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A FRAMEWORK FOR MEASURING SUPPLY CHAIN AGILITY: THE PERFORMANCE METRICS APPROACH

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ABSTRACT: Supply chain strategies have undergone tremendous changes in response to dynamic external pressures. Companies have outsourced and partnered with suppliers to reduce complexity in their SCM. There is experimentation with various supply chain innovations incorporating agility. To successfully implement an agile supply chain, companies have to establish high levels of cooperation and partnership among the supply chain partners. As agility depends on qualitative factors like 'level of cooperation and partnership', it is necessary to have controlled and structured methodology of decision making. Performance measures play an important role in helping companies measure the qualitative aspects of agility. Companies can use these metrics to retrospect their strategies and take corrective steps to enhance agility in their supply chains. Importance of performance measures takes even more prominence to ensure adequate controls on the supply chain in the changed business models of virtual and extended enterprise. This paper proposes a framework to help management in decision making to move towards agile supply chains with the help of performance metrics.

INTRODUCTION

Owing to the recent trends in international procurements, new information technologies, increasing pressure from customers on responsiveness and reliability, and globalization of operations and markets, supply chain management (SCM) has become a challenge and an opportunity for companies to explore (Bowersox & Closs, 1996). In today's competitive environment, if there is anything constant that is change. To survive such an environment, companies have to develop an inherent ability to quickly respond to these changes.

Supply chain strategies have undergone tremendous changes in response to these dynamic external pressures. Companies have started outsourcing and partnering with other enterprises to reduce complexity of their SCM. Companies are experimenting with various supply chain innovations to reduce cost, and generate revenues by achieving greater levels of customer satisfaction. To satisfy ever-demanding customer the supply chain strategies have aimed towards

incorporating agility. To successfully implement an agile supply chain, companies have to establish high levels of cooperation and partnership among the supply chain partners. As agility depends on qualitative factors like 'level of cooperation and partnership', it is necessary to have controlled and structured methodology of decision making. Performance measures play an important role in helping companies measure the immeasurable. Companies can use these metrics to retrospect their strategies and take corrective steps to enhance agility in their supply chains. Importance of performance measures takes even more prominence to ensure adequate controls on the supply chain in the changed business models of virtual and extended enterprise. As Victor Fung, CEO of Li & Fung, had identified that success increasingly depends on the ability to control what happens in the value chain outside company boundaries (Magretta, 1998).
This paper aims to propose a framework to help management in decision making to move towards agile supply chains with the help of performance metrics. Second section describes a brief literature review of supply chain management and discusses the need for agile supply chains. As the next step, characteristics of agile supply chains are discussed, which forms the basis for developing the performance metrics. A framework is then proposed to develop weights for the metrics. Finally the necessity of performance metrics in controlling the effectiveness of supply chain is explained with the help of a case study.

Need for Agile Supply Chain /Supply Chain Management: The business concept known as SCM has forever changed the way in which companies move their goods to market. It has impacted every stage of the supply chain process – from the initial sourcing of raw materials to the final point of sale. The Supply Chain Council defines SCM as 'the effort involved in producing and delivering a final product from the supplier's supplier to the customer's customer'. Supply chain encompasses all of the activities with moving goods from the raw materials stage through to the end user. These activities include procurement, production scheduling, order processing, inventory management, transportation, warehousing, and customer service (Ganeshan, 1999). SCM is about coordinating all these activities to deliver value to the customer. Performance Measurement Group, a subsidiary of Pittilgio Rabin Todd & McGrath (PRTM) consulting, conducted a research documenting the link between supply chain and profitability. The research found that market leaders were able to reduce their costs by 5 to 6 percent of sales by implementing efficient supply chain management policies. For a company with $500 million in sales, the savings amount to $25-30 million per year. Among many potential factors, six business and economic factors would have significant impact on the future of supply chain management. These are consumer demand, globalization, competition, information and communications, government regulations and environment (David and Yossi Sheffi, 1998).

The 1980s and 1990s were termed as the decades of globalization. As cost of manufacturing increased in developed countries, companies started to

search for cost effective alternative production bases. The process of globalization was further aided by liberalization and opening up of third world economies. This facilitated in expanding the supply chain activities across the world. A global corporation's supply chain consists of multiple enterprises located around the world and each enterprise is involved in a wide variety of activities. A prominent executive from Ryder quoted, "The production base will shift to the lowest cost place. Today it is Southeast Asia, tomorrow it would be South America and then Africa." While the globalization of many industries has created many opportunities for the participants, it also brought to the customer a wide variety of products that further increased his expectations. One of the biggest challenges facing organizations today is the need to respond to ever-increasing volatility in consumer demand. The 1990s have seen a new driving force in corporate strategy: delighting global customers (Anderson & Lee, 1999). To delight the customer, companies are competing to reach customer first. With the emergence of e-commerce and new ways of retailing, old channels are undergoing change. Product life cycles, particularly in high-tech sector, have grown shorter stressing the importance of speed to market (refer to Box-I), and low cost of obsolescence. All these factors are increasing the complexity of supply chain management.

Most of the supply chain management tools of 1980s and 1990s including material resource planning (MRP), JIT production, kanban, continuous improvement, and total quality management focused on traditional issues of cost control and improving operating performance. However, companies have realized that these traditional SCM tools were not sufficient to meet the increasingly volatile customer demands cost effectively. This necessity gave birth to a new concept named 'Agile Supply Chains'.

Box – I

Martin Christopher in his article draws an analogy between the supply chain and an oil pipeline. Long pipelines tend to have more oil in them than shorter ones. If demand at the other end changes to a different grade oil, then longer the pipeline, the longer the time needed to respond to that changed demand. Christopher further quotes, "Since agility is nothing but the ability to change rapidly, the total 'end-to-end' time in the supply chain directly impacts responsiveness. In a supply chain for complex products with many components, the slowest moving element will determine the pipeline length." So even if ninety-nine out of a hundred component items are available within days, the hundredth component with a three-month lead-time determines the overall response time of the supply chain.

Agile Supply Chains: In 1991, a US government sponsored workshop was held at Lehigh University that gave birth to the concept of the agile manufacturing enterprise as a successor to Lean manufacturing. The participants had agreed that the pace of change in the business environment was outpacing the capabilities of many established organizations. The workshop concluded that companies would survive based on their ability to keep up with continuous and unexpected change. The workshop coined the term 'Agility' and loosely defined it as 'the ability of an organization to thrive in a continuously changing, and unpredictable business environment. Being agile means being dynamic enough to seize the market opportunities as well as to initiate innovations. In 1995, Steven Goldman and his colleagues drew international attention to 'agility' through their book "Agile Competitors and Virtual Organization."

Rachel Mason-Jones, Ben Naylor and Denis R.Towill defined agility as using market knowledge and a virtual corporation to exploit profitable opportunities in a volatile market place (Mason-Jones, Naylor & Towill, 2000). Volatility of market demand is the key factor driving the need for agility in supply chains. The businesses should not only cope with, but also exploit this volatility to their strategic advantage. Customer service level i.e., availability of products/services in the right place at the right time, would be the market winner in serving a volatile market place.

There is a fundamental difference between the traditional approach to supplying product to markets and the newly emerging model (refer to Table-I). The traditional approach aimed at minimizing production, material handling and transportation costs by using economic batch quantities. Finished product is produced based on a forecast and is then held as inventory, awaiting customer orders. However, in the agile model goods are produced, moved or stored in response to a known customer requirement. Based on point-of-sale data during the initial stages of product life cycle or a real customer order, company's produce the final product. For example, a paint manufacturer would produce paints in most generic form and store them in warehouses near the customer. When a customer places an order for a particular shade, the paints in generic form are mixed in appropriate proportion to make the desired shade. Thus agile supply chains facilitate in customizing the product to meet the individual customer's needs and develop new products and services in a short time span.

Table – I: Comparison of Traditional and Agile Supply Chains

Traditional Approach	Agile Approach
Stock is held at multiple echelons, often based on organizational and legal ownership considerations.	Stock is held at the fewest echelons, if at all with finished goods sometimes being delivered direct from factory to customer.
Replenishment is driven sequentially by transfers from one stocking echelon to another.	Replenishment of all echelons is driven from actual sales/usage data collected at the customer interface.
Production is planned by discrete organizational units with batch feeds between discrete systems.	Production is planned across functional boundaries from vendor to customer, through highly integrated systems, with minimum lead-times.
Majority of stock is fully finished goods, dispersed geographically waiting to be sold.	Majority of stock is held as 'work-in-progress' awaiting build/configuration instructions.

Source: Martin Christopher "Creating the Agile Supply Chain", http://christopher.ascet.com.

CHARACTERISTICS OF AGILE SUPPLY CHAINS

Martin Christopher (1999) notes four key distinguishing characteristics of agile supply chains as Market sensitivity, Virtual integration, Process integration, and Network based.

Market Sensitivity: An agile supply chain should be capable of reading and responding to real demand and not forecasted demand (Christopher, 1999). Most organizations make forecast based on past sales shipments rather than actual demand due to lack of data on actual customer behavior. One of the major breakthroughs in the last decade was (ECR) Efficient Consumer Response. The ECR initiative, transforms the supply chain from a 'push system' to a 'pull system' where channel partners form new interdependent relationships and product replenishment is driven by point of sale (POS) data (Bhutta & Huq, 2000). With this real time data, more accurate forecasts of the demand are being made and fulfilled with low inventories and obsolescence.

Virtual Integration: One of the barriers to direct human interaction in the supply chain is the geographical separation of its members. Virtual integration can overcome these geographical barriers (Bal, Wilding & Gundry, 2000). Sharing of data between buyers and suppliers using information technology is creating a virtual supply chain, which is information based rather than inventory based (Christopher, 1999). All the players in the entire supply chain are connected electronically, either through EDI or Internet. This would not only facilitate real time information sharing between all the players in the supply chain but also increase the ability of members to behave as a team, sharing knowledge

and expertise, regardless of location (Jay, Bal, Wilding, Gundry 2000). Virtual Integration is crucial for the success of Agile Supply Chains.

Process Integration: Process integration helps in collaborative working between buyers and suppliers, in various aspects of supply chain management like joint product development, inventory management, routing of goods etc. For example, collaboration in product development with supplier using concurrent engineering principles would help develop a manufacturable product with minimum of lead-time and cost. This type of integration is termed as 'extended enterprise' (Siverts). Co-operation in the supply chain is increasingly necessary as companies have started focusing more on managing their core competencies and outsource all other activities. For instance, the automobile industry is moving up the value chain to manage the service aspect of the product and leaving the manufacturing to its suppliers. For the success of process integration, trust and commitment must prevail coupled with joint strategy determination, buyer-supplier teams, transparency of information and even open-book accounting (Christopher, 1999).

Network Based: It is now widely recognized that individual businesses no longer compete as stand-alone entities but rather as supply chains. It has become an era of 'network competition', where the winner is the one who can better structure, coordinate, and manage the relationships with their partners in a network (Christopher, 1999). The task of building a strong relationship between all the partners of supply chain is enormous in nature. However, prominent companies have created an extended supply chain 'communities' that leverage the core competencies of each partner. These communities work to optimize their efforts for seamless flow of materials and information through the supply chain pipelines. This would make the organization nimble, gaining the ability to respond to customers faster and more accurately than before.

FRAMEWORK

Van Hoek (1998) highlighted the need for new performance measurement systems due to complexity of supply chains and new characteristics of emerging organization. Traditional performance measures might fall short in helping management with decisions to enhance agility in the supply chain. A challenge for today's organizations would be to develop and implement a new measurement system that can help management in decision-making.

The proposed measurement and control framework would provide management with a set of actions that can be taken in enhancing the agility in supply chains. The framework is distinct from passive administrative tradition and helps in directing management attention towards areas of long term strategy improvement. For such measurement system, this article proposes the use of Multiple Attribute Utility Theory (MAUT) that can effectively deal with both

quantitative and qualitative factors. MAUT enables the decision maker to structure a complex problem in the form of a simple hierarchy and to subjectively evaluate a large number of quantitative and qualitative factors in the presence of risk and uncertainty (Keeney, 1976).

The following is the proposed framework:

Step1: Identify and interpret the performance metrics depending on the nature of industry.

Step2: Interview the decision makers for information concerning the attributes and determine the best and worst possible values of the attributes.

Step3: Determine the type of utility function and develop decision maker's utility function.

Step4: The weights for each attribute are calculated using Probability-Assessment Technique.

Step5: Provide employees with the overall utility function which would help them make appropriate decisions within their responsibility.

Probability Equivalent Assessment Technique: The probability-equivalent (PE) assessment technique is similar to certainty equivalent approach. The PE technique considers the relative desirability of one attribute at its most preferred level and all other attributes at their worst level. In this technique, the probability *p* that makes the decision maker indifferent between the option 1 (sure thing) and option 2 (lottery) has to be determined. The option 1 is set to the best on one attribute and worst on all other attributes. The Option 2 (lottery) is between best values on all attributes and worst values on all attributes. The probability *p* is the weight (scaling constant) of the odd attribute in option 1. To determine the value of *p* (scaling constant), the decision maker has to answer the following question: "For what probability would he be indifferent between option 1 yielding attribute x1 at its best and all other attributes at their least desirable levels and an alternative option 2 consisting of a lottery yielding all attributes at their most desirable level with probability p or otherwise all attributes at their least desirable level?" (Keeney, 1976).

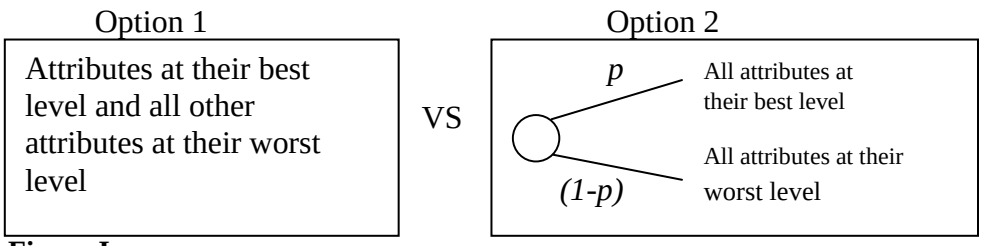

Figure I

Performance Measures of the Agile Supply Chains: Performance measures are developed based on the characteristics of agile supply chains proposed by Christopher. These measures were developed from a perspective of a typical manufacturing company as shown below in Table III.

Table – III

Characteristic	Performance Measures
Market Sensitivity	• Number of stock out situations • Number of discount sales at the end of the season • Opportunity loss for not being first to market in a product category.
Process Integration	• Percentage of correct order fulfillments • Percentage of orders meeting the due dates • Design-to-delivery cycle time • Time to Volume
Network Based	• Percentage of customer orders fulfilled by manufacturing partners itself • Cash-to-Cash cycle time. • Average length of relationship time with immediate suppliers and distributors. • Reorder replenishment cycle time.

Number of stock out situation/discount sales at the end of the season: In agile supply chain management model, firms estimate the demand based on point of sale data. Any miscalculation of demand on the part of firm would either lead to stock out situations or excess inventory, both of which are costs to the company.

Opportunity loss for not being first to market: A market sensitive company would be able to identify the changing customer tastes for a new product and proactively incorporate them into its products and reach the market before its competitors.

Percentage of purchases made electronically: A virtually integrated firm should completely place its purchase orders electronically thus eliminating manual purchase order processing by the suppliers.

Number of production run stoppages due to material shortages: Virtual integration should facilitate seamless flow of information along the supply chain. However, due to communication gap with suppliers, a production run has to be stopped if the materials do not reach the shop floor.

Percentage of virtual meetings of global teams during project duration: Virtual integration facilitates knowledge sharing by forming virtual teams comprising of people from all over the world. The strength of virtual integration in the firm could be gauged by the average number of virtual meetings held by the global teams.

Percentage of correct order fulfillment/orders meeting due dates: If the processes of the company and its suppliers are perfectly integrated then all the orders would reach the correct place within the due dates.

Design-to-Delivery cycle time: It is the time taken for a product to evolve from conceptual stage to reach the market as a real tangible product. Due to shrinking product life cycles, companies have to reduce their product development lead times. Since the profit margins in the early part of the product life cycle are greatest, the potential sales gains from being first to the market are tremendous. With process integration, concurrent engineering principles can be employed and a manufacturable product can be developed without any manufacturing and assemble complexities.

Time-to-volume: High level of process integration expedites product development, product distribution, efficient inventory management, etc., with higher product quality. For example, in an integrated product development environment Engineering change orders (ECOs) update the bill of materials (BOM) database, which in turn feeds customer configuration and manufacturing systems. These systems are shared with key suppliers allowing them to make corresponding design changes to their components. Such coordinated action would reduce time-to-volume.

Percentage of customer orders fulfilled by manufacturing partners: The supply chain network should be strong to deliver value to customer. A customer approaching OEM for a spare part should not have to wait too long for the reason that the part has to be made by a Tier II supplier. The network should be coordinated by OEM in such a way that the supplier should be able to ship the product directly from his plant.

Cash-to-Cash cycle time: The length of the supply chain should be small to respond quickly to any changes in the external market. The length of supply chain can be measured by cash-to-cash cycle time.

Average length of relationship time with immediate suppliers and distributors: The degree of trust between network participants should be high for improving time and quality performance. Such levels of trust evolve over a period of time.

Reorder replenishment cycle time: If there is a sudden and unpredictable demand for the product then OEM should be able to pull up its entire supply

chain to meet the demand. The supplier's willingness to stretch themselves to meet the OEM requirements depends to a large extent on the strength of their relationship.

These performance metrics coupled with the decision framework would help companies control and monitor their strategies. A case study is discussed to show the utility of the framework.

CASE STUDY

The XYZ Trucking Company is one of the largest trucking companies (Third Party Logistics provider) in the US. The Company had annual revenue of $5 billion over an asset base of $5.8 billion. With its headquarters in US, the company has spread its operations in North America, Latin America, Europe and Asia to serve its clients needs. The company's traditional product offering include dedicated contract carriage and carrier management. The company has over 14,000 customers operating 170,000 vehicles in US, Canada and United Kingdom.

The company has initiated various measures to make its supply chain agile and nimble. Performance measures were used to ensure that the initiatives adopted are on the right track.

As the first step of the framework, the metrics are identified and interpreted to suit the company. For example, the generic metric 'average length of relationship' can be interpreted as 'percentage of contract renewals' for a Third party logistics provider like our trucking company.

The senior executives at the company are interviewed to decide on the range of values for each attribute, over which the utility function can be assessed. These ranges are necessary to calculate scaling constants and set priorities among the metrics for decision making. The overall utility function can be represented as below:

$U(u_1,u_2,\ldots..u_i) = k_1u_1 + k_2u_2 + \ldots\ldots + k_iu_i$
Where u_i, i = 1,2,3…9 are the utility functions of the metrics
and k_i, i = 1,2,3…9 are scaling constants or weights of the metrics.
The utility function here is additive in nature.

The scaling constants (weights) are calculated using Probability-Equivalent Assessment technique. For example, let us take the example of determining the scaling constant for the attribute 4 i.e., percentage of correct orders fulfillment. The trade off decision tree is shown in figure II. The utility values for the best and worst of these attributes is

U_1 (0) = 1	U_1 (100) = 0
U_2 (100) = 1	U_2 (0) = 0
U_3 (100) = 1	U_3 (0) = 0
U_4 (100) = 1	U_4 (0) = 0
U_5 (100) = 1	U_5 (0) = 0
U_6 (2 Weeks) = 1	U_6 (6 weeks) = 0
U_7 (100) = 1	U_7 (0) = 0
U_8 (100) = 1	U_8 (0) = 0
U_9 (2 weeks) = 1	U_9 (6 weeks) = 0

To determine the scaling constant for attribute 4, the decision maker has to answer the question: "For what probability would he be indifferent between option 1 consisting of a lottery yielding all attributes at their most desirable level with probability p or otherwise all attributes at their least desirable level and an alternative option 2 yielding attribute percentage of correct order fulfillment at its best i.e., 100% and all other attributes at their least desirable levels?" The decision maker is indifferent between the option 1 and option 2 (best on percentage of correct order fulfillment) at $p = 0.18$. The indifference equation can be written as

$k_1 U_1 (100) + k_2 U_2 (0) + k_3 U_3 (0) + k_4 U_4 (100) + k_5 U_5 (0) + k_6 U_6$ (6 weeks) + $k_7 U_7 (0) + k_8 U_8 (0) + k_9 U_9$ (6 weeks)

$= 0.18 [k_1 U_1 (0) + k_2 U_2 (100) + k_3 U_3 (100) + k_4 U_4 (100) + k_5 U_5 (100) + k_6 U_6$ (2 weeks) + $k_7 U_7 (100) + k_8 U_8 (100) + k_9 U_9$ (2 weeks)] + $0.82 [k_1 U_1 (100) + k_2 U_2 (0) + k_3 U_3 (0) + k_4 U_4 (0) + k_5 U_5 (0) + k_6 U_6$ (6 weeks) + $k_7 U_7 (0) + k_8 U_8 (0) + k_9 U_9$ (6 weeks)]

Substituting the utility values we get $k_4 = 0.18 (k_1 + k_2 + k_3 + k_4 + k_5 + k_6 + k_7 + k_8 + k_9)$

Since the utility of additive function is $k_1 + k_2 + k_3 + k_4 + k_5 + k_6 + k_7 + k_8 + k_9 = 1$ Therefore $k_4 = 0.18$. Repeating the same procedure, we can find the rest of the values of scaling constants.

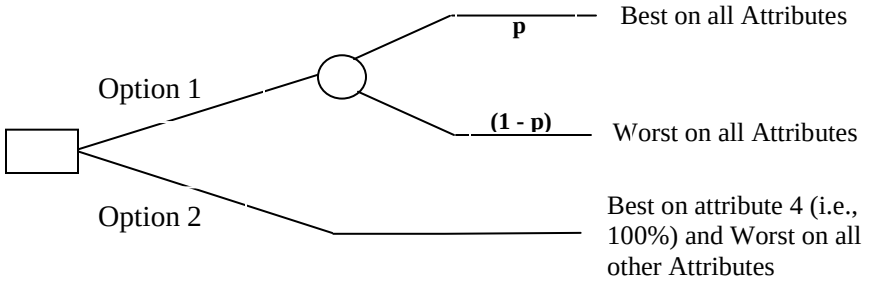

Figure II

Table – IV
Level of Importance of Performance Metrics for Trucking Industry

SNO	*Performance Measure*	*Best Value*	*Worst Value*	*Weight (k_p)*	*Rank*
	Market Sensitivity (0.06)				
1.	Number of discount sales at the end of the season (Percentage of Volume on discount pricing)	0	100	0.06	9
	Virtual Integration (0.25)				
2.	Percentage of virtual meetings (with clients) during project duration	100	0	0.13	3
3.	Percentage of orders taken electronically	100	0	0.12	4
	Process Integration (0.43)				
4.	Percentage of correct orders fulfillment	100	0	0.18	1
5.	Percentage of orders meeting the due dates	100	0	0.15	2
6.	Design-to-delivery cycle time (New service concept)	2 Weeks	6 Weeks	0.10	6
	Network Based (0.26)				
7.	Average Length of relationship time (Percentage of contract renewals)	100	0	0.11	5
8.	Reorder replenishment cycle time (Percentage of times clients additional requests for service has been accommodated)	100	0	0.08	7
9.	Cash-to-cash cycle time	2 Weeks	6 Weeks	0.07	8

Insights from Value Assessment: All major decision making processes from selecting new supplier to investing in IT to setting up new facilities can be structured using this framework. For example, the company decides to make fresh investments to increase its customer service level. A typical approach would be to split the investment equally to improve performance of the company as measured by various attributes. It does not consider the relative importance of the attributes. With the above-mentioned framework the investments can be prioritized. Since process integration is very important with a weight of 0.43, more investment should be diverted towards setting new systems or enhancing the existing system for better process integration. Based on this information, the company has prioritized its strategies and action plan to achieve agility in its supply chain. Such prioritizing helped the company in effectively utilizing time and budget. The company was able to concentrate more on value adding activities and enhance its service delivery.

The utility functions can be used to conduct a deficiency analysis by indicating the difference between the present state and a desired state (Keeney, Raiffa, 1976). By calculating the gradient of the utility function of each attribute for the present state and combining this with subjectively assessed changes in the state of each attribute for an equivalent amount of effort (time and money), one gets an indicator of policies that may be particularly fruitful to pursue.

Alternatively, impact analysis can be performed by value assessment of the attributes. Given the utility function, any specified impact on the one attribute and equivalent valued impact on another attribute can be calculated. A useful way of examining value trade-offs is in terms of economic impacts i.e., in dollar terms. From the judgment of Operations Managers of the company, a decrease in percentage of correct order fulfillments (attribute 4) by 6% would result in losing 20 customers and an annual loss of $1000,000 in revenues. Thus, if the company can enhance its level of process integration with its customers at a cost less than $1 Million to improve the attribute 4, it would be an investment worth making.

The interrelation of these performance attributes to enhance the agility of the supply chain would lead to new opportunities for decision-making. For instance, these opportunities could be found by finding the relationship between percentage of times clients additional requests for service has been accommodated (att-8) and percentage of contract renewals (att-7); percentage of virtual meetings (att-2) and percentage of correct order fulfillments (att-4); similarly finding the interrelations with various attributes would help in improving the agility in supply chains.

CONCLUSION

This paper has attempted to discuss the need for the companies to move from traditional supply chain management to agile supply chain management leveraging the latest trends in the information technology. Further the paper attempted to present performance metrics to measure the agility in the supply chains. Companies like Cisco, Dell Computers, etc have successfully implemented various measures to make their supply chains agile. With the help of excellent process integration 50% of Cisco's customers orders are fulfilled by its manufacturing partners. However, Cisco has complete visibility and control of their manufacturers. The company has also decreased its time to volume by three months and thereby increasing revenues by $100 million annually. XYZ Trucking Company has also taken measures to make its supply chain agile and benefited monetarily as well as in terms of enhanced service delivery.

REFERENCES

Anderson, David L. and Dr. Hau Lee, "Synchronized Supply Chains: The New Frontier", *http://anderson.ascet.com*, 1999.

Anderson, David L. and Dr. Hau Lee, "The Internet-Enabled Supply Chain: From the 'First Click' to the last Mile", http://Ascet.com.

Bowersox, D.J. and Closs, D.J. (1996) *Logistical Management – The Integrated Supply Chain Process*, McGraw-Hil New York.

Christopher, Martin, "Creating the Agile Supply Chain", http://christopher.ascet.com.

Cross, Gray J., "How e-business is transforming supply chain management", *Journal of Business Strategy* 21(2): 36-39, March/April 2000.

Domocker, Judy, "Business seeks to cut weak links from supply chains", *Information Week* (776): 141-146, March 06, 2000.

Ganeshan, Ram, "An Introduction to Supply Chain Management", http://silmaril.smeal.psu.edu/misc/supply-chain-intro.html, 1999.

James, Dana, "E-commerce looms large on the horizon", *Marketing News* 33(18): 3, August 30, 1999.

Jay, Bal, Richard Wilding & John Gundry, "Virtual teaming in the agile supply chain*", International Journal of logistics Management* 10(2): 71-82, 2000.

Khurrum S Bhutta, Faizul Huq "Merging ECR and Consumer Centric Marketing," working paper at Department of Management sciences, University of Texas at Arlington, 2000.

Messmer, Ellen, "Supply chain software meets Web-based e-commerce", *Network World* 17(18): 52, May 01, 2000.

Rachel Mason-Jones, Ben Naylor and Denis R. Towill "Engineering the Leagile Supply Chain" *International Journal of Agile Management Systems*, 2000.

Turban, Efraim, Jae Lee & David King, *Electronic Commerce: A Managerial Perspective,* Prentice Hall Inc. (New Jersey) 2000.

Siverts, Barbara, "Cisco's Extended Enterprise Delivers Competitive Advantage", http://siverts.ascet.com.

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DETERMINANTS OF DEBT AND DIVIDEND DECISIONS: TRADE-OFF VS PECKING ORDER

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ABSTRACT: This study tests the trade-off and pecking order theories about the dividend and debt decisions for stock firms. The decision of a firm to use debt to finance investment opportunities is important since the firm's choice between debt or equity determines the optimal capital structure. Under the trade-off theory, there is some optimal balance between debt and equity, and the firm will use debt until the cost of taking on more debt is more expensive than the cost of issuing equity. The firm uses internal funds first under the pecking order theory, and then if more financing is needed, the firm will use debt, then equity. Using Ordinary Least Squares (OLS) Regression, this study tests the effects of selected financial variables on the debt and dividend decisions for samples of firms screened through Yahoo! Stock Screener. As anticipated, profitability and growth relate positively to the debt decision in support the trade-off theory. In support of the pecking order view, only the growth variable related positively with the debt decision. Results for size, risk, and dividend payout opposed both theories. For the dividend decision study, variable results for operating margin, beta, and the current ratio support both the trade-off and pecking order theories while results for sales growth, market cap, debt ratio, insider ownership and institutional ownership do not support either theory. Profitability related positively and risk and liquidity negatively to the dividend decision. Also, firms with higher liquidity support lower dividend payout.

