of hole placements. To my surprise, there was unanimous agreement that hole positions have not become more difficult in recent years. The caddies and players suggested that the same approximate positions were used for the courses played over time. (It is possible that as new courses are introduced to the tour, those hole positions could be more difficult.)

The second hypothesis entertained was an accidental discovery. As stated previously, examination of Figures 1 and 2 reveals that the *variance* in *GIR* seems to have fallen from 2004 to 2008. It is well known that at the extreme of no variance in the explanatory variable, the intercept and slope coefficients in a simple regression are not uniquely determined. In general, as the variance of the explanatory variable decreases, its statistical significance falls (recall that the variance of x is in the denominator of the standard error of the slope coefficient) and, of course, $\overline{R}^2$ falls as well. To interpret this more concretely for the current case, if players on the LPGA tour are more evenly matched in terms of *GIR*, then other factors will play more important roles in determining scoring average across players.

The hypothesis that the variance in *GIR* has fallen is easily testable. Since the LPGA does not report full statistics on the same number of players each year, the F-test for differences in variances was conducted for the top 125 players in terms of scoring average (the results here also pertain for all players for whom full statistics are reported). The result for the F-test is contained in Table III. The hypothesis of constant variance is rejected at an alpha level far less than .01. Between 2004 and 2008, the variance in *GIR* across the top 125 players on the LPGA has fallen approximately in half.

Table III: F-test for a Change in the Variance of GIR

	GIR 2004	GIR 2008
Mean	65.8544	64.4136
Variance	12.71024258	6.616184516
Observations	125	125
df	124	124
F	1.921083451	
P(F<=f) one-tail	0.00016132	
F Critical one-tail	1.345223605	

Some observers may not find this result surprising. In recent years many would argue that the level of competition on the LPGA tour among players has become keener. That is, players are more closely

matched. To be sure, certain players dominate in terms of wins and money, but more players are capable of competing for wins and top finishes on tour than was the case just a few years ago. To further reinforce this argument, it is also true that the variance across players in scoring average has fallen on the LPGA tour is recent years. It is interesting to note that scoring average has not fallen—players are scoring the same on average, but the differences across players have diminished.

The observed increased level of competition across players on the LPGA tour coincides with an increasing presence of Asian players (especially Korean) on the LPGA tour.   The presence of the Asian players may well explain the fall in the variances of *GIR* and scoring average on the LPGA tour.

CONCLUSIONS

The explanatory power of greens-in-regulation (*GIR*) has fallen precipitously in recent years in regression models predicting scoring average on the LPGA tour. This research documents a simultaneous decrease in the variance in *GIR* across players on the tour. Players' abilities to reach greens in 2 or fewer strokes than par on a given hole are becoming more similar over the past several years. This is the likely explanation of the fall in $\overline{R}^2$ of such regressions. Players are also more evenly matched in terms of scoring average as well. That the level of competition between players on the LPGA tour has become closer is the practical conclusion of such statistical findings.

ACKNOWLEDGEMENT

REFERENCES

[1] Belkin, D.S., Gansneder, B., Pickens, M., Rotella, R.J., & Striegel, D. (1994). "Predictability and Stability of Professional Golf Association Tour Statistics." *Perceptual and Motor Skills*, 78, 1275-1280.

[2] Davidson, J. D. & Templin, T. J. "Determinants of Success among Professional Golfers." *Research Quarterly for Exercise and Sport*, 57, 60-67, 1986.

[3] Dorsel, T. N. & Rotunda, R. J. "Low Scores, Top 10 Finishes, and Big Money: an Analysis of Professional Golf Association Tour Statistics and How These Relate to Overall Performance." *Perceptual and Motor Skills*, 92, 575-585, 2001.

[4] Engelhardt, G. M. "It's Not How You Drive, It's How You Arrive: the Myth." *Perceptual and Motor Skills*, 80, 1135-1138, 1995

[5] Moy, R. L. and Liaw, T. "Determinants of Professional Golf Tournament Earnings." *The American Economist*, 42, 65-70, 1998.

[6] Nero, P. "Relative Salary Efficiency of PGA Tour Golfers." *The American Economist*, 45, 51-56, 2001

[7] Pfitzner, C. B. and Rishel, T. D. "Performance and Compensation on the LPGA Tour: A Statistical Analysis," *International Journal of Performance Analysis in Sport,* University of Wales Institute, Cardiff, Volume 5, Number 3, December 2005.

[8] Shmanske, S. "Human Capital Formation in Professional Sports: Evidence from the PGA Tour." *Atlantic Economic Journal*, 20, 66-80, 1992.

CHASING THE BUSCHWACKERS: UNINTENDED CONSEQUENCES IN NASCAR

J. Brian O'Roark; Department of Economics and Legal Studies;
Robert Morris University; Moon Twp., PA 15108

Abstract. The National Association for Stock Car Auto Racing (NASCAR) is a marketing phenomenon. The sport has grown far beyond its traditional southern roots to the point of rivaling the largest sports leagues in America for sponsorship dollars. The slick marketing of NASCAR may have received an inadvertent boost with the adoption of the Chase for the Championship format at the Sprint Cup level, and the expansion of the number of Sprint Cup regular drivers who drop down to race in the "minor league" Nationwide Series. Both of these events create a dual tournament where the incentives of the two sets of drivers are markedly different. This has led to an increase in the number of wrecks during races in both series, and a possible boom for NASCAR marketers.

1. INTRODUCTION

Prior to the recent economic downturn, the National Association of Stock Car Auto Racing (NASCAR) had moved from southern oddity to cultural phenomenon. Spanning the continent, races are now help from New England to Florida, to Southern California, and everywhere in between. In 2006, Forbes noted that NASCAR was on pace to surpass the National Football League in terms of sponsorship dollars. Forbes also cited an increase in attendance per race over a ten-year span from 115,000 in 1996 to 127,000 in 2006, while the average ticket price rose from $70 to $90. Additionally, IEG, a sponsorship consulting group, noted that in 2007 North American firms were expected to spend an estimated $3.2 billion to sponsor events, with the lion's share of that money going to NASCAR. (IEG, 2007).

Part of the attraction to NASCAR is the down-home, good-ol'-boy feel the drivers and owners exude, mixed with a slick marketing package directed at both men and women. O'Roark, Wood, and DeGaris (2009) show that in a survey of 10000 self-identified NASCAR fans 47 percent were female. The cross gender appeal holds particular sway with executives deciding where to spend their scare advertising dollars. However, two changes in NASCAR's organization over the past five years have helped promote the sport in perhaps an unexpected way. In particular, the Sprint Cup, NASCAR's premier series, instituted what is referred to as the Chase for the Cup in 2004. This playoff style of racing was intended to hold fan interest later into the season. The second change occurred in what amounts to NASCAR's top minor league, the Nationwide Series. Here, the crossover of Sprint Cup drivers into the Nationwide races, helped to bolster fan interest and increase attendance. Not coincidentally, these two events have led to what some say most attracts fans to a NASCAR race – wrecks.

Safety at NASCAR races has always been a concern for those governing the sport. The most recent spate of prominent deaths includes Adam Petty and Kenny Irwin in 2000, and most notably Dale Earnhardt in 2001. The development and eventual mandatory use of head and neck restraint systems in Nationwide and Sprint Series racing have undoubtedly increased the safety of drivers in the car. Safer barriers - walls which dissipate energy from a wreck - roof flaps, and restrictor plates – a piece of metal placed over the carburetor to reduce maximum attainable speed – have all been adopted by NASCAR to increase the protection of the primary asset in racing – the driver. Walking away from a horrendous wreck is commonplace and a credit to NASCAR, as well as those who designed the safety mechanisms.

1

However, one of the tremendous downsides of all of this safety is what Peltzman (1975) called risk-compensating behavior. Feeling safer in a car, a driver is prone to take more risks. Knowing that hitting a wall at 190 miles per hour is unlikely to cause severe injury, let alone kill you, drivers will understandably alter their on-track tactics. While, the safety features adopted by NASCAR have helped protect drivers, the slick marketing that has contributed to the rise in NASCAR's popularity may also contribute to the increasing number of wrecks seen in NASCAR.   Empirically, the role that the Chase and crossover drivers (known as Buschwhackers as described below) have played in accidents at NASCAR races can be tested, and this paper will do just that.

The paper proceeds as follows: The Chase for the Cup and the phenomenon known as Buschwhacking will be explained in Section two, followed by an elaboration of the incentives drivers face. In Section three, the model of analysis will be developed. Section four will analyze the results, and Section five concludes.

2. THE TWO CHANGES

1. Chase for the Cup

In 2003, driver Matt Kenseth took the cautious approach and came out on top. He won only once in 36 races, but by finishing consistently in the top ten, he accumulated an insurmountable points lead, so that by the final race, his championship was mathematically ensured without even having to start the engine. This had actually become commonplace in NASCAR's premier division. From 1998 until 2002, the eventual winner had locked up the season's points championship four times by the conclusion of the season's penultimate race.

With such little drama, television ratings began to lag, and fan interest at season's end waned. NASCAR's solution was to develop the Chase for the Championship. Originally, the top ten drivers in points after the first 26 races of the year were deemed to be the Chasers.[1] Only these ten drivers could compete for the championship during the remaining ten races of the season. Curiously though, each race would continue to field 43 drivers, meaning that there would be two distinct groups of participants on the track at one time: those who could become champions, and those who could not.

Even though the two strata of drivers compete in the same event, the incentives for the groups are quite different.   Chase drivers continued to accumulate points, as the driver with the most points wins. Winning a race is nice, but the goal is consistently high finishes for the remaining ten races. The non-Chasers are essentially relegated to trying to win. In sports this is usually a good thing, but since the repercussions of wrecking in one race essentially do not carry over to the next race, the focus is very short-term. Winning today is good for the financial status of the driver. These drivers may even be trying to show off their skill for a future employer. Thus, for the Chase driver, consistency is key, while the non-Chase driver is likely to take more risks.

Additionally, getting into the Chase may prove an opportunity to exhibit riskier behavior. Drivers who are near the cutoff for the Chase with a few races to go certainly have little to lose and much to gain by pushing the envelope. Once you are in the Chase a driver can finish no lower than tenth (twelfth since 2007) no matter how poorly he performs. The financial reward for this is substantial. The top ten drivers in 2007 received an average payout of $2.4 million, while the next fifteen drivers earned an average of only $600,000. This is less than the top few places earned in many individual races.

---

[1] Since 2007, the top twelve drivers are part of the Chase group.

2

Drivers recognize the potential problems the bifurcated system creates. Before a race at Bristol Motor Speedway in August 2005, driver Kyle Petty, whose chances for making the Chase were mathematically zero, noted, "there's about five or six cars that you look at and think, 'I don't want to mess with him … I don't want to be the reason they miss The Chase.'" It was implied that "Chase bubble drivers … will receive special consideration tonight. Petty says Jeremy Mayfield received the same treatment while making the Chase with a win in the cutoff race at Richmond International Raceway last September" (Ryan 2005).

Driver Scott Riggs, who was no closer to making the Chase than Petty, voiced another opinion. " 'The guys fighting to get in the Chase need to be more careful around us because we have a lot less to lose than they do,' Riggs said. 'If anybody needs to be on their toes, it'll be those guys.'" Riggs continued, saying, "I'm not going to be careful. Maybe you can push those guys even harder because you know they're going to have to be careful. They'd take advantage of me if they had the chance" (Ryan 2005).

Instead of everyone driving with the same incentives, the Chase, at least anecdotally, has changed the behavioral patterns of drivers. Table 1 shows the trend in the data before and after the beginning of the Chase. During the first 26 races of a season, there are fewer wrecks in the Chase era. Prior to this, there were fewer accidents as the season wound down. A more thorough test of this will be conducted to determine if indeed the Chase leads to more accidents.

TABLE 1: Average Number of Wrecks in Final 10 races vs. first 26 races since 2001 in Sprint Cup

	First 26	Final 10
2001	3.85	4.2
2002	4.08	2.8
2003	4.58	3.7
2004	3.85	4.1
2005	3.88	5.1
2006	2.62	5.0
2007	3.00	5.2
2008	2.58	3.7

2. Buschwhacking

Virtually every major sports league has a minor league. Major League Baseball has perhaps the most well known and comprehensive system, but hockey has various lower level leagues, the National Basketball Association has a developmental league, the National Football League has NCAA football, and European soccer has a tiered system by which only the best teams compete in the premier leagues. NASCAR is no exception to this. There are minor leagues of racing all over the United States. Some are geographically based, and others are based on age or ability. These series, some of which are affiliated with NASCAR, act as a feeder system for teams in the premier division of NASCAR.

The highest level of minor league racing changed its name from the Busch Series to the Nationwide Series in 2008 to reflect a change in sponsorship. This level of racing has evolved over time into a training ground for young drivers on their way up and as an option for older drivers on their way down.

Unlike other minor league sports, this, and most other racing series for that matter, allows a participant to filter back and forth between levels of participation. In its early stages, some drivers from the Sprint Cup series would participate in Nationwide races; however, these numbers were few. Recently the numbers of

3

crossover drivers has increased dramatically. These numbers are reflected in Table 2. In 2001 there were an average of 6.33 Bushwhackers per race. By 2007 it had risen to 14.57. The numbers waned in 2008 after extensive criticism of the practice.

Table 2: Average Bushwhackers per race 2001-2008 in the Nationwide Series

Year	Average
2001	6.333
2002	6.353
2003	5.558
2004	6.941
2005	10.429
2006	14.314
2007	14.571
2008	9.25

Because NASCAR Sprint Cup races only occur once a week, a driver is limited only by travel time and resources from participating in a lower level race. Most commonly, a driver may take part in the Nationwide Series one day, and the Sprint Cup the next. This behavior, referred to as "Bushwhacking" in reference to Anheiser-Busch's previous sponsorship of the Series, presents a unique opportunity not available in other professional sports leagues.[2]

Bushwhackers are viewed by some as spawning increased interest in the Nationwide Series. In fact, NASCAR actively promotes the more familiar names of its premier series to draw attention to the lower series. A recent commercial for the Nationwide series ends with a disembodied voice saying: "I am Carl Edwards, and I race in the Nationwide Series." Carl Edwards is a former rookie of the year in the Nationwide Series, as well as a past champion. He is also one of the more prominent drivers in the Sprint Cup Series. While this may be good marketing it raises the question race quality.

As far as developing talent is concerned, Bushwhackers are perceived as taking seat time away from younger drivers, thereby stymieing their development. Others however take the position that younger drivers can learn how to be a more competent driver by following the more experienced Sprint Cup drivers around the track, thereby learning the ins and outs of drafting and the different lines around a track. While they may not win, at least they are gaining valuable experience. Regardless there are now, more than ever, two distinct groups of drivers on the track at Nationwide events.

These groups provide an opportunity to examine the impact of different skill sets on the prevalence of accidents. The premise that variance, not speed kills found in Lave (1985) could have an application in the skill of drivers on the road. NASCAR has created an interesting environment similar to what is dealt with in the teenage driver paradox, where drivers of differing ability "compete" on the same playing field. Paraphrasing Lave – does the variability in skill kill on the track?

3. Tournament Theory

NASCAR's establishment of both the Chase and the expansion of Buschwhacking set up what in economics is called a dual tournament. Tournament theory is developed in the seminal work of Lazear

---

[2] The derisive term "Buschwhacker" is a play on words. The original term "Bush-whackers" refers to a type of guerilla warfare during the Civil War, as well as a famous wrestling tag team from New Zealand, and a contemptuous name meaning unsophisticated hillbillies.

4

and Rosen (1981). The fundamental prediction is that the efforts of workers should be greater when the difference between the top prize and prize for second place is greater. The effort workers put forth should also increase as the probability of winning increases. Originally, the theory was applied to executive compensation as a way of explaining the significant differences in the pay of top executives and lower level management. Larger payouts for those at the top of the totem pole would induce more effort by the recipients to advance the company. The theory quickly found its way into sports, and has been tested a number of times in the sporting arena. Harris and Vickers (1987) developed a theoretical model of racing, Ehrenberg and Bognanno (1990) look at golf, Bognanno (1990) studies bowling, and Becker and Huselid (1992), von Allmen (2001), Maloney and Terkun (2002), and Lynch (2005) all focus on various forms of motor sports racing. Each of these studies finds support for the predictions of tournament theory. The bigger the financial difference between the top spots, the more effort is put forth by participants.

Mixed tournaments involve players of different quality. Here there are different parameters, and the players face diverse incentives than those in normal tournaments with homogeneous players. If workers have different skill levels, sorting them into groups may be crucial for a firm to operate smoothly. Lazear and Rosen explain this using minor league baseball. The years spent in the minors allows a team to piece together a team through what amounts to as a prolonged tryout. The key difference between baseball and NASCAR's Chase, however, is that in NASCAR those who do not make it to the big leagues, or in this case the playoffs, are still competing with those who do, and that is where the problems could arise. In the case of the Nationwide Series, an up and coming driver may see the opportunity to make a name for himself. Drivers on the downside of their career may see the chance to prove they still have it. Thus, beating the Sprint Cup regulars provides a reward in itself

Von Allmen (2001) notes a rather glaring inconsistency in NASCAR's claim to want safer races. While individual race payouts should be more condensed from top to bottom to avoid additional risk taking behavior, tournament influences in NASCAR are prevalent due to the non-linear nature of the end of the year bonuses paid out to drivers. Reflecting the data from von Allmen's sample of the 1999 season, Figure 1 shows the average payouts for the top ten drivers who made the Chase from 2004 through 2007. The marginal benefit from moving up the ladder can be quite substantial.

5

Figure 1: Average payout per place in the Chase (2004-2007)
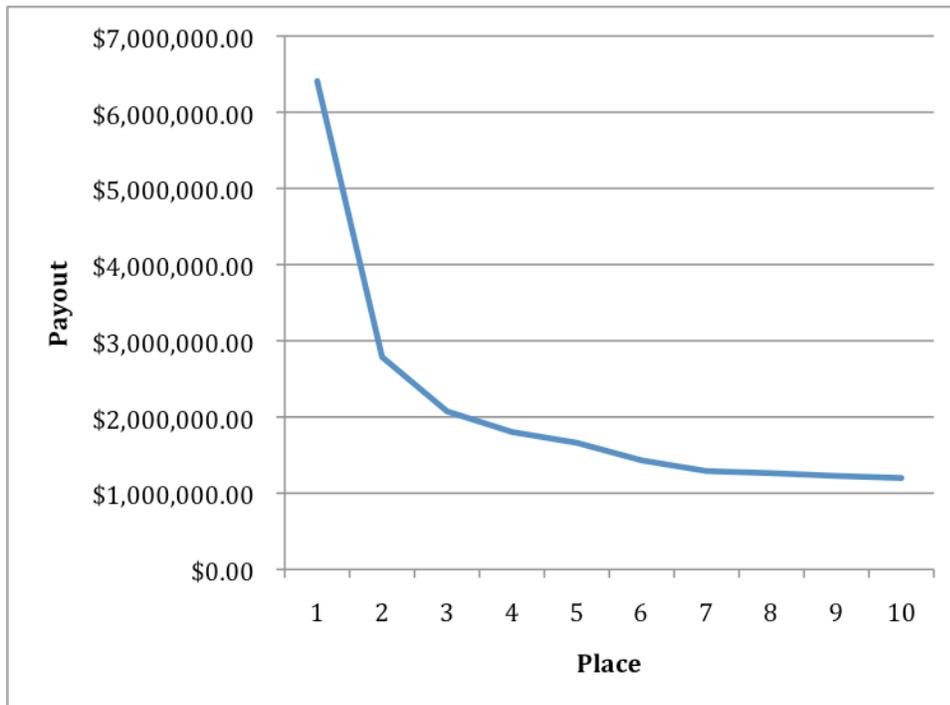
More recently, Schwartz, Isaacs, and Carilli (2007), using accidents as a proxy for aggressiveness, find that a non-linear payout structure for end of season points affects the degree of driver aggression. Drivers increase their effort as they see their final rank falling. This, they claim is an indictment of NASCAR's near linear point system in that it increases driver aggression. An implication of this paper is that Chase drivers should be less accident prone due to the high cost of wrecking out.

Tournament theory implies that splitting the field will lead to a change in the behavior of drivers. Both the Chase, and the bifurcated skill level of drivers in the Busch Series provide an opportunity to further test the theory.

3. DATA AND THE MODEL

Two models will be tested, one for the Sprint Cup's Chase for the Championship, the other dealing with the Nationwide Series and the inclusion of Buschwhackers. Both models are OLS and take the following, general form:

$$\text{Wrecks} = \Phi X + \tau + \alpha + \varepsilon. \tag{1}$$

Wrecks is the number of cars permanently eliminated from a race due to an accident. X is a vector of explanatory variables that controls for events that may affect whether cars are wrecked out of a race, τ is a year dummy, and α is a dummy controlling for track specific features.

The explanatory variables reported here include standard controls. The number of miles travelled in a race is included and is expected to be positively related to Wrecks. The longer the race goes on, the more likely that driver error or mechanical failure will result in an accident. The number of rookie drivers in a race is also controlled for and is expected to be positively related to Wrecks. The more young drivers

6

with less experience there are in a race, the more accidents one would expect. A variable to control for the use of restrictor plates is included as well, consistent with O'Roark and Wood (2004). This should hold a positive sign based on past research. Additionally, a control for the size of the purse is incorporated. Tournament theory suggests that the larger the purse, the more aggressive drivers should be, thus, a positive sign on the coefficient is predicted. To control for competitiveness of a race, the winner's starting position is included. The further back the winner starts in the race, the more cars he must pass to get to the front. More passing increases the probability of an on track incident; therefore, the sign on the coefficient is expected to be positive. Finally qualifying speed is included to control for the increased likelihood of a wreck being severe enough to end a driver's day. In some instances, a wreck can be repaired sufficiently for a driver to return to a race. It is assumed that a wreck at higher speeds would be more damaging, so at a track where the qualifying speed is higher, wrecks should be more permanent. A positive sign is expected on the qualifying speed coefficient.

Of interest are the control variables specific to each sample. In the Chase sample, a variable is included for whether a race is a Chase race or not. If the premise that Chase races have resulted in more accidents is accurate, then there should be a positive relationship between this variable and the dependent variable. In the Buschwhacking sample, the variable of interest is the number of Buschwhackers in a race. This is number of Sprint Cup regulars, those who participated in at least 20 Sprint Cup races in the corresponding year, who are involved in a given race. Thus, if in 2008, Jimmie Johnson appears in a Nationwide Series race, the tally for Buschwhackers in that race equals 1. The count increases for every Sprint Cup regular who participates in that race. A summary of these variables appears in Table 3, with summary statistics for the two samples displayed in Tables 4a and 4b.

Table 3: Variable Definitions

BW	Value equal to the number of Buschwhackers in a Nationwide Series race.
ChaseRace	Dummy equal to 1 if a particular race is a Chase Race in the Sprint Series.
Miles	Number of miles run in a race.
Purse	Total winnings of all racers in a race.
Qspeed	The qualifying speed of the pole sitter in a race.
ResPlat	Dummy equal to 1 if a race used restrictor plates.
Rookie	Number of rookies participating in a race.
Winstart	The starting position of the race winner.
Wrecks	The number of wrecks in a race.