INTRODUCTION

The purpose of this research study is to test the trade-off (TO) and pecking order (PO) theories about dividend and debt decisions for stock firms. Specifically, do more profitable firms with greater investment opportunity have more or less financial leverage? Also, do more profitable firms with greater investment opportunity have higher or lower dividend payout?

The decision of a firm to use debt to finance investment opportunities is important since the firm's choice between debt or equity determines its optimal capital structure. The issuance of dividends is an issue that stockholders in particular are interested in, since this may change their decision to buy or sell a firm's stock. The two most common models for the explanation of a firm's strategy with their debt are the pecking order theory and the trade-off theory. For dividend payout, pecking order and trade-off models also make predictions that explain how managers determine dividend policy decisions.

LITERATURE REVIEW

The Debt Decision: The pecking order theory is based on a firm's net cash flows and weighs the cost of issuing new stock against the cost of issuing debt. Under this theory, a firm would rather use internal funds than external, which gives the manager more leverage in making decisions since he/she would not have to get approval from external stakeholders. With the pecking order theory, a firm finances its investments through retained earnings until these funds are insufficient for investments. Debt is the next choice for financing a project and then, if under duress, equity. The firm will use low-risk debt first, then high-risk before issuing new common stock. Many times, rapidly growing companies use alternatives to retained earnings and depreciation since these sources provide insufficient funds.

The trade-off theory for a firm's leverage is based on a balance between debt and equity that maximizes stockholder wealth. Debt interest is tax-deductible, which is seen as an advantage over the costs of issuing equity since the after-tax cost of debt is lower than its pre-tax cost. However, there are also drawbacks with the use of debt. With most investments being financed through debt, if profitability decreases, there is a chance that a company will fall into bankruptcy and not be able to honor their obligations. Also, trade-off theory supports an optimal degree of leverage or capital structure where the cost of taking on more debt becomes more expensive than the cost of issuing new common equity.

The Dividend Decision: The Modigliani-Miller (MM) Dividend Irrelevancy Theorem determines that dividend policy is based on which portion of cash earnings should be reinvested in the firm and which should be paid out to investors as dividends (Bacon and Kania 1). There are negative aspects to paying out dividends which include tax costs, agency costs, opportunity costs of reinvestment, the insolvency rule, and the fact that dividend policy is limited by legal constraints. The behavioral reasons for dividends include market imperfections (agency costs, tax costs) and the fact that risk-averse investors prefer the predictability of dividends over reinvesting the funds in the firm (Bacon and Kania 2).

According to Myers and the pecking order model dividends are sticky, or not flexible, in the short-term for unknown reason (Fama and French 4). Also, firms with high leverage, high current and expected investments, and less profitable assets find dividends less attractive. More profitable firms pay out dividends with more earnings. The trade-off theory finds that dividend payout and leverage are positively related to profitability, and the more investments a firm has, the lower the target payout for dividends (Fama and French 11). To control the agency problem caused by free cash flows, profitable firms have more of a need for dividends (Fama and French 13). Firms that do not pay dividends

"primarily use debt to absorb short-term variation in earnings and investment" (Fama and French 30).

Long-run Financial Targets: A firm's behavior is based on partial adjustment to their long run financial targets. Variables that affect the speeds of adjustment to the firm's target for debt or dividend payout include firm size, interest rate conditions, as well as stock price levels (Jalilvand 127). Under this theory, if a firm sets target payout and debt ratios, market imperfections may affect the long run targets with influence from "corporate and personal taxes, bankruptcy costs and agency related costs" (Jalilvand 128). Jalilvand also concludes that there is interdependence among financial decisions of the firm caused by market imperfections (142). The firm may follow partial adjustment of the targets set, but they do not adjust completely to long run targets due to the adjustment costs of constraints. One reason that a firm may deviate in the short run from their long run targets is the timing considerations that occur with the conditions of the capital market (128). When a firm must finance investments with a large amount of external capital, the firm may take on more long term debt than anticipated since "debt financing is more quickly adjusted than another financing source" like the issuance of additional equity (131). If the firm believes that in the future, long run interest rates with increase, the firm may issue more long term debt now. This would cause a temporary cache of liquid assets and less use of short term debt in order to take advantage of the lower interest rate (131). Likewise, if expected long run interest rates were to decrease in the future, the firm would increase the use of external equity financing and short term debt, while postponing the issuance of long term debt (142).

OTHER PREVIOUS RESEARCH

Previous studies have shown support for both pecking order and trade-off theorems. Evidence found to support the pecking order theory shows a negative relationship between profitability and the use of debt. Contrary to the pecking order, the same study showed high growth firms reduce their debt ratio by funding with common equity capital. Trade-off theory was supported by the negative relationship between risk and financial leverage, but findings that revealed a negative relationship between the use of debt and profitability contradict the trade-off theory (Bacon and Bacon 7).

Another study, using the FM approach (Fama and MacBeth), supported both the trade-off theory as well as the pecking order theory with strong evidence that firms with more investments have less market leverage. These two theories were also supported by results showing that large firms with less volatile earnings and net cash flows have a "negative effect of volatility on the payout ratio" (Fama and French 29). With this study, pecking order was better supported than the trade-off model since leverage regressions had shown that the firms with less book and market leverage are those that are profitable. This evidence also

goes against the trade-off model. It seems the biggest challenge in the development of results for these models is the collinearity problem with several of the independent factors and their relationships with target payout or leverage (Fama and French 29). There are also auto correlated variations in net cash flows which become a problem when reading results.

It is controversial whether there is a positive correlation between dividend yield and expected returns; although some studies have found that the higher a firm's expected return is, the higher the dividend yield. Rapidly growing firms will encounter lower dividend payout rates in order to retain more of their earnings to reinvest in the firm while the firm has many current and future investments. Also, the larger the firm is, the more likely the company will pay higher dividends (Bacon and Kania 4).

The OLS regression has been commonly used to examine the dividend decision and in some studies, has supported that "the higher the firm's risk, the lower is its payout ratio." In the same study, multivariate regression analysis was used and found that dividend payout ratio relates negatively to "profitability (return on equity), growth (sales growth), risk (beta), liquidity (current ratio), control (insider ownership), and expansion (growth in capital spending)." Profitability growth and dividend payout have a positive relationship, which was hypothesized in the study (Bacon and Kania 5).

Overall, the pecking order and trade-off theory have both been supported by previous studies, although more evidence supports pecking order over the trade-off theory. For dividends, firms with more investments as well as those who are experiencing rapid growth prefer to reinvest funds in the firm instead of paying out higher dividends. The more profitable a firm is, the greater the likelihood that they will have higher dividend payout ratios.

SAMPLE SELECTION AND METHODOLOGY

This study empirically analyzed data from 849 stocks for the debt decision, and 788 stocks for the dividend decision to examine the impact of key financial variables, deemed important in the finance literature, on both the debt decision and dividend decision using the OLS regression model. Samples of publicly traded firms were created using the power-screening tool from Yahoo! Stock Screener. Yahoo! Stock Screener is part of the search engine Yahoo.com, and provides fundamental financial information on thousands of publicly traded firms. We observed the data for all firms in the selected samples for the third quarter, 2008. For both models, only those firms with positive dividend payout were examined. To analyze the determinants of the debt and dividend decisions, a series of multivariate regression models will be run on the stock sample. Variables for each of the factors in the models were selected from previous studies. Variables, definitions, and hypotheses are summarized for the debt and

dividend decisions in Tables 1 and 2, respectively. For the debt and dividend models the general tests and hypotheses follow:

DEBT DECISION = f (profitability, investment opportunity, dividend payout, growth, risk, fixed assets, size). The study proposes the following null and alternate hypotheses for the debt decision:

$H0_{debt}$: There is no significant relationship between the debt ratio and the independent variables to include, profitability, investment opportunity, dividend payout, growth, risk, fixed assets, and size.

$H1_{debt}$: There is a significant positive relationship between the debt ratio and profitability, investment opportunity, dividend payout, growth, risk, fixed assets, and size.

$H2_{debt}$: There is a significant negative relationship between the debt ratio and profitability, investment opportunity, dividend payout, growth, risk, fixed assets, and size.

Table 1: Variables and Hypotheses for Debt Decision

FACTOR	VARIABLE	DEFINITIONS	HYPOTH. SIGN
FINANCIAL LEVERAGE	DEBT RATIO	TOTAL DEBT/ TOTAL ASSETS	DEPENDENT VARIABLE
PROFIT-ABILITY	OPERA. MARGIN	OPERATING INCOME TO NET SALES	TO (+) PO (-)
SIZE	MARKET CAP	SHARE PRICE X NO. OUSTD. SHARES	(TO) (+) (PO) (+)
GROWTH	SALES GROWTH	Compounded growth rate of Sales Per Share over last year	(PO) (+) (TO) (+)
RISK	BETA	Slope of the 60 month regression line relative to the percentage price change of the S&P 500	(TO) (-) (PO) (+/-)
DIVIDEND PAYOUT	DIV. PAY-OUT RATIO	DIVIDEND/EPS	(PO) (-) (TO) (-)

DIVIDEND DECISION = f (profitability, investment opportunity, growth, risk, fixed assets, size, liquidity, financial leverage, insider ownership, institutional influence). The study proposes the following null and alternate hypotheses for the dividend decision:

$H0_{div}$: There is no significant relationship between the dividend decision and the independent variables to include profitability, investment opportunity, growth, risk, fixed assets, size, liquidity, financial leverage, insider ownership, institutional influence.

$H1_{div}$: There is a significant positive relationship between the dividend decision and profitability, investment opportunity, growth, risk, fixed assets, size, liquidity, financial leverage, insider ownership, institutional influence.

$H2_{div}$: There is a significant negative relationship between the dividend decision and profitability, investment opportunity, growth, risk, fixed assets, size, liquidity, financial leverage, insider ownership, institutional influence.

Table 2: Variables and Hypotheses for Dividend Decision

FACTOR	VARIABLES	DEFINITIONS	HYPOTH. SIGN
DIVIDEND DECISION	DIVIDEND PAYOUT	DIVIDEND PER SH. TO EPS	DEPENDENT VARIABLE
PROFITABILITY	OPERATING MARGIN	OPERA. INCOME TO NET SALES	(PO) (+) (TO) (+)
GROWTH	SALES GROWTH	Compounded growth rate of Sales Per Share last year	(P O) (-) (TO) (-)
RISK	BETA	Slope of 60 mo. regression line rel. to % price change of S&P 500	(P O) (-) (TO) (-)
SIZE	MARKET CAP	SH. PR. X No. OUTSTD. SHARES (BILLIONS)	(TO) (+) (PO) (+)
LIQUIDITY	CURRENT RATIO	CUR. ASSETS TO TOTAL ASSETS	(TO) (-) (PO) (-)
FINANCIAL LEVERAGE	DEBT RATIO	TOTAL DEBT / TOTAL ASSETS	(TO) (-) (PO) (-)
INSIDER OWNERSHIP	INSIDER OWNERSHIP	% SHARES OWN BY INSIDERS	(TO) (-) (PO) (-)
INST. INFLUENCE	INST. OWNERSHIP	% SHARES OWN BY INSTITUTIONS	(PO) (+) (TO) (+)

QUANTITATIVE TESTS AND FINDINGS

Table 3 summarizes the regression results for the debt decision analysis. The regression analysis for the debt decision indicates that the following variables related positively to the debt decision as hypothesized and are significant at the 1%: profitability and growth. There was an unanticipated positive relation between the debt decision and dividend payout as well as risk, although these results were noted as insignificant. There was also an unexpected negative relationship between the debt decision and size of the firm, which is significant at the 1%. Out of the five variables that were tested against the debt ratio, only two variables proved to be in line with the hypothesis of either the trade-off theory or the pecking order theory. Three of the variables that were tested showed unexpected results, although only one of these variables proved to be significant.

Table 3: Regression Results for Debt Decision

FACTOR	VARIABLES	BETA COEF.	HYPOTH. SIGN
FINANCIAL LEVERAGE	DEBT RATIO	NA	DEPENDENT VARIABLE
PROFITABILITY	OPERA MGN	+0.001668***	(TO) (+) (PO) (-)
SIZE	MKT CAP	-0.00093***	(PO) (+) (TO) (+)
GROWTH	SALES GR.	+0.000812***	(PO) (+) (TO) (+)
RISK	BETA	+0.011217	(TO) (-) (PO) (+/-)
DIV. PAYOUT	DIV.PAYOUT	+0.003278	(PO) (-) (TO) (-)
R square	.060145		
F statistic	10.78941		
N	849		

*** Sign. at 1% level, ** Sig. at 5% level, * Sig. at 10% level

The results for the beta coefficient are based off individual regressions done for each independent variable, as well as correlations between all the independent variables. A common problem with multiple regression analysis arises when the potential for collinearity among the selected independent variables or multicollinearity exists. To check for the presence of multicollinearity, we follow the process offered by Canavos (1984) that is, employ large samples of firms and test for collinearity among independent variables with a correlation matrix as shown in Table 4. According to Mason and Lind (1996, p. 541), "A common rule of thumb is that correlations among independent variables from negative .70 to positive .70 do not cause problems." As shown in Table 4 for the debt decision variables and in Table 6 for the dividend study variables, none of the selected independent variables for the regressions were shown to be highly correlated since all were within the –0.70 to + 0.70 guidelines. Therefore, we control for the problem of multicollinearity.

Table 4: Correlation Results for Debt Decision

	Debt Ratio	*Mkt Cap*	*Div Payout*	*Operating Margin*	*Sales Growth*	*Beta*
Debt Ratio	1					
Mkt Cap	- 0.098	1				
Div Payout	0.0332	0.0046	1			
Opera.Mgn	0.1638	-0.003	0.078539	1		
Sales Growth	0.1843	-0.040	-0.08813	0.2124236	1	
Beta	0.0298	-0.096	-0.06552	0.0804166	0.0757314	1

Table 5 summarizes the regression results for the dividend decision analysis. The regression analysis for the dividend decision indicates that the following variables relate negatively to the dividend payout ratio as hypothesized, and are significant at the 1%: risk and liquidity. The size of the firm related negatively to the dividend payout ratio at a significance of 5%,

which was an unanticipated result. Also, institutional influence related negatively with the payout ratio, which is an unanticipated result with 1% significance. The dividend payout ratio related positively as hypothesized with the firm's profitability, with the results significant at the 1%. However, the following variables related positively with the dividend payout ratio at a significance of 1%, resulting in unanticipated findings: growth, financial leverage, and insider ownership. Out of the eight variables tested against the dividend decision, three of the variables had hypothesized results at the 1% significance. Five of the variables that were tested showed unanticipated results.

Table 5: Regression Results for Dividend Decision

FACTOR	VARIABLES	BETA COEF.	HYPOTH. SIGN
DIVIDEND DECISION	DIVIDEND PAYOUT	NA	DEPENDENT VARIABLE
PROFITABILITY	OPERA. MGN.	+0.004921***	(PO) (+) (TO) (+)
GROWTH	SALES GR.	+0.003713***	(PO) (-) (TO) (-)
RISK	BETA	-0.1435***	(PO) (-) (TO) (-)
SIZE	MARKET CAP	-0.00214**	(PO) (+) (TO) (+)
LIQUIDITY	CURRENT RAT.	-0.06382***	(PO) (-) (TO) (-)
FINAN. LEV.	DEBT RATIO	+0.736004***	(PO) (-) (TO) (-)
INSIDER OWN.	INSIDER OWN.	+0.005526***	(PO) (-) (TO) (-)
INST. INFLU.	INST. OWN.	-0.00605***	(PO) (+) (TO) (+)
R square	0.153525		
F statistic	17.66084		
N	788		

***, ** Sig. at 1% level, ** Sig. at 5% level, *Sig. at 10% level

Table 6: Correlation Results for Dividend Decision

	Mkt Cap (B)	*Op. Mgn*	*Sales Gr.*	*Held Insid*	*Curr Ratio*	*Held Inst.*	*Debt Rat*	*Be-ta*	*P/O*
Mkt Cap	1								
Op.Mgn	0.05445	1							
Sales Growth	0.04472	0.095	1						
Held Insiders	-0.1947	-0.04	0.133	1					
Current Ratio	-0.1237	0.013	-0.08	0.031	1				
Held Inst.	-0.1507	-0.11	-0.21	-0.33	0.128	1			
Debt Ratio	-0.0335	-0.01	0.120	-0.01	0.040	0.00	1		
Beta	-0.0454	0.002	0.173	0.020	0.063	-0.1	0.90	1	
Div Payout	-0.0773	0.130	0.109	0.173	-0.12	-0.3	-0.1	0.0	1

CONCLUSION

This study empirically analyzed data from 849 firms for the debt decision, and 788 stocks for the dividend decision to compare the impact of selected variables on both the debt and dividend decisions using the OLS regression model.

For the debt decision analysis, as anticipated from previous research, profitability and growth both support the trade-off theory, with the results from the growth of the firm also correlating as hypothesized with the pecking order theory. However, results for size, risk, and dividend payout opposed previous research for both theories. Thus, in this study more profitable firms take on more debt than equity. This finding contradicts the pecking order view that the more profitable a firm is, the less debt the firm will use. Also, results for the growth variable concur with both theories. Higher growth firms resort to more debt from external sources to finance their investment opportunities.

For the dividend decision study, variable results for operating margin, beta, and current ratio all support of both the trade-off and pecking order theories. However, the results for sales growth, market cap, debt ratio, insider ownership and institutional ownership were all unanticipated and do not support either theory. As predicted by both theories, profitability related positively and risk and liquidity negatively to the dividend decision. The more profitable the firm the higher the dividends and the greater the risk the firm takes on, the less the firm pays out dividends. Also, when the firm has high liquidity ratios, the firm experiences a lower dividend payout.

REFERENCES

Bacon, Frank W., Sally Bacon. "Determinants of the Debt Decision: Trade-off vs. Pecking Order." 1-9.

Bacon, Frank W., Sharon L. Kania. "What Factors Motivate the Corporate Dividend Decision?" 1-9.

Canavos, George (1984). "Applied Probability and Statistical Methods." Boston: Little, Brown and Company, 485-486.

Graham, John R, Campbell R. Harvey (2001). "The Theory and Practice of Corporate Finance: Evidence from the Field. " *Journal of Financial Economics.* Volume 60, Issue 2. Amsterdam, 187.

Fama, Eugene F., Kenneth R. French (April 2001). "Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay?" *Journal of Financial Economics*. Volume 60, Issue 1. Amsterdam, 3.

Fama, Eugene F., Kenneth R. French (March 2002). "Testing Trade-off and Pecking Order Predictions about Dividends and Debt." *The Review of Financial Studies*, 1-32.

Jalilvand, Abolhassan, Robert S. Harris (1984). "Corporate Behavior in Adjusting to Capital Structure and Dividend Targets: An Econometric Study." *The Journal of Finance,* Volume 39, Issue 1.127-145.

Mason, R. D., & Lind, D. A (1996). "Statistical Techniques in Business & Economics", Chicago: *Irwin*, 541.

Myers, Stewart C. (1984). "The Capital Structure Puzzle." *The Journal of Finance*. Volume 39, Issue 3. 575-592.

Rajan, Ragjuran G., Luigi Zingalas (1995). "What Do We Know about Capital Structure? Some Evidence from International Data." *The Journal of Finance*. Volume 50, Issue 5, 1421-1460.

Titman, Sheridan, Roberto Wessels (1998). "The Determinants of Capital Structure Choice." *The Journal of Finance.* Volume 43, Issue 1, 1-19.

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A TEST OF MARKET EFFICIENCY USING A PROBABILISTIC NEURAL NETWORK

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ABSTRACT: A major tenet of investment theory is the concept of efficient markets. In an efficient market all information is fully reflected in the price of a stock. As such, there is no trading strategy based on known data that can earn an abnormal profit. Using price and volume data, this study produces a weak form test of the efficient markets hypothesis. This study employs a probabilistic neural network (PNN) to determine the buy/sell signals for stocks. A new method is presented for using a PNN and a correlation factor based on the PNN results, to determine which stocks are likely to be both significant and profitable. Also, insight is provided for the PNN parameters while giving values that produce the best results. As detailed in this study, the PNN shows promise as the basis for developing trading strategies that may earn abnormal profits.

INTRODUCTION

It has been shown with many studies that stock market returns are predictable using linear models on publicly available data (Schwert, 1990) and (Balvers, Cosimano, and McDonald, 1990). However, it is widely known that stock markets often display non-linear behavior. Therefore, it is necessary to find methods that can overcome the limitations of linear models with respect to financial markets.

One choice for overcoming linear model limitations is the neural network. Vellido, Lisboa, and Vaughan (1999) state that financial forecasting has been done extensively using multi-layer feed-forward neural networks because of their inherent ability to classify and predict a given dependent variable. Hill, O'Conner, and Remus (1996) find that neural networks have the ability to overcome problems associated with linear based methods for financial market predictions.

There are several types of neural networks that show promise in explaining the relationships within a stock market. These include Kohonen self-organizing maps used for classification (grouping of stocks) purposes, multi-layer feed-forward neural networks for estimating various parameters in a market, and probabilistic neural networks (PNN) for classification (up/down

signals for prices). PNNs are simply a variation of a feed-forward neural network and provide an output in the range of 0-1.

The contribution of this paper is to extend the notion of using a PNN for predicting stock market winners and to provide valuable insight into the PNN parameters for future research. We present a PNN that can be used to test a wide variety of stock market trading strategies. This research uses a correlation factor within a PNN to determine which of the rated stocks, as predicted by the PNN, are likely to be both significant and profitable.

FINANCIAL MARKETS REVIEW

The efficient market hypothesis claims that prices fully reflect all information. This theory of investment informational efficiency dates back to the dissertation of Louis Bachelier (1900). The early works of Fama (1965) and Samuelson (1965) provided support for the random walk hypothesis and the efficient market hypothesis. See Dimson and Mussavian (1998) for an excellent history on the development of the efficient market hypothesis.

The efficient market hypothesis is examined via various tests of market behavior and efficiency. The weak form test of the efficient market hypothesis posits that prices fully reflect all information implicit in historical price and volume information. The semi-strong form test of the hypothesis asserts that all publicly available information is reflected in market prices. The strong form test of the hypothesis asserts that information known to any market participant is fully reflected in market prices.

As computer technology caught up with investment theory, tests of market efficiency began to concentrate on the reflective efficiency of the market. That is, how quickly (efficiently) do market participants reflect new information into the price of a security? Technical analysts search for shifts in price and volume that can lead to trading rules that will signal buys and sells before all profit is lost. These technical trading rules are viewed to be most impacted by studies that continue to show support for the random walk hypothesis and the weak form test of the efficient market hypothesis. Fundamental analysts believe that searching out information about a company and applying rigorous analysis can lead one to superior returns. This type analysis does not hold up well given the results of the semi-strong form tests of the efficient market hypothesis. Most semi-strong form tests show that acting on publicly traded information does not lead to superior risk adjusted returns. The strong form tests of the efficient market hypothesis shows that some market participants do have information that may be useful. Corporate insiders may have information that allows them to legally trade the stock of their company and earn superior risk adjusted returns. Some corporate insiders' trade on information that earns superior returns, but the

information is considered illegal insider information and the profits are illegal. Does the profit have to be legal to disprove the hypothesis?

Much of the criticism directed toward the supporters of the Efficient Market Hypothesis comes from the professional investment community. Accurately noting that many academic studies are based on statistical tests that are linear, the argument has been that the factors driving risk, return, and ultimately pricing of securities is much more complex. Lendassse et. al. (2000) provide linear and non-linear models to show the ability of a neural network to provide results which "...seem sufficiently strong to question the random walk hypothesis."

There have been many attempts at quantifying neural network approaches for investments with traditional investment methods. Gençay (1998) presents a nonparametric model to maximize profits from an investment strategy. It is shown that when compared with a simple buy-and-hold strategy the technical strategies provide significant profits. Also, it is reported that the sign predictions of the nonparametric models are statistically significant. Enke et. al. (2005) present an information gain technique to evaluate the predictive relationships of some financial and economic variables. They also examine the differences between level-estimation neural networks and probabilistic neural networks and conclude that models, such as a probabilistic neural network, provide higher risk-adjusted profits than a simple buy-and-hold strategy in a financial market. Thawornwong et. al. (2003) investigate using technical indicators as input to a neural network. Their results indicate that the proportion of correct predictions and the profitability of stock trading are higher than traditional benchmarks.

Similarly, there have been attempts to compare neural network methods with other types of quantitative methods. Jasic and Wood (2004) report that neural networks provide significant information gain over a benchmark linear autoregressive model. Also, they show that buy and sell signals provided by neural networks are significantly different from unconditional one-day mean returns. Olson and Mossman (2003) compare neural network forecasts against the forecasts of ordinary least squares and logistic regression. They report that neural networks have superior performance over the other two methods. Also, they report that classification models perform better than point estimation models.

Leung et. al. (2000) evaluates the efficacy of several classification techniques in financial markets which include probabilistic neural networks, adaptive exponential smoothing, logit and discriminant analysis. Their results indicate that probabilistic neural networks perform better, almost exclusively, over the other methods tested. In addition, they note that using two thresholds for a trading strategy works better than a single threshold. For instance, when

using a probabilistic neural network, a single threshold purchase strategy could be used when the network outputs a value 0.5 or higher. However, a multiple threshold strategy allows for purchasing securities, shorting the market, or even doing nothing.

There are almost an infinite number of input variables for a neural network within the context of a financial market application. Reducing the possibilities for the inputs has been investigated. Enke et. al. (2005) list variables such as interest rates, monetary growth rates, inflation rates and changes in industrial production as some of the more statistically important inputs for predicting stock market returns. Cichocki et. al. (2005) presents a method called Independent Component Analysis that reduces the number of explanatory variables by reducing the set of financial and economic information into a subset of significant components.

It has been shown that there is evidence to argue against the efficient market hypothesis. There is also substantial and growing evidence that financial markets display complex behavior that causes linear models to be less suitable for market prediction than neural network models. Neural network models have been shown to provide insight into the behavior of markets. Trading strategies using neural networks show great promise for dealing with the non-linear complex behavior of most financial markets.

NEURAL NETWORK MODELS

Neural network models are tools that come from two branches of research. One is from the statistical community and consists of computational statistics and multivariate modeling. The other is from the machine learning community and consists of artificial intelligence and computer science techniques that allow for the creation of non-parametric models. These non-parametric models generalize data into models that can be used for classification, pattern recognition, and ultimately prediction. One of the foremost benefits of using non-parametric models is that they can accommodate nonlinear behavior without loss of information.

These models work by mimicking the human brain and the interactions of the nervous system. A typical neural network contains an input layer, a hidden layer, and an output layer. The input layer receives the inputs for the model from various sources. The hidden layer acts as an intermediate step between the input and the output layers. Lastly, the output contains the different outputs of the model. There can be multiple nodes in each of these layers as is illustrated in Figure 1. The model works using each of the connections between the nodes. The connections have weights typically ranging from 0 to 1. When an input is received, a value is propagated through the hidden layer and on to the output layer. These values are then evaluated for the desired accuracy against expected

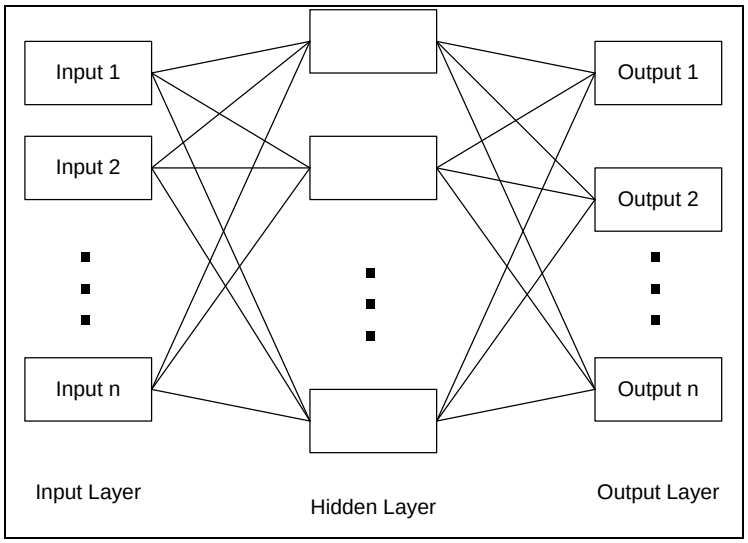

Figure 1: Illustration of a typical feed-forward neural network

values. Then, in an iterative fashion, the connections are adjusted during the learning process until the network produces the desired accuracy of results. A historic data set is used for both training and testing the efficacy of the neural network. The data are broken into a training set and a testing set. After running the training data, the network is tested against known data to assess the overall performance of the network.