Table 4a: Summary Statistics: Chase Sample

	Obs	Mean	Min	Max
ChaseRace	288	0.177	0	1
Miles	288	396.442	200.25	600
Purse	288	4479085	2488763	1.60E+07
Qspeed	288	143.276	0	196.235
ResPlat	288	0.111	0	1
Rookie	288	5.229	0	1
Winstart	288	10.58	1	39
Wrecks	288	3.74	0	17

7

Table 4b: Summary Statistics: Buschwhacker Sample

	Obs	Mean	Min	Max
BW	275	9.284	0	23
Miles	275	243.058	91.143	319.2
Purse	275	1036444	574885	8989250
ResPlat	275	0.084	0	1
Rookie	275	5.833	2	12
Winstart	275	8.724	1	38
Wrecks	275	4.916	0	16

The data for each version of the model comes primarily from Racing-Reference.com. Racing-Refernce.com provides comprehensive data on all individual races along with biographical information about the drivers in all NASCAR series. Race results report the number of laps completed, the number of cars that started the race, the number of lead changes, the starting position of all drivers in the field, and the cause of a driver exiting the race. This last item provides insight into why a driver permanently exited a race, as drivers may fail to finish a race due to mechanical problems (such as an engine failure or brake problems) as well as a result of a wreck. NASCAR's website, nascar.com, provides information on the rookie status of the drivers. Other characteristics such as the length of each track and the distance of the race are public knowledge. The length of a race is verified by multiplying the number of laps completed by the length of the track, as some races may end early due to perilous weather conditions or darkness, or a race may be continued beyond the scheduled length by what is referred to as a green-white-checkered finish. This last condition occurs when a race is under caution when it is slated to finish. In 2004, to ensure the drivers were competing at the end of a race, NASCAR instituted the green-white-checkered finish. A race will now restart with two laps to go and if another caution flag is waved during these two laps, the race instantly ends, with the drivers' positions frozen.

Safety is additionally complicated by occasional year-to-year variations in factors affecting risk. For example, late in 2001 NASCAR mandated the use of a head and neck restraining system, either the HANS or Hutchins device was the choice of drivers. In 2005 only the HANS device was allowed. Other sources of year-to-year variation include changes in manufacturers of cars, and changes in body types. To account for year-to year effects such as these, year dummy variables are incorporated. Tracks themselves also differ greatly. Therefore, a track dummy variable is included in all specification. This provides a control for track specific variation that may affect races such as the length of the track, the degree of banking in the turns, track surface, and the angles of the turns.

Each sample covers all of the races included over the years 2001 through 2008. Road course races are dropped from both samples not only because this type of racing is incongruous with NASCAR's typical oval racing as it includes both left and right hand turns, but also because it tends to include drivers who are road course specialists. Additionally, in some circumstances qualifying is cancelled due to weather. Thus, observations are dropped if they do not contain a qualifying speed. This leaves 245 observations in the Chase sample, and 236 observations in the Buschwhacker sample.

4. RESULTS OF MODELING WRECKS

A variety of control variables were used in the development of the model, however, many of them posed significant multicollinearity problems. For example, separate specifications using the starting position of the winner and the number of lead changes were analyzed to measure the competitiveness of a race. However, these two variables were closely correlated so including them in the same specification could yield a spurious outcome. For the sake a space, only a limited number of regressions are reported here; however, all results are available from the author upon request.

8

Table 5 provides the results for the Chase sample. Columns 1-4 contain different manifestations of the model; however, the results are consistent. In all versions, ChaseRace holds a positive sign and is statistically significant at the one percent level. The coefficient suggests that a Chase race has approximately 1.7 more wrecks per race than non-Chase races. This equates to a 47.9 percent increase in wrecks above the average non-Chase race. Of the control variables with significant results, Miles and Qspeed hold the expected signs.

Table 5: Regression Results for Chase Races
Dependent Variable is Wrecks
t-stat in parenthesis

	1		2		3		4	
ChaseRace	1.733	***	1.726	***	1.726	***	1.723	***
	(3.38)		(3.16)		(4.17)		(3.15)	
Miles			0.01	**	0.01	**	0.01	*
			(2.14)		(2.14)		(1.94)	
Rookie			-0.022		-0.022		-0.02	
			-0.13)		(-0.13)		(-0.11)	
Qspeed			0.376	***	0.376	***	0.38	***
			(2.64)		(2.64)		(2.63)	
ResPlat					-0.088		-0.225	
					(-0.05)		(-0.12)	
Purse							3.49E-08	
							(0.25)	
Winstart							-0.002	
							(-0.12)	
c	6.605	***	-4.730		-4.641	**	-4.618	**
	(8.78)		(-1.30)		(-2.17)		(-2.14)	
F-stat	5.22	***	5.24	***	5.24	***	4.88	***
Adjusted R^2	0.326		0.434		0.35		0.344	
Observations	245		245		245		245	

*** Significant at the 1-percent level
** Significant at the 5-percent level
* Significant at the 10-percent level

It appears based on the results of the regression that by changing the format of the season, NASCAR has incentivized behavior that leads to more accidents. Interestingly, the sample in this version of the model includes three years of data that precede the advent of the Chase. By incorporating these control years in the sample, the results become even more relevant. The Chase races not only have the benefit of resetting the field for the final ten races to prevent a run-away winner, they also produce an environment in which accidents are more prevalent.

Table 6 presents the results for the Buschwhacking sample. The variable of interest, the number of Buschwhackers in a race, holds a positive sign indicating that more drivers being involved in the lower series of racing results in ore accidents during that race. For every five Buschwhackers in a race, there is

9

approximately one more accident. This is a twenty percent increase over the average number of wrecks in the Busch Series.

Table 6: Regression Results for Buschwhackers
Dependent Variable is Wrecks
t-stats in parenthesis

	1		2		3		4	
BW	0.208	**	0.176	*	0.214	**	0.23	**
	(2.19)		(1.84)		(2.40)		(2.54)	
Miles			0.01		-0.009		-0.009	
			(1.54)		(-1.30)		(-1.25)	
Rookie			-0.239		-0.185		-0.162	
			(-1.52)		(-1.27)		(-1.09)	
ResPlat					7.75	***	7.812	***
					(5.87)		(5.89)	
Purse							3.96E-07	
							(0.10)	
Winstart							-0.028	
							(-1.06)	
c	4.888	***	3.775	**	6.565	***	6.359	***
	(4.91)		(1.99)		(3.60)		(3.42)	
F-stat	2.27	***	2.27	***	3.61	***	3.42	***
Adjusted R^2	0.139		0.148		0.268		0.375	
Observations	236		236		236		236	

*** Significant at the 1-percent level
** Significant at the 5-percent level
* Significant at the 10-percent level

This result does not necessarily imply that Buschwhackers are the source of the problems. It merely suggests that the mix of drivers is suboptimal if NASCAR wants to limit the number of accidents. It may be that more Buschwhacking would increase safety on the track since Sprint Cup drivers are more familiar with each other, not to mention, more skilled drivers. Table 7 shows the average number of wrecks per race per Buschwhacker. This number has declined over the time period reviewed indicating that while Buschwhackers may contribute to wrecks, the increased number of wrecks is happening at a decreasing rate.

Table 7: Average Number of Wrecks per Race per Buschwhacker 2001-2008

2001	1.398
2002	1.010
2003	1.398
2004	0.752
2005	0.792
2006	0.345
2007	0.485
2008	0.386

10

5. CONCLUSION

Studies that have focused on the safety features in NASCAR have shown that the organization is not always concerned with preventing accidents, and has actually created an environment that is conducive to more wrecks. O'Roark and Wood (2004) show that using restrictor plate actually lead to more accidents on the track, even though the purpose of these devices is to prevent cars from achieving speeds which could cause the car to become airborne, and possibly injure fans in the stands in addition to the driver. Sobel and Nesbit (2005) expand upon the work of Peltzman (1975) showing that NASCAR drivers become more risk loving with the increased safety features in their cars. With the advent of head and neck restraints, a more secure car construction, "safer barriers", and other safety measures, drivers take more risks.

Despite their rhetoric about safety, NASCAR administration seems to have adopted or encouraged institutions within the sport that actually furthers the chance of a driver being involved in a wreck. Here NASCAR finds itself between a rock and a hard place. They surely are interested in the well being of their most valuable assets, the drivers. However, fans love wrecks. As long as the drivers keep walking away perhaps NASCAR has inadvertently hit upon a winning strategy yet again.

11

REFERENCES

[1] Becker, B. E., and Huselid, M. A. "The incentive effects of tournament compensation systems." *Administrative Science Quarterly,* 1992, 37, 336-350.

Bognanno, M.L. *An Empirical Test of Tournament Theory*, Ph.D. Thesis, Department of Economics, Cornell University, 1990.

Ehrenberg, R., and Bognanno, M. L. "Do tournaments have incentive effects?" *Journal of Political Economy,* 1990, 98(6), 1307-1324.

Gage, J. "The big money of motorsports.", *Forbes.com*, 18 May 2006, Online: http://www.msnbc.msn.com/id/12861186/

Harris, C. and Vickers, J. "Racing with uncertainty." *The Review of Economic Studies,*1987, 54, 1–21.

IEG. "Motorsports sponsorship spending to total $3.2 billion in 2007." *IEG Press Release*, 18 April 2007, Online: http://www.sponsorship.com/About-IEG/Press-Room/Motorsports-Sponsorship-Spending-To-Total-$3.2-Bil.aspx

Lave, C. A. "Speeding, coordination, and the 55 mph limit." *American Economic Review,* 1985, 75, 1159-1164.

Lazear, E.. P., and Rosen, S. "Rank order tournaments as optimum labor contracts." *Journal of Political Economy,* 1981, 89(5), 841-864.

Lynch, J. G. "The effort effects of prizes in the second half of tournaments." *Journal of Economic Behavior and Organization,* 2005, 57, 115–129

Maloney, M.T. and Terkun, K. "Road warrior booty: Prize structures in motorcycle racing." *Contributions to Economic Analysis & Policy,* 2002, 1, 3.

O'Roark, J. B. and W. C. Wood. "Safety at the racetrack: Results of restrictor plates in superspeedway competition." *Southern Economic Journal,* 2004, 71(1), 118-129.

O'Roark, J. B., W. C. Wood, and L. DeGaris. "Brand identification among stock car racing fans in the USA." *International Journal of Sport Management and Marketing,* 2009, 6(1), 35-51.

Peltzman, S. "The effects of automobile safety regulation." *Journal of Political Economy,* 1975, 83, 677-726.

Ryan, N. "Battle inside Bristol: Opinions split about how much slack should be cut for chase bubble drivers." *Richmond Times Dispatch,* City Edition, p. D-1, August 27, 2005.

Schwartz, J. T., J. P. Isaacs, and A.M. Carilli. "To Race or to place: An empirical investigation of the efficiency of the NASCAR points competition." *Journal of Sports Economics,* 2007, 8(6), 633-641.

Sobel, R. S. and T. M. Nesbit. "Automobile safety and the incentive to drive recklessly: Evidence from NASCAR." *Southern Economic Journal*, 2007, 74(1),71-84.

Von Allmen, P. "Is the reward system in NASCAR efficient?" *Journal of Sports Economics*, 2001, 2(1), 62-79.

Cradle-to-Cradle

Rethinking Design

Jessica B. Smith

This paper introduces cradle-to-cradle design philosophy and proposes a new system for engineering, production, and distribution of products such that industry works with nature instead of against it. Many companies have already explored this concept and have been able to gain and maintain a competitive advantage, increase profitability, and help the environment.

Jessica B. Smith

Masters in Business Administration

160 Outback Rd.

Ferguson, NC 28624

(336) 973-0704

j.smith.31185@gmail.com

CRADLE-TO-CRADLE: RE-THINKING DESIGN

Executive Summary

Since the first Industrial Revolution, there has been a relentless attempt to impose universal design solutions which has manifested an underlying and dangerous assumption that nature should be overwhelmed, and industry has gone to great lengths to make these solutions "fit". The result of these careless actions will ultimately be the destruction of life as we know it. Instead of adopting a strategy of eco-efficiency to temporarily address these issues which simply prolongs the period in which materials reach their "grave", individuals as well as industries are commissioned to re-engineer the design process so that a cradle-to-cradle philosophy is achieved. The cradle-to-cradle framework is modeled after natural processes and approaches the idea of sustainability from a design perspective, proposing a closed-loop cycle of material flows so that there is no concept of waste. Dr. William McDonough and Dr. Michael Braungart advocate that the traditional approaches to sustainability only make circumstances 'less bad', which could be worse than doing nothing at all. With the help of leaders such as McDonough and Braungart and governments stepping in, some individuals and industries have begun to lead the way to this transition. However, if we are to make the most with what we have been so greatly commissioned with the responsibility of taking care of instead of destroying it, we all must work together as soon as possible.

CRADLE-TO-CRADLE DESIGN

The Cradle-to-Cradle framework is a science- and values-based vision of sustainability that describes a positive, long-term goal for engineers: the design of a commercially productive, socially beneficial, and ecologically intelligent industrial system. This approach to sustainability is from a design perspective, which makes apparent the need for a fundamental, conceptual shift away from the design of current industrial systems, which generates toxic, one-way, "cradle-to-grave" material flows, toward a "cradle-to-cradle" system powered by renewable energy, in which materials stream in a harmless, regenerative, closed-loop cycle. This new approach to design and manufacturing has also been called 'Sustainability 2.0' because of the innovative nature of this concept. This framework posits a new way of designing human systems to ultimately solve, rather than temporarily alleviate, the human-created conflicts between economic growth and environmental health that result from poor design and market structure (W. B. McDonough).

Doing the right things, the right way without perspective or guiding principles can ultimately become an efficient pursuit of the wrong goals. Subsequently, engineers can be headed toward positive ends yet be undermined by tools that will never get them where they really need to be. Dr. William McDonough introduces the Principles of Green Engineering, which provide guidance for realizing this long term goal that is convincingly achievable. These principles suggest ways in which engineers and designers can pursue optimized, cradle-to-cradle products and systems. The greatest investment of time, money, or other resources often comes from redefining the problem itself. (W. B. McDonough)

The Foundations of Cradle-to-Cradle Design

The Cradle-to-Cradle Framework identifies the natural world's operations system as a perfect model for human design. This model attempts to utilize the effectiveness provided by nature; free energy from the sun, which interacts with the geochemistry of the earth's surface to sustain productive, regenerative biological systems in which absolutely no waste is produced. The Cradle-to-Cradle Framework advocates three key design principles which are found in natural systems and can be used by humans in the design process: (1) *Waste Equals Food,* (2) *Use Current Solar Income,* (3) *Celebrate Diversity.* (W. B. McDonough)

Waste Equals Food:

There is no concept of *waste* in nature because the processes of each life form add to the health of the whole ecosystem. One organism's waste is food for another which creates an infinite flow of nutrients in the cradle-to-cradle cycles of birth, decay, and rebirth (W. B. McDonough). In their book <u>Cradle-to-Cradle</u>, William McDonough and Michael Braungart use a cherry tree to illustrate this point. They describe how nature operates according to a system of nutrients and metabolisms, such as the cherry tree which makes many blossoms and fruit to germinate and nurture that life form along with many other organisms. Although the tree produces many blossoms that will never become fruit, they are far from useless. When the extra blossoms fall to the ground and decompose, they feed various organisms and microorganisms while enriching the soil for future growth. As animals and humans exhale carbon dioxide, this tree along with all other plants take it in and use it for their own growth while emitting oxygen which is used by the animals and humans. This process is illustrated in every one of nature's systems where all of the Earth's major nutrients—carbon, hydrogen, oxygen, nitrogen—are cycled and recycled to create an effective environment where *waste equals food* (W. B. McDonough 92).

If our systems continue to contaminate the Earth's biological mass which is finite in nature and production and consumption are restrained, the Earth will literally become a grave. McDonough and Braungart describe the two distinct metabolisms that are found on our wonderful planet. The first of which is the *biological metabolism*, or the biosphere also known as the cycles of nature. The second is the technical metabolism, or the technosphere which is the cycles of industry, including harvesting resources from natural places to be used in industry. They argue that the right design will support these two metabolisms, forever providing nourishment for something new. The authors propose that products can be composed of materials that biodegrade and become food for the biological cycles, or be made of technical materials that stay in closed-loop technical cycles to continually circulate as valuable materials for industry. Great care must be taken to ensure that these two metabolisms do not contaminate one another. They suggest the idea of *worry-free packaging* to explain the process of biological metabolism which can safely decompose or be gathered and used as fertilizer. For instance, a paper ice cream cone wrapper could contain a seed that will, once discarded, grow into a plant to further nourish the environment. There is absolutely no reason why packaging should last decades or centuries past the life of the product it contained unless, of course, it can be used over and over again. A technical nutrient is a material or product that is designed to go back into the technical cycle. For instance, a television contains 4,360 chemicals, many of which are valuable nutrients for industry that are wasted and lost forever when the television ends up in the landfill. By isolating technical nutrients from biological nutrients allows them to be *upcycled* which retains the highest quality in a closed-loop industrial cycle. (W. B. McDonough 103-110)

Figure 1: Architecture and Life Cycle Analysis: Implementing Cradle-to-Cradle Thinking (Goodbun)

In describing the notion of a technical nutrient, it is important to understand the concept of a *product of service* which assumes that products are reconceived as *services* people want and enjoy, instead of assuming all products are to be bought, owned, and disposed of by "consumers". In this situation, users of these products would buy the service for a *defined user period*. For example, instead of purchasing a television, one would purchase ten thousand hours of TV viewing. This eliminates the customer paying for the complex materials that they will not be able to use after the products current life is over. The consumer will simply upgrade after the useful life of the product is over and the manufacturer takes the product back to break it down and use the complex materials as *food* for new products. Under this

scenario, consumers could indulge their hunger for new products as often as they wish, without feelings of guilt, and industry could encourage them to do so, knowing that both sides are supporting the technical metabolism process. The irony involved with the way we currently design our products as durable as possible lies in the fact that future generations do not want to have to contend with our products that were designed to last forever, but not be useable forever. This process has many advantages, including no useless and potentially dangerous waste would be produced, manufacturers would save billions of dollars in valuable materials, and the extraction of raw materials would be diminished (W. B. McDonough 109-113).

Use Current Solar Income

Virtually all of nature's industries rely on energy provided from the sun, which can be viewed as a form of current, constantly renewing income. Cradle-to-Cradle systems can tap into current solar income to thrive on the energy produced by the sun, much as the living things of nature. This can be achieved by using direct solar energy collection or passive solar processes, such as *daylighting*, which makes effective use of natural light. Solar income can also be retrieved through wind power-thermal flows fueled by sunlight. (W. B. McDonough)

Celebrate Diversity

Natural systems thrive on diversity, given that each healthy ecosystem is a complex community of living things which has developed a unique response to its surroundings that works together with other organisms to sustain the system. Each life form fits into its place and only the fittest survive. However, a long-term perspective is required since the introduction of an invasive species will enhance diversity but will eventually destroy diversity over time. As for human designs, optimal sustainable cradle-to-cradle solutions are designed from and fit within local natural systems, taking into account both the distant effects of local actions and the local effects of distant actions. Instead of offering *one-size-fits-all* solutions that are characterized in conventional engineering, products should be designed in such a way that celebrates and supports diversity (W. B. McDonough). Companies need to get away from a universal design solution, in which the product is designed for a *worst-case scenario* so that it will always operate with the same usefulness everywhere. A classic example of where this method of design is detrimental to the environment can be found in mass-produced detergent. Soap manufacturers produce one detergent for their entire distribution area, despite the fact that different areas need different amounts of detergent depending on the softness and/or quality of the water. Manufacturers simply add more chemical force to wipe out the conditions of circumstance, completely ignoring the fact that much of the runoff containing this soap runs off into bodies of water which come into contact with and harm fish. In effect, human industry's relationship with the natural world is revealed in the process of designing for the worst-case scenario—the incorrect assumption that nature is the enemy (W. B. McDonough 28-30).

WHY CHANGE?

Asthma is now the most prevalent children's disease, with 40% of children suffering from allergies, compared to only 2-3% just a few decades ago (Steffen). Relatively new research on particulates— microscopic particles released during incineration and combustion processes, such as
those in power plants and automobiles—show the lasting and damaging effects they cause to our lungs. In 1995, a Harvard study determined that around 100,000 people die every year in the United States alone as a result of these tiny particles. Not to mention, the legislation put into place to reduce

5 | P a g e

the amount of this toxin did not take effect until 2005 (W. B. McDonough). As we all know, the consistent burning of fossil fuels has prevented the heat produced by these gases from escaping, causing the most severe form of climate change the world has ever seen. Global warming has immediate and lasting detrimental effects, which we may never be able to predict. According to NASA, we have experienced two of the hottest years on record within the past decade, 1998 and 2005. Top researchers at MIT report that there has been a 100% increase in the intensity and duration of severe storms such as hurricanes and tornadoes since the 1970s. As the worldwide temperature continues to rise, glaciers continue to melt, causing sea levels to rise, wiping out many of the subtropical islands of the world (The Global Warming Overview). Unfortunately, there are many more compelling statistics that illustrate the urgency required to address these issues.

"WHY BEING 'LESS BAD' IS NO GOOD"

The Cradle-to-Cradle Framework does not approach sustainability as it is typically defined. Sustainability, or eco-efficiency, has been popularly defined in the industrial sector as "doing more with less", or "recycling the human footprint to minimize the troubling symptoms of environmental decline. Conventional sustainability from an engineering perspective too often advocates that the machines of industry be retrofitted with cleaner, more efficient engines, but this is not a sufficient or long-standing goal. While this eco-efficiency approach may seem worthwhile, this traditional model of attempting to add more value to a good or service while using fewer resources and releasing less pollution is still failing to reach the point that our society must strive to achieve. The unsighted adoption of shallow environmental approaches without fully understanding their effects can be no better, and possibly worse, than doing nothing (W. B. McDonough). Unless a product's full life-cycle is taken into consideration, "landfills will continue to overflow with these 'sustainably-designed' products whose usefulness has come to an end," says Sarah Fister Gale in GreenerDesign (Rich).

Finding markets to *reuse* or *relocate* waste will make industries and customers feel like they are doing their part to protect the environment because the piles of waste appear to go away. However, most of the time this waste and the toxins they produce are simply transferred to another place. This also applies to composting sewage into fertilizer, or feed for animals, which is the case in many underdeveloped nations. Unless the materials are specifically designed to ultimately become safe 'food' for nature, even composting can present disastrous effects. (W. B. McDonough 55-56)

Recycling=Downcycling

Recycling also illustrates how the best intentions can be devastating because the concept fails to incorporate a long-term view and goal. Most recycling is actually *downcycling*, that is, it reduces the quality of a material over time. For instance, when plastics other than those found in soda and water bottles are recycled, they are mixed with different plastics to produce a hybrid of lower quality, which will never become the same product again. This is often the case when metals are downcycled. For example, when a car is melted down to be *recycled,* the high tensile steel is mixed with other car parts, including copper from the cables, and the paint and plastic coatings. These materials in effect lower the recycled steel's quality and more high-quality steel must be added/wasted to make the hybrid strong enough for its next use. What is worse is the fact that rare metals, such as copper, manganese, and chromium as well as other items of value for the industry (paint, plastics, and other metals in auto industry) are now lost forever. Unfortunately, lost value and lost materials are not the biggest concerns.

Downcycling can actually increase contamination of the biosphere. Since downcycled materials are often less durable than their ancestors, more chemicals are often added to make them usable again. This presents a further concern, especially because people that buy and wear clothing made from recycled materials feel they are making an ecologically sound choice, when in reality they are wearing a product filled with chemicals that were never designed to lie next to human skin. Another perhaps unintended consequence of downcycling is that it is an expensive proposition for business. This is in part caused by the fact that recycling forces materials into more lifetimes than they were originally designed for, which results in a complicated conversion that eats up more energy and resources. Here again, we see how an ecological agenda becomes a burden for industry instead of a rewarding option. (W. B. McDonough 57-59)

Eco-efficiency vs. Eco-effectiveness

While being eco-efficient may reduce resource consumption and pollution in the short-term, it fails to address the profound design flaws of modern industry. Eco-efficiency simply addresses the problems without addressing the source, which inevitably institutes goals and employs practices that sustain a fundamentally flawed system (W. B. McDonough). While current strategies of eco-efficiency seek to reduce and minimize the unintended consequences of processes of production and consumption, the concept of eco-effectiveness demonstrates a positive agenda based on maximizing the ability of industry to truly support the natural systems surrounding it. By imitating the interdependent nature of biological systems, eco-effectiveness advocates that sustainability should not be concerned only with reducing the footprint of our activities on this planet, but rather transforming this footprint into a source of replenishment for those systems that depend on it (M. Braungart). Eco-effectiveness moves beyond zero emission approaches by focusing on the development of products and industrial systems that maintain or enhance the quality and productivity of materials through subsequent life cycles (M. M. Braungart).

There are many definitions that have been developed for eco-efficiency since its foundation in 1989. The World Business Council for Sustainable Development initially defined eco-efficiency as:

> "being achieved by the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life cycle to a level at least in line with the earth's carrying capacity."

Despite the many definitions of eco-efficiency, in this context, this concept can be said to encompass the dematerialization, increased resource productivity, reduced toxicity, increased recyclability(downcycling), and extended product lifespan(prolonging the period it takes the product to reach its grave). All of the strategies associated with eco-efficiency began with a common assumption of the linear, cradle-to-grave flow of materials through industrial methods. However, eco-efficiency is naturally at odds with long-term economic growth and innovation, subsequently failing to address the key issue of toxicity. In effect, eco-efficiency is simply a strategy for *damage management* and *guilt reduction* that only results in temporary relief*,* beginning with the assumption that industry is 100% *bad*, and pursues the goal of making it *less bad.*   (M. M. Braungart)

Eco-Effective methodology contrasts with eco-efficiency in that it deals directly with the issue of maintaining or upgrading resource quality and productivity through many cycles of use, rather than just attempting to eliminate waste. Strategies of reduction and minimization are not even steps in the right direction unless they contribute to the ultimate aim of achieving cyclical material flow systems which ultimately uphold maximum product quality and productivity over time. If efficiency is defined as "doing

things the right way, effectiveness can be defined as "doing the right things". Efficiency alone has no significance because if industry is motivated by systems that are destructive, making them more efficient will not solve the problem. The goal of reducing material flows per product as eco-efficiency seeks to achieve, is only beneficial in the long run if the goal of closing material flows has been achieved first.

The following figure illustrates the fact that eco-efficiency begins with the assumption that industry is 100% bad, whereas eco-effectiveness starts with a vision of industry that is 100% good that supports and regenerates ecological systems, thereby enabling long-term economic growth and prosperity. It also demonstrates that the traditional assumption inherent in eco-efficiency approaches is flawed in its reasoning that industry and nature are natural enemies. This perspective is the basis for the concept of a *triple top line*. This concept is different from the traditional *triple bottom line* objectives which promote awareness within organizations of the environmental and social impacts of their activities that hopes to influence them to reduce their ecological footprint. Pursuit of a triple top line begins with an understanding that business value is originated in natural and social capital, and celebrates the potential synergies between economic, environmental, and social business objectives (M. M. Braungart).
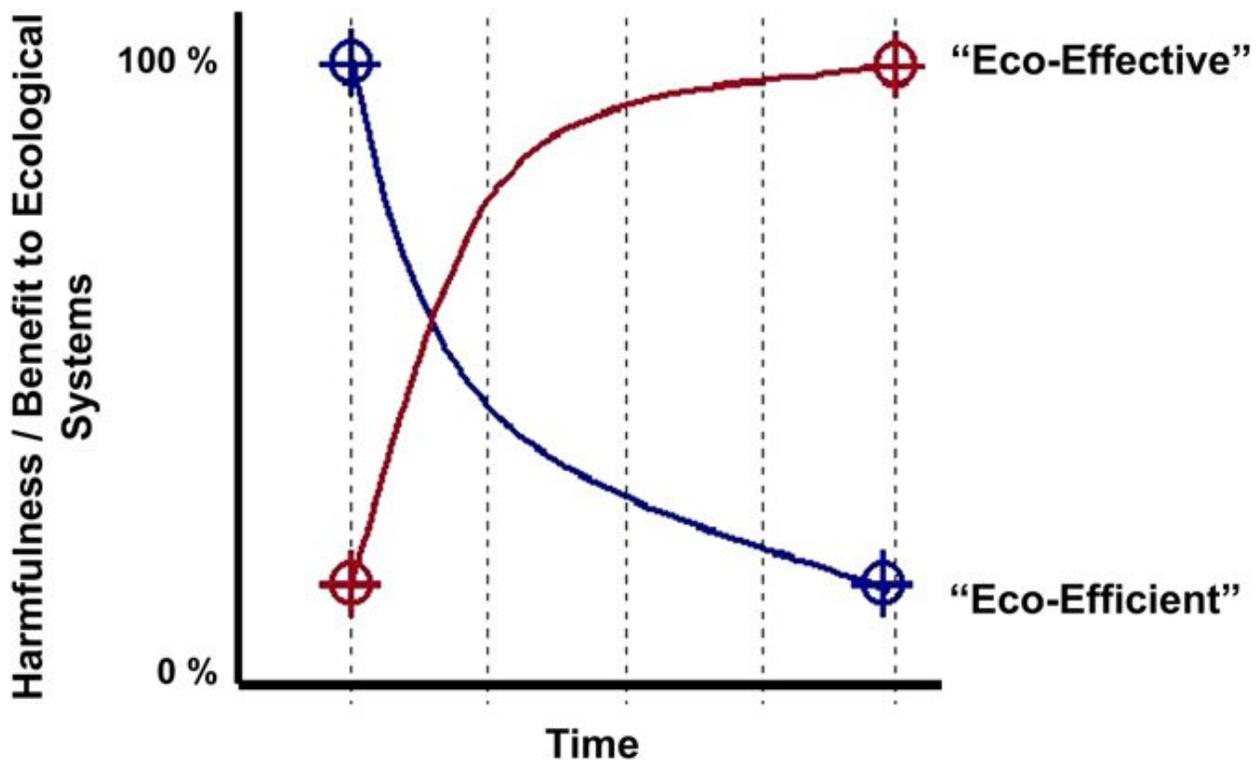
Figure 2: Eco-Effectiveness strives to generate an entirely (100%) beneficial impact upon ecological systems. (M. M. Braungart)

The following figure illustrates the process that is required for reengineering the design process:
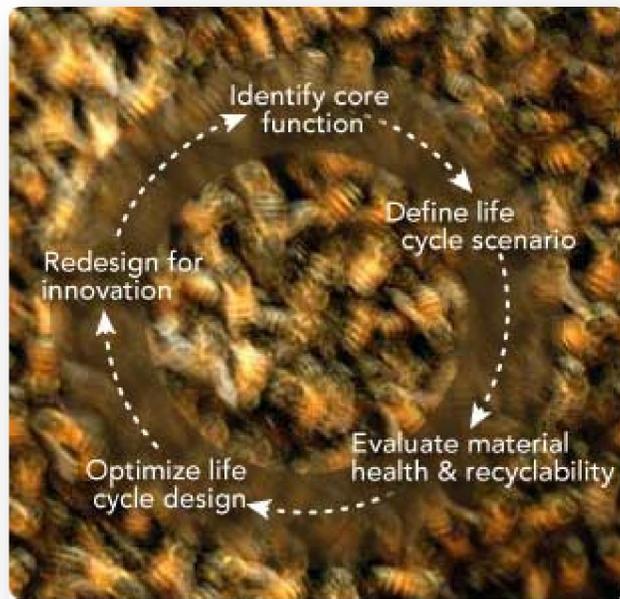
Figure 3: Architecture and
Life Cycle Analysis: Implementing Cradle-to-Cradle Thinking (Goodbun)

PUTTING ECO-EFFECTIVENESS INTO PRACTICE

Any industry must have a clear understanding of a material or product's flow through various life cycle stages before beginning to transition to cradle-to-cradle design. GreenBlue is an organization that works with individuals, industries, and governments to realize the tremendous leveraging power of intelligent design to realize the maximum benefit provided by cradle-to-cradle products, services, and systems. The following is a chart provided by GreenBlue to illustrate the project development process. It demonstrates the greatest potential for realizing the positive benefits of a cradle-to-cradle perspective lies in the early design phases of project development, when opportunities that could affect the outcome of the project are the greatest and the resources committed to a solution are the smallest. (GreenBlue)
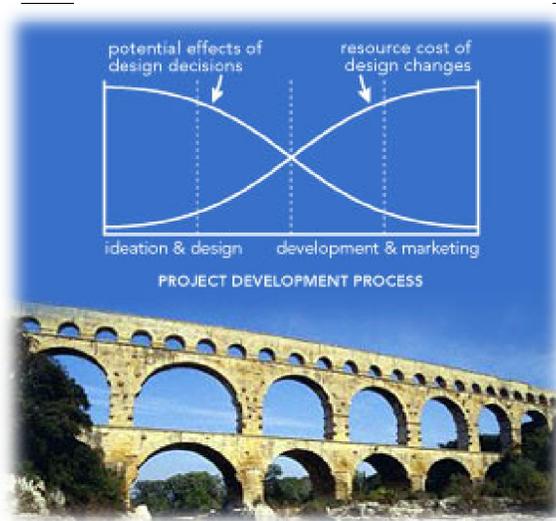
Figure 4: Project Development Process (GreenBlue)

McDonough and Braungart explain in five points how companies can most effectively adopt cradle-to-cradle practices.

1. *Get "free of" known culprits*

The first obvious step that industry as well as individuals should take toward becoming eco-effective is to turn away from material that is widely recognized as being harmful. However, this is only the first step. After removing the harmful toxin, great caution should be used to ensure that once the product is "free of" the known harmful culprit, something worse does not take its place. The important consideration is that simply being free of one thing does not necessarily make the product healthy and safe. (W. B. McDonough 166-168)

2. *Follow informed personal preferences*

In reality, decisions many times boil down to two alternatives that are both less than ideal. When choices are both equally bad, the chooser is likely to feel frustrated and helpless, which is another insightful reason redesign is critical. Until we reach the point of eco-effectiveness, ways do exist in which we can do the best with what we have to make better choices. One way we can make better choices in the meantime is to *prefer ecological intelligence* by making sure the products we use do not contain or support substances that are known to be harmful. We should also *prefer respect* for those that make the product, for the communities near where it is produced, for those who handle and transport it, ultimately for the consumer. Another element we can attempt to assess is to *prefer delight, celebration, and fun* which can accomplish more than just making the customer feel guilty or bad while decisions are being made. (W. B. McDonough 168-173)

3. *Creating a "passive positive" list*

We should go beyond existing and readily available information on the contents of a product, to ultimately conduct a detailed inventory of the entire palette of materials used in a given product and the substances emitted during production and use of that product. An *X-list* includes all of the most problematic substances that are commonly used in production—those teratogenic, mutagenic,

carcinogenic, or otherwise harmful to human and ecological health. The *gray-list* contains problematic substances that are not in immediate need of a phase-out. A *P-list* is the positive/preferred list, including substances actively defined as healthy and safe for use. Considerations that must be made in order for a material to make the P-list include: acute oral toxicity, chronic toxicity, whether the substance is a strong sensitizer, whether the substance is a known carcinogen, mutagen, teratogen, or endocrine disruptor, whether the substance is suspected to be bio-accumulative, toxicity to water organisms, biodegradability, potential for ozone-layer depletion, and whether all by-products meet the same criteria. (W. B. McDonough 173-177)

4. *Activate the positive list*

This is the point where individuals and industry stop trying to be "less bad" and determine how they can be *good.* The authors use a culinary example to illustrate this point; "you're no longer substituting ingredients—you've thrown out the recipe and start from scratch, with a basketful of tasty, nutritious ingredients that you love to cook with." (W. B. McDonough 177-178)

5. *Reinvent*

At this point, we are commissioned to recast the design assignment; in other words, do not just reinvent the recipe, we rethink the menu. For example, instead of creating a car that produces zero emissions, aim to design a car which releases *positive* emissions and generate other nutrious effects on the environment. (W. B. McDonough 178-180)

EXAMPLES OF CRADLE-TO-CRADLE BEST PRACTICES

Ford Motor Company

Henry Ford practiced an early form of upcycling when he had Model A trucks shipped in crates which became the floorboards of the vehicle when it reached its destination (W. B. McDonough 110). Ford Motor Company is continuing to pursue its founder's passion by building an automotive assembly plant at its historic Rouge River manufacturing complex in Dearborn, Michigan with a 10-acre green roof that cost-effectively filters storm water run-off. This type of facility connects employees to their surroundings, creates habitat and invites the return of native species, produces oxygen, and restores the landscape. This "living" roof effectively filters storm water run-off for $35 million less than the typical storm water management systems required to meet regulations. The soil and vegetation on the roof also provides extra insulation, protects the roof membrane from wear and thermal shock, contributes to mediating the urban heat island effect, and captures harmful particulates from the air. Rather than introduce synthetic materials or machinery to accomplish corporate goals, Ford is taking a step in the right direction to utilize the existing natural systems' processes and energy flows to accomplish these goals more effectively. Additionally Ford has developed the Model U with the help of MBDC, the first automobile to incorporate inherently safe, beneficial cradle-to-cradle materials into its design. Some of the inputs for this revolutionary car include polyester upholstery fabric; a technical nutrient made from safe chemicals and is capable of continuous recycling. The top is made from a corn-based biopolymer that may be composted after use. (W. B. McDonough).

Figure 5: Ford Rouge Factory's 'Living Roof' (Green Design-From Cradle to Cradle)

Nike

Another example of a company taking a stand to reduce their harmful footprint on the environment is Nike. This company is working with McDonough Braungart Design Chemistry (MBDC) to identify materials that meet or exceed the company's current emerging criteria for sustainable design. These components are then added to a growing list of materials that Nike will increasingly use in its products. The ingredients are either safely metabolized by nature's biological systems when the useful life of the product is over, or returned to industry to be used repeatedly to make new products. This company has been able to successfully phase out harmful polyvinyl chloride (PVC) from its products. Nike has also been influential in helping its suppliers to design next generation materials to be less hazardous and more sustainable (W. B. McDonough). One of the company's agendas is to tan leather without harmful toxins, so that it is no longer a monstrous hybrid and be safely composted after use. Nike is also testing a new rubber compound that will also be a biological nutrient that could also have a wide reaching impact on many industries.

Herman Miller

Commercial furniture producer Herman Miller also works with MBDC to better achieve cradle-to –cradle and has developed an interdisciplinary Design for Environment (DFE) team that executes materials assessments based on MBDC's protocol, which influences design goals through the company, which measures environmental performance and engages its supply chain in implementing design criteria. During the design process, the multi-faceted assessment analyzes materials for their human health and eco-toxicological effects, recyclability, recycled content and/or use of renewable resources, and product design for disassembly. The DFE team includes a chemical engineer who incorporates findings from assessments into an evolving materials database, and a purchasing agent who acts as a conduit and data source between the supply chain and Herman Miller's purchasing team. One of Herman Miller's engineers has said "getting a handle on supply chain issues from an environmental standpoint has also helped us get a handle on the organization and prioritization of materials." This strategy also ensures a consistent procurement of safe materials by involving both groups in the implementation of new design criteria (W. B. McDonough).

Recyclability	Recycled content % of total weight	Disassembly
• Material is a technical or biological nutrient • Material can be down-cycled • Material can be incinerated for energy recovery • Material is normally land filled	• Post Industrial Recycled Content • Post Consumer Recycled Content • Renewable Content	• Component can be seperated with no dissimilar materials attached • Disassembly tools can be used • One person can disassemble the component in 30 seconds or less • Material can be identified by markings

Figure 6: Herman Miller Design for Environment Assessment Criteria (W. B. McDonough)

McCool CarpetPlus Colortile

Another company that has experienced success with adapting a cradle-to-cradle philosophy into its production process is McCool CarpetPlus Colortile. This company has shown a commitment to preserving resources and ensuring the needs of future generations with its EcoChoice™ branded carpet. This innovative product is designed to utilize post-consumer carpet in a closed-loop process which allows nylon fibers to be recycled to continually make new carpet. As this nylon is collected, it is sent to Shaw's Evergreen Nylon Recycling Plant which utilizes a patented technology that converts the post consumer nylon into caprolactam, the basic building block of nylon fiber. It is then sent to a yarn extrusion plant and made into new Type 6 Nylon fiber which is used to manufacture EcoChoice™ carpet. When the carpet reaches the end of its useful life, the product can be brought back to the recycling facility so the process can start all over again. Furthermore, this company will make a donation to the National Arbor Day Foundation with every purchase of an EcoChoice™ branded product which will assist in the reforestation and rain forest preservation programs. With every dollar contributed, the Foundation will plant one seedling or preserve 250 sq. ft. of rain forest. The following illustration shows the process that the carpet material goes through in this innovative cradle-to-cradle system. (CarpetPlus Color Tile. Thinking ahead. Thinking green)

Figure 7: Thinking ahead. Thinking green. (CarpetPlus Color Tile. Thinking ahead. Thinking green)

The following figure is another, closer look at the materials and the process by which recycled carpet becomes new carpet without downcycling:

Figure 8: EcoChoice™ Flooring (CarpetPlus Color Tile. Thinking ahead. Thinking green)

GOVERNMENT INITIATIVES

Waste Electrical and Electronic Equipment Directive (WEEE Directive)

The WEEE Directive is the European Community directive on waste electrical and electronic equipment which became the law in February 2003, effectively setting collection, recycling, and recovery targets for all types of electrical goods. This directive imposes the responsibility on the manufacturer for the disposal of electrical waste and electronic equipment. The directive states that companies "should establish an infrastructure for collecting WEEE, in such a way that users of electrical and electronic equipment from private households should have the possibility of returning WEEE at least free of charge." The producers should be able to choose to fulfill this obligation individually or jointly with other manufacturers. The companies are also required to collect the waste in an ecologically-friendly manner (Parliament). So far, only a patchwork of compliance solutions has emerged throughout member states of the EU. To emphasize the importance of this directive, the Royal Society of Arts in the UK uncovered 'WEEE Man', a 21 foot tall sculpture made from 3.3 tons of electrical goods—the average amount of waste one UK individual produces in a lifetime (Waste Electrical and Electronic Equipment Directive)

The following is an illustration of the WEEE Directive's logo that is used to promote this initiative:
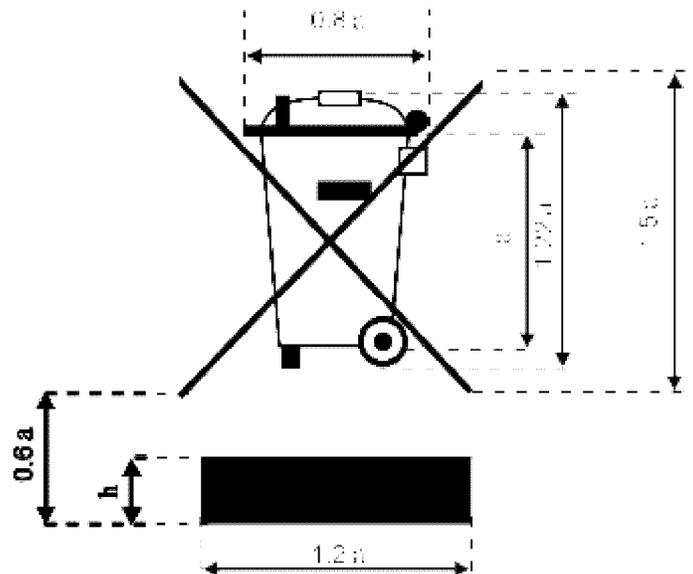

Figure 9: WEEE Crossed-out rubbish bin logo (Waste Electrical and Electronic Equipment Directive)

Restriction of Hazardous Substances (the "RoHS Regulations)

The main objective of the RoHS directive is to reduce the amount of restricted materials that are entering the waste stream. The National Measurement Office (NMO) is the UK Enforcement Authority

for the restriction of the use of certain hazardous substances in electrical and electronic equipment. These regulations apply the EU Directive 2002/95 which bans the placing new electrical and electronic equipment on the market that contains more than the agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE) flame retardants. This directive covers both household and professional electrical and electronic equipment. The RoHS directive came into effect on July 1, 2006. A website (http://www.rohs.gov.uk) has been developed which companies can visit to ensure that their products are in concordance with the law. The website outlines the due diligence that should be respected, describes enforcement procedures, and lists exemptions, events, and news. A decision tree is also provided which is intended to guide producers and other interested parties to determine whether or not their product falls within the scope of RoHS regulations (RoHS). The UK Restriction of Hazardous Substances Conformity Assessment Group (URCAG) is made up of parties interested in ensuring and assisting RoHS conformity of products. URCAG protocol defines the guiding principles for groups interested in assisting RoHS Conformity Assessment Bodies (NOMO Strategic Marketing & Design LLP).

CONCLUSION

Perhaps the greatest fallacy that the majority of people accept as true is the belief that the exhaustion of the Earth's resources will not happen in their lifetime, or their children's lifetime. Although no one knows for sure when we will tap the last of nature's goodness, if we continue our course of action, without altering our current diminution of the Earth's resources, the end of life as we know it will occur sooner than anyone could have ever imagined. Without a thorough understanding of the detrimental effects of our careless actions, there is no comprehension of how horrible the future may be and therefore, there is no motivation to change current habits, designs, and systems. We were given the great responsibility to look after and take care of nature and all its glory. We will never be without the resources we need if we take this great commission seriously, fully knowing the consequences if we fail. However, if we do not understand the cause-and-effect relationship that exists when we fail to take this responsibility seriously, if the exhaustion of resources does not occur in our lifetime, it will surely happen in our descendant's lifetime. Imagine how awful the world would be without the things you loved when you were a child; playing outside and smelling the fresh air, hearing the birds sing, seeing the flowers bloom in the spring and the leaves change colors in the fall, swimming in a lake, rolling around in the grass, going to the beach, playing in the snow, etc. It is up to *all* of us to ensure that future generations can enjoy the same things we do. Of course, we will not be able to successfully change habits and design solutions overnight. It will take everyone across the world working together to amend our course of action. It will take many years before cradle-to-cradle design solutions are adapted all over the world. However, if we all begin making small changes in the way we live every day, it will be a big step in the right direction.

Call to action!

The authors of Cradle-to-Cradle end one of the chapters of the book with a call to action that is very interesting and makes one really think:

"Insanity has been defined as doing the same thing over and over and expecting a different outcome. Negligence is described as doing the same thing over and over even though you know

it is dangerous, stupid, or wrong. Now that we know, it's time for a change. Negligence starts tomorrow." (W. B. McDonough 117)

As observed by Albert Einstein:

"If we are to solve the problems that plague us, our thinking must evolve beyond the level we were using when we created those problems in the first place." (W. B. McDonough 165)

WORKS CITED

Braungart, Michael. "Vision." Braungart.com. 15 April 2009 <www.braungart.com/vision.htm>.