METHODOLOGY

The methodology follows and extends much of the previous literature. First, a PNN is used based on the findings of both Gencay (1998) and Enke et. al. (2005). Leung et. al. (2000) state that multiple thresholds are useful for a PNN. They suggest this instead of using a basic cutoff point such as 0.5 for predictions. As such, the cutoff point for the PNN is an input variable which allows for testing different values. The hypothesis for this paper is that observed market data (volume, opening price, closing price, high price, low price and index level) contain enough pattern information to develop and employ a stock picking strategy that will outperform an index type investment. The hypothesis in this paper closely mirrors the work by Cichocki et. al. (2005) by capturing significant information from a reduced set of financial input data. A PNN is used to extrapolate that information for forecasting purposes.

The data employed by the model are grouped into three categories, (1) trading strategy, (2) stock category, and (3) a listing of the actual stocks. The model first evaluates each stock individually and is then evaluated by the neural network during the training process. Next, the neural network predicts against known values and learns from its mistakes. The resulting process is a series of

iterations which evaluates each of the stocks in the S&P 500 for all of the days in the time period. The time frame utilized for this study is March 2003 – August 2006.

The main parameters of the model are the trading strategy and the stock category. A trading strategy contains parameters for the risk tolerance (percent gain or loss allowed), the number of days of data to use for training the network, time horizon for the prediction, and the number of stocks to purchase. Trading strategies reflecting differing risk tolerances are easily accomplished. As such, a trading strategy that is risk averse could be developed to reduce the downside risk assumed. In the model tested for this paper, only the amount of positive change is specified. Another important aspect addressed by the PNN is the time horizon of the trading strategy. The model tested in this paper defines time horizon as the length of time into the future that the PNN is attempting to predict. The stock category defines the list of stocks to be considered by the PNN. In this study the S&P 500 is used as stock category. The symbols of all the companies in the index are used by the system to input the historical data for all the stocks.

The model processes the data for each individual stock. The time required to simulate 16 weeks of data is approximately 60 minutes using a 3.0 GHz processor with 1 GB of RAM. During the process of evaluating each stock a correlation score is obtained that measures the relationship of the predictability of the PNN for each stock versus the actual results for the most recent data available. In its current state the model uses only positive relationships as information for predicting the profitability of stocks. Another possibility is to convert the model to use negative relationships that would indicate a decline in price.

To simplify the model, a constant investment of $1000 USD is used for each stock purchase. It is assumed that this amount will be used to purchase each stock and that the stock can be purchased in partial shares. Also, it is assumed that any profit is taken and any loss is returned at the end of each 16 week period. This allows for the constant investment previously mentioned. The model purchases up to a given number of stocks based on the trading strategy. The stocks are chosen from a list that has the highest correlations between the PNN's predictions and known testing data. If the list has fewer entries in a given period than the desired number of stocks to purchase, the model purchases each of the stocks in the list. If the list has more entries, the model purchases the desired number of stocks based on the largest correlations. The model's selling rules are as follows. 1) The stock is sold if it reaches its low price, based on the risk tolerance of the trading strategy. 2) The stock is sold if it reaches its desired price at any time, based on the amount of change specified in the trading strategy. 3) The stock is sold at the closing price at the end of the period if the stock has surpassed neither the specified high nor the specified low prices. At the end of each period, the model steps back to the next period and simulates purchases in

that period based on the next PNN generated choices. Taxes and transaction fees are assumed to be insignificant for this study.

Stock data is downloaded from Yahoo.com and imported into the model. The model then removes the most recent period's data for simulating the purchase and sale of individual stocks. The remaining data is used for training and testing the neural network. As is common when developing a neural network 75% of the data is used for training and the remaining 25% is used for testing the neural network. The choice of training and testing data results in some stocks being excluded due to lack of available data.

CONCLUSIONS

It is discovered that the risk tolerance of the trading strategy gives its best performance in the 12-14% range. This is the amount of tolerance in the trading strategy for a loss on the purchase/sale of a given stock. This parameter is tested below 12% and is found to be too sensitive. Many of the stocks chosen by the PNN often drop up to 10% of its purchased price before rebounding into a profitable scenario. Therefore, setting the risk tolerance below 12% caused the model to prematurely sell stocks at a loss that otherwise would have produced the desired profit. Also, it is discovered that the amount of desired change gives its best performance in the 16-19% range. This is near the peak level of performance of stocks before a market correction happens within the specified length of the prediction period.

Results with the previously mentioned inputs produce a return of $4,780 over the horizon specified earlier (approximately 3 years and 5 months) for an initial investment of $5000. This approximately translates into an annualized return of 22.1%. This is calculated using the average return over each 16 week period. Since it was assumed that profit is taken or loss is replaced from/to the initial investment of $5000, a compounded rate-of-return is not calculated. This conservatively calculated return compares favorably with Ibbotson Associates reported returns for large cap stocks (15.397%), and long term corporate bond returns (4.802%) over the same time frame.

The inputs are tested to derive optimum profits. The most profitable prediction period is found to be 14-16 weeks. Running the model for less than 14 week predictions did not provide sufficient time for the stock price to grow. Running the model for more than the 16 week prediction period detracted from its ability to accurately predict short-term gains. The model had 1 out of 14 periods (16 weeks per period) where a 17.6% return was obtained. Overall, an average return of $341.43 was achieved for each of the periods tested. 3 out of 14 periods posted negative returns with a maximum loss of ($181.04) which translates to a 3.6% loss for that period. However, these losses are included in the overall profit figures.

The contribution of this paper extends the notion of using a PNN for predicting stock market returns and provides valuable insight into the PNN parameters for future research. We present a PNN that can be used to test a wide variety of stock market trading strategies. This research gives a new method for using a PNN and a calculated correlation factor to determine which of the rated stocks, if any, are likely to be both significant and profitable.

The results of this study are both significant and promising. Future improvements to this study include optimizing the parameters used for inputs, and testing different parameters. Data sets other than the S&P 500 should also be tested. Questions related to domestic versus international, small versus large companies, developed versus undeveloped stock markets, are all areas of possible future research.

REFERENCES

Bachelier, L. (1900) trans. James Boness. Theory of Speculation. in Cootner (1964), 17-78.

Balvers, R., Cosimano, T. & McDonald, B. (1990). Predicting Stock Returns in an Efficient Market. Journal of Finance, 55(4), 1177-1189.

Cichocki, A., Stansell, S., Leonowicz, Z., & Buck, J. (2005). Independent Variable Selection: Application of Independent Component Analysis to Forecasting a Stock Index. Journal of Asset Management, 6(4), 248-259.

Dimson, E., & Mussavian, M. (1998). A Brief History of Market Efficiency. European Financial Management, 4(1), 91-193.

Enke, D., & Thawornwong, S. (2005). The Use of Data Mining and Neural Networks for Forecasting Stock Market Returns. Expert Systems with Applications, 29(4), 927-940.

Fama, E. (1965). The Behavior of Stock Market Prices. Jounal of Business, 38, 34-105.

Gençay, R. (1998). Optimization of Technical Trading Strategies and the Profitability in Security Markets. Economics Letters, 59(2), 249-254.

Hill, T., O'Connor, M., & Remus, W. (1996). Neural Network Models for Time Series Forecasts. Management Science, 42(7), 1082-1092.

Jasic, T. & Wood, D. (2004). The Profitability of Daily Stock Market Indices Trades Based on Neural Network Predictions: Case Study for the S&P 500, the DAX, the TOPIX, and the FTSE in the Period 1965-1999. Applied Financial Economics, 14, 285-297.

Lendasse, A., De Bodt, E., Wertz, V., & Verleysen, M. (2000). Non-linear Financial Time Series Forecasting – Application to the Bel 20 Stock Market Index. European Journal of Economic and Social Systems, 14(1), 81-91.

Leung, M., Daouk, H. & Chen, A. (2000). Forecasting Stock Indices: A Comparison of Classification and Level Estimation Models. International Journal of Forecasting, 16(2), 173-190.

Olson, D. & Mossman, C. (2003). Neural Network Forecasts of Canadian Stock Returns using Accounting Ratios. International Journal of Forecasting, 19(3), 453-467.

Samuelson, P. (1965). Proof That Properly Anticipated Prices Fluctuate Randomly. Industrial Management Review, 6, 41-49.

Schwert, W. (1990). Stock Returns and Real Activity: A Century of Evidence. Journal of Finance, 45, 1237-1257.

Thawornwong, S., Enke, D. & Dagli, C. (2003). Neural Networks as a Decision Maker for Stock Trading: A Technical Analysis Approach. International Journal of Smart Engineering System Design, 5(4), 313-325.

Vellido, A., Lisboa, P. & Vaughan, J. (1999). Neural Networks in Business: A Survey of Application (1992-1998). Expert Systems with Applications, 17(1), 51-70.

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TAX PLANNING FOR ZERO CAPITAL GAINS TAX RATE FOR 2008-2010

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ABSTRACT: In 2008, a couple with ordinary taxable income of $65,100 or less or a single filer with ordinary income of $32,500 or less qualifies for tax-free capital gains and qualified dividend treatment. For some taxpayers, it is possible to push income down to these levels to take advantage of what may be a temporary tax benefit.

INTRODUCTION

The Jobs and Growth Tax Relief and Reconciliation Act of 2003 (JGTRRA 03) included several tax provisions, which included a provision lowering taxes on capital gains and qualified dividend income. The act reduced the 20% tax rate on adjusted net capital gains to 15% and the 10% tax rate on net adjusted capital gains to 5%. The act further reduced the 5% tax rate on adjusted net capital gains to 0% tax rate for tax years beginning after 2007. However, these favorable tax provisions fort adjusted net capital gains, including the 0% tax rate and more favorable taxation of qualified dividend income, were scheduled to sunset for tax years beginning after 2008. The tax rates would then be the same as they had been prior to the act, and qualified dividends would again be taxed at ordinary income tax rates.

The Tax Increase Prevention and Reconciliation Act of 2005 (TIPRA 05) has extended the lower tax rates for adjusted net capital gains, including the zero percent tax rate for tax years beginning in 2008 through 2010. Taxpayers now have a greater window of opportunity to take advantage of the lower capital gains rates, and should plan to do so in the near future. The advantage is particularly great for middle income investors who fall within the ten and fifteen percent tax brackets, as they are the individuals who may take advantage of the zero percent capital gains tax rate. Other taxpayers who may benefit during this window of opportunity include retirees, parents and children, and individuals with high net worth but low income.

The Tax Increase Prevention and Reconciliation Act of 2005 includes other tax provisions of particular interest to individual taxpayers. The act provides relief for alternative minimum tax. It also changes the rules regarding

the kiddie tax. The act also makes provision for conversions of IRAs to ROTH IRAs regardless of income level.

SPECIFICS REGARDING THE CAPTIAL GAINS TAX RATES

The Tax Increase Prevention and Reconciliation Act of 2005 (TIPRA) extended the favorable tax rates for adjusted net capital gains and qualified dividend income provided for in the Jobs and Growth Tax Relief and Reconciliation Act of 2003 (JGTRRA). Before JGTRRA taxpayers in the income tax brackets above 15% paid a 20% tax rate on capital gains. JGTRRA changed the 20% rate of tax on capital gains to 15%. Also prior to JGTRRA, taxpayers in the 10% and 15% income tax brackets paid a 10% rate of tax on capital gains. JGTRRA lowered the 10% rate to 5%. The 5% rate was then further lowered to a zero percent rate of tax on capital gains for tax years beginning after 2008. In addition, JGTRRA included a provision which applied capital gains tax rates to qualified dividend income. The old law required that dividends be taxed at ordinary income tax rates. These provisions regarding capital gains tax rates were scheduled to sunset after 2008, however TIPRA has extended these more favorable capital gains tax rates through 2010.

A definition of adjusted net capital gain may be helpful in further explaining the capital gains tax rules. To begin with, net capital gain is net long-term capital gains less net short-term capital losses. This does not include sales from collectibles, sales of Section 1202 qualified small business stock or sales of depreciable real property. Net capital gain becomes *adjusted* net capital gain by adding qualified dividend income to the net capital gain. In order for the qualified dividend income to qualify for capital gain tax treatment it must not be included in investment income in calculating investment interest expense.

For tax year 2008, those taxpayers who are married and file a joint return with ordinary taxable income no greater than $65,100 will fall within the 10% to 15% income tax brackets. Individuals who file a return with a single filing status with ordinary taxable income no greater than $32,500 will also fall within the 10% to 15% income tax brackets. These are the individuals who will be able to take advantage of the zero percent capital gains tax rate for tax years beginning in 2008.

HOW THE CAPITAL GAINS TAX RATES ARE CALCULATED

It might be helpful to look at a few examples of the application of the new rules. The following examples pertain to tax years beginning in 2008.

Example 1: Ted and Lisa are a married couple filing a joint tax return. They have two children whom they claim as dependents. Ted earned $40,000 in wages during 2008 and Lisa earned $42,000 in wages during 2008. They itemize their

deductions which include mortgage interest of $9,000, real estate taxes of $1,100, state income tax withholding of $5,000, and charitable giving of $2,000. In addition, they withdrew funds from one mutual fund account and transferred them to a new mutual fund account during 2008, resulting in capital gains incurred on the transaction of $1,500.

Ordinary taxable income would be calculated as follows:	
Wages	$82,000
Less: Personal Exemptions	(14,000)
Less: Itemized Deductions	(17,100)
Ordinary Taxable Income	$50,900
Ordinary taxable income	$50,900
Adjusted Net Capital Gain	1,500
Total Taxable Income	$52,400

Because the total taxable income of $52,400 is less than $65,100 the maximum taxable income taxed at 15%, then the total capital gain from the transfer of mutual funds will be taxed at the zero percent capital gains tax rate. Remember, the calculation is based upon *taxable* ordinary income, not gross ordinary income.

Example 2: Maryann is a single taxpayer who earned $41,000 in wages during 2008. She also sold some stock she inherited, and the transaction resulted in a capital gain of $3,500. Maryann claims no dependents, and she claims the standard deduction on her income tax return.

Ordinary taxable income would be calculated as follows:	
Wages	$41,000
Less: Personal Exemption	(3,500)
Less: Standard Deduction	(5,450)
Ordinary Taxable Income	$32,050
Ordinary Taxable Income	$32,050
Add: Adjusted Net Capital Gain	3,500
Total Taxable Income	$35,550

The maximum taxable income at the top of the 15% income tax bracket for single filers is $32,500, therefore only $450 of the capital gain from the sale of the stock would be taxed at the zero percent capital gains tax rate ($32,500 - $32,050 ordinary taxable income). The remaining $3,050 would be taxed at the 15% capital gains tax rate. Only the amount of adjusted net capital gains which would not exceed the top income in the 15% income tax bracket if added to ordinary taxable income would qualify to be taxed at the zero percent capital gains tax rate.

Example 3: Kendra and Marcus are a married couple who will file a joint income tax return for 2008. Marcus retired from his job during the year, and earned wages of $29,500 during 2008. Kendra is a homemaker and had no earned income during 2008. Kendra and Marcus sold stock during the year, and reinvested the proceeds into other investment accounts. The transactions resulted in net capital gains of $30,000. In addition, they received qualified dividend income from the stock during the year in the amount of $25,000. Their home is paid for, so they claim the standard deduction on their tax return.

Ordinary taxable income would be calculated as follows:

Wages	$29,500
Less: Personal Exemptions	(7,000)
Less: Standard Deduction	(10,900)
Ordinary Taxable Income	$11,600

Net adjusted capital gains would be calculated as follows:

Net Capital Gains from sale of stock	$30,000
Add: Qualified Dividend Income	25,000
Adjusted Net Capital Gains	$55,000

Once again, the top income level taxed at the 15% income tax bracket is $65,100 for married couples filing jointly. Ordinary taxable income plus the adjusted net capital gains equals $66,600. Therefore, $1,500 of the adjusted net capital gains would be taxed at the 15% capital gains tax rate ($66,600 total taxable income less $65,100), and the remaining $53,500 would be taxed at the zero percent capital gains tax rate.

Example 4: Now assume the same scenario as Example 3, but assume instead of wages that the couple qualified to receive Social Security retirement benefits instead. In figuring the ordinary taxable income, one would have to take into account that the net adjusted capital gains would increase the amount of the Social Security benefits which would be taxable. This is an important fact to keep in mind when planning to take advantage of the zero percent capital gains tax rate for retirees.

Example 5: Juan is a single individual who earned wages during 2008 totaling $30,000. He also received qualified dividend income of $250 during 2008. Juan also had incurred investment interest expense of $300 from borrowed funds which he used to buy investment property. Juan takes into account his qualified dividend income when calculating his investment interest expense, allowing him to deduct $2,500 of the investment interest expense on his 2008 income tax return. Juan's total taxable income will clearly fall well below the $32,500 maximum income at the 15% income tax bracket. However, he used the qualified dividend income in calculating his deductible investment interest expense which means that the qualified dividend income will now be characterized as ordinary income. The qualified dividend income will be taxed at

ordinary income tax rates, and will not qualify for the zero percent capital gains tax rate.

CAPITAL GAINS TAX PLANNING FOR RETIREES

The above examples clearly show how middle income investors will be able to take advantage of the zero percent capital gains tax rates. However, the advantage is not so clear-cut for retirees. If careful planning is done in advance, retirees will be able to also benefit from the zero percent capital gains tax rate. The tax planning will differ depending upon the different stages of retirement. For example, early retirees may not qualify yet to receive Social Security benefits, while older retirees will definitely need to take those benefits into account. Some retirees will have the ability to gift to children and grandchildren, while other retirees may not have descendants, or perhaps may not have the financial means to make gifts, and are instead concerned about maintaining a minimum income. And many retirees have a high net worth, but a low annual income, making it possible for them to benefit from the zero percent capital gains tax rate.

Early retirees may take advantage of the zero percent tax rate after they have retired from high paying jobs, but before receiving Social Security benefits. Many of these retirees hold part-time jobs, earning far less than their previous jobs, and they will fall within the taxable income ranges which allow them to supplement their incomes by cashing out mutual fund accounts or selling stock. And the gains incurred in these transactions can then be tax free for at least a couple of tax years.

Retirees may also want to take advantage of the opportunity to reallocate their assets, perhaps reducing the level of risk in their portfolios. If planned for carefully, the gains realized from these transactions can be managed to fall under the taxable income limits which will allow the retirees to benefit from zero tax.

Retirees may also be invested in mutual fund accounts with which they are satisfied, and which have gained in value. The accounts could be sold during tax years 2008 through 2010 and the gains would be tax free. Then the retirees could reinvest in the same mutual funds, and now have a higher basis in their accounts for future tax purposes. This strategy would also be appropriate for middle income investors.

Some of these strategies may be met with some reluctance by taxpayers. For example, there could be concern about qualifying for certain types of financial assistance. Incurring capital gain income could disqualify some retirees from drug assistance plans, or property tax refunds.

CAPITAL GAINS TAX PLANNING FOR PARENTS AND CHILDREN

Parents/grandparents may also want to consider gifting appreciated stock to children and grandchildren whose income levels fall within lower tax brackets. The annual exclusion for such gifts is $12,000 per donee. So, two parents can exclude up to $24,000 in gifts per child per year. However, there are some potential tax issues which must be taken into account. It may be wise to limit these gifts to older children or grandchildren in order to avoid the kiddie tax. Children aged 18 and younger will be taxed on investment income in excess of $1,800 at their parents' higher tax rates. The same rule applies for dependent full-time students between the ages of 19 and 23. Also, making gifts to college students may eliminate their ability to receive financial aid. It may be best to make these gifts following the first semester of their junior year of college when income levels are no longer examined for financial aid purposes.

Some of these strategies may also be met with some resistance by taxpayers. Transfers of assets to children and grandchildren may be viewed by states as an intentional strategy to qualify for Medicaid, and may delay receipt of benefits while the transfers are reviewed. In addition, some taxpayers may be reluctant to make gifts of appreciated assets when the same assets will receive a step-up in basis when the children/grandchildren inherit them upon the taxpayer's death.

CAPITAL GAINS TAX PLANNING FOR INDIVIDUALS WITH HIGH NET WORTH AND LOW INCOME

Individuals with a high net worth and a low income can take advantage of the zero percent capital gains tax rate by re-evaluating investments and perhaps selling those appreciated assets which don't look to be as favorable in the future. Portfolios might be restructured, perhaps selling riskier assets in favor of less risky assets. Since other income is low, these taxpayers can obviously take advantage of the zero percent tax rate on a higher amount of adjusted net capital gain income. It is also important to remember to factor in any capital loss carryovers from previous years when planning to sell appreciated assets.

This might also be the time to invest in assets which yield qualified dividend income since this income also receives the more favorable capital gains tax treatment. Qualified dividends are dividends which are paid by domestic corporations, or foreign corporations which trade in an established United States market, or a corporation which is incorporated in a United States possession. The dividend income must also be received prior to January 1, 2011 to be considered qualified, and the investment generating the income must generally have been held by the investor for a minimum of 61 days within the 121 day period beginning 60 days before the ex-dividend date. Obviously, this strategy could also work for taxpayers of lower net worth and higher incomes.

MANAGING INCOME AND DEDUCTIONS

With the opportunity to benefit from a zero percent rate of tax on adjusted net capital gains available for tax years 2008 through 2010, it is important to keep in mind that levels of taxable income will be an important factor in qualifying for the zero tax rate. It is advisable to try to plan for the timing of the receipt of income, as well as the timing of deductions. Some income should be timed for receipt in tax years 2008 through 2010, and other income should be held off until after 2010. For example, some retirees may want to avoid minimum distribution requirements by converting traditional IRAs to ROTH IRAs. Individuals still earning wages on the job may want to maximize contributions to 401(k) plans in order to reduce taxable income. Others may want to convert investments which yield taxable interest to municipal bonds which yield tax free income. For some taxpayers it may be advisable for them to take an early redemption on certain investments.

It is also important to plan to take deductions during the favorable tax years. For example, plan to pay for as many medical bills in one tax year as possible, thereby hopefully exceeding the 7.5% adjusted gross income limitation. It might also be wise to reduce taxable income by contributing to tax deductible traditional IRA accounts. Perhaps consumer loans might be converted to home equity loans, allowing the taxpayer to deduct the taxable interest.

OTHER FEATURES OF THE TAX INCREASE PREVENTION AND RECONCILIATION ACT OF 2005

The Tax Increase Prevention and Reconciliation Act of 2005 contains other tax provisions of interest to individual taxpayers. These provisions impact such tax items as alternative minimum tax, the kiddie tax, and IRA conversions. It is important to be aware of these provisions as they may have an impact on tax planning for the zero percent capital gains tax rate.

The lower capital gains tax rates also apply to the alternative minimum tax. Consequently, the lower rates are not a tax preference item taken into account when calculating alternative minimum tax. Regular tax and alternative minimum tax are calculated the same for adjusted net capital gains.

As mentioned earlier in the discussion concerning tax planning strategies for parents and children, the kiddie tax has also been recently revised. For tax years beginning after 2005, investment income in excess of $1,700 for children under 18 years of age was taxed at the parents' rate of tax. This was an increase from the original law which made the provision applicable to the investment income of children under 14 years old. Now, it is important to note that the limitations imposed by TIPRA 05 have been revised by the Small Business and Work Opportunity Tax Act of 2007. For tax years beginning after 2007,

investment income of children under 19 years of age, and of dependent college students between 19 and 23 years of age will potentially be subject to the parents' income tax rate. In addition, the level of investment income to which this applies has been increased from $1,700 to $1,800.

The act also makes a provision for those taxpayers who wish to convert their traditional IRA accounts to ROTH IRA accounts, but were unable to do so previously due to adjusted gross income limitations. According to TIPRA 05, the $100,000 modified adjusted gross income limitation has been eliminated for tax years beginning after 2009. The income which must be included in gross income as a result of the conversion will be ratable recognized in 2011 and 2012. Taxpayers can elect, however, to recognize all of the income in 2010. This provision might have some bearing on the decisions of those planning to take advantage of the capital gains tax rates, since taxable income will potentially be increased by the amount of realizable income from the conversion, and the year that the taxpayers choose to recognize it.

CONCLUSION

Due to the extension of some favorable tax provisions by the Tax Increase Prevention and Reconciliation Act of 2005, taxpayers may be able to take advantage of a zero percent capital gains tax rate in tax years 2008 through 2010. The zero percent tax rate is available to taxpayers with income taxable in the 10% and 15% income tax brackets. For married couples filing a joint income tax return, an ordinary taxable income level of no more than $65,100 will allow them to take advantage of this provision. For single taxpayers, the ordinary taxable income limit is $32,500.

Careful tax planning will be required in order for taxpayers to fully benefit from this provision. Middle income investors, retirees, parents and children, and individuals with high net worth and low incomes will all have specific considerations and decisions to make if they wish to take advantage of the zero percent tax rate. It is important to mention here, as well, that this law may be impacted by a new administration. Since 2008 is an election year, taxpayers may wish to plan to benefit from the provision perhaps sooner than later.

REFERENCES

Block, Sandra (2007). 2008 Drop in Capital Gains Rate Won't Be for Everyone. Retrieved from www.USAToday.com.

Hube, Karen (2008). What's Mine Is Mine: Retirees, in particular, may be able to benefit from a new zero-percent tax rate. *The Wall Street Journal*, 251 (104), pR6.

McPherson, David (2008). Zero Capital Gains Tax. Retrieved from www. Forbes.com.

McPherson, David (2008). Capital Gains Tax Cuts for Middle Income Investors. Retrieved May 7, 2008 from: www.Ivestopedia.com.

Perez, William (2008). The Zero Percent Capital Gains Tax Rate. Retrieved from www.About.com.

P.L. 109-222, 109th Congress. May 17, 2006.

Sumutka, Alan R., Sumutka, Andrew M., & Margarido, Gina S. (2006). Planning for the 2008/2010 Zero-Percent Adjusted Net Capital Gain Rate, *CPA Journal*, December 2006.

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GOING GLOBAL: FACTORS INFLUENCING U.S. BASED SMES' INTERNATIONAL MARKET ACCESS

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ABSTRACT: Globalization promotes vast business opportunities for trade, flow of capital, ideas, and people. In order to integrate into the global economy, countries tend to promote policies, which in turn, help to remove barriers to the flow of investment, goods, and services. While there is ample information describing how multinational corporations have benefited from globalization through greater access to international markets and investment, there is a need to identify ways to unburden small to medium-sized enterprises so that they can reach their potential in the global economy. Barriers vary across business sectors. However, there are fundamental impediments that prevail, in general. The barriers to SME exports add to the resistance of their leaders to launch businesses outside of the NAFTA region. This descriptive paper summarizes international trade activity of US-based SMEs and focuses on key export barriers to US-based SMEs. An analysis of demographics and purchasing power of and Brazil, Russia, India and China is conducted, suggesting opportunities for US-based SMEs export to those markets.

INTRODUCTION

Globalization has opened world markets to United States' businesses, including small to medium-sized enterprises (SME) at an unprecedented rate. Due to advances in transportation and communication, globalization continues to change and challenge the nature of conducting business. It brings vast expansion of market opportunity that goes well beyond multinational corporate businesses. The expansion of an emerging middle class in Brazil, Russia, India and China (BRIC), for example, offers SMEs untold export opportunities. However, there are real and imagined barriers to transforming United States' (US) small to medium-sized enterprises (SMEs) into international enterprises exporting to more than one country, which is the typical profile of American SMEs.

This article summarizes the international trade activity between US-based SMEs with BRIC countries, and key impacts of globalization on prospects of these businesses to expand their international reach to the developing BRIC economies. The descriptive study focuses on the following questions: 1) "What are the barriers and opportunities to US-based SMEs to position themselves to be competitive internationally. 2) Why should US SMEs consider exporting to BRIC economies?" Further, the article provides an overview of globalization

and internationalization theories which focus on multinational corporations (MNCs) than on SMEs. This is followed by a discussion about the BRIC economies, US trade policy and impact on SMEs. This paper provides an overview of US exports, an examination of the contribution of SMEs to US trade around the world, and describes barriers faced by SMEs.

GLOBALIZATION AND RESEARCH ON INTERNATIONALIZATION OF FIRMS

Globalization involves the integration of economies through increased trade, flow of capital, ideas, and people. In order to integrate into the global economy, countries promote liberalization policies, which in turn help to remove barriers to the flow of investment, goods, and services. There are a number of factors associated with the process of globalization. The integration of financial markets and the resulting flow of capital in the form of investments form a world economy. According to International Monetary Fund (2008) the value of trade of goods and services as a percentage of GDP has increased by 20 percentage points, from 42.1 percent in 1980 to 62.1 percent in 2007. Over 1980 to 2006, foreign direct investments have increased from 6.5 percent to 31.8 percent (International Monetary Fund, 2008). Advancements in transport and communication technology have extended the reach of finance and brought countries closer, thus increasing the scope and scale of conducting business. In spite of the reduction in transportation cost, large companies conduct the vast majority of international business with limited involvement on the part of SMEs.

Some of the theories frequently used to explain the internationalization efforts of large business include product life cycle model (Vernon, 1966), stage theory (Johanson and Vahlne, 1977), monopolistic advantage theory (Hymer, 1976), and eclectic theory (Dunning and Narula, 1998). These theories focused on the role of innovation and internationalization efforts of the firm, process of internationalization, and the locational, ownership and organizational advantages that firms and host economies offer. Based on the size of the organization, MNCs have greater access to capital, technological know-how and have the resources to operate at a global scale. These organizations have greater access to export market by virtue of economies of scale, which they enjoy, and their ability to enter into the foreign market. On the other hand, host countries possess advantages, which relate to market: internal and external, skilled and un-skilled labor, infrastructure, and government policies to promote a productive business environment. According to Khanna, Palepu and Sinha (2005) initially many MNCs failed to understand the importance of local customer preferences, challenges associated with infrastructure, and policy differences in developing countries. As a result they preferred to invest and conduct business in the developed countries. Therefore, international trade theories must go beyond MNCs to include SME trade and investment opportunities.

OVERVIEW: BRIC ECONOMIES, US TRADE POLICY AND ROLE OF US-BASED SMES

In 2006, there were 26.8 million US-based SMEs (United States Small Business Administration, 2007), which is less than 1% (239,287) exported goods, accounting for 28.9% of export value but 97% of export activity (United States Department of Commerce, 2006). Large companies, those employing more than 500 workers, represented over 71% of known export value, but only 3% of US exporters (United States Census Bureau, 2008).

United States' SMEs are grossly under-represented in the global markets, with a few exceptions including Canada and Mexico as seen in Table 1. According to the United States Census Bureau (2008), 58% of all US-based SMEs exported to only one international market in 2006, namely Canada or Mexico. As shown in Table 1, nearly four times more US-based SMEs trade with Canada than trade with China. Since Canada and Mexico are our key North American Free Trade Agreement (NAFTA) partners, these statistics are not surprising. However, given the population projections of emerging world markets, and the many changes that globalization has brought, it is surprising the US business is so narrowly focused.

US companies could benefit from expanding their export activities to developing and emerging countries. BRIC's long-term sustainable growth should be of interest to SMEs worldwide. According to O'Neil (2001) the BRIC economies would account for over 10% of the world's GDP by 2010. O'Neil's prediction has proven to be conservative since as of June 2008, the BRIC countries' combined economic power makes up 15% of the global economy (Symmons, 2008). Since 42% of the world's population (Population Reference Bureau, 2007) are represented by BRIC countries. Given the growth of both the population and emerging economies of BRIC, opportunities abound for US-based SMEs prepared to expand their export activities.

Table 1: US-based SMEs Export Destination Profile, 2006

Countries	Total US Exporters (#)	US-Based SMEs (#)	SME Exporters (%)	US SME Export Value (% of Total US Export Value)
Top five export destinations				
Canada	87,554	82,715	94.5	20.8
Mexico	44,204	40,929	92.6	27.5
United Kingdom	39,684	36,547	92.1	31.5
Germany	29,416	26,802	91.1	25.8
Japan	26,648	24,138	90.6	30.4
BRIC countries				
China	25,873	23,389	90.4	34.9
India	13,774	12,013	87.2	40.1
Brazil	13,465	11,627	86.3	28.5
Russia	4,684	3,885	82.9	50.5

Source: International Trade Administration, 2007.

US Trade Policy, SMEs and BRIC: An important component of US trade policy is the free trade agreement (FTA). According to the US Trade Promotion Coordinating Committee (2007), 16% of US overall trade deficit resulted from FTA trading partners, while 84% of the trade deficit came from those countries with which the US lacked FTA agreements. Overall, FTAs appear to have been beneficial to US-based SMEs export business. According to the International Trade Administration (2007), US-based SMEs exported $82.1 billion of goods to American FTA partners, 36% of the total value of SMEs global exports in 2005.

According to the International Trade Administration (2008), in 2003 almost 95% of all companies that exported to NAFTA partners were SMEs. Moreover, SMEs accounted for the majority of exporting companies to other FTA partners as well. Since the primary purpose of the FTA is to level the international trade playing field, and SMEs appear to be cautious, if not reluctant, to engage in international trade too far from the secure NAFTA borders, it would seem reasonable to assume that SMEs will be wary of venturing into BRIC economies until the U.S. has at least negotiated FTAs with BRIC nations.

Of great interest to US-based SMEs should be the International Trade Administration's (ITA) short-term priorities for 2007-2008 focused on advancing U.S. international and commercial strategic interests by developing and implementing FTAs and other regional initiatives. Among the first priorities of this plan is to focus specifically on BRIC nations. The priorities include the expansion of business initiatives with China and India through bilateral efforts, completion of the Russian market access package, and launching a US-Brazil commercial dialogue (International Trade Administration, 2007b). Each of these initiatives is designed as steps towards the longer-term goal of FTAs with the BRIC nations.

PURCHASING POWER AND BRIC

According to Population Reference Bureau (2007) the BRIC countries account for over 43% of the world's population and these demographic trends will lead to a rise in the supply of labor force and create demand for goods and services. As the per capita income rises the emerging countries contribute towards additional growth of the global economy. This will help to grow the size of the middle class in these countries. In the year 2000, about 400 million people were classified as middle class and projected to increase to 1.2 billion by 2030 (World Bank, 2007). The US National Export Strategy included Brazil, China and India as its priority focus for US exports due to their growing economies. US exports to these countries combined in 2006 grew by 30% (Trade Promotion Coordinating Committee, 2007).

According to Deseglise (2007) the purchasing power of the middle class in China and India will continue to grow. In the case of China, the middle class is growing at a faster pace than the upper and lower income segments (Gadiesh,

Leaung & Vestring, 2007). Further Farell, Gersch & Stephenson (2006) note that the middle class in China will be younger than those in the developed countries, ranging between 25 to 44 years, compared to 45 – 54 years in the advanced countries. This suggests a strong likelihood that demand will grow for new products. India has also witnessed a surge in the number of middle class citizens. By 2025, the middle class will account for 41% of the population, or 583 million. The middle class will primarily be concentrated in the cities and by 2025 nearly 75% of the urban population is projected to be categorized as middle class (Beinhocker, Farrell and Zainulbhai, 2007). Further, it is suggested that this segment of the population will spend nearly 70% of their income on discretionary products: Health care, recreation, education, personal products, transportation and other items.

Unlike China and India, Brazil faces economic stagnation. According to Elstrodt, Laboissiere and Pietracci (2007), Brazil is characterized by low cost of labor and low labor productivity. The country depends on a large informal sector workforce. As a consequence of the availability of cheap labor, presence of complex regulations, and high interest rates many businesses prefer to function in the informal sector (Musacchio, 2008). All of these factors impact the size of the middle class and the purchasing power of the population. Further as one looks at Russia, it is clear that the pace and scope of economic growth is expected to continue in the coming years. Over the last ten years the country's economy has grown by 7%. During the period 2002 to 2006, consumer spending increased by 107% and disposable income grew by 11% (Financial Times, 2008).

BARRIERS TO INTERNATIONALIZATION OF US-BASED SMES

Barriers vary across business sectors. However, there are fundamental impediments that prevail, in general. The frequently cited barriers to SME expansion into emerging markets include 1) inadequate national policies and bureaucracies, both US and export countries, 2) trade agreements and treaties to promote international trade, 3) long term capital financing and investment, 4) lack of intellectual property rights protection, 5) lack of international trade knowledge and experience, 6) bribery and corruption, 7) inadequate technology and e-commerce knowledge, 8) lack of or ineffective local partnerships and 9) misconception that international markets are suited for existing products and services, rather than re-engineering, distributing and packaging to fit the various cultural settings of the emerging markets (Trade Promotion Coordinating Committee, 2007; Fliess, and Busquets, 2006; Organisation for Economic Co-operation and Development, 2006).

Inadequate national policies and bureaucracies, both US and export countries: The most recent US government study, "Unlocking America's Potential" (Trade Promotion Coordinating Committee, 2002) surveyed 3,000 SMEs and conducted focus groups with 100 exporters. The study proposed

several recommendations related to better customer service by US agencies to SMEs, access to financing, access to information about overseas market opportunities, need for early project development and lack of information about government programs to assist US businesses. However, the two major areas for improvement cited were 1) the need for US government services to be seamless and timely and 2) need coordinated assistance to SMEs in international markets.

According to the Trade Promotion Coordinating Committee (2007), doing business in BRIC countries is challenging due to bureaucracies at the central, provincial and local levels. Each country has its own challenges. For example, in China, enforcement of the law is inconsistent, lacking predictability, and an incomplete understanding of competition and free enterprise. Customs procedures and domestic regulations can be as much of an impediment to exporting as import tariffs (Fliess and Busquets, 2006). Facilitating US-based SME access to international markets is directly linked to the need for governments to standardize regulatory systems for an internationalized infrastructure in regulations and dispute resolution processes (Organisation for Economic Co-operation and Development, 2004).

Lack of trade agreements and treaties to promote international trade: The United States Department of Commerce (2008) states FTAs are especially important for SMEs since they reduce the cost of conducting business overseas and allow SMEs to become global players at a much faster rate. FTAs benefit SMEs in many ways including the lowering or eliminating tariffs, updating and enforcing laws on intellectual property protection, facilitating customs and providing a level playing field by addressing market access issues for specific industries. In BRIC countries, US exporters are impacted by the significant import tariffs and taxes. In Brazil, for example, the combination of high taxes and import tariffs can lead to doubling the price of goods (Trade Promotion Coordinating Committee, 2007). The US does not have FTAs with any of the BRIC countries.

Need for long term capital financing and investment: According to Tobin (2006) the lack of financial resources can inhibit the expansion of SMEs. The Organisation for Economic Co-operation and Development (OECD), in cooperation with Asia Pacific Economic Cooperation (APEC), studied barriers to SMEs access to international markets. A key finding was that a majority of the SMEs reported the most problematic barrier was their own companies' internal capabilities. Interestingly, when the SMEs were broken down between experienced and non-experienced exporters, there was a significant difference. The companies lacking export experience cited the need for financial assistance and trade access. Those active exporters cited more concern with their own internal business operations (Organisation for Economic Co-operation and Development, 2006). Also, SME foreign direct investment can be an important

strategy for larger SMEs to go global (Organisation for Economic Co-operation and Development, 2004).

Lack of intellectual property rights protection: Innovation is pervasive in the SME sector. Fixed costs and expenses of acquiring and enforcing intellectual property rights required for bringing inventions to market are a reality for all business. However, Jensen and Webster, (2006) determined that SMEs tend to have a higher rate of inventions than larger firms and more often seek and have more incentives to obtain intellectual property protections. Concerns of intellectual property right infringements are most often reported by SMEs related to emerging economies, most frequently cited are China and Russia (Fliess and Busquets (2006). However, India is also of significant concern (Trade Promotion and Coordinating Committee (2007).

Lack of international trade knowledge and experience: According to Prater and Ghosh (2005), US-based SMEs have traditionally invested in European countries and in Mexico and Canada. The former had priority due to familiarity with the business culture and long-term economic relations. US businesses have invested in Canada and Mexico perhaps due to geographic proximity, as well as trade agreements, such as NAFTA. Also, the time and resources required of SMEs to contend with deal with tariffs and trade barriers put a drain on the financial and human resources of these companies. They lack expertise of international trade and are resistant to invest in hiring legal advocates to help untangle the trade regulations (Fliess and Busquets (2006). There is a need for "how-to" guides to assess the novice SMEs interested in launching their export business (Organisation for Economic Co-operation and Development 2006).

Corruption and bribery: Lack of transparency is a fundamental impediment to conducting business. Bribery and corruption is pervasive and impacts local, national and global business. Transparency International (2008) indicates that bribery and corruption is a pressure on all businesses, but that SMEs are particularly vulnerable since they typically lack the resources to institute systems to resist bribery demands when conducting business around the world. Transparency International publishes an annual ranking of the perception of corruption in public sector organizations in the 180 world countries as reported by businesses and individuals. The rankings range on a 1 to 10 Corruption Perception Index (CPI) with 1 being the most corrupt rating. The 2008 rankings (Table 2) illustrate that BRIC countries are perceived as among the most corrupt in the world with Russia at 2.1, India and Brazil and China were ranked similarly at 3.4, 3.5 and 3.6 CPI respectively.

Table 2. Corruption Perception Index (CPI), 2008

Rank	Country	CPI
180	Somalia	1.0
147	**Russia**, Syria, Bangladesh, Kenya	2.1
85	**India**, Senegal, Panama, Serbia, Montenegro, Madagascar, Albania	3.4
80	**Brazil**, Swaziland, Burkina Faso, Saudi Arabia, Thailand, Morocco	3.5
72	**China**, Bulgaria, Macedonia, Peru, Mexico, Suriname, Trinidad, Tobago	3.6
18	USA, Japan, Belgium	7.3
1	Denmark, Sweden, New Zealand	9.3

Source: Transparency International, 2008.

Three of the BRIC countries, China, Brazil and India have comparable CPI ratings, with Russia perceived dramatically more corrupt. The least corrupt countries ranked as number 1 were Denmark, Sweden and New Zealand with a 9.3 CPI. The US is ranked 18 with Japan and Belgium. According to the Financial Times (2008), Russia's federal government's corrupt ties to big business supports large companies, leaving Russian SME businesses struggling to compete. The Trade Promotion and Coordinating Committee (2007) reports similar concerns with Brazil, India and China. BRIC Based upon the perceptions of corruption, US-based SMEs are cautious and reluctant to venture into the BRIC

Inadequate technology and e-commerce knowledge: Despite the considerable advancements made in transport and communication technology, SMEs perceive international trade to be too expensive. However, E-commerce represents a cost effective method by which means by which SMEs can enter the international marketplace. Experienced exporters can also utilize e-commerce tools to expand their reach. However, lack of knowledge and infrastructure a common concern by SMEs (Hornby, Goulding and Poon, 2002; Trade Promotion and Coordinating Committee, 2007).

Lack of or ineffective local partnerships: Further, the reluctance of SMEs may be explained by lack of knowledge about international partners and the resulting perception of high-risk. SMEs' excessive costs of travel and time invested trying to foster trading partner relationships impede their decision to consider exporting their products, or can also bring failure to international export efforts (Taylor, 2004). Also, understanding the customs and needs of the emerging marketplaces is crucial to SMEs success in export markets (Khanna, Palepu and Sinha, 2005; Prahalad and Hart, 2002). Furthermore, there are misconceptions that international markets are suited for existing products and services. Rather than attempting to re-engineer, distribute and package the product to fit the various emerging markets' cultural settings, often SMEs fail to address these localization factors. This impedes the internationalization efforts of SMEs (Prahalad and Hart, 2002). Local partners facilitate the understanding of emerging markets' needs and strategies to conduct successful business ventures.

Misconceptions that international markets are suited for existing products and services: Khanna, Palepu and Sinha (2005) provide a framework that can assist potential exporters to shape their strategies according to the realities found in each of the BRIC nations in applying the schema suggested, exporters, while not utilizing the identical strategies in all BRIC countries, can at least generate synergies by analyzing the distinct markets as part of a system. Prahalad and Hart (2002) advised that MNCs expand their focus beyond upper and middle class markets to the vast growing markets in emerging markets. Given that these markets have limited cash and inventory space, exporters must incorporate local markets lifestyles and not just seek to sell their American products to the emerging markets. They sight compelling examples of how changing from bulk to individual portion packaging will appeal to middle and low income customers. Research and development conducted in the local emerging markets is needed to develop products specific to those markets. The lessons to these MNCs have a direct applicability to the SMEs that can respond competitively.

CONCLUSION AND FUTURE RESEARCH

The world economy offers opportunities to both large and small businesses to go global. In the era of globalization, SMEs from the United States have further opportunities to expand in the manufacturing and service sectors. It is imperative that US-based SMEs adopt a global approach. Advancements in communication technology will further help to extend the scale and scope of SMEs. While there are many barriers to US-based SMEs to expanding beyond the NAFTA countries, the opportunities for American business to enter the newly emerging world markets are significant. The 2007 National Trade Strategy (Trade Promotion Coordinating Committee, 2007) has selected China, India and Brazil as the top three priority opportunities for US export trade development. Given that 42% of the world's population is in BRIC countries, and their economies are among the fastest growing in the world, US federal and state governments are committed to expanding US trade to these markets.

The most frequently cited barriers faced by US-based SMEs seeking to expand into emerging world markets include: Inadequate country specific policies and bureaucracies, lack of trade agreements and treaties, inadequate long term financing and investment, insufficient intellectual property rights protection, limited international trade knowledge and experience, bribery and corruption, lack of technology and e-commerce knowledge, need for effective local partnerships and lack of understanding of the heterogeneous needs of emerging markets and conducting business across various cultural settings. US-based SMEs need to have a global approach, going beyond NAFTA. International trade needs go beyond regional trade. US-based SMES should seek to expand and diversify their export markets to include the BRIC nations.

SMEs perceive so many barriers to launching their exports to emerging markets. Free trade agreements reduce these barriers while lowering the trade imbalances. Therefore, it is important for the US Government to aggressively seek free trade agreements with BRIC nations to assist US-based SMEs to overcome the many barriers that impede them from entering the global marketplace. These agreements may serve as incentives for SMEs to venture out to more diverse international markets.

This descriptive study leads to further research questions. What are the barriers that SMEs face in each of these BRIC countries? What specific industry sectors have the most potential for US trade expansion to BRIC? Why does the US trade strategy exclude Russia as a primary trading partner its 2007 export strategy? What business, export and in-country, opportunities exist for California SMEs to BRIC? Because of California's significant economy and its geographical location, the state's SMEs have export potential to Pacific countries. Are the needs identified by US-based SMEs comparable to California SMEs? What are the specific industry sectors' barriers to export expansion? Future research is needed to understand the landscape of California's SME business sectors and perceived barriers and opportunities for business expansion to BRIC countries.

REFERENCES

Beinhocker, E.D., Farrell, D., & Zainulbhai, A.S. (2007). Tracking the growth of India's middle class. The McKinsey Quarterly, 3, 51-61.

Deseglise, C. (2007). Emerging Markets: GDP and Profitability of BRIC Countries Will Overtake Developed Areas by 2050. October 1, http://www.investmentweek.co.uk/public/showPage.html?page=printer_friendly_breakingnews&pring=477471.

Dunning, J.H., & Narula, R. (1998). (Ed) Foreign Direct Investments and Governments: Catalysts for Economic Restructuring. Routledge, New York, NY.

Elstrodt, H., Laboissiere, M.A., & Pietracci, B. (2007). Five Priorities for Brazil's Economy. The McKinsey Quarterly, Special Edition, 93-105.

Farrell, D., Gersch, U.A.., & Stephenson, E. (2006). The value of China's Emerging middle Class. The McKinsey Quarterly, 60-69.

Financial Times (2008). Russia Special Report. April 18, http://media.ft.com/055e2176-0c83-11dd-86df-0000779fd2ac.pdf

Fliess, B., & Busquets, C. (2006). The Role of Trade Barriers in SME Internalization. OECD Trade Policy Working Papers, No.45, OECD Publishing. Doi:10.1787/246707602042.

Gadiesh, O., Leung, P., & Vestring, T (2007). The Battle for China's Good-Enough Market. Harvard Business Review, September 2-11.

Hornby, G., Goulding, P., & Poon, S. (2002). Perceptions of Export Barriers and Cultural Issues: The SME E-Commerce Experience. Journal of Electronic Commerce Research, 3, 213-226.

Hymer, S. H. (1976). The International Operation of National Firms A Study of Direct Foreign Investment. MIT Press, Cambridge, MA.

International Monetary Fund (2008). Globalization: A Brief Overview. International Monetary Fund Issues Brief, May, Number 2, 1-8. http://www.imf.org/external/np/exr/ib/2008/pdf/053008.pdf

International Trade Administration (2007). U.S. Export Fact Sheet. October 11. www.commerce.gov/ssLINK/PROD01_004233.

International Trade Administration (2008). SME Exporters by Market, 2006. http://ita.doc.gov/td/industry/otea/edb/index.html.

Jensen, P. H., & Webster, E. (2006). Firm Size and the Use of Intellectual Property Rights. Economic Record, 82, 44-55.

Johanson, J., & Vahlne, J. (1977). The Internationalization Process of Firm: A Model of Knowledge Development on Increasing Foreign Commitments. Journal of International Business Studies, 8, 23-32.

Khanna, T., Krishna, G. P., & Sinha, J. (2005). Strategies That Fit Emerging Market. Harvard Business Review. June 4-18.

Musacchio, A. (2008). Brazil Under Lula: Off the Yellow BRIC Road. Harvard Business Review. March 1-25.

Organisation for Economic Co-operation and Development (2004). Promoting Entrepreneurship and Innovative SMEs in a Global Economy: Toward a More Responsible and Inclusive Globalisation. 2nd OECD Conference of Ministers Responsible for Small and Medium-sized Enterprises, Istanbul, http://www.oecd.org/dataoecd/5/24/31919590.pdf.

Organisation for Economic Co-operation and Development (2006). Removing Barriers to SME Access to International Markets. OECD-APEC

Keynote Paper on Removing Barriers to SME Access to International Markets. http://www.oecd.org/dataoecd/4/16/37818320.pdf .

O'Neil, J. (2001). Building Better Global Economic BRICS. Goldman Sachs Economics Paper No: 66, November 30, 2001.

Prahalad, C.K., & Stuart L. H. (2002). The Fortune at the Bottom of the Pyramid. *Strategy + Business*, Issue 26, 1-16.

Population Reference Bureau (2007). World Population Data Sheet. http://www.prb.org/pdf07/07WPDS_Eng.pdf.

Taylor, R. L. (2004). Pursuing the Global Economy: Assistance for Small Business. Competitiveness Review, 14, 1& 2.

Tobin, M. (2006). Debunking the Five Myths of Global Expansion. Financial Executive, 22, 57-59.

Trade Promotion and Coordinating Committee (2007). 2007 National Export Strategy. http://www.ita.doc.gov/media/Publications/pdf/nes2007FINAL.pdf.

Transparency International (2008). Corruption Perceptions Index. http://www.transparency.org/policy_research/surveys_indices/cpi.

United States Census Bureau (2008). A Profile of U.S. Exporting Companies, 2005-2006. http://www.census.gov/foreign-trade/Press-Release/edb/2006/edbrel.pdf.

United States Department of Commerce (2006). Small & Medium-Sized Exporting Companies: Statistical Overview, 2006. http://ita.doc.gov/td/industry/otea/sme_2006/SME_index_2006.html.

United States Department of Commerce, Global Diversity Initiaitive (2008). Free Trade Agreements (FTAs) Benefit SMEs. http://www.buyusa.gov/globaldiversity/fta_benefits.html.

United States Small Business Administration (2007). Small Business Profile: United States. www.sba.gov/ADVO/research/profiles/07us.pdf.

Vernon, R. (1966). International Investment and International Trade in the Product Life Cycle. Quarterly Journal of Economics, 80, 190-207.

World Bank (2007). Global Economic Prospects. Overview and Global Outlook. The International Bank for Reconstruction and Development, The World Bank, Washington, DC.

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INVESTMENT COSTS AND RETURNS OF GROWTH MUTUAL FUNDS

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ABSTRACT: *Beating* the market is a zero-sum game. After the deduction of investment management costs, investors collectively underperform market averages. Since investors are unlikely to foretell the best-performing growth mutual funds, they should be alert to a signpost that increases the probability of identifying winners--funds that levy below-average financial intermediation expenses.

INTRODUCTION

Millions of individuals and families invest in mutual funds as their primary mechanism for accumulating and storing wealth. There are thousands of mutual funds available in which to allocate financial assets. Almost one in three Americans owns at least one mutual fund.

Mutual funds offer investment management, regulatory protection, liquidity, diversification and convenience. A beneficial corollary of investing in mutual funds is an enhanced quality of life deriving from the peace of mind that accompanies liberation from the emotional and intellectual burden of having to devise critical financial decisions independently.

GROWTH INVESTING

The *efficient market hypothesis* postulates that the price of a financial asset such as common stock is identical to its underlying economic value. Investment professionals such as v*alue* investors and *growth* investors are persuaded that asset price and intrinsic value (the sum of the present value of a company's future cash flows) differ. Growth is a component of value.

If the efficient market hypothesis is irrefutable then a portfolio construction methodology such as growth investing or value investing cannot succeed in delivering market-beating performance.

Growth investors often are willing to pay a premium price to own a financial asset with prospectively accelerating earnings and/or revenue momentum. Growth investors recognize they must pay a high price to accumulate an ownership interest in a company’s future prospects. Income is secondary to capital gains. Capital gains arise when other investors recognize the

earnings growth potential and momentum arising from factors such as new products, patents, and expanded markets. Growth fund investors invest in stocks that are relatively expensive and volatile in comparison with value stocks.

An alternative growth fund strategy is growth at a reasonable price. This blended approach, in contrast to earnings-driven or revenue-driven tactics, is more sensitive to price, and often commits capital to stocks rejected by momentum investors.

Growth investors purchase stocks whose earnings escalation justifies their price; value investors gravitate toward companies whose stock prices are fractions of their estimated intrinsic value.

INVESTMENT COSTS

The implication of the efficient market hypothesis is that an efficient stock market will likely induce relatively similar gross returns from investing, causing net returns to be highly dependent on fees and expenses. Since there is a direct relationship between low costs and high returns, low expenses are a potent advantage.

Several researchers have examined these relationships and developed a methodology that is employed analogously in this study. Their focus has been various categories of fixed-income funds, measured over various time frames, and money market funds rather than equity funds.

Bogle (1994) concluded that higher expenses were highly correlated with relative returns. In a subsequent study, Bogle (1999) reiterated and re-emphasized the importance of selecting lower-cost bond funds. Reichenstein (1999) demonstrated that higher expenses consistently predicted lower returns for taxable bond funds. Domian and Reichenstein (2002) extended Reichenstein's analysis to municipal bond funds. They concluded that expense ratios were consistent predictors of relative returns.

Seminal research on money market funds funds was conducted by Domian and Reichenstein (1997). They endorsed the commodity view of money market funds (often associated with Bogle, 1994), observing that these funds "have little ability to distinguish their portfolios from those of their competitors," (p. 171) and "primarily compete based on differences in expenses." (p. 172) Bogle (2007) employed an ordinal ranking of taxable money market funds in terms of returns and expenses. He reported that "costs tell virtually the entire story in money market funds." (p. 148)

The issue of expenses as a deadweight loss for bond funds has also been studied. Reichenstein reported strong statistical evidence of a one-to-one negative relation between expense ratios and net returns.

Bogle (1999) observed, with irony, that load funds typically had higher expense ratios, compounding the detrimental impact on investment performance. Reichenstein compared both the gross returns and net returns of load funds and no-load funds. The hypothesis that average gross returns were equal for load and no-load funds received robust support.

Legendary investor Warren Buffett addressed the issue of investment costs in Berkshire Hathaway's 2005 Annual Report. He commented that "investors have had experiences ranging from mediocre to disastrous" by not choosing a low-expense path. "There have been three primary causes: first: high costs, usually because investors traded excessively or spent far too much on investment management; second, portfolio decisions based on tips and fads rather than on thoughtful, quantified evaluation of businesses; and third, a start-and-stop approach to the market marked by untimely entries (after an advance had been long underway) and exits (after periods of stagnation or decline)…they should try to be fearful when others are greedy and greedy only when others are fearful."

Costs impede investment performance. Each dollar of fees, expenses, and sales charges is not merely removed immediately from investable assets, but is a continuous hemorrhage that dispenses financial punishment by mathematically compounding the cumulative penalty of the costs imposed.

The expenses extracted from an actively managed fund are a significant impediment to overcome. Sustainable lower costs presage competitive advantages for equity mutual funds.

The portfolio management business is an intensely competitive search for undervalued securities. The stock market is dominated by highly sophisticated investors. The efficient market theory predicts that: (a) operating expenses and trading costs (bid-ask spreads and the market impact of trades) instigate a malign effect and trigger a deadweight loss that must be wholly offset in order for a fund’s performance to match a benchmark; (b) equity market pricing reflects all publicly available information, compromising and eclipsing fund managers’ ability to exploit opportunities to deploy assets in undervalued securities; and (c) there is an inverse relationship between the net returns and expense ratios of funds.