Braungart, Michael. McDonough, William. Bollinger, Andres. "Cradle-to-cradle design: Creating Healthy Emissions-a strategy for eco-effective product and systme design." ScienceDirect:Journal of Cleaner Production 15 (2007): 1337-1348.

"CarpetPlus Color Tile. Thinking ahead. Thinking green." McCook Carpets Plus Colortile. 15 April 2009 <www.mccookcarpetsplus.com/Eco_Friendly.php>.

Goodbun, Jon. "Architecture and Life Cycle Analysis: Implementing Cradle-to-Cradle Thinking." 30 October 2007. The Polytechnic. 14 April 2009 <wag.myzen.co.uk/thepolytechnic/?p=165>.

Green Design-From Cradle to Cradle. April 2007. 19 April 2009 <http://www.wipo.int/wipo_magazine/en/2007/02/article_0002.html>.

GreenBlue. The Power of Design. 21 April 2009 <www.greenblue.org/cradle_design.html>.

McDonough, William. Braungart, Michael. Anastas, Paul. Zimmerman, Julie. "Cradle-to-Cradle Design and the Principles of Green Design--Toward New Perspectives and Practices for Engineering and Design." 1 December 2003. Environmental Science and Technology. 15 April 2009 <http://www.mcdonough.com/writings/c2c_design.htm>.

McDonough, William. Braungart, Michael. Cradle-to-Cradle: Remaking the Way We Make Things. New York: North Point Press, 2002.

NOMO Strategic Marketing & Design LLP. URCAG. 2006. 20 April 2009 <http://www.rohsgroup.com/>.

Parliament, European. "Directive 2002/96.EC of the European Parliment and of the Council of 27 January 2003 on WEEE." Offical Journal of the European Union. 27 January 2003.

Rich. Trends: Cradle-to-Cradle Design. 16 January 2009. 19 April 2009 <http://lovetomorrowtoday.com/2009/01/16/trends-cradle-to-cradle-design/>.

RoHS. 20 April 2009 <http://www.rohs.gov.uk/Default.aspx>.

Steffen, Alex. "Cradle-to-Cradle Design & Intelligent Materials Pooling." 26 June 2005. World Changing. 15 April 2009 <www.worldchanging.com/archives/002967.html>.

The Global Warming Overview. Global Warming Statistics. 21 April 2009 <http://www.theglobalwarmingoverview.com/index.php/Global-Warming-Statistics.html>.

Waste Electrical and Electronic Equipment Directive. 19 April 2009 <http://en.wikipedia.org/wiki/Waste_Electrical_and_Electronic_Equipment_Directive>.

Still got that Picture of Yourself Chugging a Brewski on Facebook? Better listen to us and take that Pic Down! - A Look at when Social Networking Sites and Human Resource Recruiting Collide

Scott Lamm, MBA Student, University of North Carolina at Pembroke

Renee Phile, English Education Graduate Student, University of North Carolina at Pembroke

ABSTRACT

This article will discuss the popular trend of Social Network Sites such as MySpace.com and Facebook.com and focus on how employers are screening job applicants via these sites. The pros and cons of material on these sites will be discussed as well as discussion about the legal and ethical issues involved with employer snooping. These sites are very popular as one in five Americans are using them, so discussion will be had about cleaning up the "dirt" on a personal site, and the information users can display on their sites that will be helpful instead of harmful. EEOC and FCRA documentation will be reviewed as the reader will have to make a decision on whether employers have a right to the "public information."

INTRODUCTION

Social Network Sites are becoming one of the most popular phenomena on the information highway since the inception of the World Wide Web; but are these sites helping to build the coffins of job applicants' career opportunities? Believe it or not, but one in five Americans have a social networking site, according to a recent study by the Pew Research Center for the People and the Press and the Pew Internet and American Life Project. (Valle, 2008) Social Networking sites such as MySpace.com and Facebook.com have become a virtual playground for friends and foes alike. Many people use sites such as these as a way to keep contact with old friends and acquaintances as well as an avenue to make new friends and create online social connections. But oh "Beware", your friends aren't the only one perusing your site. Over the last few years employers have come to the realization these sites are another way to screen job applicants. These sites provide useful information and offer sometimes and employer's validation whether to interview certain job candidates or make a final hire or not hire decision. Many companies believe they are entitled to get as much information as they can about job candidates, and that reviewing these personal Web sites is fair game to find out who will be the "best fit" for their organization according to Paula Marks, vice president of the executive search firm Gilbert Tweed Associates. (Anonymous, *Managing Accounts Payable*, 2006, 4)

Traditionally, when screening job applicants, employers contacted previous employers and performed reference checks to either weed out applicants or to make final hiring decisions. Social Network Sites

1

such as MySpace.com and Facebook.com have provided another avenue to the types of background checking performed by employers. This process will pose concerns to some applicants, while others may have no concerns at all. Those not concerned may find later that maybe they should have been concerned after all. In many cases these sites cause employers to dismiss the candidates for consideration while in other situations employers solidify their choice to hire the candidates. It may be asked, "Is it legal for employers to review applicant's social network sites?" Regardless of the answer employers are going to look, so how can information found be harmful or how can it be helpful? Also, how can harmful information be erased or sanitized from a social network sites? These questions are answered along with advice on the do's and don'ts of maintaining a social network site and the ongoing reminder that information posted on online profiles is no longer private and forever will be public. Would you hire the person you have portrayed on your personal site?

BACKGROUND

Not too long ago assessment of job applicants came via resumes, references and first impressions when employers were determining candidates to interview. After the interview employers would base hiring decisions on the way information was presented before, during and after an interview. Career experience and presentation usually provided most of the information a future employer would need to know about the applicant. Information obtained before, during and after the interview made up the ingredients of an almost final decision. Prior to offering a candidate a position with the company employers will typically make the decision after necessary reference checks and background checks. But, oh how the system of background checking has changed in just a few short years. Technology, and the thought knowledge is power, employers have found a new way of researching applicants. (Reddin, 2007) Employers now can find information about job applicants, sometime much more than they would ever need to know or want to know with the touch of mouse and access to the World Wide Web. With a few keystrokes many potential job applicants have mounds of information on personal websites such as MySpace.com and Facebook.com.; their life has become an open book.

The trend of social networking on the web began with people wanting to reconnect with lost school friends. Then it expanded to sharing messages, music, and videos with people sharing pieces of their culture and life interests. So what are these social network sites everyone is talking about? Social Network Sites have been around since the 1990's but the most popular such as MySpace.com and Facebook.com have popped up since 2003. These are just two examples of social network sites that will be discussed in this article. A social network site works very similar to social interacting one might do at a meeting, a bar, a club, a church or any event for that matter. Users or members introduce themselves with profiles, tell about their hobbies and interest and learn about others. Sites such as Myspace.com and Facebook.com are the most common of these sites where their users, people and businesses for example, create and maintain their own web page or profiles with ease. As someone builds their profile they are allowed to upload pictures, videos, personal information, and interest that allow them to personalize their profile. The ability to add pictures and video to a profile can be a very intriguing aspect for many users. Everything from mothers showing off family photos at the beach, to guys bragging about the new wheels they got for their car. The ability of these social networking sites to "shrink the world" is amazing; placing everyone around you just a mouse click away has forever changed the internet and the way we use it.

The two premier social networking sites, Myspace.com and Facebook.com have woven themselves into the very core of the current culture of America and the World. These sites have allowed many people to establish and keep a large peer group even though they may have never actually met many of the people face to face that they choose to keep corresponding and engaging in conversation with. These sites

2

expand the people users meet by being introduced to friends' friends, their friends' friends and their friends' friend's friends.   Myspace.com and Facebook.com have also allowed business the opportunity to advertise in a non intrusive fashion. Companies are creating customer loyalty with these sites, and the businesses have become friends of the users, just like an individual. Burger King and Chase are examples of two well known companies that use these sites for advertising. (Business Week, 2006) This has allowed Myspace.com to become one of the most successful web sites on the net today.   Yet Myspace.com is not alone many similar sites such as Facebook.com, Match.com, and even Youtube.com, have become a integral part of the net and that is largely in part due to the social networking ability they provide. The ease of communication with others, and the ability for a big business to work its self into the social lives of its customers, has made Social Networking sites a mainstay in the world as we know it. As the early business pioneers step into the new social arena, they are pushing themselves to redefine applications and advertising in way that could, over time, reshape much broader business arenas. (Hagel, 2008)

Social Network Sites are growing by leaps and bounds since their inception just a few short years ago. As people learn of the many uses of these sites and the ease of using them they are having a hard time not signing up themselves. Myspace.com has over 114.6 million visitors and Facebook.com has 123.9 million visitors and both are growing daily, thus it is hard to argue their incredible success. (Musgrove, 2008) The success of these sites has even garnered the interest of big investors like Bill Gates who have bought into Facebook.com. With the wind in their sails and the world at their feet, these sites have no clears signs of slowing down, and a bright prosperous future ahead of them.

Originally MySpace.com and Facebook.com were both created for students on college campuses to communicate with one another. As on campus popularity grew so did the outside interest in such sites. While many people think sites like MySpace.com and Facebook.com are primarily for teenagers and those in their younger twenties, the reality is the more and more people of many different age groups have become privy to the abilities of such sites. As many things in life have a "trickle down" effect that allows knowledge to be passed down to the younger generation, social networking sites have seem to created a "trickle up" effect. Where as the parents of children and students that have pages on these sites have learned there are many benefits to creating a page for themselves. Users 35 years and older account for more than one half of Facebook's daily visitors and are the network's most rapidly growing demographic. (Hagle, 2008) These sites have made it possible for people to prepare for a 10, 20, even 30 year class reunion without missing a beat or forgetting a unfamiliar face. That of course is probably of the least importance to the younger generations but as time pass, expect to see more and more of this world's older echelon taking on these sites with full force.

SOCIAL NETWORKING SITE AND HUMAN RESOURCE RECRUITING

Although many businesses are using social network sites for advertisement and communications, more and more businesses are now using social network sites for screening job applicants. Of the many businesses using social network sites, Human Resource Departments large and small have seen that the personal pages of these sites provide a plethora of information on awaiting applicants. Employers have begun, in large numbers, to screen applicants through various social networking sites. An article in HRfocus stated that in a recent survey by CareerBuilder.com, it was found that 20% of employers use Social Networking sites to research prospective applicants, this is up from just a mere 11% in 2006. Yet among the over 3,100 employers surveyed only 34% said that the content they discovered caused them to reject the potential applicant. In addition another 9% of those surveyed stated that they are not currently using social networking sites to screen potential applicants but plan on implementing such practices in the foreseeable future. (HR Focus, 2008) On the other side of the employment coin are the applicants. On

November 11, 2007, The News Tribune of Tacoma Washington, stated that 57% of people seeking employment chose to edit their profiles when they began seeking new employment. Another 28% of people surveyed stated that they believe that information on their profile would be detrimental to their being hired if a prospective employer were to see it. The article also states 75% of all people surveyed were fully aware that potential employers may chose to view their profile. (Musgrove, 2008) Social-networking sites give a glimpse into "the real person", said Randy Johnson, vice president of human resources for Noridian Mutual Insurance in Fargo. (Finneman, 2008) Employers are scanning the internet for any information on an applicant that could potentially damage a company's reputation. (Valle, 2008).

Applicants should always anticipate their sites will be reviewed by potential future employers. Students looking for jobs or applying for internships have more to worry about than perfecting their resume. Students are also being warned not to post anything on their sites that could make them look immature or irresponsible, such as posting pictures or comments about partying, drinking or sex. Article after article reminds us that information on the web "Is out there forever." (Wardle, 2007) Steve Rothberg said "I think of social networking sites much like a tattoo, it seems like a good idea at the time, but you have to live with it for the rest of your life." (Hancock, 2006:18) According to Gina Hernandez, pictures and comments posted on social-networking sites such as Facebook.com and MySpace.com can cost people their current or even future jobs. Lance J. Richards, global practice leader & consultant with Kelly Services says, "People need to think about the impact of anything they put on the web. If there's something you wouldn't want your parents to know about, by all means, don't do it" (Hernandez, 2007:49) This is a good rule of thumb when thinking about the repercussions of the information we post online.

Employers have many reasons for checking the profiles of prospective applicants. Robyn Greenspan, editor in chief with ExecuNet, said she has spoken with many job candidates who have lost out on employment opportunities because of what recruiters dug up online.(Baird, 2008) Many people let their guard down when it comes to building their profile. It almost as if they do not understand the ramifications that may occur if some information were to end up in the hand of their current employer or future potential employer. Acts such as use of illegal drugs, the participation in activities such as vandalism or robbery, the abuse of alcohol, outlandish photographs, and any other manner of incompetence and immaturity are regularly posted on users' profiles. To a potential employer this information is priceless. This information allows employers to weed out bad seeds early before they have the opportunity to infect the entire corporation. Extensive background checking affords employers the ability to find employees that fit into the business culture and that seem to fit the company's current structure.
 Collin Bannon's Facebook profile, includes disrespecting police and chasing pills and liquor. When he is asked about this he says, "I just kind of made it a joke." This is what can be so damaging to individuals. What seems to be cool at the time can ruin a persons chances later. Vonder Heide, a consultant for U.S. Trust in Greensboro reminds us that online perception can be reality for employers. (Jarboe, 2006) In other words, the information users put on their profiles will be taken serious by many of those perusing the site, and we are accountable for what we post.

The following is a chart of top areas for concern among these hiring managers according to a survey from careerbuilder.com: (HR Focus, 2008:9)

- 41% - candidate posted information about them drinking or using drugs
- 40% - candidate posted provocative or inappropriate photographs or information
- 29% - candidate had poor communication skills
- 28% - candidate bad-mouthed their previous company or fellow employee
- 27% - candidate lied about qualifications
- 22% - candidate used discriminatory remarks related to race, gender, religion, etc.

4

- 22% - candidate's screen name was unprofessional
- 21% - candidate was linked to criminal behavior
- 19% - candidate shared confidential information from previous employers

We must also not forget the information found on personal profiles can also be helpful when looking for a job. Sometimes the final decision to hire is determined from the site rather than the decision not to hire. Qualities such as good communication skills, organizational skills, professionalism, information about previous activities and club memberships as well as jobs recently held are common information that can be found on ones profile. Awareness of these things may entice an employer in to hiring someone just as the finding of the negative information may sway the employer against them. That proved to be the case for Jean Syverson, 42, principal of Grace Lutheran School in Fargo. She found positive information online about one job candidate and ended up hiring the teacher.(Finneman, 2008)

If we think about a possible scenario or two we can better see how social network sites can help job seekers. John graduates from college and spends most of his adult life participating and organizing humanitarian type projects, such as Habitat for Humanity.   Many of John's charitable contributions may not likely be part of the application process and his deep involvement is not always easily explained in a resume either. If a potential employer of John's were to visit his site, they would uncover this wonderful information about the candidate. They would also see pictures of John helping to repair and replace home in hurricane ravished cities. This may entice the employer into seeking John as an employee, because this type of person is great for the company, especially if they meet the job requirements. Qualities such as leadership and good ethics may not convey on the application in the same way as the social network site. All of this information is readily available on one's profile, and can allow an employer to really "get to know" John before he ever steps in the front door.

As a second scenario look at the example of an employer who has two great job candidates. Mary and Jane, both with great credentials and excellent interviews are up for hire in the marketplace. As an employer is reading their site profiles they will discover the very creative, full of color, and flashiness of Mary's site and the basic, yet professionalism of Jane's site. If the employer is a marketer or designer they may decide Mary is the best choice. If the employer is a major law firm, the firm may be likely to choose Jane because of the professionalism and less need of flare.

According to careerbuilder.com some social network site examples give the job seekers an edge over the competition by the following factors; (HR Focus, 2008:9)

- 48% - candidate's background supported their qualifications for the job
- 43% - candidate had great communication skills
- 40% - candidate was a good fit for the company's culture
- 36% - candidate's site conveyed a professional image
- 31% - candidate had great references posted about them by others
- 30% - candidate showed a wide range of interests
- 29% - candidate received awards and accolades
- 24% - candidate's profile was creative

As today's job market changes, and many companies choose to seek background information about potential employees through social networking site, personal privacy issues come into question. All Human Resource officers know there are certain questions that are off limits when reviewing a job applicants potential of being hired within an organization. (Reddin, 2008) Employers may want to consider the ethical and legal questions of looking at social-networking sites. (Finneman, 2008) Many parts of a person's personal life are exposed on social networking sites that normally are not privy to the

5

employer such as age, race, sexual orientation, religious affiliation, family life arrangements and disabilities. All of these things can be found on social network sites and may have an effect on the hiring decision if this information if exposed. For example, if an employer were to research a person's social networking profile and find out that the applicant had ten school age children, the employer may feel that the demands of such a large family may take away from the prospective applicant's ability to perform at the work place. If this information were to hinder an employee's ability to become employed, the potential employer may very well be in violation of laws. Employers' growing use of social networking sites such as MySpace.com and Facebook.com to scrutinize job applicants could lead to charge of employment discrimination and litigation, experts warn. (Greenwald, 2008)

There is no law preventing an employer from checking Web pages on social networking site, but the Equal Employment Opportunity Law sets ground rules for the hiring practices of employers. (Security Director's Report, 2006) An employer may not discriminate against any persons of a protected class. Title VII of the Civil Rights Act of 1964 prohibits discrimination against race, color, religion, sex, and national origin. The Americans with Disabilities Act of 1990 protect applicants with disabilities not be discriminated as well. The Age Discrimination in Employment Act of 1967 protects those applicants over the age of forty years old. (EEOC Laws, 2008) While it is easy for an employer to conduct themselves properly at the beginning of the application process, employers may choose to use a social profile site search as a way of finding out things they cannot legally ask during the application process. If an employer were to research an applicant's profile and find information that could cause concern for the employer, they may choose to pass on the applicant, thus potentially violating the EEOC laws. Using someone social networking profile may lead to conscious and unconscious discrimination of potential employees. Nevertheless, companies may need to consider putting this background checking policy in the company handbook. As with all personnel issues, human resource managers need to be consistent and document when handling background checks. If employers are going to use sites to investigate job applicants, it needs to be performed for "all" candidates, not just a selected few.

Many people feel that without specific policies being put into action, many employers will be left open to charges of discrimination, based on the information they retrieve off one's profile. Attorney Matthew S. Effland from Indianapolis says employers should have a policy in place that "details what the purpose of the Internet search is," and that specifically spells out that the firm does not base it decision on race, color or national origin. As stated in Business Insurance, "Looking someone up on the internet is not illegal because the internet is public property". (Greenwald, 2008) While this is true, the potential of using information improperly is still on the table for debate. For this reason there are employers who choose not to use social network sites when making decisions about job applicants. Donna Miller, Enterprise Rent-a Car's HR director, stated to People Management that using social networking sites to obtain information on job applicants is equal to "going into somebody's house and searching through their bedroom drawers." She feels the people's social networking profiles are personal and not appropriate for employers to use. She's said "I think alot of students use these sites to meet people and to share pictures with friends, and it is certainly not a way that people look for jobs."(Phillips, 2007:11) Some lawyers warn that using social networking sites to vet job candidates may hurt employers by turning off good candidates who don't want the company snooping on them without their consent. (Zeidner, 2007) Others may wonder what it is they have to hide.

The participation in Social networking sites can have many adverse affects on future employees. Outside of discrimination based on the EEOC law, it also can affect the overall view of ones future employee's views on a person as a whole. Many people boast about sexual conquest, estranged social ideas, show off pictures of tattoos, and even tend to bash previous employers. When a potential employer sees these thing it becomes easy for one to judge someone based on what they see on a person's profile. Many social networkers tend to be carefree and post readily on their profile with no regard to the potential of their information being found by the wrong person.

6

Besides the clear cut cases of someone posting inappropriate information on their profile there is also the potential for fraud against the person. With abundance of information available on the net it is easy for someone to create a fake profile using the information of another. For example a jaded lover, or a disgruntled co worker, could build a profile filling it with damning photographs, and misleading information. When an employer decides to pursue researching someone's social networking profile they may come across this "fake" profile, and be led to believe that the information on the profile is true and be turned away from accepting that person as a viable candidate. If the information an employer learns turns out to be false, and it relies on it in making a decision, the company is in danger of being sued, according to Tim Best, president of Arlington, Texas-based PreScreen America, Inc., a background investigating service. (Greenwald, 2008)

The potential for fraudulent and inaccurate information brings up the thought of the employer's obligations under the Fair Credit Reporting Act (FCRA). This act applies to a "consumer report" when selecting employees to hire, promote, reassign, or retain. The law defines "consumer report" as any communication by a "consumer reporting agency" bearing information on someone's creditworthiness, credit standing, credit capacity, character, reputation, personal characteristics, or mode of living.(Wright, 2001) The law goes on to say that employers cannot procure a consumer report without written documentation of the employer's intentions and written permission of the employee or applicant. In other words, it may be argued that employers have no right to view the social network site of employees or applicants without written consent and when information is found to be pertinent to a selection, the employer has the obligation to discuss the accuracy and explanation of the content. Sue Murphy, manager of N.H. National Human Resource Association says, "But where the liability starts to come into play is when people are making hiring decisions based on the information without coming back and talking to the applicant." She says "I think it is going to be tested in the courts."(Greenwald, 2008) Employers need to be very careful not to subject themselves to harm later. "Great care must be taken by employers who conduct Internet background investigations of potential employees not to violate the FCRA." (Holland, 2008:50) Employers need to be ever mindful that not necessarily is the information factual. (Bzdega, 2006)

Upon further review the terms and use of these popular sites emphasize they are not to be used for commercial use. Employers need to be aware of the terms and use advisory on these websites. (Maltby, 2008) If an employer should decide to create a profile on the site and then use this site for hiring selections the argument could be posed that they are using the site for commercial use which is a violation of the site. According to the Facebook.com terms and use section users agree when accepting the terms and services that "the Service and the Site are available for your personal, non-commercial use only" The site also warns against impersonating as it states not to use the site to "impersonate any person or entity, or falsely state or otherwise misrepresent yourself." (Facebook.com, 2008) Employers are taking great risk if they should present themselves on the sites under false identity. If the employers wish to use the public domain they should definitely not put themselves at risk or their company by posing as someone else. Employers must use caution because they may not be able to change their thoughts once they find information online. (Maltby, 2008)

IMPLICATIONS FOR JOB APPLICANTS

Job applicants should also beware of "Google" searches. There is a growing trend in the number of employers who are Googling candidates to research for additional information. (Huard. 2008) Googling is becoming a popular way to obtain information on potential employees. (Conlin, 2006) Google searches will bring up anything on an applicant that is in the public forum. The information can bring up

newspaper articles, memberships in groups, legal proceedings, and sometimes late payments to local, state and national governments. This kind of information may be embarrassing, but more importantly be damaging. The laws state that being charged for a crime is not committing a crime, so if you are not convicted this information does not have to be placed on job applications. But if an employer is snooping, they may very well find where the charges were brought and to their impression that may be all it takes to set aside the applicants file. Users may also not realize that the information they include on their websites may also be linked to a Google search. It would not be a bad idea for all of us to Google ourselves to see if any detrimental information should appear.

In Jason Hancock's article "Looking Deeper Online" he writes about a gentleman named Tien Nguyen who at age 22 had good credentials yet could not find a job. Everything about him looked good or so he thought until a friend suggested he Google himself. His search found a link to an article he had written a year earlier on how to cheat the system to make employers have a better impression of you and how to get away with it. "Overall, it was simply for humor," but if you were to Google his name this is what you would find. Nguyen immediately pulled the article from the Web and ironically two weeks later he was called for two interviews and offered a job with a Fortune 500 company. (Hancock, 2006)

John Kerzmann of Preference Personnel says "Whether it's right or wrong, people are going to go out there. Employers want to find out all the information they can about a person, just like employees want to find out everything they can about an employer." (Finneman, 2008)   MySpace.com themselves even remind the users of the potential risk of the social network site. The users are reminded in the safety tips and settings portion of the myspace.com website of the following: (MySpace.com, 2008)

- Don't forget that your profile and MySpace forums are public spaces
- People aren't always who they say they are
- Don't post anything that would embarrass you later. Think twice before posting a photo or information you wouldn't want your parents, potential employers, colleges or boss to see!

So is your career life over once you have posted information on your social network site? Experts say there are ways to clean up the "digital dirt".   The first steps are to remove pictures, content and links that could send out the wrong messages. Add to your profile accomplishments in the workplace and outside the workplace. If possible block comments from others and if not monitor those comments on a regular basis. Talk to your friends and ask that they do not post lewd photos or derogatory comments about you and others on your profile. Also if you have more than one social network site have consistent and matching information on both sites. Don't be Superman on Myspace.com and Batman on Facebook.com. It also important to not join groups that have ties to any beliefs or values you would not support publicly and in the workplace. If you are an animal rights activist there is nothing to be ashamed about, but be aware that applying for a job in a testing facility that works with animals in the testing lab, may prevent you from the hiring roster, especially if you post this online and more so if you have very strong opinions about the subject matter. It seems very awkward for the human resource manager to accept the fact that this would be a good candidate when the labs are constantly using animals to conduct research. Even if the candidate is not necessarily an animal rights activist but they may have friends and blogs on their profile of others who are. This too may hinder possible job offers at a plant such as this. The most obvious suggestion for cleaning up a profile is to go private, be discreet.   Myspace.com and Facebook.com allow the user to be private and no one can see their information except the guest they have invited or approved. In keeping with this, remember a person could pose as a friend; so be very careful.

In an article in the Charlotte Observer, Anandn Chauhan while looking for a new job has been "un-tagging" photos of himself on Facebook, including a shot from a Chapel Hill bar with just too many

plastic cups of beer in the frame. In the same article Ashley Dewitt a graphic designer "scoffs at post from old acquaintances depicting drinking and partying. She feels "It's like, aren't you a little old to be putting up stuff like that?" (Valle,2008) She doesn't want to be viewed as immature and childish. She, like many others, would like to be taken serious and respected by her business peers. Many like her feel this type of publicity would prevent her from gaining respect of her business associates. She constantly reviews her profile and keeps material of this nature off of her site.

Remember to Google yourself as you may be surprised at what is brought up. If you have concerns after Googling there are now companies who can clean up your dirt. Andy Beal, founder of a Raleigh-based online reputation management company, Trackur does just that. For a fee, Trakcur can cleanup your online act by keyword placement and linking. Reputation management companies say they can shift down the negative news, placing newer information at the top of a search. Beal reminds us that, "In their real-life world, they've corrected the situation, but it still lingers on Google and has a negative impact." (Caron, 2008) Unfortunately many fail to consider the information they post on the internet is often harder to remove than it is to remove a tattoo. (Holland, 2008) In article about cleaning up the web of damaging information, one author calls it your "Webutation." Another company, ReputationDefender.com, will scour the Internet for mentions of your name and then contact various sites to remove incriminating material. Fertik, CEO of ReputationDefender.com , reminds users, "There are two different things going on. One is stuff about you ends up on a Web site, and you don't like it. The other one is when you voluntarily put stuff up." (White, 2007)

CONCLUSION

All in all, social networking has forever changed the landscape of our world culture. It has provided people with ways to communicate and meet each other that just a few years ago would have been impossible. The incredible growth of these sites and the continuing loyalty of their users will assure these web sites a long and prosperous life. From time to time they will be put in the spot light and scrutinized for the way some people or businesses choose to use them, but over all their impact has done a great deal to bring us all a little closer together. Virtual communities are a way of life today, so users should not necessarily avoid being part of the communities; they should just make smart decisions when they are posting online. (Wagner, 2006)

For at least the next few years we will probably hear horror stories about how employers using social networking sites have discriminated potential employees and very few stories about how someone's profile helped to land them the job of their dreams. Let us not forget the way the world works; people talk about the bad and stifle the good. Social Network Sites have the same ability to help job applicants as they do to hurt job applicants. In the nature of this ever changing world it is those that do not embrace change that get left behind, the growth of these social networking sites has made a lasting impression on the work place as we know it. It is up to us to choose to use them wisely.

REFERENCES

[1]Baird, K. (2008, August 24). Digital dirt: What you post about yourself online could hurt you someday. *The Toledo Blade*. Retrieved from NewsBank.

[2]*Business Week* (2006). A guide to social networking: Tip sheet.
www.businessweek.com/technology/ceo_tipsheet/2006_5.htm (Accessed 22 November 2008).

[3]Bzdega, S. (2008). Recruiting socially. *Regional Business News, 26(37)*, 30-31.

9

[4]Caron, M. (2008). Searching for you – Know what your name reveals on search engines? That job recruiter does. *The Charlotte Observer.* Retrieved from NewsBank.

[5]Conlin, M. (2006) You are what you post. *Business Week, 3977,* 52-53

[6]The U.S. Equal Opportunity Commission (2004). Federal equal employment opportunity (EEO) laws. www.eeoc.gov/abouteeo/overview_ laws.html (Accessed 28 October 2008).

[7]Facebook (2008). *Terms of use.* www.facebook.com/terms.php (Accessed 22 November 2008)

[8]Finneman, T. (2008, March 2) Networkers warned of 'space' invaders. *Forum.* Retrieved from NewsBank.

[9]Greenwald, J. (2008). Web-based screening may lead to bias suits. *Business Insurance, 42(10)*, 1-6.

[10]Hagel, J. (2008). Life on the edge: Learning from facebook. *Business Week Online. 4/3/2008*, 14-14.

[11]Hancock, J. (2006). Looking deeper online. *Des Moines Business Record. 24(20),* 1-19

[12]Hernandex, G. M. (2008). More employers use the web to screen applicants. *Caribbean Business, 36(43)*. 48-49

[13]Social networks yield good & bad input for hiring. (2008, November). *HR Focus*, *85(11)*. 1-2.

[14]Using social networking sites for recruitment: Pros & cons. (2007, April). *HR Focus, 84(4)*. 8-9.

[15]Huard, P. (2008). Clean up your act online or risk a bad review from HR screeners. *California Job Journal, 26(1135),* 1-17.

[16]Holland, P. L. (2008). Job-candidate selection and the internet. *Business North Carolina, 28(6),* 50-51.

[17]Jarboe, M. (2006, August 27). Job hunters, what's in your online profile?? *Greensboro News & Record*. Retrieved form NewsBank.

[18]Maltby, K. (2008). Don't get caught in the web. *Business West, 24(19),* 33-58.

[19]Pitfalls of checking job applicants' personal web pages. (2006, October). *Managing Accounts Payable, 6(10),* 4-6.

[20]Musgrove, M. (2008). Facebook passes myspace with global boost. *The Washington Post.* Retrieved from NewsBank.

[21]MySpace (2008). *General Tips.* www.myspace.com/index.cfm?fuseaction=cms.viewpage&placement=safety_pagetips (Accessed 22 November 2008).

[22]Phillips, L. (2007). MySpace, not your space, firms told. *People Management, 13(15)*, 11.

[23]Reddin, N. (2007). MySpace makes hiring process trickier. *Des Moines Business Record, 27(35),* 34.

[24]Reddin, N. (2008). Stop crowding myspace, would you? *Des Moines Business Record, 26(4),* 28.

[25]Myspace check: Can you go beyond the suit and firm handshake? (2006, November). *Security Director's Report, 6(11),* 8-9.

[26]Valle, K., (2008, November 16). Bosses checking up on workers via facebook – profiles full of wild party pics and offensive talk might just put you out of the running for that promotion. *The Charlotte Observer.* Retrieved from NewsBank.

[27]Wagner, C.G. (2006). Blabbing on your blog. *Futurist, 40(4),* 7.

[28]Wardle, L. (2007). Job-seekers advised to keep internet profile clean. *Standard-Examiner, 2/01/2007.*

[29]White, E. (2007) What's your webutation?: What you do online may affect your carreer opportunities. *Arizona Daily Star, 1-09-2007.*

[30]Wright, T.B. (2001) Employers' FCRA obligations. *Credit Union Magazine, 67(1),* 69.

[31]Zeidener, R. (2007). How deep can you probe? *HRMagazine, 52(10),* 57-62.

Personalized Stress Management:
A Tool for Organizational Wellness

Meeting – **Southeast INFORMs**
Track - **Graduate Student Paper Competition**

Abstract

The number of wellness programs offered by organizations is growing each day and most of them include stress management objectives. Thus, enhancing the effectiveness of coping with job stress is an increasingly important strategic objective for organizations who wish to maintain their competitive advantage. Following some compilation of background work done on stress and coping, an argument is made supporting the recent paradigm shift that favors an individualized rather than general approach to stress and coping. Specifically advocated is the use of critical incident analysis when it comes to identifying stressors that plague the workforce and cognitive behavioral therapy as an effective coping measure.

Introduction

In today's world, longer working hours and increased job pressures are common occurrences. Employees encounter a variety of complex challenges as they struggle to meet the demands of the modern workplace. In a technologically advanced, global marketplace, traditional nine-to-five schedules have fallen by the wayside. The introduction of cell phones, pagers, laptops and emails are making it harder for workers to draw boundaries physically and psychologically between their work and family life (Mesmer-Magnus & Viswesvaran 2006). This leads to increased stress, which takes its toll on employee health and well-being.

As a response to the increased job pressures and stress, organizations are increasing their focus on the preventive or wellness approach toward employee health. One way of defining health is to say it is the absence of disease. A more informative definition of health is to represent it as "a state of physical, mental and social well-being" (Gordon & Henifin, 1981). An employee's health can therefore be harmed not through just disease and accidents, but also by stress (Ryan & Watson, 2004). Managers now realize that they must be concerned with all aspects of employee health, including their psychological well-being.

Job related stress has been associated with a vast array of diseases, such as coronary heart disease, hypertension, peptic ulcers, colitis and various psychological problems including anxiety and depression. Research has shown that stress has a direct effect on the endocrine system, the cardiovascular system, the muscular system and emotions (Levi, Sauter & Shimomitsu, 1999).

While changes in the work environment are often inevitable, managers often underestimate how easily these changes can throw a person off kilter. Psychologists refer to people who are not comfortable with their work environment to be in a state of disequilibrium. This occurs when a person's skills, abilities, and goals do not fit with the work environment such as the boss, co-workers, compensation systems etc. Lack of fit between the person and the environment can have results on several levels: subjective (feeling fatigue), behavioral (accident-proneness), cognitive (a mental block), physiological (elevated blood pressure), and organizational (higher absence rate) (Bunce & West, 1996). Some of the costs to organizations include higher rates of accidents, performance inefficiencies, increased turnover and increased disability payments. (Burke 2000).

Over the last 15 years, researchers have observed that preventable illness makes up 70% or more of the total cost of health care (Fries et al, 1993). Preventable illnesses often result when individuals do not adequately address modifiable health risk factors such as nutrition, weight control, physical activity, cholesterol levels, blood pressure, tobacco use, safety and mental well-being.

Health and wellness promotion programs in organizations seek to reduce these risk factors by promoting healthy lifestyle choices and discouraging behaviors and attitudes that are detrimental to good health. If the current health trends in the U.S. population continue, we will see dramatic increases in serious health problems and early mortality due to stress related preventable conditions such as diabetes and heart disease. At the same time, the employer-based health funding mechanism is already approaching the breaking point, with some employers recognizing that their global competitiveness will be in jeopardy unless sufficient steps are taken to curb rapidly escalating health care costs (Hall, 2008).

Several 2007 surveys of mid-to-large sized employers report that 77% to 89% offer wellness programs (ERISA committee 2007; Hewitt Associates, 2007). Wellness programs seem to be an amazing countertrend in American businesses. While pundits talk about declining employer/employee loyalty, the growing employer interest in the wellness and health of their employees expresses the opposite. Even as health care costs continue to increase, businesses are spending large amounts on wellness programs for their employees and promoting it as part of their corporate culture (Fitch & Pyenson, 2008).

The American institute of Stress estimates that stress costs workers between $200 billion and $300 billion a year in increased workers' compensation claims, lost productivity, higher health care costs, and turnover (Ivancevich, 2007).

For the various reasons described above, an organization's success and competitiveness depends in large part on its willingness to view wellness and stress management as part of its strategic objectives.

The purpose of this paper is to establish that wellness objectives for any organization are closely tied to the effectiveness of its stress management programs. Some background on existing job-stress theories is presented along with modern day suggestions for their modification to today's changing workplace.

Background

There has been extensive research on the subject of job-stress. However, when reviewing the literature, one finds a lack of consensus in many areas. Perhaps this is warranted due to the highly individualized and perception based nature of stress. Generally speaking, the literature focuses on two areas 1) stress and its causes, often known as stressors and 2) coping, which is a behavioral response to the stressor. Hence, stress and coping are terms that are often used in tandem.

Stress definitions and concepts

Stress is the way we react physically and emotionally to demands. That there are no universally accepted definitions of stress reveals not only the complexity of the construct but also the limitations to research in the field. Although many definitions of stress exist, one of the more widely accepted ones considers it to be an affective state that occurs in response to perceived demands or threats in the environment with which one feels unable to cope (Lazarus & Folkman, 1984; Selye, 1975). Here the physical and psychological signs and symptoms often associated with prolonged exposure to stressful states are referred to as strain (Fox et al., 1993). This distinction helps to clarify why states of stress are not always associated with illness; moreover, the definition emphasizes the important role of coping in the management of stress.

Stress can also be seen as a person-environment relationship (Folkman, 1984; Lazarus, 1966). Stress is a process, a sequence of events that will lead to a particular end. According to McGrath (1970), stress is the result of an imbalance between the physical or psychological demands encountered and the response capability of the individual, more so in cases where failure to meet the demands has important implications for the individual.

Brewer (1995) suggests that two powerful conditions affect the level of stress. If the outcome is important, stress will increase and if the outcome is important and uncertain, stress will further

4

increase. We must recognize that stress is unavoidable and is an unpleasant fact. A certain level of stress, often known as eustress may actually improve performance and decision-making. For example, the importance and uncertainty of the results of a test may cause the student to study more and learn the material. However, when stress becomes too much, it is termed to be dysfunctional, resulting in poor performance and deteriorated decision-making. This type of stress is commonly called distress.

A state of work-related stress is characterized by various complaints, which can be clustered into distress complaints and burnout complaints (Lindblom et al, 2006). Distress complaints predominantly consist of symptoms of anxiety and depression (Lindblom et al, 2006). Burnout complaints are commonly described in three dimensions, comprising emotional exhaustion, a distant and cynical attitude toward work, and self-perceived diminished competence to fulfill the demands posed by the job (Maslach, Schaufeli, & Leiter, 2001). Burnout complaints are explicitly linked to work.

An influential theory in the field of stress and health is the transactional theory of Lazarus and Folkman (1987). This theory states that an individual's reaction to the environment is mediated by (a) the subjective evaluation (i.e., appraisal) of the environment, and (b) the process of coping with a stressful appraised event. Appraisals of situations and coping behavior are influenced by personal characteristics, such as personality, social skills, and problem-solving skills. According to this theory, prolonged duration of the stressful experience leads to exaggerated affective, cognitive, physiological, and behavioral responses. Consequently, complaints (e.g., psychosomatic and psychological distress) and impaired functioning (e.g., absenteeism) develop (Lazarus & Folkman, 1987).

We generally tend to respond to stress in one of three ways, avoidance, resistance, or confrontation/adaptation (Xie & Johns, 1995). The effects of stress can be viewed in three different ways: physiological, psychological and behavioral. Physiological stress means that no matter how hard we try, we cannot keep stress locked inside or ignore it. Doctors estimate 75% of all medical complaints to be stress related (Brewer, 1995). Psychological stress is caused in the work force due to factors such as undefined job responsibilities, lack of recognition, boredom due to one's skills not being utilized and lack of priorities. Its effects are seen through tension, anxiety, fear, irritability, poor work performance and procrastination. Behaviorally related stress includes changes in productivity, absenteeism, and turnover. Individual reaction to behavioral stress could show up as changes in eating habits, increased smoking or alcohol consumption, hurried speech, nervousness and sleep disorders.

Coping with stress

Thirty years of systematic study have generated a substantial body of evidence on factors that contribute to stress—the 'sources' of stress. Much less is known, however, about how individuals deal with or manage the stress they experience, and about effective methods of coping with work-related stress.

Despite numerous efforts to examine coping strategies, our understanding of the stress-coping process remains incomplete (Edwards, 1988). Lack of effective stress management may lead to significant decrements in well-being, dissatisfaction, feelings of disengagement from the job, and reduced job performance. Prolonged maladaptive coping may ultimately induce a chronic, highly debilitating form of stress known as burnout. There is general agreement that coping forms part of the person-environment transaction, which occurs when an individual perceives a situation as stressful. Dewe and his colleagues have described coping as cognitions and

5

behaviors adopted by the individual following the recognition of a stressful encounter, that are in some way designed to deal with that encounter or its consequences (Dewe, Cox & Ferguson, 1993). Lack of understanding the coping phenomenon is also due to the various techniques used to measure coping.

Coping is defined as efforts to manage demands, conflicts, and pressures that severely drain, or exceed, a person's resources (Lazarus & Folkman, 1984). Lazarus and Folkman (1984) identified two broad categories of coping viz. emotion based coping and problem focused coping.

Emotion-focused coping methods involve attempting to reduce the symptoms of stress. Emotion-focused coping is also known as avoidance coping (Roth & Cohen, 1986), although it should be acknowledged that the two terms have been used to refer to a wide range of coping behaviors (Scheier, Weintraub, & Carver, 1986). Emotion-focused coping is considered an appropriate response to a stressor (a situation or event causing stress) that is short term or cannot be changed (Lazarus & Folkman, 1984). However, stress and strain often arise because of long-term social or environmental factors such as work demands (Karasek, 1979) for which emotion-focused coping would be less effective. As a result, regular use of emotion-focused coping has been associated with greater risk of psychological and physical problems than has problem focused coping (Scheier et al., 1986; Snow et al 2003; Soderstrom et al 2000). Problem focused coping methods involve attempting to change or eliminate stressors or their effects. In theory, someone could use both coping strategies, but some research has suggested that using emotion focused coping impedes the use of problem-focused coping (Scheier et al., 1986). It is perhaps for this reason that most stress management interventions (SMIs) focus on only one of these two approaches.

There are three types of interventions when it comes to coping techniques. (Murphy, 1988; Sidle, 2008). Primary level interventions are concerned with modifying or eliminating the source of stress (stressors) inherent in the workplace in order to adapt the environment to better fit the individual. Primary interventions involve changes such as redesigning jobs to give employees greater flexibility or more decision control. Secondary interventions focus on the individual and are concerned with increasing awareness and extending the physical and psychological resources of employees to enable them to minimize the damaging effects of stress and manage stress more effectively. They help employees better recognize and manage stress symptoms as they occur. Examples of secondary interventions include relaxation techniques, meditation, time management and cognitive behavioral therapy. Finally, tertiary interventions are designed to help employees recover from stressful events. Tertiary interventions are frequently related to coping from a one-time significant stress-causing event. Their role is recuperative rather than preventive. An example would be a company's employee assistance program offering help to an employee who had to deal with a house fire.

In the analysis section, support for the critical incident method for evaluating coping techniques is extended and the use of CBT is advocated as an effective coping intervention. Closely tied to CBT, we introduce the many advantages of higher levels of emotional intelligence (EI) in coping with job-stress.

Personalized Stress Management

The ultimate goal of studying stress and its organizational effect is to come up with solutions that deal with removing the source (the stressor) and/or provide employees with effective coping techniques for those stressors that are difficult or sometimes even impossible to eliminate. Both

of these goals are complimentary and not mutually exclusive. Whether one approach is better than the other really depends on the situation. It is generally accepted that removal of the stressor, though it appeals to a higher purpose, is often not possible. The issue of stressor removal is further complicated by perception i.e. what is a stressor for one person is not necessarily a stressor for another.

Hence, the focus is generally on stress response and coping. The research on coping is taking a more holistic turn, in that it answers the question as to how organizations can better understand each employee and what stresses affect him or her. Then, coping techniques are sought and applied in a personalized manner to each individual situation. Such an approach while recommended often comes with a significant cost in terms of time and expense for the company. Hence, from the point of view of employee welfare alone, this is not something that most corporations will pursue. The main goal of organizations is maximizing shareholder value and minimizing costs. The shift will only occur when corporations recognize that there is indeed an increase in the performance and output of workers who have lower stress levels. This realization has been slow but it certainly exists as evidenced by the vast increase in wellness programs incorporated by companies in recent years.

It is important to understand two things when it comes to stress management. One, there is no single coping technique that can be applied to everyone because each person reacts differently to stress and therefore copes in a different way. Second, the techniques for coping are evolving with the change in times. Today's workplace is very different from what it was a few decades ago. Factors such as globalization, increased demands from workers in terms of skill sets and productivity have lead to a new set of stressors that did not really exist in the past. Thus, it is important to continually evolve the coping techniques and align them with the new set of problems.

In this section, we focus on the importance of improved evaluation of coping techniques using Critical Incident Analysis and then focus on Cognitive Behavioral Therapy as a personalized coping technique. We also take a brief look at the role of emotional intelligence as an aid to coping with job-stress.

Evaluating coping behaviors through critical incident analysis

Effective evaluation of coping techniques is crucial to learning how to deal with stress. Most of the coping techniques used so far rely heavily on deductive inferences based on existing research and literature. In contrast, a more effective manner is gathering data on coping techniques using induction. Inductive techniques make no assumptions about how individuals might respond in specific situations and therefore have ecological validity. As a consequence, this avoids placing any restriction on the types of behaviors which individuals may report during stressful events   Another improvement can be achieved by the use of elicited over predetermined stressors. Predetermined stressors involve general factors such as role demands, human resource practices, or job conflicts whereas with elicit stressors respondents actually identify stressful experiences that they have confronted themselves. This leads to responses that are more valid as they are specific and of importance to the people questioned (O'Driscoll & Cooper 1994).

As a result, the Critical Incident Analysis (CIA) method for understanding the coping process is recommended. CIA entails asking individuals to describe stressful transactions in terms of three elements:

7

(i) The antecedents or circumstances in which the stress occurred: Here individuals are asked to think of situations that have had a disruptive effect on their work or created undue pressures for them. We avoid the use of the word "stress" in framing the question as this may predispose respondents to only think of situations where they did not effectively cope, hence limiting the opportunity to explore effective coping behaviors.

(ii) Their responses in that situation, along with the responses of other people: Here we ask individuals to describe specific behaviors that they exhibited when confronted by each disruption. It is important here to focus on the description of behaviors and not an evaluation of whether particular responses were effective in helping the individual to cope.