The implication of these hypotheses is that an efficient stock market will likely induce relatively similar gross returns from investing, causing net returns to be highly dependent on fees and expenses. That is, the high (sometimes hyperkinetic) level of trading among active managers and their attendant costs

undercuts and shrinks the net returns to investors. In such an environment, once investors have determined the asset classes appropriate for their portfolio, they should be vigilant sentinels and select investment vehicles such as index funds and/or low-cost competitors. The low-cost overhead of index funds accrues a formidable and durable advantage that compounds over time and elevates the probability of earning strong relative returns. Since there is a direct relationship between low costs and high returns, low expenses are a potent advantage. "There is a strong tendency for those funds that charge the lowest fees to the investor to produce the best net results." (Malkiel, 2007, p. 309)

If the empirical evidence from this research study affirms the efficient market theory, investors would maximize their prospects of attaining a market return by being assiduously focused on funds that do not extract high operating and trading costs or impose sales charges either as a price of admission or contractual exit outlay. In addition, presuming adequate diversification and an appropriate level of risk, other decision filters should be: the integrity of management as the stewards of shareholder capital, examples of which are transparent corporate disclosure and candid communications with shareholders; and alignment of interests with shareholders.

Manifestations of the latter are rational allocation of capital, moderate asset turnover, sensitivity to tax consequences, a management team that has invested substantial personal assets in its fund and also implemented policies designed to discourage short-term speculators and market timers, and periodic closing of funds to new investors either to inhibit asset bloat or when confronted by diminished investment opportunities.

These guiding principles would counterweight Bogle (2008, p. 96), who opined, "The mission of the fund business has turned from *managing* assets to *gathering* assets, from stewardship to salesmanship."

The stewardship grade ratings reported by Morningstar (assigned by evaluating regulatory issues, board quality, manager incentives, fees, and corporate culture) are functional proxies for these screening variables.

A fresh re-examination of growth mutual fund data is warranted to highlight evidence of the currency of the theory of efficient markets.

DATA AND METHODOLOGY

The database employed in this research study is *Morningstar Principia Mutual Funds Advanced*, dated July 2007 (data as of June 30, 2007). Each mutual fund and exchange-traded fund in Morningstar's fund universe is classified by investment objective and 3-year, 5-year, and 10-year compound average annual total return data (geometric total returns) are itemized along with

allied information such as expense ratios. To be included in this study, a fund in a particular growth-style category must have at least ten years of rate of return data, as reported by Morningstar. The total number of growth funds satisfying this condition is 1,749. Table 1 enumerates the number of funds within various classifications.

TABLE 1: GROWTH MUTUAL FUNDS

Category	Number of Funds	No-Load Funds	Load Funds
Large Cap Growth	916	520	396
Mid Cap Growth	461	247	214
Small Cap Growth	372	213	159
Total	**1749**	**980**	**769**

The Morningstar database incorporates different share classes, such as those labeled "A" shares, and both retail and institutional funds. These funds were maintained in this study because of the observed differences in expense ratios. The database reports expense ratios as of the date of publication. As noted by Domian and Reichenstein (2002, p. 64), "Expense ratios are quite stable. Therefore, it is easy to predict funds that will have low actual expenses before the fact." Similarly, they observed (1997, p. 182), "Most funds maintain stable expense ratios." Thus, while there is some variability, this research follows their path by employing the expense ratios reported by Morningstar for each fund, which are not averaged, as close approximations of operating costs.

Morningstar assigns the universe of growth funds into various categories: large-cap, mid-cap, and small-cap. This study will examine each of these categories over multiple time periods: 3 years, 5 years, and 10 years.

The purpose of this research study is to investigate two empirical issues that are of vital interest to individual and institutional investors.

The first issue will address the extent to which higher-cost growth funds penalize shareholders by delivering lower rates of return, on average, in comparison with lower-cost funds.

The conventional wisdom is that funds with high expenses will provide noncompetitive yields unless they increase risk. In contrast, low-fee funds (with low turnover of assets) will achieve a rate of return matching the market return as closely as can reasonably be expected. Hence index funds and other low-cost funds should garner yields superior to most actively managed funds since they are not handicapped and undermined by high costs.

This issue will be addressed for each component of the preceding growth-style fund categories, as classified by Morningstar, for three time frames: 3 years, 5 years, and 10 years. Expense ratio data for each fund category will be

divided into three groups and an average total return computed for each group. The data will be analyzed to test the hypothesis that lower-cost funds deliver superior average total returns and that higher-cost funds provide inferior average total returns. The results of this analysis are indispensable to investment decision-making since rational, opportunistic economic agents would re-design portfolios based on information reporting whether or not the level of expenses is the best predictor of future growth fund performance.

The second issue of exploration in this research study will be to examine the proposition that expenses are a deadweight loss. Expenses do not simply reduce returns. Efficient market theory contends that there exists a roughly one-to-one inverse relationship between expenses imposed by mutual funds and their total returns. This prediction is more demanding and precisely formulated than the first research issue to be addressed. It tests the hypothesis that the estimated slope coefficient in a regression analysis is not statistically different from negative one (-1). That is, if the expense ratio of a fund increases by one percentage point, then the fund's total return decreases by one percentage point. Regression analyses will be performed in testing the deadweight loss hypothesis for each of the aforementioned fund categories for three time horizons: 3 years, 5 years, and 10 years.

SALES CHARGES

The first hypothesis to be tested is that mutual fund sales charges assessed either upon purchase or redemption are a deadweight loss. Since gross returns are independent of and liberated from sales loads, and thus exclude the impact on portfolio performance, this test compares gross returns of load funds and no-load funds for each of the three growth-style fund categories.

The null hypothesis states that average gross returns are equal for load funds and no-load funds. That is, the average gross rate of return is not shaped or influenced by an investor's decision to pay or shun sales fees. Statistical support for this contention would affirm the deadweight loss hypothesis, wherein the deadweight loss is measured by the sales charge.

Section A of Table 2 through Table 4 addresses this issue. The initial step is to compute the gross return of each fund in each category. Gross return is equal to net return plus expense ratio. After separating load funds from no-load funds, the average 3-year, 5-year, and 10-year gross returns are computed for each fund category and reported in Section A. Finally, a two-sample hypothesis test is conducted to test whether or not gross returns on load funds can be discriminated from gross returns on no-load funds.

The hypothesis that there is no statistical difference between the means, applying a 95% level of confidence, cannot be rejected in 7 out of 9 (78%) tests

(three time horizons for each of the three fund categories). Increasing the level of confidence by one percentage point improves the outcome to 8 of 9 (89%). There is little statistical support for the alternative hypothesis that average gross returns differ between load funds and no-load funds. (A secondary test compared average net returns for no-load funds and load funds in each time period. These data are not as pure as above since fund-management costs are affecting *net* performance whereas they have no impact on *gross* performance. In 8 out of 9 trials the no-load funds, as a consequence of their lower expense ratios factored into this analysis, earned statistically greater net returns; in one case the net returns were statistically equal.)

This conclusion garners support from logic as well as quantitative evaluation. Sales charges, whether collected at purchase or sale, are shared between brokerage organizations and affiliated investment advisors. They are not distributed to mutual fund management teams and hence should not affect investment performance.

The decision to consent to a sales load when allocating risk-capital is defensible for those economic agents unschooled in investment analysis and/or unwilling to commit the requisite time, resources and energy to researching no-load fund alternatives. But many investors who are not constrained by these parameters voluntarily pay commission charges. Apparently, they have cultivated the impression that higher costs correlate with higher returns. Historical information is viewed as an unreliable messenger. Emotional devotion to the task of outwitting the market is costumed as statistical likelihood, with insufficient regard to empirical evidence.

TABLE 2: LARGE CAP GROWTH FUNDS

A. Gross Return

		Gross Return (%)		
Fund Category	N	3 Year	5 Year	10 Year
No-Load	520	10.80	10.32	7.31
Load	396	10.58	9.97	6.75
Statistically Different Gross Return?		No	Yes*	Yes

B. Net Return

		Net Return (%)				
Fund Category	N	3 Year	5 Year	10 Year	Expense Ratio	Combined Load
No-Load	520	9.70	9.22	6.20	1.11	
Load	396	8.86	8.25	5.02	1.72	3.71

	3 Year	5 Year	10 Year
Slope Coefficient (916 observations)	-1.32	-1.22	-1.98
p Value	2.2E-12	2.35E-13	4.63E-26
R^2	.05	.06	.11
Slope Statistically Different from 0?	Yes	Yes	Yes
Slope Statistically Different from -1?	No	No	Yes

C. Expense Ratio and Net Return

		Net Return (%)		
Expense Category	Expense Ratio	3 Year	5 Year	10 Year
Low	0.86	10.06	9.44	6.49
Middle	1.30	9.36	8.89	5.92
High	1.97	8.59	8.06	4.66

D. Turnover Ratio and Net Return

		Net Return (%)		
Turnover Category	Turnover Ratio	3 Year	5 Year	10 Year
Low	31.49	9.31	9.44	6.80
Middle	78.29	8.99	8.17	5.19
High	163.37	9.71	8.78	5.09

* At a confidence level of 96% the gross returns are *not* statistically different.

TABLE 3: MID CAP GROWTH FUNDS

A. Gross Return

		Gross Return (%)		
Fund Category	N	3 Year	5 Year	10 Year
No-Load	247	14.59	13.98	10.29
Load	214	14.48	13.64	9.88
Statistically Different Gross Return?		No	No	No

B. Net Return

		Net Return (%)				
Fund Category	N	3 Year	5 Year	10 Year	Expense Ratio	Combined Load
No-Load	247	13.37	12.75	9.07	1.22	
Load	214	12.68	11.83	8.08	1.81	3.80

	3 Year	5 Year	10 Year
Slope Coefficient (461 observations)	-2.00	-1.99	-1.20
p Value	3.02E-10	1.59E-16	6.61E-05
R^2	.08	.14	.03
Slope Statistically Different from 0?	Yes	Yes	Yes
Slope Statistically Different from -1?	Yes	Yes	No

C. Expense Ratio and Net Return

		Net Return (%)		
Expense Category	Expense Ratio	3 Year	5 Year	10 Year
Low	0.98	14.02	13.31	9.22
Middle	1.42	13.08	12.31	8.59
High	2.08	12.04	11.35	8.00

D. Turnover Ratio and Net Return

		Net Return (%)		
Turnover Category	Turnover Ratio	3 Year	5 Year	10 Year
Low	42.76	12.95	12.25	9.97
Middle	92.94	13.21	12.23	7.79
High	163.96	12.98	12.49	8.05

TABLE 4: SMALL CAP GROWTH FUNDS

A. Gross Return

		Gross Return (%)		
Fund Category	N	3 Year	5 Year	10 Year
No-Load	213	11.01	9.09	11.65
Load	159	11.25	8.75	11.26
Statistically Different Gross Return?		No	No	No

B. Net Return

		Net Return (%)				
Fund Category	N	3 Year	5 Year	10 Year	Expense Ratio	Combined Load
No-Load	213	9.65	7.72	10.28	1.36	
Load	159	9.35	6.84	9.35	1.90	3.78

	3 Year	5 Year	10 Year
Slope Coefficient (372 observations)	-2.32	-2.05	-2.21
p Value	5.23E-14	1.27E-11	1.16E-10
R^2	.14	.12	.11
Slope Statistically Different from 0?	Yes	Yes	Yes
Slope Statistically Different from -1?	Yes	Yes	Yes

C. Expense Ratio and Net Return

		Net Return (%)		
Expense Category	Expense Ratio	3 Year	5 Year	10 Year
Low	1.09	10.54	8.52	10.65
Middle	1.49	9.19	7.24	10.03
High	2.20	8.82	6.28	8.97

D. Turnover Ratio and Net Return

		Net Return (%)		
Turnover Category	Turnover Ratio	3 Year	5 Year	10 Year
Low	47.68	9.73	8.14	10.05
Middle	91.94	10.17	6.84	9.53
High	188.65	8.65	7.06	10.08

Sales charges deducted from capital intended for investment are a deadweight loss--a cost penalty and unnecessary tax on economic value. They are not committed to the investment decision-making process, but rather reduce or stimulate the forfeiture of profits for equity fund shareholders who choose to travel on this toll road. Furthermore, load funds also have higher operating costs (refer to the expense ratio data reported in Section B of Table 2 through Table 4), compounding the financial injury.

EXPENSES AND NET RETURN

Professional investment managers operate in competition with the efficient market hypothesis. They are enrolled in a challenging contest (performance derby) that demands that they repeatedly discover mispriced securities and purchase/sell these assets at prices that are beneficial to wealth creation.

In this highly competitive arena, costs of operating and trading play a decisive role in the outcome. Escalating costs compound into a brushfire that consumes the fertile, profitable opportunities that have been identified.

Efficient market theory predicts that there is an inverse relationship between a fund's annualized rate of return and its expense ratio. The initial test of this hypothesis employs bivariate regression analysis on the aforementioned data for all three time horizons and all three growth-style fund categories.

Consider Section B of Table 2 through Table 4. The slope coefficient is mathematically negative in 9 out of 9 regression analyses and is statistically negative in 9 of 9 (100%) regressions. Expenses decrease total return. The latter result indicates that there is less than a 5% probability that any of these 9 estimated slope coefficients is different from zero purely by chance.

The second investigation of the hypothesis that expenses and total returns are inversely related is strictly specified and therefore a much more demanding claim than the initial test. It asserts that expenses are a deadweight loss. An increase in the expense ratio results in a mathematically identical (one-to-one) reduction in net return. The null hypothesis states that the slope coefficients are statistically equal to negative one (-1).

The slope coefficient was statistically equal to negative one 3 out of 9 (33%) times and statistically greater than negative one in 6 out of 9 (67%) regression analyses using a 95% confidence level. This empirical relationship is persuasively strong. In all 9 tests, expenses inflicted either a one-to-one or greater than one-to-one deadweight loss on growth funds' ultimate delivery of investment returns.

A final issue demands empirical investigation. For growth-style funds classified in a particular category, do differences in expense ratios account for and explain differences in net returns?

The issue of the relationship between the net returns of growth-style funds and their operating expenses is examined further by segmenting each of the three fund categories into three sample groups, ranked by expense ratio.

The expense ratio data are ordered from lowest to highest, divided into thirds, and hereinafter designated the low-cost, middle-cost, and high-cost fund groups. The average expense ratio for each group in each category is computed in addition to the average annualized total return for time periods of three years, five years, and ten years.

In order to test this relationship, each of the three fund categories is divided into three groups of equal size and sorted and differentiated by their expense ratios. The average expense ratios for the high-cost, middle-cost, and low-cost groups are computed and compared with the calculated average net returns for each of the three groups for 3-year, 5-year, and 10-year time intervals.

The research issue under consideration is the degree to which lower expense ratios are linked with higher-return funds. More specifically, what is the degree of association and connection between higher expenses and lower returns?

Consider Section C of Table 2 through Table 4. The statistical linkage observed is very revealing. In three out of three (100%) fund classifications the low-cost funds earned the highest average total return during 3-year, 5-year, and 10-year time periods.

Net total return decreased in 9 of 9 instances as the expense ratio increased from the low-cost group to the middle-cost group, in 9 of 9 instances as the expense ratio increased from the middle-cost group to the high-cost group, and in 9 of 9 instances as the expense ratio increased from low to high. Overall, rising expenses correlated with lower returns in 27 of 27 data sets. Investors can anesthetize their portfolio from performance deficits by astutely applying this information advantage.

Each of the results reported in this section on expenses and net return and in the preceding section on sales charges is consistent with efficient market theory. Expenses reduce net returns and constitute a deadweight loss. Furthermore, as costs increase, growth funds' performance increasingly deviates from a market rate of return.

Investors must be alert to the level of investment costs in order to avoid needlessly diminishing wealth-creation. The expected total return of lower-cost

funds exceeds higher-cost funds and earns compounded returns as the investment time horizon expands. Financial planners should demonstrate due diligence by providing value-added education for clients about the relationship between expenses and net returns, counseling clients not to invest in funds that extract high operating costs.

PORTFOLIO TURNOVER AND NET RETURN

The fifth and final hypothesis under review addresses the issue of portfolio asset turnover as a filtering strategy. Commissions, fees and bid/ask spreads are an additional thicket of costs confronted by mutual fund managers when they trade securities. These costs dissipate the power of compounding. Trading and transaction costs are not components of the expense ratio and should be scrutinized separately.

A basic contention of the efficient market hypothesis is that asset turnover activates a conspicuous cost of fund management that sacrifices net performance by inflicting a financial outlay borne by shareholders. Malkiel (2006) succinctly summarized this linkage: "low-turnover mutual funds have outperformed high-turnover mutual funds…The surest route to top-quartile performance is to buy funds with bottom-quartile turnover and expense ratios." Moreover, Malkiel asserted (2007, p. 379) "The two variables that do the best job in predicting future performance are expense ratios and turnover…The best-performing actively managed mutual funds have moderate expense ratios and low turnover."

As validated above, mutual fund management fees and expenses are a persuasively effective indicator of equity fund performance. Another aspect to investigate is portfolio turnover.

Consider Section D of Table 2 through Table 4. In two of the three growth fund classifications the low-turnover funds earned the highest average total return during 5-year and 10-year time periods; the low-turnover funds did not earn the highest average total return in any of the three fund classifications measured over 3 years. Also, in two instances the low-turnover funds and high-turnover funds had nearly identical net returns.

Net total return decreased in 7 of 9 instances as the degree of portfolio trading increased from the low-turnover group to the middle-turnover group, in 3 of 9 instances as turnover increased from the middle-turnover group to the high-turnover group, and in 5 of 9 instances as turnover increased from low to high. Overall, rising expenses correlated with lower returns in 15 of 27 (56%) data sets.

Additional examination of the hypothesis of an inverse relationship between portfolio performance and portfolio turnover was obtained from regression analyses of net returns and turnover ratios for each of the three categories and each of the three time intervals. The estimated slope coefficients were negative in 5 of 9 regressions and statistically negative 4 times; the slope coefficients were positive in 4 of 9 regressions and statistically positive 2 times.

Trading securities is expensive, a direct deduction from a fund's assets. In addition to commissions and possible market-impact costs, behavioral errors arise when trading securities. The emerging theory of behavioral finance reveals that investors (individual and professional) do not reliably implement investment decisions that are rational. This contention deviates from the coin of the realm of economic and financial theory, namely the presumption that economic agents exhibit dependably rational behavior.

To cite one example from behavioral finance, households and fund managers are prone to trading based on recent market activity. This conduct "anchors" their buy/sell decision to criteria such as price momentum. This robotic, copycat tactic presents both opportunities (mispriced financial assets) and penalties (trading costs).

The data presented in Section D of Table 2 through Table 4 are moderately in accord with Malkiel's declaration, affirming that transaction costs generally reduce portfolio performance, and imparting mixed evidence that trading costs are a deadweight loss.

SUMMARY AND CONCLUSIONS

Operating expenses and fees charged by mutual funds are direct deductions against earned revenue and thus rupture net income by siphoning profits. But the relationship between costs and returns is imperfect. For example, some funds impose above-average costs but deliver above-average returns. The research presented herein investigated whether such occurrences are abnormal aberrations or routine results.

Once an asset allocation decision has been formulated, investors are more likely to profit (robust relative returns) by electing mutual funds charging low or restrained expense ratios. Lower expenses enable fund managers to be competitive in the investment performance derby without necessitating higher-risk strategies designed to overcome the performance deficit induced by the drag of transaction costs on net return.

Costs are a critical determinant of equity fund performance. During measurement periods of 3 years, 5 years, and 10 years, lower-cost funds tended

to gravitate toward and be clustered among an Honor Roll of growth-style funds that have earned satisfactory long-term returns.

Expenses prominently influence the ultimate total return delivered by mutual funds. However, many investors are unaware that the compounded erosion of returns precipitated by the operating expenses of mutual funds (particularly higher-cost funds) exerts a profound impact on fund performance. This research study has reinforced the principle that lower-cost funds outperform their more expensive peers over the long-term.

Mutual fund prospectuses, websites and promotional materials exhibit expense ratio data both in percentage terms and dollar values. It has become more difficult to conceal or camouflage expenses.

The empirical evidence and statistical barometers presented herein strongly affirm the financial scripture that low expenses play a crucial role by partially inoculating a fund from poor performance. Lower costs confer an enduring competitive advantage on equity funds. When assembling a portfolio, investors should concentrate their search for growth funds among the lower-cost funds and expand this due diligence by identifying funds within this subset whose net return exceeds the category average net return by an amount greater than their net annual expenses advantage.

Since exceeding a broad market index is a zero-sum contest before the deduction of financial intermediation costs, and an inferior outcome after withdrawing these investment expenses from the gross return, equity fund investors increase the probability of attaining their objectives by assiduously selecting investments from among the subset of low-cost funds.

The level of expenses is the best predictor of future growth fund performance; expenses explain the bulk of the difference in relative performance. Investors and financial advisors can reduce the probability of sub par portfolio performance (and expand the odds of an above-average net return) by committing capital to funds that can authenticate economical expenses on their financial report card. Most higher-cost growth funds should be expunged from the roster of recommended funds.

Concentrating financial capital among lower-costs funds is the antidote for the destruction of shareholder wealth that accompanies investment in funds that persistently extract high operating costs.

REFERENCES

Bogle, J. (1994). *Bogle* on Mutual Funds. New York: Dell Publishing.

Bogle, J. (1999). Common Sense on Mutual Funds. New York: John Wiley & Sons.

Bogle, J. (2007). The Little Book of Common Sense Investing. Hoboken, NJ: John Wiley & Sons.

Bogle, John. (2008). A Question So Important that it Should Be Hard to Think about Anything Else. Journal of Portfolio Management 34, 95-102.

Domian, D., & Reichenstein, W. (1999). Performance and Persistence in Money Market Fund Returns. Financial Services Review 6, 169-183.

Domian, D., & Reichenstein, W. (2002). Predicting Municipal Bond Fund Returns. Journal of Investing 11, 53-65.

Malkiel, B. More Than You Know. (6/14/2006) The Wall Street Journal, D12.

Malkiel, B. (2007). A Random Walk Down Wall Street. New York: W. W. Norton & Company.

Reichenstein, W. (1999). Bond Fund Returns and Expenses: A Study of Bond Market Efficiency. Journal of Investing 8, 8-16.

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FINANCIAL ENTERPRISE WEBSITES: A COMPARISON OF COMPONENTS AND TECHNOLOGIES

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ABSTRACT: This paper details the components and technologies used by current financial enterprise websites. E-business is highly competitive. As such, financial enterprises that have successful websites exhibit growth where it counts – the bottom line. One way to compete is to know the competition and what makes the competitor so successful.

INTRODUCTION

As the internet continues to expand into more homes, customers are doing more business on the internet than ever before. Making a business available to the online customer is essential for continued growth and success. In order to remain competitive in this growing market, financial enterprises are making great efforts to upgrade their websites to reflect the desires of their customers and at the same time incorporate the latest technology to provide the utmost in functionality and quality. A savvy website can attract millions of new customers that would otherwise never set foot inside their traditional brick-and-mortar bank resulting in great financial gain as recently discovered by ING Direct who was able to attract over 60,000 new checking accounts in just over two months which resulted in more than $2.2 billion in new deposits (Pasha 2007).

Incorporation of acquired companies and new technologies, security, overall design, and ease of use are just a few of the reasons creating the perfect financial website can be difficult. A customer frustrated with or confused by a website will ultimately take their e-business elsewhere. The goal then should be a website that is intuitive, fast, secure, and takes advantage of technologies which allow customers to perform all of their banking needs without ever having to physically set foot in a bank.

The question then is what makes certain financial websites so successful? We seek to answer this question based upon research into a cross-section of financial websites selected based on current financial rankings as well as familiarity by the authors. They include, in alphabetical order, AmTrust, Bank of America, Capital One, Chase, Citibank, Guaranty Bank, ING Direct, Schwab, Wachovia, and Wells Fargo. We will present the current financial rankings, a top-level comparison, a feature comparison, an overall website ranking of these

ten financial institutions by the authors based upon these comparisons, and offer conclusions based upon the overall research.

CURRENT RANKINGS

When researching financial enterprise websites, we determined that a general cross-section would be sufficient; however, we sought to include those of many of the most successful financial institutions as ranked by Forbes Magazine (DeCarlo, 2007), Fortune Magazine (Fortune 2007), TheBanker (TheBanker 2007), and NetValley (NetValley 2006) as shown in Table 1. The rankings of the parent companies are based upon different formulas based mainly upon sales, market values, assets, profits, returns, and capital. NetValley ranked banks based upon assets alone. Likewise, the Fortune Global 500 is based only upon revenues.

Bank Name	Parent Company	Forbes Global 2000	Fortune Global 500	Fortune US 500	The Banker	NetValley
Citibank	Citigroup	1	14	8	2	3
Bank of America	Bank of America Corp.	2	21	9	1	1
JPMorgan Chase	JP Morgan Chase & Co.	3	31	9	1	1
ING Direct	ING Group N.V.	10	13	NR	NR	24
Wells Fargo	Wells Fargo & Co.	34	126	41	5	5
Wachovia	Wachovia Corp.	35	131	46	4	4
Capital One	Capital One Financial Corp.	192	492	154	11	44
Charles Schwab	Charles Schwab	480	NR	389	NR	NR
Guaranty Bank	Temple-Inland Inc.	840	NR	414	NR	NR
AmTrust Bank	Ohio Savings Securities, Inc.	NR	NR	NR	NR	64

NR – Not Rated

Table 1. Rankings of Banks (2006 – 2007)

Also considered was the ranking of the top ten e-banks by Personal Finance Magazine (Kiplinger's, 2005) which yielded results quite different from the above (see Table 2). This report based its findings on rankings by Watchfire's GomezPro Scorecard, sold to Keynote in 2005 (Berkowitz, 2005).

Areas of consideration by GomezPro were transfer of funds to other banks, receiving bills online, low-balance e-mail alerts, receiving web-only statements, and stopping payment on checks.

Rank	Bank Name	Website
1	Wells Fargo	wellsfargo.com
2	Citibank	citibank.com
3	Bank of America	bankofamerica.com
4	E-Trade Financial	bakus.etrade.com
5	Huntington	huntington.com
6	First National	firstnational.com
6	HSBC	hsbc.com
6	US Bank	Usbank.com
9	JPMorgan Chase	chase.com
9	Wachovia	wachovia.com

Table 2. Kiplinger's Top 10 E-Banks (2005)

TOP-LEVEL COMPARISON

Our comparison of the financial institute websites begins with a top-level comparison and then a more specific feature comparison. On the top-level, we compare default and personal homepage components, technology, security, and features.

Homepage Components:

Default Homepage: The default homepage is the most important page of the website as it is what attracts customers in the first place. Therefore, the overall look and usefulness of the homepage are incredibly important factors.

- The bulk of the homepage should *fit into the initial window* so that a customer may find what they are looking for as quickly as possible.
- It should look *clean* with little clutter. However, a stark homepage is boring and unattractive, therefore, it is important to find a balance (see Figure 1).

Figure 1. Homepage Cleanliness

- There should be *clearly defined sections*.
- The *use of color* should be limited to a few contrasting, yet complimentary hues.
- The *login area* should be placed where the returning customer would first look. Based upon the Western style of reading from left to right, it is logical to place the login area on the left side of the homepage.
- For convenience, a customer should be given the *choice of login destinations* in order to diminish the number of page loads and subsequently the time it takes to get to a desired page.
- *Tabs* should be placed near the top of the webpage that link to the different areas of interest to the customer, such as personal banking, small business, commercial business, and information about the bank.
- *Advertising*, although important in order to present customers with the highlights of the website, should not detract from the main links of the webpage due to placement or size.

Overall, of the financial websites we researched, the *Wells Fargo* default homepage was the best example of a well-designed, well-balanced, useful default homepage.

Personal Homepage: The second most important page of an ecommerce website is the customer's *personal homepage*. The reason for this is that once customers open an account, they rarely revisit the default homepage except to log in. Therefore, it becomes a bank's primary contact with customers once they open accounts and subsequently has influence over whether customers choose to increase their financial portfolio with the bank or take their business elsewhere. Here the overall look is important in order to cut down on confusion.

- The *main content* of the page should fit in the initial window.
- The page should be *uncluttered* and *symmetrical*.
- The *customer's real name* should appear somewhere on the page, preferably near the top in order to personalize the page.
- *Tabs* should be near the top of the page and be clear, useful, and allow customers to quickly navigate through the WebPages.
- All *accounts* should appear clearly separated from each other with links to a more detailed page.
- In the instance of credit card accounts, a clear *link to payment options* is preferable since paying online is a highly desirable feature.
- No link should lead to a *dead-end page* (one with no links back to the original site).
- A link should be provided that allows a customer to see new account options and *open a new account* easily without having to return to the default homepage.