(iii) The consequences of both their own and others behavior: here we focus on two sets of questions. The first descriptive question asks, "What happened as a result of what you did?" and the second on evaluation of the outcomes to gauge the effectiveness of the coping behavior through the question, "How did you feel about what happened?"

Critical incident analysis offers several advantages in the study of stress-coping strategies, the most obvious being the ecological validity of information about individuals' responses in specific situations. Secondly, CIA ensures a more accurate portrayal of the specific behaviors that individuals display in response to stressful events. The information generated from critical incident analysis of coping provides a more comprehensive framework for examining the relationship between behaviors and the environments in which they occur. Finally, this approach enables a closer examination of the outcomes of situationally specific coping behaviors. Rather than asking global questions about coping effectiveness, CIA probes the specific consequences for individuals of their responses, along with their evaluation of the outcomes of those responses.

Cognitive behavioral treatment as a stress management intervention

Cognitive-behavioral treatment (CBT) was frequently used for the treatment of psychopathology and has only recently been used for treating work related stress. This makes sense because the psychiatric disorders such as mood and anxiety disorders bear similarities to those with work related stress complaints. The primary goal of CBT for work-related stress is to increase an individual's skills (i.e. to equip patients to cope more effectively with difficult work conditions and demands). These interventions typically consist of psycho-education, analysis of individual responses and cognitive restructuring (Ivancevich et al 1990; Jones & Johnston, 2000).

Cognitive-behavioral approaches are secondary interventions that help employees rethink their beliefs about challenging situations. Specifically, individuals learn to recognize how their pessimistic and often distorted thoughts of gloom and doom lead to stress. Next, they learn to replace their overly pessimistic thinking with more realistic or more optimistic thinking (Sidle, 2008).

Cognitive restructuring techniques and social and coping skills training are explicitly aimed at changing appraisals of threats by enhancing both the quality and quantity of individual coping skills.

It has been seen that CBT is perhaps the most promising approach for coping with job related stress. However, there are often cost considerations involved when an organization chooses between various intervention techniques. Techniques such as relaxation are much easier and

cost effective to implement, often involving a step as simple and giving an employee a DVD. CBT based techniques however, are more expensive as they involve hiring a professional for a group or private session.

However, while relaxation approaches may help people feel calmer, they do not change how people view stress in their lives. They are mainly focused on symptom control. On the other hand, cognitive-behavioral interventions encourage people to actively change the way they think and behave in stressful situations. This allows people to deal with stress head-on and try to actually solve problems rather than just passively coping with them— result being sustainable lower stress level.

Organizations may be tempted to use a hybrid approach to stress management i.e. they may want to combine methods such as relaxation techniques and CBT. It is interesting to note that this is not a recommended approach. Research shows that more resource-intensive techniques such as cognitive-behavioral skills training tend to be *less* effective when bundled with other approaches (Richardson and Rothstein, 2008). While the reason for this is not fully understood, it is probable that the cause lies in the different ways that these secondary intervention techniques work. The non-CBT techniques simply allow for stress reduction while they are actively pursued and in some cases for a short time thereafter. However, every time an individual encounters the same problem, he or she still feels the same stress. The only difference is that the individual now has is a technique that will alleviate the symptoms of stress temporarily. This does little good in the long run as it does not offer a comprehensive solution. CBT approaches on the other hand work with the assumption that stressful situations are a constant in the workplace and that the best approach is that we actually change our response to them. The process of reaching the required level of internal cognitive change might initially even result in a feeling of increased perceived stress as the tools for pure symptom control are discarded. A combination of CBT and non-CBT techniques therefore could lead to dissonance as they work in different ways to tackle the problem of job stress.

It is seen that CBT results in a reduction of complaints in groups with lower level of stress-induced depressive complains (de Vente et al 2008). More specifically, cognitive behavioral interventions for work-related stress have been shown successful at achieving increased well-being in the short-run (de Jong & Emmelkamp, 2000; van Dierendonck et al 1998) and long-run (de Jong & Emmelkamp, 2000).

Role of emotional intelligence (EI) in stress management

Recently, there has been a growing awareness concerning the role of emotional intelligence (EI) in stress management. EI is the ability, capacity and skills to identify, assess, and manage the emotions of one's self and of others (Bradberry & Greaves, 2005). Salovey and Mayer (1990) defined EI as: "the verbal and non-verbal appraisal and expression of emotion, the regulation of emotion in the self and others, and the utilization of emotional content in problem solving." Studies show that improved emotional intelligence correlates to more effective stress management. There are major individual differences in coping with stressful situations. The same situation may be highly stressful for one individual while, for another, it may not be stressful at all. EI can come to our rescue in potentially stressful situations by empowering us to respond effectively, so as to eliminate the perceived stress or reduce its harmful consequences to the minimum. Regarding the relationship between EI and stress, Goleman (2001) found that the emotionally competent individual would encounter significantly less perceived stress than the emotionally incompetent. We can see CBT as an effective tool to developing emotional intelligence as it focuses on trying to change the perception people have about stress.

With higher levels of EI, there is better psychological adaptation. This results in lower anxiety, enhanced confidence, and reduced susceptibility to stressful situations. It is also apparent that those who are high on EI tend to become more committed towards their work. This commitment is experienced in the form of achieving targets, having a good rapport with their colleagues in the work set-up, regular attendance, and active participation in day-to-day life activities (Panda 2008).

The future

A majority of the new research suggests that we treat stress as an individual problem rather than a general one. The same applies for coping techniques. Research is showing us that there really is not any panacea when it comes to coping with work related stress. Though difficult and expensive, personalized interventions seem to give better and long-term results when compared to general approaches.

Research shows promising trends on how the effectiveness of coping techniques is evaluated. Using critical incident analysis as a base, a need exists to arrive at effective implementation of such techniques in the workplace. HR departments need to be active in identifying internal training needs and when needed hire external consultants to ensure that they are gathering the right type of data when evaluating the effectiveness of coping techniques used by their employees.

Recent advances in actual coping techniques point towards further exploration of the cognitive behavioral approach. HR departments would do best to recognize the effectiveness of such therapy and implement it. Cost considerations are always an issue but these could be minimized by using group CBT sessions. Organizations should realize that popular techniques such as relaxation are perhaps too generalized and offer limited relief and invest in higher cost interventions.

Training of managers should also focus on emotional intelligence. Through emotional intelligence, one is able to understand oneself better, which leads to a better understanding of people and situations around us. It is also a good tool as it helps with perceptive issues that are often a large contributor to job-stress. Continued research in this area is needed to see what types of stressors are more effectively combated by high emotional intelligence. Research on which techniques are more useful in increasing emotional intelligence of managers would also be of much help.

Summary and Closing Comments

There is overwhelming evidence that more organizations are continuing to incorporate employee wellness and stress management objectives as part of their strategic objectives. Employers recognize the tangible and intangible benefits of an employee who perceives himself in a state of "well-being" over one that does not.

Effective stress management is the key to an effective wellness plan for any organization. When carefully analyzed, one observes that most wellness objectives consciously or sub-consciously aim at lowering stress levels and/or offer coping techniques.

The field of stress management and coping is a highly complex one due to the various subjective effects (e.g. each person is unique and views and responds to stressors differently).

The issue of stress and coping is further complicated due to its dynamic nature. As the world around us continues to change at a rapid pace, there is a continuous evolution of thought patterns and perceptions of both individuals and organizations. This introduces new stressors on a continuous basis, ones that need to be dealt with quickly and effectively.

An important change that is beginning to occur involves using critical incident analysis for understanding what causes job related stress in employees. Simply put, this means that because stress is a phenomenon that is specific to each individual, the way data is gathered to understand the problem should also be from an individual source and not from general literature. While this is not a technique that helps reduce stress or helps with coping, it is part of understanding the problem better. Understanding the problem well and having relevant data is perhaps the most important step in developing effective coping techniques.

Focusing on effective coping leads us to research that shows how CBT can be an effective tool for stress management. This technique offers more than traditional coping techniques such as relaxation, which merely suppress the symptoms induced by high stress. CBT is a personalized technique, which aids the employee to rethink his belief about a stressful situation. Again, the focus here is based on seeing the problem as being unique to the employee. This allows for specific individualized coping techniques, which lead to results that are more effective in the long term.

Emotional Intelligence, while a stand-alone topic in its own right can be viewed as something that is enhanced through CBT. Developing EI allows employees to adapt much better to stressful situations and reduces the harmful effects of stress by allowing for a better perspective on the situation. While some people naturally have higher emotional intelligence, this is another area where progress can be made through training.

To summarize, it appears that HR departments in organizations need to move away from overly general approaches to stress management and focus on individual methods. While these techniques are more expensive, their tendency for permanent effectiveness in terms of employee well-being would more than compensate the cost of their implementation. At the same time, research should continue to develop these techniques to be more efficient and cost-effective.

Ideally, there should be a symbiotic relationship between both academia and industry leading to increased collaboration on the subject of stress management. It is only the continual efforts of both groups that will lead to advances in this often neglected area of human resource management.

References

Bradberry, T. and Greaves, J. (2005). *The Emotional Intelligence Quick Book.* New York: Simon and Schuster.

Brewer, K.C. (1995). *Managing Stress.* American Media Publishing, West Des Moines, IA, p.10.

Bunce, D. & West, M.A. (1996). Stress Management and Innovation Interventions at Work. *Human Relations*, pp 209-232.

Burke R. J. (2000). Workaholism in Organizations: Psychological and Physical Well Being Consequences, *Stress Medicine*, pp 11-16.

de Jong G. M. & Emmelkamp P. M. G. (2000). Implementing stress management training: Comparative trainer effectiveness, *Journal of Occupational Health Psychology*, 5, pp 309–320.

de Vente W., Kamphuis J. H., Emmelkamp P. & Blonk R. (2008). Individual and Group Cognitive-Behavioral Treatment for Work-Related Stress Complaints and Sickness Absence: A Randomized Controlled Trial, *Journal of Occupational Health Psychology*, Vol. 13, No. 3, pp 214–231.

Dewe P., Cox T., & Ferguson E. (1993). Individual strategies for coping with stress at work: A review, *Work and Stress, 7,* pp 5-15.

Edwards J. (1988). The determinants and consequences of coping with stress. In C. Cooper & R. Payne (Eds), *Causes, Coping and Consequences of Stress at Work,* pp. 233-263.

ERISA Industry Committee (2007). National Association of Manufacturers; Incent One, Employee Health and Productivity Management programs: The Use of Incentives, a survey of major US employers.

Fitch K. & Pyenson B. (2008). Taking Stock of Wellness, *Benefits Quarterly*, Second Quarter 2008.

Folkman S. (1984). Personal Control and Stress and Coping Processes: A Theoretical Analysis, *Journal of Personality and Social Psychology*, Vol. 46, pp. 839-852.

Fox M. L., Dwyer D. J. & Ganster D. C. (1993). Effects of stressful job demands and control on physiological and attitudinal outcomes in a hospital setting, *Academy of Management Journal,* 36, pp 289–318.

Fries J., Koop C. E., Beadle C. E. et al (1993). Reducing Health Care Costs by Reducing the Need and Demand for Medical Services, *The New England Journal of Medicine,* 329, pp 321-325.

Goleman D. (2001). An EI–Based Theory of Performance, in Cherniss Carry and Daniel Goleman (Eds.), *The Emotionally Intelligent Workplace, Consortium for Research on Emotional Intelligence in Organizations*; www.ciconsortium.org

Gordon G. C. & Henifin M. S. (1981). Health and Safety, Job Stress, and Shift Work, in H. Metzer and Walter R. Nords (Eds.), *Making Organizations Human and Productive* (New York: Wiley), p.322.

Hall B. (2008). Health Incentives: The Science and Art of Motivating Healthy Behaviors, *Benefits Quarterly,* Second Quarter 2008.

Hewitt Associates L.L.C. (2007). *The Road Ahead: Emerging Health Trends.*

Ivancevich J. (2007). *Human Resource Management*, 10th edition" McGraw-Hill Publishing Co. p 562.

Ivancevich, J.M., Matteson, M.T., Freedman, S.M. & Philips, J.S. (1990). Worksite stress management interventions, *American Psychologist*, 45, pp 252-261.

Jones, M.C. & Johnston, D.W. (2000). Evaluating the impact of a worksite stress-management programme for distresses student nurses: A randomized controlled trial, Psychology *and Health*, 15, 689-706.

Karasek R. A. (1979). Job demands, job decision latitude and mental strain: Implications for job redesign, *Administrative Science Quarterly,* 24, pp 285–307.

Lazarus R. S. (1966). *Psychological Stress and the Coping Process*, McGraw-Hill, New York.

Lazarus R. S. & Folkman S. (1984). *Stress, appraisal, and coping* New York: Springer.

Lazarus R. S. & Folkman S. (1987). Transactional Theory and research on emotions and coping, *European Journal of Personality*,1, pp 141–169.

Levi L., Sauter S., & Shimomitsu T. (1999). Work Related Stress - It's Time to Act, *Journal of Occupational Health Psychology*, pp 394-396.

Lindblom K. M., Linton S. J., Fedeli C., & Bryngelsson I. L. (2006). Burnout in the working population: Relations to psychosocial work-factors, *International Journal of Behavioral Medicine*, 13, pp 51–59.

Maslach C., Schaufeli W. B., & Leiter M. P. (2001). Job burnout, *Annual Review of Psychology, 52,* pp 397–422.

McGrath J. E. (1970). Major Methodological Issues, in McGrath J. E. (Ed.), *Social and Psychological Factors in Stress,* pp 19-49.

Mesmer-Magnus J. R. & Viswesvaran C. (2006). How Family-Friendly Work Environments Affect Work/Family Conflict: A Meta-Analytical Examination, *Journal of Labor Research*, Volume XXVII, Number 4, Fall 2006.

Murphy, L.R. (1988). Workplace interventions for stress reduction and prevention. In C.L. Cooper, and R. Payne (eds) *Causing Coping and Consequences of Stress at Work,* pp 301-331, Chichester and New York: Wiley.

O'Driscoll, M. P. & Cooper, C.L. (1994). Coping with work-related stress: A critique of existing measures and proposal for an alternative methodology, *Journal of Occupational and Organizational Psychology,* 67, pp 343-354

Panda, Y. (2008). Emotional Intelligence and Perceived Stress, *The Icfai University Journal of Organizational Behavior,* Vol. VII, No. 3 pp 13-16.

Richardson K. M. & Rothstein H. R. (2008). Effects of occupational stress management intervention programs: A meta-analysis, *Journal of Occupational Health Psychology, 13*(1), pp 69–93.

Roth S. & Cohen L. J. (1986). Approach, avoidance, and coping with stress, *American Psychologist,* 41, pp 813–819.

Ryan D. & Watson R. (2004). A Healthier Future, *Occupational Health*, Vol. 56, Issue 7, pp 20-25.

Salovey P. and Mayer J. D. (1990). Emotional Intelligence, *Imagination, Cognition and Personality*, Vol. 9, pp 185-211.

Scheier M. F., Weintraub J. K. & Carver C. S. (1986). Coping with stress: Divergent strategies of optimists and pessimists, *Journal of Personality and Social Psychology*, 51, pp 1257–1264.

Selye H. (1975). Confusion and controversy in the stress field, *Journal of Human Stress,* 1(2), pp 37–44.

Sidle S. (2008). Workplace Stress Management Interventions: What Works Best? *Research Briefs, Academy of Management Perspectives,* Aug 2008, pp 111-112.

Snow D. D., Swan S. C., Raghavan C., Connell C. M. & Klein I. (2003). The relationship of work stressors, coping and social support to psychological symptoms among female secretarial employees, *Work and Stress,* 17*,* pp 241–263.

Soderstrom M., Dolbier C., Leiferman J. & Steinhardt M. (2000). The relationship of hardiness, coping strategies and perceived stress to symptoms of illness, *Journal of Behavioral Medicine,* 23*,* pp 311–328.

van Dierendonck D., Schaufeli W. B., & Buunk B. P. (1998). The evaluation of an individual burnout program: The role of inequity and social support, *Journal of Applied Psychology,* 83*,* pp 392–407.

Xie J. L. & Johns G. (1995). Job Scope and Stress: Can Job Scope be Too High? *Academy of Management Journal*, October 1995, pp 1288-1309.

TRANSACTIONAL COST ECONOMICS: A MODEL FOR EVALUATING THE FEASIBILITY OF OUTSOURCING IN THE SERVICES INDUSTRY

Hongwei Song, MBA Student, University of North Carolina at Pembroke hs0012@uncp.edu

ABSTRACT

Services based outsourcing continues to be a growing trend for US companies. At such a juncture, there is a tendency for companies to pursue this strategy without careful evaluation of the costs and risks involved. The evaluation of the cost-benefit analysis is crucial before making a decision as to whether one should outsource or not. Transactional Cost Economics (TCE) is one model that has relevant applications to both manufacturing and services based outsourcing. The findings show that the model can be used as an effective cost comparison tool between various alternatives. In terms of risk management, TCE is useful when evaluating vendors and the types of relationships that companies need to maintain with them if they wish to succeed at outsourcing.

INTRODUCTION

Global outsourcing is defined as the right mix of onshore, near-shore and offshore delivery options to achieve the optimal balance of cost, growth, risk and efficiency. Choosing where to locate operations is not a new problem and this is an area of interest to both researchers and companies alike. There are even separate theories, called Location Theories, which are addressing questions of which economic activity should be located where and why. With the spread of globalization, Internet, new technologies and logistics, choosing the location is taking new significance as managers are constantly evaluating what site is the most feasible for delivering products and services to customers at right price and quality (Kvedaravičienė 2008).

The number of service industry functions that are being off shored continues to grow at a rapid rate. Research continues to show that reducing cost remains one of the primary drivers for outsourcing, particularly offshoring, but placing too much emphasis on cost reduction usually leads to dissatisfaction because many savings are either unsustainable or never achieved. Companies that outsource services purely to cut costs are likely to set themselves up for short-term gains and long-term criticisms from upper management (Ho 2007).

Along with looking at where to outsource, a more fundamental question-whether to outsource

is often overlooked by several companies. Often companies look at cost savings from the point of view of lower wage rates or other similar eye catching indicators and ignore the total impact of outsourcing a particular function. Rather than focus on stand-alone costs, a better focus is perhaps to look at the sum cost of all the transactions and the risks involved. One such methodology is the application of Transaction Cost Economics (TCE) theory proposed by Ronald Coase in 1937 to outsourcing. Although TCE was originally applied to the manufacturing industry, we find that the model has relevant application to the services industry as well. The focus of this paper is to understand the role of TCE as a decision making tool for outsourcing in the services industry.

History of outsourcing and emerging trends:

In broad terms, outsourcing refers to the practice of contracting out specific organizational functions and activities (e.g. manufacturing, shipping, accounting, customer support, human resources, etc.) to independent external firms, rather than performing those functions in-house. In other words, outsourcing is how one firm acquires certain value-creating activities by means of entering into market-based contractual arrangements with other independent firms (Doh, 2005; Gainey & Klaas, 2003).

The Second World War provided one of the crucial ingredients for the future emergence and explosive growth of outsourcing (Clott, 2004; Palley, 2006; Prestowitz, 2005). During the decades of the 1950s and the 1960s, a number of U.S. multinationals, for instance, set up production facilities in Europe and other parts of the world. During the early years, nevertheless, outputs from such overseas production facilities were rarely shipped back for meeting the demands of the U.S. market; rather, foreign outputs were primarily intended for supplying local markets in the very countries where those production facilities were situated. However, this model of multi national company (MNC) operation began to come under considerable strain once the Japanese industry had perfected lean production systems and emerged as a serious competitive threat to the original group of multinationals (Levy 1997, 2005; Levy & Dunning, 1993; Prestowitz, 2005).

The growth and radical redesign of the MNC phenomenon in the few decades following World War II played a very important role in developing valuable organizational capabilities and techniques for the effective management, coordination and integration of technology, capital, and production methods on a global scale. Such organizational capabilities and techniques were indispensable for formulating and implementing successful outsourcing strategies under conditions of intensifying economic globalization (Prasad & Prasad 2008).

An overview of services outsourcing

Contemporary offshore outsourcing entails the extension of the said global sourcing model to services sectors as well. Outsourcing from manufacturing firms has fueled some of the service sector's rapid growth (Fixler & Siegel, 1998).

In prior years most firms constructed their own, local, processes for almost all services that needed to be accomplished. Whether it was how to pay vendors, administer payroll, or interact with customers, the dominant species of service processes were company and location specific. A physical product could be made by outside forces, as it could be measured and tested more easily. However, service processes, largely, remained idiosyncratic to individual firms or even to individuals within firms. The first step in the evolution of service process thinking was the concept of ''shared services.'' Shared services generally refer to the centralization of back office services within a firm to a single location. The geographically dispersed units of a service firm then ''shared'' the services of a central facility rather than have all the services provided locally. The shared services were typically financial (general ledger, cost accounting, etc.), personnel (payroll, benefits, application processing), MIS, purchasing, and other back office services (Metters & Verma 2008).

Changing the view of service processes from idiosyncratic to commodities allowed these processes to be decoupled and moved across town. Changes in technology allowed these processes to be moved across oceans. A limited amount of services offshoring occurred prior to modern telecommunications. It is believed that offshore service work started in the U.S. in the 1970s. At that time, a few firms sent large batches of paperwork that was not time sensitive to the Caribbean by ship. Round trip shipping and port time alone was 4 weeks (Wilson, 1995). Technology, however, transformed the type of work that could be done, and the response time it could be done at. Voice communication technology has changed most abruptly, so call centers provide a good example of the explosiveness and suddenness of the technological impact. In the past, it was operationally infeasible to locate a call center overseas (Frank and Cook, 1995).

Over the last decade there has been a dramatic decline in the price and increase in the capacity of computing and international telecommunications. The resulting global interconnectivity has provided North American and Western European companies with access to price cutting offshore vendors of services. The international offshore 'Information Technology Enabled Services' (ITES) sector is set to become one of the fastest growing international business sectors. (Nicholson et al, 2006) The services outsourcing phenomenon spans across a wide range of industries and activities including, but not limited to important areas such as corporate information technology (IT) functions, along with 'back-office' operations such as accounting, customer support, and so on that form part of so-called 'business process outsourcing' (BPO). Lately, there is a growing trend towards the offshoring outsourcing of accounting and finance (AF) activities. The process of AF services outsourcing is part of a wider trend towards the relocation of business processes to offshore call centers and 'back office' transaction processing centers located in India, the Philippines, China and Eastern Europe with India being the clear leader in the field (Morstead and Blount, 2003; Sahay et al., 2003; Stack and Downing, 2005).

Prior research in domains of the management of offshore outsourcing indicates that communication between the client and the offshore vendor may be problematic due to relatively poor telecommunications, cultural differences, accents and language ability. Time-zone differences accentuate these communication difficulties (Sarkar and Sahay, 2004;

Walsham, 2002). The offshore personnel may lack domain knowledge in the client's business application, and the transfer of such knowledge is hampered by distance (Cramton, 2001; Nicholson and Sahay, 2004).

To combat some of the limitations posed by services offshoring to far away countries, there is a growing interest in a new type of services outsourcing called "near-sourcing". Near-shoring involves sourcing service activities to a foreign, lower-wage country that is relatively close in terms of distance and time zone. Often, the advantage of similarities in cultural background can be availed of as well. With near-shoring, the customer generally expects to benefit from one or more of the following constructs of proximity: geographic, cultural, linguistic, economic, political or historical linkages (Kvedaravičienė 2008).

Classical economics limitations and the advent of modern economics to measure organizational costs

We have ample support to prophesize that services outsourcing will continue to grow at a rapid rate. What is lacking, however, is a careful analysis by organizations in terms of its economic feasibility. It is important to note how outsourcing flows from the free market economy model. Starting with a look at classical economics, we now delve into the seminal transaction cost economics work done by Coase and its application to services outsourcing.

"The economic problem of society," according to Friedrich Hayek, "is a problem of the utilization of knowledge not given to anyone in its totality" (1945). He argued persuasively that "the peculiar character of the problem of a rational economic order is determined precisely by the fact that the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form, but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess. The economic problem of society is thus not merely a problem of how to allocate 'given' resources. It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know". The challenge, however, is that although the dispersion of knowledge makes decentralized decision making more attractive, it also increases the transaction costs associated with accessing and using this knowledge. This was the original contribution of Coase (1991, 1992): the identification of transaction costs as a major reason, if not the reason, for the existence of organizations. Translated at the level of a single focal organization, this problem poses a dilemma: how to reduce transaction costs within the organization while at the same time maintaining the ability to exploit local knowledge of organizational members that is so vital for effective adaptation.

Another limitation is that classical economics does not devote much attention to the theory of the firm. The business enterprise is seen as a production function, which operates, as a "black box". The existence and scope of the firm are taken for granted. This is so because classical economic theory assumes away most transactional difficulties: uncertainty is low or nonexistent, and prices convey all the relevant information to the contracting parties. Transaction costs are negligible, and the decentralization of decisions through market

relations achieves an efficient allocation of resources. Modern organizational economics, starting with Coase (1937), recognizes the prevalence and the theoretical importance of modeling transaction costs. These refer to the cost of organizing information, coordinating behavior, safeguarding the interests of the transacting parties, monitoring the transactions, inducing the appropriate behavior adjustments, etc. (Aubert et al, 1996).

It should be noted that from a cost perspective, off-shoring is deeply interrelated with the make or buy decision, as sourcing decisions in general have their origins in make or buy alternatives (Culliton, 1942). The question of whether processes of a company should be supplied by external providers or should be maintained in-house, is in turn related to the core competencies concept (Prahalad & Hamel, 1990; Quinn & Hilmer, 1994). This means that in general a company will tend to outsource functions that are not their core competencies.

The TCE Model

A unique method that can be used to evaluate options in terms of costs and risks of outsourcing is by using the transactional cost analysis model, which is also commonly known as transactional cost economics (TCE).

As mentioned previously, the service sector has been growing at a more rapid rate than the goods sector.   Studies of this phenomenon have focused on its underlying causes and the aggregate implications for economic growth (Baumol, 1967; Baumol et al. 1985). More specifically, the working hypothesis is that productivity growth in services is lower than that in manufacturing because services are labor intensive and resistant to technological change (Fixler & Siegel, 1998). Thus, a lack of standardized processes leads to transaction cost analyses that are quite different from the manufacturing sector.

Several other studies have used TCE to better understand outsourcing decisions, lending support for the validity of TCE as a suitable lens through which to view outsourcing (Arnold, 2000; Aubert et al., 2004; Maltz, 1994; Murray and Kotabe, 1999; McCarthy and Anagnostou, 2004; Noordewier et al., 1990; Odagiri, 2003; Ulrich and Ellison, 2005; Walker and Weber, 1987). Using transaction cost economics (TCE) as the framework, it is postulated that organizations will choose the business alternative that yields the lowest total cost of running their operations. TCE provides a rich framework beyond cost, also hypothesizing that organizations will not offshore outsourcing areas where there is high potential risk of vendor opportunism. Thus, TCE serves as both a model for cost analysis and risk management.

Trampel (2004) offers a breakdown of transaction costs. Transaction costs consist of search and information costs, negotiation and agreement costs, surveillance and implementation costs as well as termination costs. Search and information costs arise when searching for a suitable partner with whom the company can establish an outsourcing relationship. These can occur in direct form as expenses or indirectly in the establishment of organized markets such as trade fairs. Communication costs between potential partners also contribute to this block of costs. Negotiation and agreement costs arise due to the expenses incurred when negotiating a

contract in terms of price, venue, number of employees needed, working hours etc. This in turn depends for the most part on the competition and structure of the provider market. While implementation costs are the bulk of the initial costs needed to set up the required infrastructure, train the employees and implement systems, surveillance costs involves costs associated with ways to monitor and control performance. Termination costs arise when ending a contract. A major part of termination costs occur when consulting a legal advisor. The crucial factor in this case is the respective legal system of the country involved and availability of lawyers who are familiar with the legal system of more than one country. Presumably, the need to seek out legal advice and information is lower in near-shore rather than in unfamiliar offshore destinations. Moreover, in emerging countries, costs can result from delays caused by bringing conflicts before a court. The key factor of a successful contract is not the contract per se but the context and the cultural framework in which it is being realized.

Concerning services outsourcing, as clients' partly give up control over the activities outsourced to vendors, there is potential for transaction costs and an increase in control problems. TCE elements most applicable to outsourcing are transaction frequency, asset specificity and uncertainty to outsourcing situations with the limitation that the transactions themselves take place in an environment where the players are limited by their own bounded rationality, and are subject to the possibility of opportunism by other players in the marketplace (Williamson, 1985, 1988). We now look at each of these three factors in some detail:

a) Transaction frequency

Probably the factor that has undergone the most dramatic change is the reversal in correlation between transaction frequency and transaction costs. Transaction frequency has historically been viewed as the number of transactions, where the number of transactions is a surrogate for the total cost of transactions; more transactions means higher cost (Maltz, 1994; Williamson, 1985). TCE suggests that outsourcing becomes cost prohibitive as the number of transactions increase. However, current information technology (IT) and communications systems cause the transaction costs for many services (relative to performing the tasks internally) to be dominated by the fixed set-up costs associated with the monitoring and management systems rather than the variable transaction costs associated with the ongoing management itself. Thus, the cost curve has shifted, so that fixed set-up costs outweigh the variable transaction costs in offshoring outsourced professional services.

While this may seem contrary to TCE's usual focus on transaction frequency, it fits well with the founding assumptions of TCE, which were simply ''translated'' to fit to the nature of industry cost structures at the time.

b) Asset specificity

Level of asset specific investment assumption presumes that the more specific assets that are

required to support an activity, the less likely that the firm is to outsource that activity (Dyer, 1997; Masten et al., 1991; Klein et al., 1978; Williamson, 1975, 1981, 1985). Specific assets refer to assets that cannot be readily used in another application or transferred to another customer. Such activities are not good candidates for outsourcing because the firm could develop a high level of dependence on the vendor, and the vendor could then become opportunistic, raising prices, reducing service levels, or other such issues. In cases where the vendor owns the specific assets, the vendor is subjected to potentially significant risk associated with accepting the activity.

c) Environmental Uncertainty

Uncertainty in the external environment deals with the degree of volatility and unpredictability in the market place with regard to changes in availability, technology, price, key players, and any other significant disruptions to the market. Transaction cost economics posits that in highly uncertain markets, firms prefer to perform a task internally, believing that they can favorably respond to the whims of the market more readily than their vendors can (Kaufmann and Carter, 2006; Vidal and Goetschalckx, 2000; Williamson, 1985). This is more so the case today as we deal with high levels of environmental uncertainty in many nations. Many countries lack the economic and political stability that one is traditionally accustomed to in the US and other western countries. Often the temptation of cost savings leads companies to not evaluate the potential costs and risks of environmental uncertainty prior to making an outsourcing decision. It is not surprising then that a large number outsourcing projects end in failure whereby the companies often have to bring back the operations to the country of origin. This in turn can add to significant costs both in terms of the time and money wasted on the outsourcing project. These costs include those of training and hiring host country nationals and reinvestment in related infrastructure costs. As the world continues to become filled with uncertainty, decision-making should be further scrutinized not only in terms of where to outsource but also what functions to outsource.

Use of TCE to evaluate alternatives: A cost and risk analysis perspective

We can easily imagine a continuum of the range of governance structures observed for outsourcing professional services. One end is anchored by "doing things internally," while the other is anchored by "complete business process outsourcing." Between these extremes, everything from using temporary labor to managing the outsourced provider's supply base through buy-sell processes to outsourcing part of departmental function such as hourly worker payroll is observed (Ellram et al., 2008). The gist here is that companies are not faced with just two options. The entire business needs to be looked at carefully and the potential benefits of outsourcing activities at each step evaluated before making a decision.

Managing business risk:

From a business risk perspective, there is always the traditional type of risk that organization faces due changes in business cycles. This is systemic and there is not much a company can

do to avoid this type of risk as is evident based on the current economic downturn. However, this does not mean that an organization cannot plan for such events and mitigate the outcome. Along with this, an organization always faces specific risks based on its supply chain. If the organization does not put controls in place to deal with shortages, price increases, and other sources of supply interruption, the cost of these occurrences will be very high. The costs associated with contingency plans should be considered a part of the total cost of outsourcing and offshore outsourcing. TCE estimates therefore should include these above variables.

While making an outsourcing decision, the future is not known with certainty. Hence, the outcome of our decision can always be favorable or unfavorable based on factors outside of our control. To lower risk, organizations should be more concerned with satisficing versus optimizing when making outsourcing decisions, or any decision under uncertainty (Rosenhead et al., 1972). The focus would then be on which decisions, if made today, will leave open the greatest number of future possibilities, while still reducing total costs, or improving achievement of other outcomes.

Our focus here is on the vendor one ultimately chooses, which becomes the most important strategic partner and without whom successful outsourcing, by definition becomes impossible. Some fundamental ways in which TCE enables cost and risk analysis is through looking at setting specifics targets for vendors that can measured unambiguously, preventing overpayment to vendors and managing the risk relationships with vendors. There are three main ways that TCE can help evaluate costs and reduce risks issues that arise due to vendor relationships and these are elucidated as follows:

1) Specificity and Measurability of Outcomes from Vendors

The right type of outsourcing arrangement depends on how clearly the organization can specify and measure outcomes. For example, if it is setting up a call center to process incoming orders and is able to clearly define and measure the performance of the call center, it might be best to use business process outsourcing so it can turn the whole process over to a third party while minimizing its investment. The company here would ask for a quantitative breakdown of every cost involved with this type of outsourcing from various potential vendors. This also allows them to have written estimates that can be used to evaluate various vendors in terms of cost. Using formalized contracts based on the estimates and negotiations is another outcome whereby the company can clearly mention what it needs to achieve and how it plans to go about evaluating the progress of the outsourced project. The use of negotiation and agreement costs through TCE requires the vendors to agree upon performance measurement standards prior to outsourcing taking place. It acts as a control mechanism for monitoring performance at a later date, thus increasing the accountability of the vendor through a formalized process.

2) Prevention of overpayment and under servicing from vendors

Whenever a firm out sources a service it runs significant risk regarding overpayment and not

receiving the adequate amount of benefit (under-servicing). A big reason is the fact that the company is not very familiar with the cost structures of the country where the project is outsourced. Often, the savings seem so dramatic that quality issues are almost forgotten. Transference of responsibility for control to the vendor, and reliance on investments made by service providers have been shown to be insufficient to control costs (Amaral et al., 2004, 2006). The cost of relying on the service provider's controls is potentially quite high. Without a good initial assessment of risk, and good management controls in place, there are many problems that can and do occur (Amaral et al., 2004, 2006; Narayanan and Raman, 2000). Cost estimates must be screened with some rigor, which is achievable by using TCE. Thus, the use of TCE as a vendor evaluation tool is helpful in ensuring that the firm is getting a good return on their investment and reducing the possibility of over payment.

3) Ensuring longevity by managing vendor relationships

This aspect focuses on the possibility of a vendor becoming a competitor. By not fully recognizing the risk of loss of tacit knowledge, the organization may become dependent on a vendor (Fine, 1998; Venkatesan, 1992). It can be held hostage because it cannot adequately assess alternative sources of supply. In the most extreme case, because the vendor now knows some aspects of the business better than the original firm, the vendor may forward integrate and become a competitor (Fine, 1998).

An internal risk that may occur is that the firm becomes dependent on a vendor because the vendor ingratiates itself with internal customers. In such cases, the supply management function may find itself outside of the purchasing loop once again, not involved in key decisions, but because internal customers believe the item or vendor relationship is too important. Another internally based risk is the risk of inadvertently letting the vendor do more and more, due to the organization's lack of clarity regarding what it wants and the outsourcing boundaries. Over time, the vendor may step into strategic areas, and this self-induced risk jumps dramatically. This is a prime example of the use of TCE as a risk management tool by its focus on surveillance costs. The main point here is that TCE allows us to think about these issues before hand, analyze the possibility of their occurrence and then estimate the costs involved to set up control systems to prevent such occurrences. One can see how such costs could be easily ignored in a traditional cost analysis.

Limitations of TCE and the invisible costs in services outsourcing:

Even though a services oriented firm may use the TCE model, it should always be aware of the potential other costs that might remain uncaptured by the model. A large reason for this is that these costs are invisible and specific to a firm, thereby not lending themselves as being predictable through any model.

The TCE model goes beyond the traditional approach of service off shoring decisions, which are traditionally made based on visible costs, notably labor costs. For example, the hourly cost of a customer contact center worker is estimated to be U.S. $ 13–15 in China, U.S. $ 13–18 in

India and the Philippines, and U.S. $ 25–32 in the Czech Republic (Fluss, 2004). These costs are dramatically lower than the estimated U.S. $ 30–60 for a similar worker in the United States. Service and knowledge work is highly labor-intensive, so from a pure cost perspective, it would seem to make sense to outsource as much of this knowledge work as possible to offshore sites where labor is less expensive than in the United States or other industrialized countries.

Along with the large number of unexpected visible costs, such as labor turnover rate, transporting employees to work and the cost of updating infrastructure, which can be captured by advanced models such as the TCE, Weidenbaum (2005), introduces the notion of invisible costs. These refer to the costs that are not always apparent to firms making the decision to provide services from offshore locations. These costs may be categorized as: (1) invisible costs associated with reduced customer service quality and (2) invisible costs due to ineffectiveness (taking longer time and expending more effort to do the same amount of work correctly). However, offshore processes do not all incur invisible costs to the same extent. In addition, the invisible costs depend on the particular country selected for services off-shoring. When the service process is non-standardized, requires complex judgment and has reciprocal interdependence among steps and sequences, the reliability and assurance of service quality are at risk. Performing the promised service dependably and accurately is hard to maintain when the service process cannot be standardized. When customers perceive inconsistencies in the quality of service delivery, they may question service providers' knowledge and their ability to provide high quality service. Complex service offerings coupled with non-standardized service process contributes to high interaction intensity. As a result, invisible costs associated with ineffectiveness and lack of service quality increase as interaction intensity becomes high. In addressing invisible costs, research shows the prominent role of culture. Workers are influenced not only by national cultures, but also by organizational and professional cultures. For example, Zhao (2006) has pointed out that multinational firms may take action to counter adverse effects of the institutional environment. Firms that are able to develop effective organizational cultures may be able to counter some of the effects of cultural distance, and may experience fewer ''invisible costs.'' However, invisible costs are an area of increasing prominence. As the services outsourcing industry is becoming more mature and more data is available, the magnitude and importance of these costs are slowly being better understood.

Conclusion

The economies of the developing world are rapidly evolving from manufacturing to services based. The options that a company has are to perform the task in house or resort to outsourcing. In principle, all functions that do not require physical contact are service industry based outsourcing candidates. Therefore, typical offshore services such as information technology (IT) and other Business Process Off shoring (BPOs) continue to grow.

Several companies often suffer from the false assumption that outsourcing is always beneficial and cost effective, and do not hesitate to jump on the band-wagon. This fallacy is due a lack of a careful evaluation of the actual costs involved with each option. Transaction Cost Economics (TCE) is an effective tool to evaluate whether outsourcing is a beneficial

option. The spirit of the transaction cost economics theory is to consider several factors and come up with a total cost which is obtained from combining the costs that are like to arise due to each transaction. Unlike offshore outsourcing of manufacturing, offshore outsourcing of services does not have high variable transaction costs such as transportation, handling and inventory charges. Because the administrative and set-up costs for offshore outsourcing of services, such as vendor selection, training, monitoring systems, and other information linkages have a high upfront fixed cost, low transaction volumes are unattractive. Due to the fixed nature of these costs, the per unit cost allocation actually goes down and the number of transactions increases. Furthermore, high levels of asset specificity and environmental uncertainty leads to firms wanting to perform the task internally and not outsource it due to perceived higher risk.

As previously discussed, perhaps the simplest advantage of the theory is that its applications forces one to think about all cost and risk implications prior to engaging in any form of outsourcing. Following the TCE model implies that firms are thinking of the different types of transaction costs that are relevant in today's business environment and the related risks. The TCE model recommends that general business risks arising due to economic cycles, pricing problems and shortages be included as variables.

More specifically, the model has useful applications in terms of managing vendor relationships. An important focus of organizations should be to recognize that it must be able to measure vendor performance versus expectations. TCE stresses the importance of having outcomes that are both specific and easily measurable. It also recommends being attentive to what the job being outsourced actually costs in the new location can lead companies to avoid overpayment.

Furthermore, TCE helps us avoid vendor risk in terms of the vendor becoming a competitor and/or vendor transgression into strategic areas of the parent firm. The cost of managing the complexity and buffering the risks associated with vendors should be included in the outsourcing decision making process. This is a transaction cost that firms tend to ignore, because it is not visible until after the offshore outsourced relationship has been established. The TCE model recommends that firms avoid overdependence on a vendor and have clearly defined roles for them. Strong internal controls are recommended to prevent vendors from gaining too much customer knowledge and consequently becoming a competitor to the firm.

In summary, when outsourcing risks are adequately addressed, one realizes that the costs and complexities of managing outsourcing are high and should not be underestimated. TCE thus provides us insights into the different types of costs and risks involved offshore outsourcing, and is a tool for accounting for all the costs prior to the do or buy decision while mitigating the risk. Thus, the dual application of the TCE model in terms of decision making/selection and risk management makes it a powerful tool that merits extensive use in the services based outsourcing industry. At the same time, careful consideration should be paid to the invisible costs, which are increasingly becoming an important part of the mix as firms continue to evaluate their outsourcing options in the twenty first century.

REFERENCES

[1] Amaral, J., Billington, C. & Tsay, A. (2004). Outsourcing production without losing control. *Supply Chain Management Review* (November–December), 44–52.

[2] Amaral, J., Billington, C. & Tsay, A. (2006). Safeguarding the promise of production outsourcing. *Interfaces* 36 (3), 220–233.

[3] Arnold, U. (2000). New dimensions of outsourcing: a combination of transaction cost economics and the core competencies concept. *European Journal of Purchasing & Supply Management,* 6 (1), 23–29.

[4] Aubert, B.A., Rivard, S., & Michel, P. (1996). A transaction cost approach to outsourcing behavior: Some empirical evidence. *Information Management*, 30, 51-64.

[5] Aubert, B.A., Rivard, S., & Michel, P. (2004). A transaction cost model of IT outsourcing. *Information Management,* 41 (7), 921–931.

[6] Baumol, W.J. (1967). Macroeconomics of unbalanced growth: The anatomy of urban crisis. *American Economic Review*, 57, 415–426.

[7] Baumol, W.J., Blackman, A.B. & Wolff, E.N. (1985). Unbalanced growth revisited: asymptotic stagnancy and new evidence. *American Economic Review*, 75, 806–817.

[8] Clott, C. (2004). Perspectives on global outsourcing and the changing nature of work. *Business and Society Review*, 109(2), 153-170.

[9] Coase, R.H. (1937). The Nature of the Firm, *Economica*, 4, 386-405.

[10] Coase, R. H. (1991). In O. E. Williamson & S. G. Winter (Eds.), *The nature of the firm: Origins, evolution, and development*, New York: Oxford University Press, 18-33.

[11] Coase, R. H. (1992). The institutional structure of production. *American Economic Review*, 82, 713-719.

[12] Cramton, C. (2001). The mutual knowledge problem and its consequences for dispersed collaboration. *Organ. Sci.,* 12 (3), 346–371.

[13] Culliton, J.W. (1942). *Make or Buy: A Consideration of the Problems Fundamental to a Decision Whether to Manufacture or Buy Materials, Accessory Equipment, Fabricating Parts, and Supplies*. Harvard University Press, Boston.

[14] Doh, J. (2005). Offshore outsourcing: Implications for international business and strategic management theory and practice. *Journal of Management Studies*, 42, 695-704.

[15] Dyer, J. (1997). Effective inter-firm collaboration: how firms minimize transaction costs and maximize transaction value. *Strategic Management Journal*, 18 (August (7), 535–556.

[16] Ellram, L., Tate, W., & Billington, C. (2008). Offshore outsourcing of professional services: A transaction cost economics perspective. *Journal of Operations Management*, 26, 148–163

[17] Fine, C. (1998). *Clockspeed.* Perseus Press, Boston.

[18] Fluss, D. (2004). Successfully navigating the offshore outsourcing waters. *Call Center Magazine,* 8–10.

[19] Frank, R. & Cook, P. (1995). *The Winner Take All Society*. The Free Press, NY.

[20] Gainey, T. & Klaas, B. (2003). The outsourcing of training and development. *Journal of Management*, 29, 207-229.

[21] Hayek, F. (1945). The use of knowledge in society. *American Economic Review*, 35, 519-530.

[22] Ho, A. (2007). *Enterprise innovation*, article from enterpriseonline.net, 10.

[23] Kaufmann, L. & Carter, C. (2006). International supply relationships—determinants of non-financial performance. *Journal of Operations Management*, 24 (5), 653–675.

[24] Klein, B., Crawford, R. & Alchian, A. (1978). Vertical integration, appropriable rents, and the competitive contracting process. *Journal of Law & Economics*, 21 (October), 297–326.

[25] Kvedaravičienė, G. (2008). Development of near-shoring in global outsourcing market. *Economics and Management*, 125-126.

[26] Levy, D. (1997). Lean production in an international supply chain. *Sloan Management Review*, 38, 94-102.

[27] Levy, D. (2005). Offshoring in the new global political economy. *Journal of Management Studies*, 42(3), 685-693.

[28] Levy, D. & Dunning, J. (1993). International production and Sourcing. *Science, Technology, and Industry Review*, 13, 14-59.

[29] Maltz, A. (1994). Outsourcing the warehousing function: economic and strategic considerations. *Logistics and Transportation Review*, 30 (3), 245–266.

[30] Masten, S., Meehan, J., Snyder, E., (1991). The costs of organization. *Journal of Law, Economics & Organization,* 7, 1–25.

[31] McCarthy, I. & Anagnostou, A. (2004). The impact of outsourcing on the transaction costs and boundaries of manufacturing. *International Journal of Production Economics,* 88 (1), 61–71.

[32] Metters, R. & Verma, R. (2008). History of offshoring knowledge services. *Journal of Operations Management*, 26, 141–147.

[33] Morstead, S. & Blount, G. (2003). *Offshore ready: Strategies to Plan and Profit From Offshore IT-Enabled Services*. ISANI Press, Dallas.

[34] Murray, J. & Kotabe, M. (1999). Sourcing strategies of U.S. services firms: a modified transaction cost analysis. *Strategic Management Journal,* 20 (9), 791–809.