- The *message center* should be easy to find and should alert customers on the homepage when they have a new message.
- The *logout button* should be placed in the upper right-hand corner and should contrast in color to the rest of the webpage in order to make it easy to find as did Bank of America, Capital One, Chase, and Wachovia.

Overall, of the financial websites we researched, the *Capital One* personal homepage was the best example of well-designed, well-balanced, useful personal homepage.

Technology Components:

Login Times vs. Technology Used: The technology utilized by the financial institutions we studied varied greatly as did the login times. We use the term login time to refer to the time it took for the personal homepage to appear once the initial login button was clicked entering the userID (and, in most cases, the password). As shown in Table 3, the sites incorporating ASP.NET technology had significantly faster login times.

Bank Website	Technology Used	Average Login Times (sec.)
amtrust.com	HTM, ASP, ASP.NET, CFM	7
bankofamerica.com	JSP, CFML, CGI, PHP	8
capitalone.com	PHP, ASP.NET	3
chase.com	JSP, ASP.NET, HTML	5
citibank.com	JSP, CGI	4
guarantybank.com	ASP.NET	2
ingdirect.com	ASP	10
schwab.com	JAVA, Non-JAVA/Barista, C/CGI	4
wachovia.com	ASP.NET	1
wellsfargo.com	CGI	6

Table 3. Technology Used by Financial Websites

AmTrust, Bank of America, and ING Direct had the longest logins because they required customers to complete an additional login step which sent them to a second screen where a sitekey picture was verified and the password was entered. In the case of ING Direct, the user was required to manually enter the password through a number keypad with the mouse or type the letters corresponding to the numbers on the keyboard.

Although requiring additional steps increases security, it complicates the login process and potentially frustrates the customer to the point of not wanting to use the site anymore, therefore if a second step is to be required, it should be made as painless as possible.

Integration of Technology: In relation to the technology used, it is desirable to move seamlessly from page to page, as well as enable users to freely move money from one account to another. In many cases, when financial institutions are sold and absorbed into parent companies, the integration process results in diverse technologies being utilized for the various components such as banking, lines and loans, credit cards, insurance, and investments. It is important that once incorporated, the added sites should contain links back to the bank's default homepage. Banks that contained *dead-end links* were:

- AmTrust – investment side and mortgage side
- Bank of America – investment side
- Citibank – investment side
- Chase – student loans
- Guaranty Bank – insurance side

In contrast, the following websites provided *seamless navigation*:

- *Capital One* and *Wells Fargo* contained homepage links on every single page
- *Schwab* and *ING Direct* were easily navigated since all of the pages were contained within a master page which contained tabs to all areas of the website.
- *Wachovia* not only incorporated the use of a master page, but provided additional links at the top and left to improve navigation.

Money Transfer Capabilities:

For customer convenience, it is advantageous for banks that offer investment accounts to also provide an easy means to transfer money between their banking and brokerage accounts (see Table 4). Requiring customers to call customer service or mail in requests to transfer money is simply not acceptable in this day and age. If a bank is going to offer a full-service online banking experience, they must allow customers to manage their money themselves if they so desire. *Schwab's* site is a good example of seamless money management. It is possible to keep money in the investment side and transfer it to a checking account whenever needed. But the *Chase's* site does not provide this kind of feature online. The obvious advantage to this is that the customer's money is earning much higher interest while in the investment side. The downside is, of course, that brokerage accounts are not FDIC insured.

	AmTrust	Bank of America	Capital One	Chase	Citibank	Guaranty Bank	ING Direct	Schwab	Wachovia	Wells Fargo
Credit Card side	-	X	X	X	X	X	-	X	X	X
Credit link in-site	-	X	X	X	X	X	-	X	X	X
Lines & Loans side	X	X	X	X	X	X	X	X	X	X
Lines & Loans link in-site	-	X	X	-	X	X	X	X	X	X
Insurance side	X	X	-	X	-	X	-	-	X	X
Insurance link in-site	X	-	-	X	-	X	-	-	X	X
Investment side	X	X	X	X	X	X	X	X	X	X
Investment link in-site	-	X	X	-	X	X	-	X	X	X
Easy transfers between banking and brokerage accounts	-	X	-	-	X	-	X	X	-	X

X – Site contains this feature

Table 4. Technology Links

Security Components:

With the rise in identity theft in today's society, security should be the number one priority of any financial institution. Even so, it was surprising that many of the sites researched did not utilize every security measure available. We are not claiming that the low scoring sites are insecure; however, many features that are available to them are not being utilized, such as foreign computer sitekey recognition, additional login steps, privacy measures such as encoding the user ID and account numbers, and session timeouts.

Sitekeys and Additional Login Steps: Foreign computer sitekey recognition entails recognizing that a user has logged on from a different computer and subsequently requiring an additional login step, usually in the form of a question to which the user must provide the answer stored in the database. Bank of America, Capital One, Guaranty Bank, and Chase all utilize this extra level of security. Those banks usually will ask online customers to answer security questions or activation code before they can login when they use a public computer. The banks that provided an extra login step at every login were Bank

of America and ING Direct. They both employed the use of a sitekey picture in addition to a password to ensure security.

Encoding UserIDs, Passwords, and Account Numbers: Both Bank of America and ING Direct encode the userID as well as the password. This is something more financial institutions should implement to keep casual onlookers from knowing a customer's userID. In addition to this, the account numbers should be encoded on every screen. It was found that both *Schwab* and *Wachovia* had windows which displayed a customer's entire account number.

Session Timeouts: Additional security in the form of session timeouts is another measure which should be implemented by more financial institutions. Although it is annoying to be kicked off every ten minutes as do the Bank of America and ING Direct sites, it is better to place some sort of limit upon sessions as far as security is concerned. Consider the following scenario:

> A businessman decides to check his bank balance before he heads out for the day. He is distracted by a phone call and an email request and forgets that he left the window open. He leaves for the day without shutting down his computer. An unscrupulous night worker sees the computer on, finds the open banking window, and transfers funds out of the account to an unnamed account.

Is this scenario likely? Probably not, but the point is made. Session timeouts should be less than twenty minutes to avoid untoward activity in the case of abandoned sessions. *AmTrust*, *Bank of America*, *Chase*, *ING Direct*, *Capital One*, and *Guaranty Bank* were the only banks researched that provided session timeouts of less than twenty minutes.

Session Timeout Warning: In the addition of session timeouts to a site, it is important also to warn the user that they are about to be logged off. Of the sites that provided session timeouts, AmTrust, ING Direct, Schwab, and Wachovia all failed to provide any type of warning. The poorest performance came from the Schwab site which not only logged the customer out without warning, it failed to elegantly redirect the user to a new login page resulting in a failure of the entire window (Windows Internet Explorer 7).

Feature Comparison:

Over the years some standard features have come to be included in most financial websites, such as placing a summary of all accounts held at that financial institution on the customer's homepage and allowing customers to change address, email and password information, set account alerts, elect to receive their statements online, pay bills, order checks, request copies of checks,

and stop payments on checks online. It is the additional features that vary from bank to bank that not only attract customers, but keep them (see Table 5).

Feature	AmTrust	Bank of America	Capital One	Chase	Citibank	Guaranty Bank	ING Direct	Schwab	Wachovia	Wells Fargo
Add users	-	X	X	X	-	-	-	-	-	X
Allow external transfers	X	X	X	X	X	-	X	X	X	-
Autopay credit card setup online	-	X	-	X	X	-	-	X	-	X
Change preferences	X	X	X	-	X	X	X	-	-	X
External transfers free	-	-	X	-	X	-	X	X	-	-
Mobile banking	-	X	-	X	X	-	-	-	X	X
Nickname accounts	X	X	X	X	-	X	-	X	X	X
Open new acct. logged in	-	X	X	X	X	-	X	X	X	X
Select default accounts	-	X	-	-	-	-	-	X	-	-
Session timeout warning	-	X	X	X	-	X	-	-	-	-
Set login destination	-	-	X	-	-	X	-	X	X	X
Unlink accounts	-	X	X	X	X	-	-	-	-	X
View page in Spanish	-	X	-	-	-	-	-	-	X	X
Overall Score (of 12)	**3**	**10**	**9**	**7**	**7**	**4**	**4**	**7**	**6**	**9**

X – Site contains this feature

Table 5. Additional Feature Comparison

It is important to remember that a financial institution's website is first and foremost about convenience. The more features that are offered, the more likely a customer is to transfer his or her portfolio to the bank exclusively. The following account-related features are desirable for that very reason:

- adding users
- changing preferences
- allowing customers to view the website in Spanish
- nicknaming accounts
- selecting default accounts
- warning customers of impending session timeouts (discussed earlier)
- setting login destinations

Although allowing the *addition of users* to the account may complicate concurrency issues, it allows for a more detailed usage log in the event of a questionable transaction. Also, being able to *change preferences*, *choose the viewing language*, and *nickname accounts* can give customers a feeling of familiarity and make them feel more comfortable with the site. Lastly, allowing customers to *select default accounts* and *set login destinations* saves them time when accessing their most frequented pages.

External Transfers: Allowing external transfers is a convenience that not only makes life easier for the customers; it also makes it easier for them to transfer money into the bank. All of the banks we researched allowed funds to be transferred between accounts held at their institution, however, not all of them allowed funds to be transferred online between their accounts and outside institutions (although Wachovia limited the selection of outside banks to a select few). Neither Guaranty Bank nor Wells Fargo provided this convenience. Along the same lines, several of the banks that allowed linking of external accounts did not allow them to be edited or removed. Of the banks that allowed external transfers, all of them allowed in-bound transfers at no charge; however, AmTrust, Bank of America, and Wachovia charged fees for out-bound transfers (see Table 6). Unfortunately, it was difficult finding these disclosures on some of the websites (see Table 6).

Bank Name	**Fee Disclosure Finding Ease**	**Inter-Institution Transfers**			
		Inbound		**Outbound**	
		3 Day	**Next Day**	**3 Day**	**Next Day**
AmTrust	difficult	Free	Free	$1.50	$8.95
Bank of America	medium	Free	Free	$3.00	$10.00
Capital One	medium	Free	Free	Free	Free
Chase	easy	Free	Free	$3.00/Free	$3.00/Free
Citibank	easy	Free	Free	Free	Free
Guaranty Bank	*	*	*	*	*
ING Direct	easy	Free	Free	Free	Free
Schwab	difficult	Free	Free	Free	Free
Wachovia	easy	Free	Free	$3.00	$10.00
Wells Fargo	*	*	*	*	*

* – Bank does not offer this feature

Table 6. External Transfer Fees

Automatic Payments: Auto-payment of credit cards is another point of convenience. Although all of the banks researched for this paper offered some

form of bill payment service, only few of them, such as Chase and Bank of America, allowed customers to set up an automatic monthly payment with the choice of minimum balance or statement balance online for the credit card held by the bank itself.

Open New Accounts Online: The ability to open and fund new accounts online is a convenience that not only benefits the customer, but the bank as well. Surprisingly, neither AmTrust nor Guaranty Bank allowed customers to open new accounts online once they had logged in. They only allowed customers to apply for new accounts from their default homepage.

Mobile Banking: A current trend in customer convenience is allowing customers to access their accounts from their mobile phones (Sraeel, 2007). The greatest challenge to mobile banking is, of course, security. In order to be competitive in the future of banking, it is imperative that banks face the challenge in a proactive manner before the want-it-now generation takes their business elsewhere.

OVERALL RANKING

Combining the scores given for homepage, technology, and security components and additional features produced an overall ranking for the websites researched (see Table 7). The top website is clearly *Bank of America*, although *Capital One* and *Wells Fargo* are close behind. All three offer attractive and functional homepages and many additional features. The latter two both lost points in the security features category, but were strong in the Personal Homepage and Default Homepage categories, respectively.

Rank	Bank Name	Overall Score	Default Homepage	Personal Homepage	Security Features	Website Features
1	Bank of America	33	9	9	5	10
2	Capital One	30	7	10	4	9
3	Wells Fargo	29	10	7	3	9
4	Citibank	23	8	7	1	7
5	Chase	22	4	7	4	7
5	Schwab	22	7	7	1	7
7	Wachovia	21	6	8	1	6
7	ING Direct	21	5	8	4	4
9	Guaranty Bank	20	7	6	3	4
10	AmTrust	19	5	6	5	3

Table 7. Overall Ranking

CONCLUSION

It is interesting to note that two of the top-ranked banks financially, Citibank and Chase, did not receive top rankings here. Citibank lost points mainly in the security features area, however, Chase could definitely use some sprucing up its default homepage.

When the goal is to lure as many customers to a website as possible, it is imperative that the target be as attractive and functional as a spider's web: equally distributed, pretty to view, technically sound, and catches the customer's attention. In the competitive and growing world of virtual banking, the lure of an attractive and functional website can mean the difference between vulnerability to mergers due to loss of revenue or continued growth and stability. As the competition increases, it will prove imperative that financial enterprises step up and improve their websites if they hope to continue to attract new customers as well as keep the ones they already have.

REFERENCES

Berkowitz, D. (2005). Keynote Acquires GomezPro Business Unit from Watchfire, Keynote Systems, Dec 6, 2005.

DeCarlo, S. (2007). The World's 2,000 Largest Public Companies, Forbes.com, Mar 29, 2007.

Fortune (2007). Fortune 500: Our annual ranking of America's largest corporations, CNNMoney.com.

Kiplinger's (2005). The Top 10 Online Banks, MSN Money: Kiplinger's Personal Finance Magazine, July 2005.

NetValley (2006). Online Banking: Top 100 Banks. NetValley.

Pasha, S. (2007). ING offers interest on online checking. CNNMoney.com, Feb 15, 2007.

Sraeel, H.(2007). Mobile Banking 2.0: Was There a First Wave? Bank Technology News, Nov 1, 2007.

TheBanker (2007). Ranking: Top 200 US Banks. TheBanker.

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ROLE OF COMMUNICATION IN AN ONLINE BUSINESS PROGRAM: ANALYSIS OF STUDENT PERCEPTIONS

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ABSTRACT: This study examined the role of communication in contributing to the perceptions of students concerning online program quality. Other attributes of online programs that were perceived by students as positively contributing to good learning experiences and perceptions of quality in the online environment were also analyzed. Participants in the study were enrolled in a fully online baccalaureate degree program in Management. While respondents indicated high satisfaction with program delivery, course structure, and quality of learning, varying levels of communication skill development in the online program were indicated. The analysis indicated that communication-based components in the virtual environment impacted student perceptions. Respondents positively identified with consistently used interactive learning components of courses.

INTRODUCTION

The Sloan Consortium's most recent study of online learning reported that approximately 3.5 million students in higher education were enrolled in online education. The growth of online education in higher education is growing at a much faster rate than overall higher education enrollments (Allen & Seaman, 2007, p. 5).Yet institutions vary extensively in their approaches to online education and their online learning framework. About 23 percent of higher education institutions indicated that online education is not strategic to their long-term success; approximately 5 million students are enrolled in these institutions.

The study also reported attitudes toward online education that reflect barriers to its success. Of the institutions which believe online education is strategic for their long-term success, defined as "engaged" and "fully engaged" institutions, 7.3 percent do not believe online degrees have the same level of legitimacy as face-to-face degrees. Likewise, only 52.3 percent of these institutions indicated that faculty at their institutions accept the "value and legitimacy" of online education (Allen & Seaman, 2007, p. 11).

The mixed attitudes toward online education are understandable since the pedagogical evolution in the online environment is founded upon ever changing

technology. Varied teaching tools, methods, techniques, and activities comprise the world of online education. The continuing evolution makes extremely difficulty both the defining of the term "online education" and replicating and generalizing from online program assessment and evaluation. The factors which combine to determine quality within the online environment, as described later in this paper, are numerous. The increasing investment in new educational and collaborative technologies makes the defining of e-learning ever more nebulous (Nagel, 2008).

Although many reputable models of online education have been developed, such as the one by Salmon (2003), online programs vary from institution to institution and even within institutions. Thus attaching ratings of credibility or effectiveness to online programs is most evasive. However, one way of measuring success and projecting directions for e-learning in an institution is evaluating student perceptions of learning and satisfaction. "High satisfaction reflects that learners are more willing to continue in online instructional programmes, resulting in lower attrition rates, more referrals from enrolled students, greater motivation, better learning achievement and increased commitment to the programme" (Chen, Lin, & Kinshuk, 2008, p. 115).

This paper analyzes the perceptions of program quality and satisfaction of students enrolled in a fully online business degree program in a southern metropolitan university. The university is classified as a Research II institution, with an approximate 12,000 student enrollment. Purposes of the research were to determine the following:

- factors or course characteristics that contribute to good learning experiences.
- examples of positive learning experiences.
- success in the development of discipline-based skills and competencies and soft skills.
- perceptions of skill improvement in communication related areas—business writing, using correct grammar, business speaking, working in teams, and displaying electronic etiquette.

Analysis revealed that a recurring theme among student responses was the impact of communication or communication related skills applications within the learning environment. Thus, this discussion will focus on the role of communication in effective online course delivery.

BACKGROUND

Over the last decade numerous studies have investigated the role of instructor facilitation and use of e-technologies to enhance learning and skill development in the online environment: Kanuka and Anderson (1998), LaPointe

and Reisetter (2008), Liu, Magjuka, and Lee (2008), Tutty and Klein (2007), to name a few. These discussions have often been the basis of debating effective paradigm shift from face-to-face instruction to online education.

Seok (2008) provided a discussion of the e-learning teaching characteristics which in combination set e-learning apart pedagogically from the traditional model(s) of education:

- the e-teacher as a facilitator providing opportunities for collaboration and cognitive engagement.
- the e-teacher providing communication promoting high-order cognitive interactions among students and between teacher and students.
- the e-teacher recognizing the importance of social (interpersonal) and cultural accommodations necessary for learning to occur.
- the e-teacher preparing students for project work by teaching teaming skills and time management.
- the e-teacher providing appropriate learning content using varied delivery modes, such as static content, discussion groups, chat rooms, interactive activities, and other available technological tools.
- the e-teacher evaluating transaction distance (psychological space of misunderstanding among participants) and appropriately responding in ways such as altering learning materials, increasing opportunity for increased dialogue among participants, and providing more or less autonomy for students.

E-teaching is often viewed as synonymous with facilitating communication and enhancing interactions and collaborations that lead to student learning (Seok, 2008, p. 735).

The Salmon (2004) learning model for online education in computer-based environments consists of five steps:

- Access and Motivation—assuring student ability to interact online and making the system inviting.
- Online Socialization—exchanging personal information among participants, establishing personal and community identities.
- Information Exchange—facilitating and participating in task completion.
- Knowledge Construction—facilitating the interaction process, participation in collaboration.
- Development—reviewing benefits of the system, integrating the learning into other aspects of self, and reflecting on the experiences. (Salmon, 2004, pp. 28-50).

To be effective in facilitating student movement through these stages, an e-teacher must consider the effect of e-learning on knowledge development, the

importance of true dialog, the role and efficacy of a learning community, and indicators of meaningful engagement.

Learners must gain both explicit and tacit knowledge in the e-learning environment. One major detriment of removing face-to-face communication from the educational environment is the potential impact on knowledge creation and transfer. Explicit knowledge (facts) can be transferred within the e-learning environment. Whether tacit knowledge (values, beliefs, emotions) is developed and to what extent, however, is debatable; Zack (1999, p. 2) indicated that this knowledge is "understood and applied subconsciously, is difficult to articulate, is developed from direct experience and action and is usually shared through interactive conversation, story-telling and shared experience" (Zack, 1999, p. 2, as cited in Ozdemir, p. 553). Thus to go beyond solely distributing information, teaching is dependent upon developing a learning community which effectively creates knowledge and learning (Ozdemir, 2008).

The e-learning environment must encourage interactions among students, the instructor, and others outside the immediate e-environment. Such dialog with others and with oneself (reflection) precedes knowledge creation and dissemination (Webb, Jones, Barker, & Schaik, 2004).

The 2002 study by Al-Balooshi on the role of discussion rooms in developing e-learning community (as cited in Chang, 2008) found that online discussion resulted in more learning than other online interaction during the web-learning process. Most learners indicated online "discussion forum may improve their skills in reading, writing, and comprehension" (Chang, 2008, p. 478). Further, the Baltes study (2002) comparing virtual classroom discussions with traditional classroom discussions (as cited in Chang, 2008) found that "learners in the web course participate more in an online conversation with each other than in the face-to-face classroom" (Chang, 2008, p. 478).

E-learners may use chat rooms, discussion groups, and other technology-based tools to promote interactions both synchronously and asynchronously. Webb, Jones, Barker, and Schaik (2004) again validated that active learners have more effective learning; even passive activity is positively associated with learning. They caution, however, that often discussions in online courses are shallow and responses show low quality of learning and little reflective thinking. Since active learning is often more difficult to control online (such as in e-discussions versus face-to-face discussions), e-teachers must be actively involved in discussions and intervene and redirect discussions to focus on learning objectives (McCrory & Putnam, 2008). Tallent-Runnels et al. (2006) revealed similar results concerning limited cognitive engagement in online communications.

Since text-based communication structures differ so much from face-to-face environments—lacking nonverbal auditory cues and timing differences, for example—emphasis must be placed on developing a course structure in which students can meaningfully experience and transmit new learning. McCrory and Putnam (2008) conclude that limited experience of e-educators makes difficult developing a structure that will result in productive student engagement. Unless specific participation norms and patterns are established early, discussion results may be unpredictable, since students often control the online "space."

The ultimate goal of e-learning is to develop a virtual learning environment through which participants are actively engaged in moving through the learning model, as characterized by the following [research by LaPointe and Reisetter (2008), however, indicated that the need for certain of these components and also their effectiveness vary among learners]:

- a competent e-teacher.
- an engaged teacher facilitating through a well constructed course.
- active engagement with others (though not all learners view social interactions as necessary for learning).
- meeting the need to belong to a community while also providing autonomy (needs mixed among learners).
- meeting students' needs to relate to the learning opportunities.
- providing a variety of ways to exhibit mastery of the course (not dependent solely upon peer interactions).

RESEARCH DESIGN

Students enrolled in a fully online baccalaureate business management degree program were surveyed during fall-spring, 2007-2008 (preliminary findings reported in Mitchell, Crawford, Hall, and Madden, 2008). The initial request for students enrolled in the program to complete a survey was distributed via e-mail during October; in addition, the survey was mailed to student home addresses and a second e-mail request was sent during November and February. A 60 percent rate of return was achieved (86 responses from 143 enrolled in the program).

One-way ANOVA was used to analyze perceived differences in improvement levels among communication related skills; where differences existed, Tukey's Pairwise Comparison Method was used for follow-up analyses. All responses were evaluated qualitatively from the perspective of relationship to communication within the learning environment.

Demographics of respondents: Eighty-four of the 86 respondents indicated their sex—13 male (15 percent), 71 female (85 percent). Ages of the respondents

were as follows: 16 (18.8 percent), under 25; 57 (67.1 percent) from 25-39; 12 (14.1 percent) over 39. Ninety-four percent of the respondents were juniors or seniors: 5 (5.8 percent), sophomore; 36 (41.9 percent), junior; 45 (52.3 percent), senior. Seventy-nine percent had over five years of full-time work experience: 5 (6.0 percent), less than one year; 7 (8.3 percent), from one to three years; 6 (7.1 percent) from over three to five years; 18 (21.4 percent), from over five years to ten years; 48 (57.1 percent), over ten years. Sixty-two percent lived over 30 miles from campus, with 30 percent living over 90 miles from campus.

Reasons for enrolling in program: Students indicated varied reasons for enrolling in the online program. The reasons related to the following:

- commute time to campus/expense involved.
- conflict of personal life with on-campus course schedules.
- convenience and flexibility of program delivery.
- prestige of school versus that of other online programs.
- program content.
- program credibility.
- program accessibility.
- student friendliness.
- work/travel restrictions.

Reasons students stated for enrolling in the online program were not related to desire to participate in a virtual learning community or to participate in a program based on an interactive learning model, for example. Rather, the reasons for enrolling parallel those identified in the literature—availability, convenience, and flexibility (Lee & Nguyen, 2007; Singh & Pan, 2004). The following section discusses positive aspects of the program identified by the students; they indicated that their expectations of the program once enrolled do include participating in a communication-rich learning experience.

Program strengths and positive learning experiences: Participants were asked to rate the overall quality of the online program, using a scale of 1-5, with 1, needs major improvement; 2, needs improvement; 3, average; 4, good; 5, exceptionally good. The mean rating was 4.32. They justified their ratings by identifying strengths of the online program and positive learning experiences, as shown in Table 1. The components identified with an asterisk (*) relate to communication components of the online environment. Qualitative analysis of the detailed student responses revealed that students positively identified characteristics or components of the e-learning environment identified in the literature as being favorable to virtual learning:

- instructor facilitation.
- social involvement/interpersonal communication.
- varied instructional delivery modes.

- opportunities for learning via interactions with both the instructor and students.
- discussions.
- opportunities for community development.

Since student satisfaction seems to be positively impacted by these program components, program administrators should consider instructor training to assure online teachers design and facilitate courses which effectively integrate communications related components.

Communication related skill development: Respondents were asked to rate their improvement in the following communication related skills based on their experiences in fully online courses (using a scale of 1-4 (with 4 being "much improvement"; 3, "some improvement"; 2, "little improvement"; 1, "no improvement"): business speaking, business writing, displaying correct etiquette, interpersonal communication (tactfully/constructively communicating with others), time management, using correct grammar, and working in teams. Mean ratings of the skills areas are shown in Table 2.

Table 1
Student comments regarding program strengths and positive learning experiences

- Ability to work at own pace and personally determine effort to expend
- Anonymity in participation*
- Anytime/anywhere access to class
- Audio/PowerPoint lectures*
- Audio/video of lectures*
- Calendar feature*
- Detailed syllabus/assignments*
- Development of self reliance skills
- Ease of communicating with other students (virtual environment)*
- Flexible time frame for assignments
- Forced time management*
- Improvement of time management skills*
- Integration of real world virtual activities
- Interactive experience with faculty/students*
- Instructor involvement/availability*
- Limited distractions from other students
- Opportunity for/ease of group interaction*

- Opportunity for networking with other students*
- Participation in weekly discussions*
- Perfect attendance
- Positive responsiveness from instructors*
- Precise expectations/directions*
- Quick feedback*
- Use of discussion board*
- Well organized classes

*Comments relating to communication components of the e-environment

Table 2
Varied improvements in communication related skills

Skills Area	n	Mean Rating*	Significantly Greater than**
a. Time Management	85	3.44	e, f, g
b. Displaying Correct Etiquette	83	3.34	f, g
c. Interpersonal Communication	85	3.22	g
d. Using Correct Grammar	85	3.08	g
e. Business Writing	84	3.05	
f. Working in Teams	84	2.94	
g. Business Speaking	83	2.70	

* Scale of 1-4, with 1, "No Improvement"; 4, "Much Improvement,"
** $p \leq 0.05$

The following significant differences in improvement levels were perceived between pairs of skills:

- The skill of time management showed greater improvement than the skills of business writing, working in teams, and business speaking.
- The skill of displaying electronic etiquette showed greater improvement than the skills of working in teams and business speaking.
- The skill of interpersonal communication showed greater improvement than the skill of business speaking.
- The skill of using correct grammar showed greater improvement than the skill of business speaking.

No significant differences in perceived improvement for any of the other pairs of skills were found.

As shown in Table 1, the students indicated that the development of time management skills is important in their online experience. The self-discipline that results enhances students' abilities to develop and apply the more traditional communication skills. Table 2 indicates students perceived their skill development in this area to have improved. Also the improvement students perceived in interpersonal communication skills may have resulted from their experiences in online chats, discussions, and group projects. Teaming and oral presentations have been used less in the online program due to the design of the curriculum and technology limitations, as student perceptions regarding skill development in these areas validate.

If improvement in communication skills is to be achieved in an online program, online educators must purposefully develop program objectives focused on developing these skills. The literature does indicate the importance of integrating development of these skills into the curriculum. Web-based technologies have now matured to the extent that such skill development can be accomplished.

Preference for fully online versus hybrid delivery: The respondents were asked if they would like fully online classes to meet on campus three or four times each semester for required meetings. Some instructors have voiced that they would like to have face-to-face meetings on campus for a limited number of times (hybrid course delivery) to facilitate community development via face-to-face class meetings and to accomplish select learning objectives more difficult to meet in the fully online delivery format.

The respondents overwhelmingly voiced they did not want on-campus meetings—2 percent responded "yes"; 98 percent responded "no." The respondents indicated consistently that requiring on-campus classes would defeat the convenience advantage of the online program.