[35] Narayanan, V.G. & Raman, A. (2000). Aligning incentives for supply chain efficiency. *Harvard Business School*, Note 9-600-110, Retrieved from: http://harvardbusinessonline.hbsp.harvard.edu/b01/en/common/viewFileNavBean.jhtml?_req uestid=36333, on 12/13/2005.

[36] Nicholson, B. & Sahay, S. (2004). Embedded knowledge and offshore software development. *Inform. Organ,* 14, 329–365.

[37] Nicholson, B., Jones, J. & Espenlaub, S. (2006). Transaction costs and control of outsourced accounting: Case evidence from India. *Management Accounting Research,* 17, 238–258.

[38] Noordewier, T., John, G. & Nevin, J. (1990). Performance outcomes of purchasing arrangements in industrial buyer–vendor relationship. *Journal of Marketing*, 54 (5), 80–93.

[39] Odagiri, H. (2003). Transaction costs and capabilities as determinants of the R&D boundaries of the firm: a case study of the ten largest pharmaceutical firms in Japan. *Managerial and Decision Economics,* 24 (23), 187–211.

[40] Fixler, D.J. & Siegel, D. (1998). Outsourcing and productivity growth in services. *Structural Change and Economic Dynamics*, 10, 177–194.

[41] Palley, T. (2006). The economics of outsourcing: How should policy respond? *Foreign Policy in Focus*, Retrieved from: (http://www.fpif.org/fpiftxt/3134).

[42] Prahalad, C. & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68, 79–91.

[43] Prasad, A. & Prasad, P. (2008). Moving Out: Toward Understanding the Complexity of Outsourcing in the Age of Globalization. *The Business Renaissance Quarterly: Enhancing the Quality of Life at Work,* 67-91.

[44] Prestowitz, C. (2005). *Three billion new capitalists: The great shift of wealth and power to the East*. New York: Basic Books.

[45] Quinn, J. & Hilmer, F. (1994). Strategic outsourcing. *Sloan Management Review,* 35, 43–55.

[46] Rosenhead, J., Elton, M. & Gupta, S. (1972). Robustness and optimality as criteria for strategic decisions. *Operational Research Quarterly,* 23 (4), 413–431.

[47] Sahay, S., Nicholson, B. & Krishna, S. (2003). *Global IT Outsourcing*. Cambridge University Press.

[48] Sarkar, S. & Sahay, S. (2004). Implications of space and time for distributed work: an interpretive study of US–Norwegian systems development teams. *Eur. J. Inform. Syst.*, 13 (1), 3–20.

[49] Trampel, J. (2004). To Offshore or Nearshore IT services? – An investigation using transaction cost theory. *Economics Working Paper Archive* at WUSTL / Industrial Organization, RePEc:wpa:wuwpio:0406001.

[50] Ulrich, K.T. & Ellison, D.J. (2005). Beyond make–buy: internalization and integration of design and production. *Production and Operations Management,* 14 (3), 315–331.

[51] Venkatesan, R. (1992). Strategic sourcing: to make or not to make? *Harvard Business Review*, 70 (6), 107.

[52] Vidal, C.J. & Goetschalckx, M. (2000). Modeling the effect of uncertainties on global logistics systems. *Journal of Business Logistics*, 21 (1), 95–120.

[53] Walker, G. & Weber, D. (1987). Vendor competition, uncertainty, and make-or-buy decisions. *The Academy of Management Journal*, 30 (3), 589–596.

[54] Walsham, G. (2002). Cross-cultural software production and use: a structurational analysis. *MIS Quart.*, 26 (4), 359–380.

[55] Weidenbaum, M. (2005). Outsourcing: pros and cons. *Business Horizons,* 48, (July/August), 4, 311–315.

[56] Williamson, O.E. (1975). *Markets and Hierarchies: Analysis and Antitrust Implications*. Free Press, New York, NY.

[57] Williamson, O.E. (1981). The economics of organization: The transaction cost approach. *American Journal of Sociology*, 87, 3, 548–577.

[58] Williamson, O.E. (1985). *The Economic Institutions of Capitalism*. The Free Press, New York.

[59] Williamson, O.E. (1988). The logic of economic organization. *Journal of Law, Economics & Organization*, 4 (1), 65–93.

[60] Wilson, M. (1995). The office farther back: business services, productivity, and the offshore back office. In: Harker, P. (Ed.), *The Service Productivity and Quality Challenge*. Kluwer Academic Publishers, Chapter 7.

[61] Zhao, M. (2006). Conducting R&D in Countries with Weak Intellectual Property Rights Protection. *Management Science*, 52, 8, 1185-1199.

Considering adding an Entrepreneurship Course to your Curriculum? Consider this.

Gregory R. Shaff, Roanoke College, Salem, VA 24153; shaff@roanoke.edu

ABSTRACT

Each year the number of colleges and universities adding a course in Entrepreneurship increases to meet the demand of our students. While the need for Entrepreneurship course offerings is undisputed, there are many considerations to be made in designing such a course. This paper examines some of these issues.

INTRODUCTION

One of the fastest growing course offerings being requested today by students and parents when researching their choice of colleges and universities is entrepreneurship. Parents and students are asking whether the college they are considering has an Entrepreneurship class, and even if there is a major or concentration in Entrepreneurship. Even in the economic bust of 2008, students and displaced middle age managers alike want to be masters of their own destinies and they are looking for the educational system to give them programs that address those desires. "More than 2,000 colleges now offer some sort of entrepreneurship course – up from 250 in 1985 – with more than 500 offering formal degree or certificate programs."(1)

In response to this need, at a minimum many colleges are now offering Entrepreneurship course and some are looking at developing fully fledged Entrepreneurship programs. So, if you are one of those institutions, and if you have decided to dip your toes into the Entrepreneurial course waters, what things should you be considering?

This paper will address some of the issues that should be reviewed prior to adding a class to your college's curriculum. Some are general in nature and some are specific. Some issues discussed will be from the umbrella of the college or department itself, and some will be the specifics of who may best teach such a course.

The Entrepreneurial train has already left the station and is in full throttle. Every educational institution that wishes to ride the train must decide how best to put the course on the rails. Those decisions will define the type of course or courses offered and the depth at which these courses will extend into the curriculum of the school.

1

DEFINING THE COURSE AND ITS FIT WITHIN THE INSTITUTION

Strategic planning in business works optimally if the employees buy into the plan. The same is no different on several levels for the implementation of an Entrepreneurship course. The college administration and faculty must be shown the need for the introduction of an Entrepreneurship course for it to be introduced into the curriculum. To most business school faculty, that sounds like and easy sell, but it is not always as easy as it may seem.

The benefits to all students of an entrepreneurship program to the campus as a whole should be obvious. Marjorie Smelstor, vice president of Kauffman Campuses and Higher Education Programs says the Kauffman Campuses program, which is a foundation designed to promote entrepreneurship on college and university campuses "is using entrepreneurial education in all disciplines to help students become creative, innovative entrepreneurs. Our view is that entrepreneurship and entrepreneurial education should not be confined to schools of business and engineering; it is the kind of mindset and discipline that every student should be exposed to." (2)

Once the question of need and benefit has been answered, we need to ask the following:

- How does an Entrepreneurship class fit into your institution as a whole?
- How does an Entrepreneurship class fit into your major or concentration requirements?
- How will this course fit in with your other business courses?

How does an Entrepreneurship class fit into your college as a whole?

Institutions with business schools and divisions are most likely already offering such a course. If they are not, the addition of an Entrepreneurship course is seamless. This question is intended more for those liberal arts schools with business departments. In many cases the business department may comprise a large minority of the total student body, and may in fact be the largest single discipline at the institution.

While the need may seem obvious, the institution must still buy into the need for such a course. With such a demand for such a course, this should be the easiest hurdle. For those schools with a liberal arts core, the challenge from other disciplines on campus may easily be overcome by offering such a course to all students, rather than limiting the course to only business majors.

At liberal-arts institutions like Oberlin College, "efforts to sell the concept of entrepreneurship as pedagogy to often skeptical administrators, faculty members, and students can present a marketing challenge. When the college first considered adding an entrepreneurship component, says Andrea Kalyn, associate dean of academic affairs at Oberlin's Conservatory of Music, some faculty members and administrator were wary of the word's money making associations. But she says that an emphasis on entrepreneurial values such as creativity, leadership, and sustainability – and highlighting the work of Oberlin alumni like Jerry Greenfield, of Ben & Jerry's – convinced skeptics that the concept could be integrated with the college's focus on social justice and academic rigor."(3)

2

The need for offering an Entrepreneurial course at the college level is largely undisputed. Even the most liberal arts centered schools would be remiss in not offering such a course. Artists own art galleries, writers own publishing companies and biologists run companies that research and develop drugs to further our society. All of these require a skill set taught in an Entrepreneurship class. John Clarkin, director of the College of Charleston's Tate Center for Entrepreneurship suggests liberal arts majors should use their degree to start a business. He calls entrepreneurship "a vehicle for channeling creativity and innovation into business ventures that create economic, social and intellectual value. That's pretty much the doings of the burgeoning 'creative class,' those artists, scientists, engineers and other professionals whose brainpower is revitalizing many of our nation's cities. Liberal arts graduates forma s sizeable segment of the creative class."(4)

Some schools are now offering programs outside of the business department to utilize the entrepreneurial spirit of students in creative ways. While these programs may not directly impact the need for or the design of an Entrepreneurship course, it could certainly be a useful tool for attracting engaged students into the program. Of course, opening up the course to students from all disciplines will help define the depth of the course and or the prerequisites required.

How does an Entrepreneurship class fit into your major or concentration requirements?

Schools offering a new course in Entrepreneurship at a liberal arts institution may in fact find they are challenged to fit the course into their total offering without sacrificing another core course or general elective. With most institutions requiring a minimum number of general core courses in the humanities, writing, lab sciences, social sciences, foreign language and physical education, there are only a limited number of courses that can be offered in the general business curriculum without taking extra courses to fulfill a concentration or a major.

The usual course load required to attain a business degree would include some form of micro and macro economics, financial and managerial accounting, business law, marketing, organizational behavior, quantitative methods, operations management, information systems, corporate finance and perhaps a capstone course in business policy. This leaves a very limited number of electives for students to take in order to engage in a concentrated study in a particular field, and would in most cases require an additional four or five courses in that intended field.

At Roanoke College, until 2007-2008 the curriculum was based on the theory of requiring each business student to take one of several courses as a required business elective with the intention that this would start them on the path needed to attain a concentration in a field that supposedly interested them. This worked well in theory for every discipline except Entrepreneurship.

This method of requiring a "stepping stone" course left entrepreneurship out of the pathway to the business major. Students expressed a desire to take the course, but their first question was, "will this count toward my concentration?" Enrollment in the course hovered around ten to twelve each semester until the decision was made to allow any sophomore or above level business course to count as fulfilling the last elective rather than requiring it be one of four or five mandated courses. Enrollment immediately went to twenty, and it has remained there.

The concern that allowing students to select any sophomore level or above business course to count toward the business major would detract from students selecting a concentration has also been unfounded. There has been virtually no change in the number of students who have chosen a concentration in the five years prior and the two years subsequent to changing the "stepping stone" rule. The conclusion is that offering an Entrepreneurial class as an elective will not detract from the business majors selecting an area of concentration.

How will this course fit in with your other business courses?

Consideration should also be given to what other business courses are already offered and if any of these would cover the same elements and if so, how that will impact the design of the course. At Roanoke College a capstone course is required of every Business major in their senior year. The course is highly intensive and culminates in a presentation of an operational plan to faculty and community business leaders.

The Entrepreneurship course touches on many of the same elements and culminates in the presentation of a business plan, but the course is geared toward a sophomore or junior and is taught at a less involved level. There have been students who have taken both the Business Policy course and the Entrepreneurship course during the same semester and have reported that while they were similar in nature, the objectives and direction of each course was sufficiently different as to not be repetitious. In fact, these same students reported that the groundwork laid in the Entrepreneurship class allowed them to have a fuller understanding of the concepts taught in the Business Policy course than their peer group of students in Policy who did not have the Entrepreneurship course.

As a last remaining hurdle, there needs to be a vision of whether this course will be taught as a standalone elective course, or whether the long term plan would include expanding the Entrepreneurship program to be a fully fledged concentration or major. We will not address that in this paper, because there are too many variables to be considered to sufficiently address here, but it should be on the radar. Whether a course will be offered as part of a larger concentration at a later point should be considered, but even if that is not a consideration, an initial offering should be made to get the Entrepreneurship program off the ground.

In concert with this broader and longer term planning of the Entrepreneurship program; consideration should also be given to whether the college has any other programs outside of the curriculum which would enhance the courses being offered in Entrepreneurship. Roanoke College has the distinction of offering an intensive and selective program called the Innovative Challenge. This program which runs during the summer months offers students from several different colleges and universities the opportunity to participate in a collaborative project designed to launch a new product. Students are selected from a pool of applicants to live on campus and work together to bring a new invention to fruition. The program works with local companies whose mission it is to develop new ideas and bring them to the marketplace.

While the Entrepreneurship course does not have an objective to feed students into this program, it is a natural feeding ground for those exceptional students who are motivated to pursue their

4

entrepreneurial zeal in a more intensive fashion. In that sense, while the course would not necessarily be designed with the Innovative Challenge in mind, exceptional students could be encouraged to apply for the program and may have a leg up on students without such a base course.

At what level should this course be taught?

Depending on how the proposed Entrepreneurship course will be integrated into the entire business curriculum and the college at large will dictate the level at which the course should be taught. For example, if the course is going to be open to all students across campus, the course should be taught from a very broad perspective. However, if the course will be limited to business majors only, the focus may be different. This paper will not address those institutions which already have Entrepreneurship programs, but rather will concentrate on those institutions looking to add a new Entrepreneurship course.

The offering of an Entrepreneurship course to non business majors opens up the question of how intensively the course may be taught. There are many students on campus from other disciplines who would gain a vast amount of insight into the business dynamic by taking an Entrepreneurship course for non business majors. Such a course may introduce business concepts such as marketing, finance and management at a very basic level. Even concepts such as reading a financial statement and understanding cash flow would have to be taught at a very introductory level.

This would bring to the forefront the question of whether prerequisites should be required. If the course were to be taught with the objective of giving the flavor of entrepreneurship to non business majors, then perhaps there may be no prerequisites required. However, if the intention of the course were to be able to complete a full business plan at course end, then perhaps some basic accounting or other basic business courses should be required prior to taking the course.

The question of prerequisites would also have to be considered for an Entrepreneurship course taught to business majors. For example, many students taking the course as a sophomore may have not yet taken the introductory marketing course, especially at a liberal arts college where they may have spent the majority of their freshman year taking general studies. So making the assumption that students taking the course have had basic courses in business may be a false assumption. At a minimum, a financial accounting course should be required as a prerequisite. This may be overridden if the instructor has talked with the student and found his or her prior knowledge to be sufficient. In many cases, you may find that students registering for an Entrepreneurship course have parents who own businesses themselves and the student already has a rudimentary understanding of business and financial statements. Many students may have already worked in their parent's business and have a fair amount of hands on experience.

It may even be found that you may want to offer different versions of the same course or offer the course as a two semester course. Offering the course as a sophomore level course may require spending more time teaching the basics of business and may leave little time for exploring more experiential teaching methods such as simulation games and sales projects. Pedagogy will not be discussed here, but in considering how to teach the Entrepreneurship class, thought should be given to teaching in a manner which allows the students to learn and experience entrepreneurship.

5

The group preparation and presentation of a written business plan is a good way to focus even the sophomore level students on one section of material at a time, while illustrating how they all come together in a business.

The last piece of this puzzle would be to understand who comprises your student population. Students of a four year liberal arts college may be taught differently than the working, commuting students at a two year community college. The motivation of the student should be considered. Many students taking night classes at a community college may already be working or may have years of experience and are now sincere about starting their own enterprise. These students may be more or less receptive to certain teaching methods than the typical four year undergraduate at a liberal arts college who may or may not ever desire to start their own business. Their experience may be utilized to make the class a more interactive learning classroom, rather than merely lecturing to the students who have little or no baseline experience in a business environment.

Who will teach this course?

Who would be best prepared to teach a course on entrepreneurship? In a community of academics, it is difficult to solicit an unbiased response, except to quote the Roman author Pliny the Elder in "Naturalis Historia" (A.D. 77) who wrote, "Experience is the most efficient teacher of all things." Who has the experience other than an entrepreneur himself?

Unless they have been there, an instructor cannot convey the different complications of working with their spouse in a small business. The most interesting issues are those that are never covered in a text, but are often the most important in determining whether the student is ready to be an entrepreneur. The text will never convey the demands of owning a business as vividly as the telling of husband and wife business owners who received a call from their children at 10:30 PM asking when they would be eating dinner. Both parents thought the other had fed the children, but both were working together at the office because the client had an urgent quote that had to be completed that night. That paints a more vivid picture of the difficulty integrating the family and workplace when owning a small business than a two sentence statement in a text book.

The same could be fulfilled through the use of a guest speaker. As an example, the text discussed engaging family and friends as a method of acquiring startup capital. It was listed in mundane fashion along with other means of financing. While all were appropriate, none of the pluses and minuses resonated with the students until an entrepreneur from the business community spoke to the class. The speaker told the class an engaging tale of the drama that had now become Thanksgiving dinner, all as a result of his starting a business and asking his family for seed money.

Those are the life stories that only experience can provide, and they illustrate the true measure of the demands of being an entrepreneur. The right guest speaker could add the personal experience if your faculty member has never owned a business, but that only gives the flavor of entrepreneurship. A member of the land crew chasing a balloon can describe the flight as they followed the balloon over three counties, but only the balloonist can describe the feeling of being two thousand feet in the air and descending through a cloud bank while feeling the weightlessness

6

of flying with the birds. So who would you want to tell the story of flying, the land crew or the balloonist? An entrepreneur has taken the balloon ride.

Do you have an entrepreneur on your faculty? This would be the logical place to begin the search. This may be the time to hire someone from the business community as an adjunct. Of course many people in the business community may come at a price tag too high to afford, but with a little effort, such a person can be found at a price you can afford.

Faculty in the business department can always be used to teach an Entrepreneurship course; however that would be a good time to build a relationship with the business community and ask for speakers to talk to the class on various topics. Entrepreneurs may not have time to adjunct an entire semester, but may be more than willing to talk on a subject that interests them most, their business.

Conclusion

There is little dispute of the need for an Entrepreneurial course to offered by almost every college and university. The need is obvious, but the need must be communicated and sold to the administration and faculty of the college. Once accepted, the course must be designed with both the college and the business department in mind. Consideration must be given to the fit within the college as a whole and the course must be constructed to fit within the parameters of the business electives without disrupting the requirements already in place.

The course can be designed as a standalone elective or as part of a larger Entrepreneurship program currently in place or one being considered for the future. The level of difficulty of the course will be in part dictated by how entrepreneurship is being integrated into the entire curriculum.

The last component to a good Entrepreneurship course is selecting a faculty member to teach the course. The best choice would be to have the experience of entrepreneurship taught through the eyes and mind of an entrepreneur. This also presents a great opportunity for the college to engage in the business community.

Incorporate the class and they will come. Students and parents all over are looking to our colleges and universities to provide courses on Entrepreneurship. Give them what they want and do it well.

References

(1) Wasley, P. *Entrepreneurship 101: Not Just for Business School Anymore.* The Chronicle of Higher Education, June 20, 2008.

(2) Worth, T., *Enterprising education: Colleges add entrepreneurship to curriculum.* Kansas City Business Journal, June 29, 2007

7

(3) Wasley, P. *Entrepreneurship 101: Not Just for Business School Anymore.* The Chronicle of Higher Education, June 20, 2008.

(4) Quick, D. *Kauffman Foundation awards College of Charleston $90,000 grant to strengthen entrepreneurship program.* Charleston Regional Business Journal, December 1, 2003.

8

PROFESSIONALLY QUALIFIED FACULTY:
WHAT THEY BRING TO THE TABLE

Greg Shaff, CPA, Roanoke College, Salem, Virginia (540) 375-4909
Shaff@Roanoke.edu

SUMMARY

In this session a panel faculty including Professionally Qualified (PQ) faculty discuss the contribution of PQ faculty to business programs. The main topic of discussion is the role PQ faculty play in designing and implementing business curricula. Also, the panel will discuss the level of PQ faculty contribution in bringing together the business faculty, students, and the professional community.

Panel members will share their personal experiences and will discuss the challenges they face or have faced to assimilate to the academic environment.

Background

With a varied background in entrepreneurship and accounting, I can offer a unique real world perspective on business.   I began as a CPA with the Roanoke, VA office of KPMG in the audit department. After five years, I accepted a position of the Manager of Accounting for Hopeman Brothers in Waynesboro, VA, and then moved to the position of Chief Financial Officer of Littlefield Adams Co., and Collegiate Pacific Co. In 1995, I founded and still own Shirts & Other Stuff, Inc., a promotional products company in Roanoke, VA.

- My experience in performing and supervising the audit engagements for one of the world's largest accounting practices allows me to bring to life the subject of accounting in the classroom by illustrating the varied directions a major in accounting can take you in your business career. Having sat in the position of an auditor, a Controller and CFO and as a business owner, I can best illustrate the interplay among all the various functions and how each role is integral in a successful organization.

  As an example, when discussing the chapter on internal controls, I can tell the students the questions the auditors will ask, the answers the chief financial officer will give, why they'll ask those questions and give those responses, and how the reader of an audited financial statement should read an unqualified audit report with a slight bit of skepticism. My experience allows me to illustrate the importance of the Sarbanes-Oxley legislation in a historical perspective.

- The fact that as a licensed CPA, I have to maintain CPE credits of 120 hours every three years means that I have to remain current and this will only enhance the relevance of the classroom.

- Based on students' responses, my experiences in starting and running a small business are the most valued lessons they take away from my Entrepreneurship class. They want to hear the good, the bad and the ugly from someone who has lived it, rather than trying to lift it from the pages of a textbook, written by someone who has probably never risked their family savings to meet a payroll or ventured beyond the security of a lectern.

- How will my business experience add value to the ethics class I will be teaching in the upcoming Spring semester? I witnessed first hand the power of the SEC and the tug of remaining ethical and true to your convictions, even though by doing so it could have resulted in losing the job that was the sole support of my young family. I sat in front of an SEC panel and answered questions on the unethical behavior of the CEO and his appointed CFO to whom I reported. I stood firm on my ethics, and watched as the CEO was convicted of severe civil and criminal penalties and the CFO faced suspension of his license to practice as a CPA, and was barred from doing work for any publicly held company which reported to the SEC. I was an unintentional whistle blower before Sarbanes-Oxley even added the term to their lexicon.

What unique challenges am I presented with?

- Despite having twenty five years of experience in the workforce as a CPA and a small business owner, it is difficult to feel as if I am a peer to those with PhDs, even those young academics with virtually no experience in life or business.
- Without the experience of going through a Doctorial program, we are not as comfortable weaving our way through the academic maze of grants and research required from administration.
- Until the academic community accepts the experience of those without the traditional academic degrees as bringing something equally relevant and unique to the table, colleges and universities will continue to struggle to attract and retain those instructors because of the disparity in pay and advancement to those individuals.
- Due to the pay inequity, many qualified professionals must maintain some ties to business endeavors outside of teaching in order to afford to teach. This creates the (often incorrect) assumption or fear that the effort given to the college is being shortchanged. In fact, in my case, and I suspect in the case of most qualified professionals, the time spent on college related matters is usually equal to or surpasses those of many of our colleagues who are purely academics.