This online program had been advertised as fully online; students live throughout the state, with some in other states and other countries. Thus the student population of the program was not interested in hybrid course delivery and its opportunity for face-to-face communication. Under such circumstances and with similar student populations, technology alternatives such as WIMBA and chats can be integrated to provide the advantages of face-to-face, synchronous communication.

SUMMARY OF FINDINGS AND IMPLICATIONS OF THE RESSEARCH

This research study was designed to evaluate student perceptions of the quality of a fully online baccalaureate degree program in Management, which operates in a culture supportive of e-learning. Results indicated that students are very satisfied with the method of program delivery, the structure of the courses, and the quality of learning.

When asked to identify program strengths and positive learning experiences, students consistently identified components of the curriculum which are communication based. Analysis revealed they positively identified with specific characteristics or components of the e-learning environment, such as instructor facilitation, social involvement/interpersonal communication, varied instructional delivery modes, opportunities for learning via interactions with both the instructor and students, discussions, and opportunities for community development. Although students made the decision to enroll in the program generally for reasons of program availability, convenience, and flexibility, their satisfaction with the learning experience appeared related to the effective use of pedagogy and techniques as recommended in the literature. For example, they positively identified with varied learning opportunities involving interaction with the instructor and other students—the overall development of a culture of interactive learning, which is identified as necessary for e-learning community development.

Students indicated improvement in the development of select communication skills, such as interpersonal skills, and writing skills. Perception of improvement of speaking skills was rated lower than certain other skills. To increase skill development in specific communication related areas, educators must purposefully focus on these skills and use the tools now available for skill development.

This research reinforces the need for educational institutions to evaluate student perceptions of the quality of online instruction, one component of an online program assessment. Such evaluation will help focus on factors of program success, as identified in this research. Student satisfaction is impacted by course objectives and design and faculty development and involvement. Overall this research identified communication related components as important in the e-learning environment. Program administrators are encouraged to assure online instructors are trained to integrate communication related components effectively.

REFERENCES

Allen, I. E., & Seaman, J. (2007). Online Nation: Five Years of Growth in Online Learning. Needham, Massachusetts: Sloan Consortium.

Chang, C. (2008). A case study on the relationships between participation in online discussion and achievement of project work. Journal of Educational Multimedia and Hypermedia, 17(4), 477-509.

Chen, N., Lin, K., & Kinshuk. (2008). Analysing users' satisfaction with e-learning using a negative critical incidents approach. Innovations in Education and Teaching International, 45(2), 115-126.

Kanuka, H., & Anderson, T. (1998). Online social interchange, discord, and knowledge construction. The Journal of Distance Education, 13(1), 57-74.

LaPointe, L., & Reisetter, M. (2008). Belonging online: Students' perceptions of the value of efficacy of an online learning community. International Journal on E-Learning, 7(4), 641-665.

Lee, Y., & Nguyen, H. (2007). Get your degree from an educational ATM: An empirical study in online education. International Journal on E-Learning, 6(1), 31-40.

Liu, X., Magjuka, R. J., & Lee, S. (2008). The effects of cognitive thinking styles, trust, conflict management on online students' learning and virtual team performance. British Journal of Educational Technology, 39(5), 829-846.

McCrory, R., & Putnam, R. (2008). Interaction in online courses for teacher education: Subject matter and pedagogy. Journal of Technology and Teacher Education, 16(2), 155-180.

Mitchell, R. B., Crawford, M. C., Hall, F., & Madden, R. B. (2008). Assessing student perceptions of online business program quality. Association of Business Information Systems Proceedings (pp. 63-67). Houston, Texas: Association of Business Information Systems.

Nagel, D. (2008, September). Educational technology spending to top $56 billion by 2012. Retrieved from THE Journal: http://www.thejournal.com/articles/23299

Ozdemir, S. (2008). E-learning's effect on knowledge: Can you download tacit knowledge? British Journal of Educational Technology, 39(3), 552-554.

Salmon, G. (2004). E-moderating: The Key to Teaching and Learning Online. New York: RoutledgeFalmer.

Seok, S. (2008). Teaching aspects of e-learning. International Journal on E-Learning, 7(4), 725-741.

Singh, P., & Pan, W. (2004). Online education: Lessons for administrators and instructors. College Student Journal, 38(2), 302-308.

Tallent-Runnels, M. K., Thomas, J. A., Lan, W. Y., Cooper, S., Ahern, T. C., Shaw, S. M., et al. (2006). Teaching courses online: A review of the research. Review of Educational Research, 76(1), 93-135.

Tutty, J. I., & Klein, J. D. (2007, June 21). Computer-mediated instruction: A comparison of online and face-to-face collaboration. Educational Technology Research and Development, 56(2), 101-124.

Webb, E., Jones, A., Barker, P., & Schaik, P. (2004). Using e-learning dialogues in higher education. Innovations in Education and Teaching International, 41(1), 93-103.

Zack, M. (1999). Managing codified knowledge. Sloan Management Review, 40(4), 45-58.

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NATIONAL CULTURE AND TRUST ON SATISFACTION IN SYNCHRONOUS COLLABORATIVE DECISIONS

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ABSTRACT: The idea of collaborative advantage has become increasingly important with the expansion of multinational corporations and the need of having people from different countries and cultures working together. However, when trying to reap benefits from collaborative relationships, corporations need to be aware of cultural and other significant differences among people from diversified, mobile workforce. These differences can affect the collaboration success. In the present study we test the impact of several factors in the way participants from the United States and Mexico collaborate. We find that the collaboration satisfaction is different between American and Mexican users, and for individuals who trust partners more, they are more satisfied with collaboration task. In addition, we find that the limitation of the lack of trust due to different nationality can be mediated if technology competency is present.

INTRODUCTION

The idea of collaborative advantage has become increasingly important in the last decade, in which multinational corporations have expanded their reach to different countries. The collaborative advantage can be achieved by integrating the resources and expertise of one organization with that of others or by pooling organizational resources to create synergy across departments or employee expertise (Vangen and Huxham 2006). Globalization and diversified workforce have noteworthy impact on how enterprises respond to opportunities and threats rapidly and effectively. However, when employees across departments or even national boundaries work together on a project, they face a work environment that is challenging in many ways: not being able to communicate face to face, difficult to set common goals, different ways of saying things, etc. Therefore, collaboration at this scale is not at all an easy task.

One way that many organizations choose to respond to the challenge of collaboration is to utilize communication technologies that are available to help with the exchange of ideas and to facilitate the collaboration process. Despite apparent benefits of using communication technologies in collaborative decision making, an essence to collaboration success as identified in prior research is trust (Tschannen-Moran 2001; Colletti et al. 2005). When individuals from diversified backgrounds are involved in collaborative decision making, as many

multinational enterprises face in daily operations, they bring their different backgrounds, which can make it difficult to collaborate optimally. As a result, trust is especially an important element in a mobile and diversified workforce.

In this paper we challenge the assumption that communication technologies are "one-size-fits-all" solutions to collaborative decision making. We argue that nationality, as an aspect of cultural background, and trust should play important roles in collaborative decision making. We investigate these factors in two different countries: the United States and Mexico. We believe it is important to investigate this issue using American and Mexican participants for several reasons: First, we need to take into account the economic relationship between these two countries, accentuated by the North American Free Trade Agreement (NAFTA) signed by Mexico, the United States and Canada and enacted in 1994. In fact, the United States is Mexico's largest trade partner, and Mexico is the United States' third largest trade partner. Besides, many multinational companies operate in both countries, thus making it an interesting comparison on how communication technologies affect collaborative decision making within each country.

The empirical results of our findings suggest that trust is an important determinant for collaboration success in synchronous collaborative decision making as suggested by literature. Nationality, the inherent characteristics of collaboration partners' background, is also an important factor to determine how satisfied individuals are in collaborative tasks. We also find that because of different social norms and legal systems, Americans are more satisfied in collaborative decision making supported by communication technologies than their Mexican counterparts. This higher level of satisfaction can probably be attributed to higher trust levels Americans have on their collaboration partners. Our results also suggest that to overcome an inherent limitation of different nationalities, improving the level of comfort using technology seems to be a solution to promote collaboration success.

The remainder of this paper is organized as follows. The next section provides an overview of the literature and presents hypotheses of this study. The research design and results of hypotheses testing are discussed in section 3 and section 4. The last section provides the conclusion and discussions on implications.

HYPOTHESES DEVELOPMENT

Nationality as an aspect of cultural background: Research has shown that specific social characteristics in each country, such as the legal system, cultural background, law enforcement and corruption levels can impact the economic, accounting and financial environments in different ways (La Porta et al. 1997). For example, the U.S. and Mexico are not distant from each other geographically,

but most people would agree that these neighboring countries are very distant from each other culturally. Traditionally this country comparison has been of great interest because of the increasing economic and cultural ties with these two countries. It has been said that Mexico often is a strategic choice because it is right next door, from the point of view of a U.S. headquarters, but at the same time it is a world away, with different economic environments, different habits and cultural standards (Dyer et al. 2004). Because of the different social norms and legal systems in these countries, individuals usually process different attitude when they work on collaborative projects. As a result, we propose our first hypothesis:

H1: The satisfaction level of synchronous collaborative decision making supported by communication technologies will be different between American and Mexican users.

Level of trust: In a modern day multinational enterprise, the need for collaboration among departments, project teams, and co-workers should never be underestimated. Managers need to be able to respond to time-based competition with greater flexibility within the organization (Migliarese and Paolucci 1995) by encouraging internal collaboration. For example, more and more organizations seek to create synergy from employees by utilizing teams, encouraging team members to work together to achieve common goals (Coletti et al. 2005). In the world of management accounting, for example, advances such as corporate performance measurement system that focuses on resource management may involve more than technological advantages; there is also a need to integrate – to effectively collaborate among different organizational entities that is necessary to achieve unity of effort (Busco et al. 2006). Often the genuine collaboration contributes not only to higher quality decision making, but also greater motivation and commitment to the organization's mission and success (Tschannen-Moran 2001). Despite the obvious advantage and theoretical merit of the shared decision making in a multi-cultural environment, the outcome of the attempts to encourage collaboration among co-workers has been discouraging (Bititci et al. 2007; Reuer 1998). The need to collaborate in an organization requires coworkers to contribute each member's talent and expertise, and may be undertaken for reasons that are not hard to subscribe to. However, one factor that hinders collaboration is individualism; or opportunism. In other words, the lack of mutual trust between collaborative team members can be disastrous, and often the consequence is collaboration failure (Zaheer et al. 1998; Zaheer and Venkatraman 1995).

Empirical evidence that links trust and collaboration is provocative. The level of trust was found to be significantly related to the level of voluntary collaboration in school settings. Tschannen-Moran (2001) found that schools with higher level of trust are schools where there will be higher level of collaboration. For example, when parents and students could be trusted to engage

constructively with school teachers, there is less defensiveness on the part of principal and faculty. In the experiment conducted by Coletti et al. (2005), business collaborators increase their level of cooperation when the trust among them is increased. Accordingly, we propose the following hypothesis:

H2: The trust in the collaboration partner will affect the satisfaction level of collaborative decision making supported by communication technologies.

METHODOLOGY

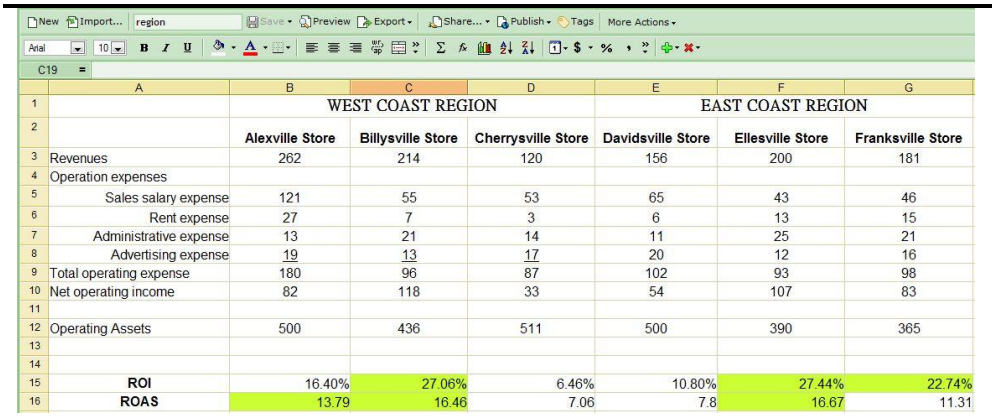
Participants: Our data collection involves working on a collaborative project by volunteers and answering a survey soliciting their responses to questions that are designed to answer research questions. A total of 60 students from two mid-sized universities in the United States and Mexico were recruited to complete the collaboration project. The participants were comprised of undergraduate business students. Fifty-five students finished the collaboration task and the survey without missing information. Among these 55 participants, 28 are Americans and 27 are Mexicans. In terms of gender, 57% of our participants are male and 43% are female. Their average age is 24.36 (SD=6.13). Our participants were equally represented in two countries.

Procedure and Task: The synchronous collaborative decision making task used in the current research involves a decision making that requires two collaboration partners to work together. Participants in each country completed their own collaboration task at different times. Participants were randomly assigned a collaboration partner from the same country and were instructed to assume the role of mid-level managers who were assigned to evaluate regional store performance for a chain retail store. Partner A was told that he/she was in charge of the west coast stores and his/her bonus would depend on whether stores under his/her management earned the "store of the year" recognition by the headquarters. From a total of six stores that the company operated, there were three stores in the west coast region which were under partner A's responsibility. Following the background information questions, participants were introduced with the communication and synchronous collaboration technology[2] used and received information about their collaboration partner. After they signed in to the online collaboration web site, the store performance information was presented to the participants. Both partners received the same performance score card for all six stores. As presented in Figure 1, the score card contained sales revenues, operational expenses, and store operating assets. Using this online collaboration and communication tool, participants were asked to calculate the return on investment (ROI) and the return on advertising spending (ROAS)[3]. For partner A, the ROAS had traditionally been a leading indicator of store success and stores with the highest ROAS usually received the "store of the year" designation. The partner B received the same information with following differences: (1) Partner B was told that he/she was responsible for the east coast

stores, and (2) Partner B was told that ROI had been traditionally a leading indicator of store success and that "store of the year" recognition was normally awarded to stores with the highest ROI.

The collaboration task for each team was to determine three (out of six) stores that should earn "store of the year" designation and recommend them in a joint memo to the headquarters. On the store performance card presented to participants, there was a definite winner in each region (under each collaboration partner's management) according to both ROI and RAS. For partner A, the third winner (out of six stores) was one of the west coast stores with the third highest ROAS. However, for partner B, the third winner was one of the east coast stores with the third highest ROI. In other words, because of the different focus on how performance was determined (ROI or ROAS), partner A would reach a different recommendation for the third store to receive "store of the year" designation from that of partner B. Since both partners were told that their compensation is based on the number of stores receiving "store of the year" designation, both partners needed to do their best to recommend one of his/her stores for "store of the year" designation.

FIGURE 1
The Collaborative Task Online: Store Performance Card



		WEST COAST REGION			EAST COAST REGION		
		Alexville Store	**Billysville Store**	**Cherrysville Store**	**Davidsville Store**	**Ellesville Store**	**Franksville Store**
3	Revenues	262	214	120	156	200	181
4	Operation expenses						
5	Sales salary expense	121	55	53	65	43	46
6	Rent expense	27	7	3	6	13	15
7	Administrative expense	13	21	14	11	25	21
8	Advertising expense	19	13	17	20	12	16
9	Total operating expense	180	96	87	102	93	98
10	Net operating income	82	118	33	54	107	83
11							
12	Operating Assets	500	436	511	500	390	365
13							
14							
15	**ROI**	16.40%	27.06%	6.46%	10.80%	27.44%	22.74%
16	**ROAS**	13.79	16.46	7.06	7.8	16.67	11.31

Note: The ROI and ROAS require collaboration partners to calculate them together. The shaded cells indicate that in each region, a clear winner of the "store of the year" designation exists (Billysville store from the west region and Ellesvile store from the east region). However, to determine a third "store of the year" requires some collaborative efforts between two collaboration partners because of different focuses on performance measures (Alexville store from the west region if ROAS is used or Franksville store from the east if ROI is used).

During the collaboration process, each participant was instructed to use the web site to calculate ROI and ROAS together and to use the chat room feature to facilitate discussion. Each team was also told to write a short memo

documenting their joint decision and why this decision was made. All participants were told not to reveal his/her true identity in this process in order to avoid any change in behavior, because they were classmates and they could fear some kind of retribution. In fact, it has been shown that anonymity can change the behavior of participants in diverse experimental settings (Kachelmeier and Towry 2002). After the collaborative decision making task, each participant completed a survey collecting variables investigated in this research.

The same instrument and survey were translated from English into Spanish before the task was implemented in Mexico. In order to ensure a proper translation process and that no information would be lost or mislead; all materials were first translated to Spanish by the authors and then back translated to English by a colleague who had no knowledge of this research. The authors then compared original materials with the back-translated version to determine that there was no information loss in the translation process.

RESULTS

Effect of nationality on collaboration success: To test our hypotheses, we use users' collaborative decision making satisfaction level as a proxy for collaboration success. Many measures are available to capture many different facets of satisfaction. Brown et al. (2006) develop an attitude survey to evaluate performance of online group work based on prior works on team member perceptions of various attitudes. Since our study focuses on individual satisfaction level by working with a partner, we adopted five questions from Brown et al. (2006)'s attitude survey to measure collaboration satisfaction: "I have benefited educationally from the collaborative experiences of this task" (SAT1), "Working with my partner has been a positive experience" (SAT2), "I enjoy working as a team member in this task" (SAT3), "Online collaboration promotes creativity" (SAT4), and "It's easier to complete this task when working as a group with your partner" (SAT5).

The first hypothesis predicts that users from different countries will experience different satisfactory level when they are required to collaborate synchronously online. The results in Table 1 show that, overall, American users are more satisfied when collaborated online than Mexican users. ANOVA result reported in Panel B, Table 1 verifies that nationality has a significant impact on user satisfaction in synchronous collaborative decision making ($F= 3.18$, $p=0.08$), supporting H1.

The effect of trust on collaboration success: Next, we test the effect of trust on user satisfaction in an online collaborative task. Trust is defined as one's perception of the reliability and integrity of one's partner (Morgan and Hunt 1994). In the context of synchronous collaborative decision making, the level of trust also reflects one's willingness to uphold some social norm since the purpose

of collaboration using the synchronous tool is to reap the synergy from both collaboration partners (Coletti et al. 2005). The theoretical perspective of measuring trust comes from the commitment-trust theory originated from the marketing literature (Morgan and Hunt 1994). This theory investigates the role of

TABLE 1
Variable Descriptive Statistics and Hypotheses Testing

Panel A. Variable Mean (S.D.), Reliability, and Correlation Analysis

					Variable correlations		
	TOTAL	U.S.A	Mexico	Reliability	1.	2.	3.
1.SATIS-FACTION	22.51 (3.26)	22.96 (2.63)	22.07 (3.77)	0.85	1.00		
2. TRUST	18.00 (2.86)	18.82 (2.23)	17.14 (3.21)	0.83	0.45	1.00	
3.EFFI-CACY	72.50 (18.20)	73.04 (22.17)	71.96 (13.53)	0.92	-0.10	-0.19	1.00

Note: Reliability is Cronbach's alpha for multi-item scales. Underlined correlation is significant at p < 0.05.

Panel B. Analysis of Variance

Factor	d.f.	F-value	*p*	
Nationality	1	3.18	0.08	*
Trust	1	12.35	0.00	**
Efficacy	1	0.99	0.74	
Culture x Efficacy	1	28.43	0.07	*

* *Significant at 0.10 level.*

** *Significant at 0.05 level.*

trust and commitment in business relationships. As discussed above, the interaction with the collaboration partner is similar to the business interaction described in the commitment-trust theory. It is true that the trust-building is a long-term process through members' repetitive interactions. However, our interest in this paper is to test whether the individual background can affect the level of trust – right after the first interaction with one's collaboration partner synchronously. Four questions in the survey were used to measure trust: "There's sufficient individual accountability in this collaboration task" (TRUST1), "Your partner is trustworthy" (TRUST2), "Your partner has your confidence" (TRUST3), and "Your partner is honest" (TRUST4). Again, confirmatory factor analysis confirms that the four questions used to measure trust load high on a single factor. ANOVA result in Panel B of Table 1 shows that trust is a significant factor affecting satisfactory level in synchronous collaborative decision making (p=0.000). As such, the data supports that for individuals who

trust their collaboration partner more, they will be more satisfied in a collaborative decision making. H2 is supported.

The effect of computer efficacy on collaboration success: As an additional test, we wanted to know how computer ability (as a control variable) could affect how participants are satisfied with the collaboration task. The computer ability is measured by Compeau and Higgins (1995)'s computer efficacy index. The computer efficacy is defined as how individuals feel about using computers to complete a particular task. It is measured by 10 questions (EFFICACY 1 – 10) answered on a 10-point scale. We found that computer efficacy is not statistically different for participants in our two countries (p=0.83, not reported in tables). Also, ANOVA result in Panel B, Table 1 shows that the computer efficacy factor is not significant (p=0.74).

One reason that nationality is such an important factor to determine user satisfaction in a synchronous collaborative task is that people with different backgrounds manage conflict and trust in different ways. Comparing the trust level by American and Mexican users confirms our argument. In general, American users trust their collaboration partners more than their Mexican counterparts (18.82 trust score for American users and 17.14 for Mexicans, t=2.035, p=0.047, not reported in tables). Although computer efficacy is not a significant factor in our model, we argue that it is a contextual factor that needs to be considered where technology know-how is heavily emphasized. As demonstrated by prior research, adequate computer training is expected to promote user satisfaction. To further explore possible channels to increase satisfaction level in synchronous collaborative decision making, we tested the interaction effect of nationality and computer efficacy. We argue that if individuals are more comfortable with using technologies, the gap due to different backgrounds between them and their collaboration partner would be mediated and they should be more satisfied with synchronous collaboration task. Our analysis supports our argument that the interaction between nationality and computer efficacy is significant at 0.07 level (p=0.071).

CONCLUSION AND DISCUSSION

To answer the important challenges arising from globalization, increased information volume, and diversified workforce, many organizations are striving to reap synergies from its employees and external partners. Some examples within the organization are project teams and distributed workforce. We see the same trends among organizations such as strategic alliances. Many of these forms of collaborations can only be successful because of the development in information and communication technologies. However, a common myth of applying technologies in a business setting is that technologies are always helpful to increase productivity. This paper investigates factors such as nationality and

trust, with computer efficacy as a control variable, on user satisfaction in a synchronous collaborative decision making.

Our results confirm that nationality and trust are two main factors in our research model that have significant impact on collaboration success in synchronous collaborative decision making. Specifically, American users in general are more satisfied with synchronous collaborative task than their Mexican counterparts. It will be interesting to explore some ways to alleviate this difference. Also, as expected, individuals across the national boundaries who trust their collaboration partners are more satisfied in the synchronous collaborative task.

One interesting finding in our research is that nationality seems to interact with individual computer efficacy to affect collaboration success. In another words, although individuals from some nationality do not like collaborative task, their satisfaction level can be significantly improved if they are confident about their computer abilities. Results from our data analysis indicates that we can attribute more satisfied American collaborators to higher trust levels they inherently process, given that computer efficacy across our two different cultural groups is the same. This finding suggests that computer training designed to increase individual efficacy is able to mitigate the limitation effect of cultural barriers to increase satisfaction level in synchronous collaborative task.

These findings will be important and helpful for real-time collaboration tool developers as well as users from a practical perspective, especially when diversified collaboration team members are present. Although team members can be diversified geographically and culturally, technological advancements have enabled efficient and effective means to promote more social interactions virtually. By encouraging and promoting an environment of trust and advocating necessary technology efficacy, a real-time collaboration tool can maximize its potential for the organization to reap "collaborative advantage".

NOTE

1. Contact author. The first author wishes to acknowledge financial support provided by the Office of Research at the University of Michigan – Flint.
2. The online tool supporting synchronous collaboration used in this study is Zoho Sheet (http://www.zoho.com). It is regarded as one of innovative online tool to support synchronous collaboration (Cong and Du 2007).
3. The formula to calculate both measures was provided to every participant. An example was also provided to show participants how to use provided information to calculate threes numbers. Participants learned related concepts in prior business courses and these concepts were reiterated before the collaborated decision making task.

REFERENCES

Bisconti, K. 2007. IM: ready for the enterprise? Communications News, 44(1): 44.

Bititci, U., T. Turner, D. Mackay, D. Kearney, J. Parung, & D. Walters. 2007. Managing synergy in collaborative enterprises. Production Planning & Control, 18(6): 454-465.

Brown, L., N. Eastham & H, Ku. 2006. A Performance evaluation of the collaborative efforts. Performance Improvement Quarterly, 19(3): 121.

Busco, C., M. Frigo, E. Giovannoni, A. Riccaboni, & R. Scapens. 2006. Integrating global organizations through performance measurement systems. Strategic Finance, 87(7), 30-35.

Coletti,A. L., K. L. Sedatole,& K. L. Towry. 2005. The effect of control systems on trust and cooperation in collaborative environment. The Accounting Review, 80(2): 477-500.

Compeau, D. R. and Higgins, C. A. (1995). Computer self-efficacy: development of a measure and initial test. MIS Quarterly, 19(2): 189-211.

Davis, F. D., R. Bagozzi, & P. Warshaw. (1989). User acceptance of computer technology: a comparison of two theoretical models. Management Science, 35(8): 982-1003.

Dyer, D., F. Dalzell, & R. Olegario. (2004). Rising Tide. Boston, Mass; Harvard Business School Press.

Goodbody, J. 2005. Critical success factors for global virtual teams. *Strategic* Communication Management, 9(2): 18-21.

Kachelmeier, S., K. Towry. (2002). Negotiated transfer pricing: Is fairness easier said than done? The Accounting Review, 77(3): 571-594.

La Porta, R. F. Lopez-De-Silanes, A. Shleifer, & R. Vishny. 1997. Legal determinants of external finance. The Journal of Finance, 52(3): 1131 – 1151.

Reuer, J. 1998. The dynamics and effectiveness of international joint ventures. European Management Journal, 16(2): 160-169.

Tschannen-Moran, M. 2001. Collaboration and the need for trust. Journal of Educational Administration, 39(4): 308-331

Migliarese, P. & E. Paolucci. 1995. Improved communications and collaborations among tasks induced by Groupware. Decision Support Systems, 14: 237-250.

Morgan, R.M. & S. D. Hunt. 1994. The commitment-trust theory of relationship marketing. Journal of Marketing, 58: 3: 20–38.

Vangen, S., & C. Huxham. 2003. Nurturing collaborative relations: Building trust in interorganizational collaboration. The Journal of Applied Behavioral Science, 39(1): 5-31.

Wood, R. & A. Bandura. 1989. Social cognitive theory of organizational management. Academy of Management Review, 14:3: 361-384.

Zaheer, A., and N. Venkatraman. 1995. Relational governance as an interorganizational strategy: An empirical test of the role of trust in economic exchange. Strategic Management Journal, 16 (5): 373–392.

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CLARITY OF PROJECT TARGET TRADEOFFS

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ABSTRACT: Extending goal-setting theory and with the focus on early, front-end activities of a NPD project, this paper presents a hypothetical research model that was tested using data collected from 191 product development projects. Results from structural model tests indicate that contextual variables such as the heavyweight product manager, strategic fit, and project mission are related positively to clear tradeoff decisions in the early, front-end stage of NPD.

INTRODUCTION

Tradeoff decisions exist in any area of decision-making (Steinbruner, 1974). Such tradeoff decisions are particularly important for a cross-functional new product development (NPD) team behavior in a complex and uncertain project environment in their collective efforts to construct, maintain, and follow a viable project plan (Shaw and Morris, 2005). From idea creation to market introduction, multiple criteria such as engineering specification and customer attributes, or engineering specification and manufacturing requirements are involved (Hauser and Clausing, 1988). Product success or failure may depend upon a careful mix of tradeoffs between competing objectives, goals, and performance measurements. If tradeoff decisions are not handled appropriately, the product may have high performance, but be introduced too late to enjoy first to market advantage; or the product may meet customer quality expectations, yet fail to meet cost or delivery time requirements.

Such tradeoff decisions are routinely made with incomplete information and significant uncertainty by the development team (Koufteros, Vonderembse, and Jayram, 2005). Market, technological, and competitive uncertainty can make it difficult for a project team to launch a product concept with internal as well as external integrity (Clark and Fujimoto, 1991). Inconsistency in tradeoff decisions across the project can damage value generation (Parsaei and Sullivan, 1993).

NPD activities require concurrent involvement of cross-functional teams in and across various stages of the project (Bhuiyan, Thompson, and Gerwin, 2006). Integrated and coherent tradeoff decisions are a daunting task in new product development environment as members usually have competing social identities and loyalties (Holland, Gaston and Gomes, 2000) and team members tend to identify more strongly with their own function (Ashforth and Mael,

1989). However, decisions on emerging project problems need to be consistent with overall performance objectives and goals (Herrmann and Schmidt, 2002).

However, in the absence of a systematic, large scale, empirical study, we have a limited understanding on what contextual factors can lead to clear project target tradeoffs decisions (Terwiesch, De Meyer and Loch, 2002). In this study, we provide a hypothetical model that identifies relationships between three important contributors of target tradeoffs in the early stage of the project. We further argue that a cross-functional team with clear project tradeoffs can enhance the performance of a NPD project.

THEORY DEVELOPMENT

Quality function deployment (QFD) has been a powerful decision making tool for cross-functional product development team (Prasad, 1998). QFD maintains a careful evaluation, selection and clarity of the tradeoff decisions among team members at various stages design and development of the product. Cross-functional team needs a clear understanding of such project targets and tradeoff decisions from the onset of the project, which is only possible if the project goals are explicitly defined in the front-end stage.

The clarity of project target tradeoffs is the extent to which project targets clearly specify the tradeoffs among performance, cost, time, and quality to the cross-functional team for a specific NPD project. In NPD, the time-cost tradeoff refers to overall product development time and its associated cost. Cost-quality tradeoff compares the cost in terms of resources for producing particular products and the quality of the products received by customers (Bolot, 1996). In their study, Gupta, Brockhoff, and Weisenfeld (1992) revealed how R&D, marketing, and manufacturing managers make tradeoffs among critical measures in NPD. Clear project target tradeoffs can ensure that no functional goals and objectives take precedence over the project's needs.

Since the front-end stage is an area for which a void exists in the literature (Reid and de Brentani, 2004), we focus on clarity of project target tradeoff decisions in the front-end stage for the cross-functional project team.

Heavyweight product managers are senior managers in the NPD project that have substantial power and influence to reassign people and reallocate resources (Schilling and Hill, 1998). Product development teams driven by a heavyweight product manager (Wheelwright and Clark, 1992; Clark and Fujimoto, 1991) are critical to effective product development (Koufteros, Vonderembse, and Doll, 2002). Such project leaders help to translate the product concept in unequivocal expressions in order for all members of the team to understand it (Clark and Fujimoto, 1991). Through formal and informal influence in the project, the role of the heavyweight product manager during the early

stages of the NPD could be crucial in formulating and clarifying the NPD strategic fit, project mission, and project target tradeoffs. In the role of concept infuser, the heavyweight manager becomes the guardian of the concept and not only reacts and responds to the interests of others, but also sees that the choices made are consistent and in harmony with the basic concept (Clark and Wheelwright, 1992). Thus we propose,

H1: The heavyweight product manager can have a positive influence on the clarity of project target tradeoffs for the team.

In this study, we define strategic fit as the extent to which a firm's overall business, product, and technology guide the product development contents and processes (Wheelwright and Clark, 1992). If the NPD project is aligned to the business strategy then it has a better chance of being selected, accepted, and executed by the team members (Song and Parry, 1997). A good fit between the new product to be developed and business strategy provides an integrated effort among the functional units and allocation of resources for the project. During the early interaction with the project team, the heavyweight product manager can help organizations formulate product concepts and implement them coherently across organization functions (Fujimoto, Iansiti, and Clark, 1996). The heavyweight product manager can clarify and regularly communicate the overall strategic importance of current NPD project so that diverse cross-functional team activities are aligned towards common purpose. Therefore we propose the following hypothesis:

H2: The heavyweight product manager can have a positive influence on the strategic fit of the project for the team.

In addition to strategic fit, the heavyweight product manager needs to translate strategy into action by converting it into operational terms or specific targets and objectives. Project targets that have a high degree of strategic fit tend to receive quicker top management support and easier access to internal resources. A project that has a high level of strategic fit enhances teamwork (Trygg, 1993) and drives superior project performance including time to market (Mabert, Muth and Schmenner, 1992) and manufacturing cost (Cusumano and Nobeoka, 1992). A clear strategic fit of the project can help clarify project target tradeoffs to the team. Thus we propose,

H3: The strategic fit of NPD is related positively to clear project target tradeoffs.

Project mission is the extent that the NPD team's mission and purpose is communicated and understood by the entire cross-functional team. The team needs a clear and realistic project mission about what the product does, what the product is, and whom the product serves (Clark and Fujimoto, 1991). Thus, the project mission clarifies the purpose of a particular project for the team members

(Rosenthal, 1992). Clark and Wheelwright (1992) argue that the project mission is captured in an explicit, measurable *project charter* and usually is articulated even before the team is selected. By clarifying and continuously communicating a common project mission, the heavyweight product manager integrates and aligns project decisions and the actions of the cross-functional team. Properly understood, the mission statement is a tool of transforming leadership (Nicholls, 1992) for heavyweight managers. It encapsulates the synergy that energizes the project. Hence we propose,

H4: The heavyweight product manager can have a positive influence on the project mission for the team.

If cross-functional decisions were based on a strong single definition of the project mission, there would be more clarity about the specific project goals and targets. This should help the cross-functional team on conflicting decisions in timely manner. Sharp et al. (2000) proposed that shared purpose, goals and direction are among the key attributes of a high performance team. With a common, shared project mission, cross-functional teams can develop a clear understanding of the key project target tradeoffs. This helps the team to focus on more important project criteria and filter out decisions and alternatives that are not congruent with the overall project mission. Thus we propose,

H5: The NPD project mission is related positively to clear project target tradeoffs.

Product development time is the time required from product concept to product introduction (Gupta, Brockhoff and Weisenfeld, 1992). Having a shared understanding of project purpose and strategic intent substantially affects the time to market (Murmann, 1994). If the team has a clear understanding of project target tradeoffs, less time is spent in discussing, arguing, and concurring the team works towards tradeoff related decisions. Problems and conflicts are resolved in a timely and disciplined manner. Thus we propose,

H6: Clarity of project target tradeoffs will have a positive impact on reducing product development time.

Customer satisfaction measures the satisfaction of the customer for a product designed for a certain target market (Cooper and Kleinschmidt, 1987). Team members can identify closely with each other through a shared understanding of project target tradeoffs to resolve coordination problems affecting quality issues. With a clear understanding of project target tradeoffs, cross-functional team members would avoid possible misunderstandings and exchange resources and critical knowledge more freely that can benefit the customers (Tsai and Ghoshal, 1998). Thus we propose,

H7: Clarity of project target tradeoffs will have a positive impact on customer satisfaction.

Our research framework in Figure 1 illustrates the positive relationship between the clarity of project target tradeoffs and the contextual drivers of tradeoffs, such as heavyweight product manager, project strategic fit, and project mission.

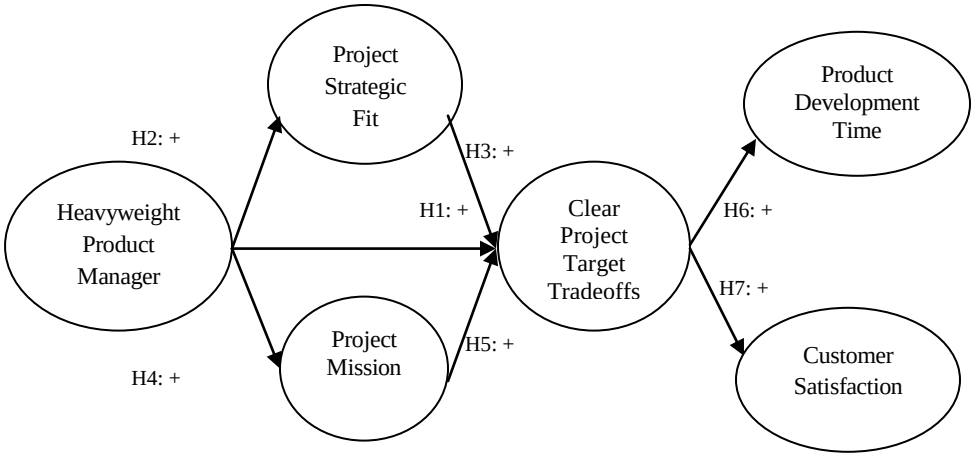


Figure 1. Research Framework for project target tradeoff for cross-functional team in early stages of NPD project

RESEARCH METHOD

An extensive literature review and case studies in NPD as discussed earlier and structured interviews with product development professionals (managers and team-members) and academicians helped us to define the domain of constructs in our research framework of figure 1 and facilitate item generation. Next, three practitioners and three academicians from the area of NPD evaluated the items in a formal pre-test. Five items were finalized to measure the heavyweight product manager (HW), three for strategic fit (SF), five for project mission (TM), three for project target tradeoffs (PTT), five for customer satisfaction (CS), and four items to measure product development time (PDT). A five-point Likert scale was used where 1 = strongly disagree and 5 = strongly agree. A pilot study using a small sample was employed to determine whether any of the items should be modified prior to investing time and resources in the large-scale study.

For our empirical study, the Society of Automotive Engineers (SAE) provided a mailing list of 3,200 professionals involved in NPD projects. 200 individuals from the SAE mailing list were then randomly selected for the pilot

study. A total of 34 usable responses (or a response rate of 17.7%) were obtained to conduct the preliminary investigation on the constructs of the proposed research model. All constructs reported a high Cronbach's alpha value (>0.80) and all items for each construct reported high corrected-item total correlations (CITCs) value, which indicated a good reliability of the items. Exploratory factor analysis (principal component analysis with oblimin rotation) resulted in separate factors for each construct under investigation with no cross loadings among the constructs. The results of pilot study indicated that no modification of the items for large-scale study was necessary.

After a satisfactory indication of factorial validity and reliability of our instruments in the pilot study, a large-scale survey was administered. Out of 3,000 (3,200 – 200 for pilot study) questionnaires mailed, 191 usable responses were received resulting in a response rate of 6.3 %.

Of the total responses received 28% of the respondents worked for companies with up to 499 employees, 8% with companies having 500 to 999 employees, 24% with companies having 1,000 to 4,999 employees, 12 % with companies between 5,000 to 9,999 employees and 27% with companies having over 10,000 employees. In addition, about 67% represented supplier companies.

ITEM PURIFICATION AND DISCRIMINANT VALIDITY

To evaluate construct validity, all twenty-five items were subjected to factor analysis using principal component analysis and oblimin rotation. All the items loaded on their respective factors with no cross-loadings. The total variance explained by our factor analysis was 74% (HW-8.7%, SF-7.3%, TM-4.12%, PTT-6.28%, CS-10.8%, and PDT-36.3%). Next, we tested the reliability of each construct using Cronbach's alpha. The composite reliabilities of HW, SF, TM, PTT, CS, and PDT were 0.84, 0.83, 0.93, 0.85, 0.89, and 0.91, respectively. All reliability estimates exceeded the customary acceptable level of 0.80.

Discriminant validity is demonstrated when a measure does not correlate very highly with another measure from which it should differ .To fully satisfy the requirement for discriminant validity, average variance extracted for each construct should be greater than the squared correlation between constructs (Fornell and Larcker, 1981). Table 1 represents the correlation matrix. All the correlations were significant at $p<0.01$ levels. The descriptive statistics of the constructs are also presented in Table 1.

	Mean	Standard Deviation	HW	SF	TM	PTT	CS	PDT
Heavyweight Product Manager, HW	3.36	1.09	α= 0.84, AVE =0.52					
Strategic Fit, SF	3.86	0.93	0.35	α= 0.83, AVE =0.63				
Project Mission, TM	4.11	0.79	0.27	0.47	α= 0.93, AVE =0.74			
Clear Project Target Tradeoffs, PTT	3.65	1.01	0.29	0.42	0.38	α= 0.85, AVE =0.65		
Customer Satisfaction, CS	3.67	0.95	0.38	0.48	0.36	0.31	α= 0.89, AVE =0.62	
Product Development Time, PDT	3.51	1.04	0.39	0.3	0.43	0.35	0.56	α= 0.91, AVE =0.73

Note: All Correlations significant at p<0.01

Table 1: Reliability (α), Average Variance Extracted (AVE) and Correlation

The diagonal values contain the Cronbach's alpha (reliability) and the average variance extracted of the specific construct. As indicated in Table 1, the average variance extracted is > 0.50 which were greater than the square of the correlation between constructs.

MEASUREMENT MODEL

AMOS 5.0 was used to analyze the measurement and structural models. Following Gerbing and Anderson's (1988) paradigm on model testing, the measurement model was tested first, followed by tests of the structural model. This was done in order to avoid possible interactions between the measurement and structural models. For each measurement model tested, the statistical significance of the parameter estimates (standardized regression weights) and the goodness-of-fit statistics are reported. Multiple indices of model data fit should be considered in assessing overall model-data fit. We report CMIN/df, CFI, TLI, and RMSEA values for the measurement and structural models. For each of these indices, good model-data fit is indicated by CMIN/df value < 2.00 , CFI value > 0.9, and TLI value closer to 0.95 . RMSEA values ranging from 0.05 to 0.08 are considered to be a reasonable fit. Measurement models for all the constructs were analyzed simultaneously. Each measurement model defined relations between the observed indicator variables or items (for example, HW1) and the underlying constructs (for example, HW). The results of the first order measurement models are summarized in Table 2.

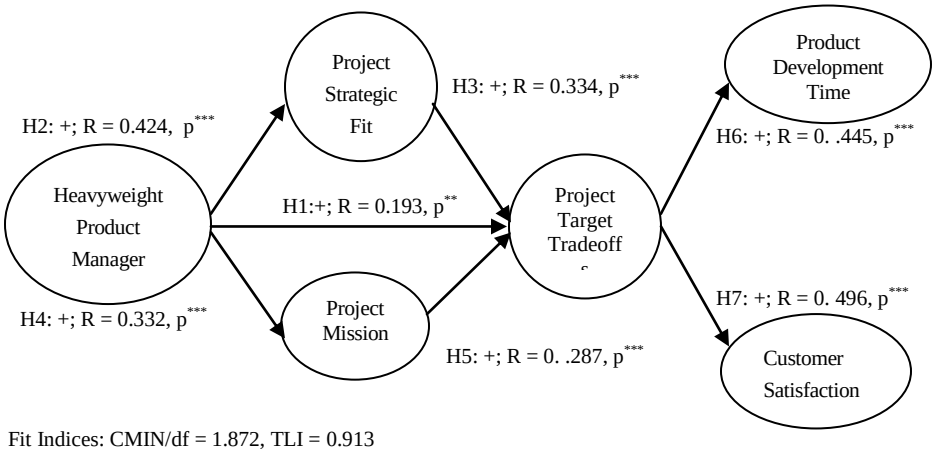
Indicators		Constructs	Standardized Regression Estimate	S.E.[a]	C.R.[b]	P[c]
Heavyweight Product Manager, HW						
HW1	<---	HW	0.800			
HW2	<---	HW	0.787	0.067	10.814	***
HW3	<---	HW	0.622	0.083	8.350	***
HW4	<---	HW	0.689	0.081	9.445	***
HW5	<---	HW	0.688	0.071	9.196	***
Strategic Fit, SF						
SF1	<---	SF	0.849			
SF2	<---	SF	0.686	0.075	8.903	***
SF3	<---	SF	0.831	0.096	10.316	***
Project Mission, TM						
TM1	<---	TM	0.870			
TM2	<---	TM	0.786	0.078	13.46	***
TM3	<---	TM	0.907	0.064	17.693	***
TM4	<---	TM	0.869	0.070	16.208	***
TM5	<---	TM	0.847	0.065	15.739	***
Project Target Tradeoffs, PTT						
PTT1	<---	PTT	0.801			
PTT2	<---	PTT	0.835	0.092	10.806	***
PTT3	<---	PTT	0.783	0.087	10.737	***
Customer Satisfaction, CS						
CS1	<---	CS	0.721			
CS2	<---	CS	0.792	0.132	10.375	***
CS3	<---	CS	0.711	0.129	9.204	***
CS4	<---	CS	0.885	0.119	11.432	***
CS5	<---	CS	0.824	0.128	10.571	***
Product Development Time, PDT						
PDT1	<---	PDT	0.794			
PDT2	<---	PDT	0.781	0.081	11.829	***
PDT3	<---	PDT	0.929	0.077	15.028	***
PDT4	<---	PDT	0.898	0.078	14.283	***

Notes: [a] Standard Error, [b] Critical ratio, [c] $p < 0.001$

Table 2: Summary results from the measurement model

Table 2 reports the parameter estimates and standardized regression weights resulting from the measurement model analysis. The last column in Table 2 represents the significance at the $p < 0.001$ levels All significant relations are represented by "***". The CMIN/df, TLI, CFI, and RMSEA for the overall measurement model were 1.431, 0.957, 0.963, and 0.048. The overall measurement model fit for was adequate to proceed to the next phase of analyzing the structural model without any modification to the items underlying

the respective constructs. The result of the structural model data analysis is presented in Figure 2.



Note: *R= Standardized regression weight, p^{***} = significant at p <0.001, p^{**} = significant at p <0.05*

Figure 2. Results of structural model

The results from Figure 2 indicate that all seven hypotheses were supported by the data. The first hypothesis suggested that there was a positive relationship between the heavyweight product manager and the project target tradeoffs. The standardized regression estimate of 0.193 was found to be statistically significant at p-value <0.05.

The second hypothesis suggested that a positive relationship existed between the heavyweight product manager and the project strategic fit. The standardized regression estimate at 0.424 was found to be statistically significant at p-value <0.001. Similarly, the third hypothesis suggested that there was a positive relationship between the strategic fit of the project and project target tradeoffs. The standardized regression estimate at 0.334 was found statistically significant at p-value <0.001. The fourth and fifth hypotheses stated a positive relationship existed between heavy weight product manager and project mission and the project mission and project target tradeoff, which were again supported by our data analysis with standardized regression weights of 0.332 and 0.287. Both these hypotheses were significant at p <0.001 levels.

Finally the sixth and seventh hypotheses suggested that a positive relationship existed between project target tradeoff and customer satisfaction, and between project target tradeoffs and product development time. Both these

hypotheses were found to be statistically significant with standardized regression weights of 0.445 and 0.496, respectively.

The model fit indices for the overall model were found to be CMIN/df = 1.872, TLI = 0.913, CFI = 0.922, and RMSEA = 0.068. All the indices indicated a good model fit between the data and our research model.

DISCUSSION

This study has empirically investigated the relationships of the heavyweight product manager, strategic fit, project mission, project target tradeoff, and NPD performance outcomes. However the result of this study should be interpreted with caution. One can argue that there can be several other contextual factors that may affect project target tradeoff decisions. Identifying and empirically studying such other factors can enhance our current understanding on project targets. One of the limitations of this study is the low response rate of 6.3 %. Future studies may involve studying our research model with a larger sample size. Another shortcoming of this study is that our sample was restricted to the automotive industry. A multi-industry study of our research framework can help generalize our current theory.

Against these limitations, however, our study provides several implications for practitioners and researchers community. Early understanding of project target tradeoffs can help the team in evaluating complex decisions and to maintain integrity or congruency among the decisions during all the downstream activities of projects. Such clarity of tradeoff decisions can lead to coherent decision-making among the diverse team members to deliver project outcomes with superior customer satisfaction and reduced product development time.

When development tasks can be well formulated with clear set of tradeoffs and common objectives, the team members' decision-making process is the solution of an optimization problem (Herrmann and Schmidt, 2002) for superior project outcomes such as development time and customer satisfaction.

Our hypotheses also show the importance of a heavyweight product manager in influencing the team through project tradeoff decisions, strategic fit, and project mission. Although the leadership literature stream is abundant in the area of NPD, in their comprehensive review of the extant literature on NPD, Gerwin and Barrowman (2002) report that only six empirical studies exist on heavyweight product managers. To this end, the current empirical research may contribute to the existing literatures on the heavyweight product manager by enhancing our understanding of the formal and informal influence of the heavyweight product manager during the early stage of the project.

CONCLUSION

Based on goal-setting theory, the present study focuses on the front-end stage of NPD for clear project target tradeoffs in the cross-functional team. Our study empirically investigated that the heavyweight product manager, strategic fit of the new product, and project mission can help the clarity of project target tradeoffs for the cross-functional team and that the clarity of project tradeoff decisions can enhance customer satisfaction and improve product development time.

REFERENCES

Ashforth, B.E. and Mael, F. (1999). Social Identity Theory and the Organization, Academy of Management Review, 14(1): 20-39

Bhuiyan, N., Thomsom, V. and Gerwin, D. (2006). Implementing Concurrent Engineering. Research Technology Management, 49(1), 38-43

Bolot, J.C. (1996). Cost-Quality Tradeoffs In The Internet. Computer Networks and ISDN Systems 28: 645-651

Clark, K.B. and Fujimoto, T. (1991). Product Development Performance, Boston, MA, Harvard Business School Press

Clark, K., and Wheelwright, S.C.(1992). Organizing and Leading "Heavyweight" Development Teams. California Management Review 34: 9-28

Cooper, R. G. and Kleinschmidt, E. J. (1987). New Products: What Separates Winners From Losers, Journal of Product and Innovation Management, 4: 169-184

Cusumano, M.A. and Nobeoka, K. (1992). Strategy, structure and performance in product development: observations from the auto industry, Research Policy, 21(3), 265-94.

Fornell, C. and Larcker D.F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Errors, Journal of Marketing Research, 18: 39-50

Fujimoto, T. Iansiti, M. and Clark, K.B. (1986). External Integration in Product Development, Nishiguchi, T., Managing Product Development, Oxford University Press, New York

Gerwin, D. and Barrowman, N.J (2002). An Evaluation of Research on Integrated Product Development, Management Science, 48 (6): 938-53

Gupta, A. K., Brockhoff, K. and Weisenfeld, (1992).. Making Trade-offs in the New Product Development Process: A German/ US Comparison. Journal of Product Innovation Management, 9:11-18

Hauser, J. and Clausing, D. (1988). The House of Quality, Harvard Business Review, 66(3): 63-73

Herrmann, J.W., and Schmidt, L.W. (2002). Viewing Product Development as a Decision Production System, DETC2002/DTM-34030, Proceedings of the 14th International Conference on Design Theory and Methodology Conference, ASME 2002 Design Engineering Technical Conferences and Computers and Information in Engineering Conference, Montreal, Canada

Holland, S., Gaston, K. and Gomes, J. (2000). Critical Success Factors for Cross-functional Teamwork in New Product Development. International Journal of Management Review 2(3): 231-259

Koufteros, X.A., Vonderembse, M.A and Doll, W.J. (2002). Integrated Product Development Practices and Competitive Capabilities: the Effects of Uncertainty, Equivocality, and Platform Strategy. Journal of Operations Management 20: 331-355

Koufteros, X.A., Vonderembse, M.A., and Jayaram, (2005). Internal and External Integration for Product Development: The Contingency Effects of Uncertainty, Equivocality, and Platform Strategy, Decision Sciences, 36(1): 97-133

Mabert, V.A., Muth, M.F. and Schmenner, R.W.(1992). Collapsing New Product Development Times: Six Case Studies. Journal of Product Innovation Management, 9(3): 200-212

Murmann, P.A. (1994). Expected Development Time Reduction in the German Mechanical Engineering Industry. Journal of Product Innovation Management 11 (9): 136-152

Nicholls, J.R. (1992). Leadership of Customer-driven TQM, Technical Communications Publishing Ltd.

Parsaei, R.H. and Sullivan G.W. (1993). Concurrent Engineering. Contemporary issues and Modern Design Tools, Chapman and Hall, London

Prasad, B. (1998). Review of QFD and related deployment techniques. Journal of Manufacturing Systems, 17(3): 221–234

Reid, S. E. and de Brentani, U. (2004). The Fuzzy Front End of New Product Development for Discontinuous Innovations: A Theoretical Model, Journal of Product Innovation Management 21 : 170-184

Rosenthal, S.R. (1992). Effective Product Design and Development. How to Cut Lead Time and Increase Customer Satisfaction, Business One Irwin, Homewood

Schilling, M. A. and Hill, C.W. (1998). Managing the New Product Development Process: Strategic Imperatives. Academy of Management Executive 12(3): 67–81

Sharp, J., Hides, M., Bamber, C. and Castka, P. (2000). Continuous Organizational Learning Through the Development of High Performance Teams. Proceedings of International Conference on Systems Thinking in Management, Geelong

Shaw, B.S. and Moriss, T.G. (2005). Managing the Tradeoff: Similarities Between Managing New Product Development and Well-Drilling/ Completion Project, JPT Online, (http://www.spe.org/spe/jpt/jsp/jptmonthlysection/0,2440,1104_11038_3877903_3880047,00.html)

Song X. M. and Parry M. E. (1997). The Determinants of Japanese New Product Success. Journal of Marketing Research 34(1): 64-76

Steinbruner, J. (1974). The Cybernetic Theory of Decision, New Dimensions of Political Analysis, Princeton University Press, New Jersey, 16-18

Terwiesch, C., De Meyer, A. and. Loch, C.L. (2002). Exchanging Preliminary Information in Concurrent Engineering: Alternative Coordination Strategies, Organization Science, 13(4)

Trygg, L. (1993). Concurrent Engineering Practices in Selected Swedish Companies: a Movement or an Activity of the Few? Journal of Product Innovation Management 10 (11): 403, 415

Tsai, W., and Ghoshal, S. (1998). Social Capital and Value Creation: The Role of Intrafirm Networks. Academy of Management Journal 41: 464-476

Wheelwright, S.C.and Clark, K.B. (1992). Revolutionizing Product Development, Quantum Leaps in Speed, Efficiency and Quality. The Free Press, New York

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SERVICE LEARNING: UNDERGRADUATE STUDENT PERCEPTIONS OF CONFIDENCE IN SKILL AND PERSONAL ABILITY IN A BUSINESS SERVICE LEARNING EXPERIENCE

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ABSTRACT: The purpose of this study was to determine undergraduate student perceptions in the areas of confidence in skill and personal ability, as well as the effectiveness of the group experience within the context of a business class service learning assignment. Eighty undergraduate students participated in a service-learning project, which required presenting Junior Achievement curriculum to local high school students in Azusa, California. A multiple-choice questionnaire was administered to the undergraduate students in week eleven of a traditional semester and in the last week of the service-learning project. The survey was comprised of 13 questions addressing confidence in personal skills and ability, group experience, and feelings towards the service-learning project itself. Significant findings revealed a positive correlation between the group experience and the feelings towards the project as well as a positive correlation between the students' confidence in their skills and their feelings towards the project. Multiple linear regressions suggested a positive and significant prediction. Findings are conclusive with positive correlations found in prior research.

INTRODUCTION

The purpose of this study was to determine undergraduate student perceptions in the areas of confidence in skill, personal ability, and group experience within the context of a business class service learning assignment.

A multiple-choice questionnaire was administered to undergraduate students in a senior-level Organizational and Administrative Behavior class and analyzed for correlations and relationships. The survey was administered in week eleven of a traditional semester and in the last week of the service-learning project. The survey was comprised of 13 questions with four addressing confidence in personal skills and ability, seven relating to the group experience, and one based on the impact of the service learning project itself.

Significant findings revealed a positive correlation between the group experience and the feelings toward the project, as well as a positive correlation

between the students' confidence in their skills and their feelings toward the project.

From the findings, implications for the development of experiential learning projects for use in the college classroom will be discussed.

BACKGROUND AND PRIOR RESEARCH

Providing opportunities for students to learn coursework through application is a method of teaching that contributes to the styles of experiential based learning, service learning, and co-learning. Experiential learning involves any type of teaching that calls upon relevant life and learning experiences and a reflection of the past in order to create deeper understanding (Barth, Goredemann, Riekmann, & Stollenberg, 2007). Service learning and co-learning are aspects of experiential learning that combines community service projects with credit bearing educational experience (Govekar & Rishi, 2007). VanWynsberghe & Andruske (2007) describe this method as "the place where education meets the community." For the purpose of this article, we will use the term service learning as defined by McClam, Diambra, Burton, Fuss, & Fudge (2008): "An effective method of learning whereby students learn and develop through active participation in thoughtfully organized service" (p. 237).

Regardless of what term is used to describe this style of learning, numerous studies have identified a wide range of benefits. These benefits include the personal and social development of students (Hunt 2007); community engagement (VanWynsberghe & Andruske, 2007); increased ability to think creatively, engage in group discussion, lead a group, go beyond the textbook to find answers, communicate with others, and know whom to contact to get things done (Govekar & Rishi, 2007). Govekar & Rishi (2007) have also noted growth in written and oral communication skills, commitment and work ethic, teamwork and team skills, cultural awareness and sensitivity to diversity.

By narrowing the scope of service learning to undergraduate business classes, the quantity of data is less prevalent, but the results are similar and demonstrate that applications improve the achievement of learning objectives in information systems, management, and marketing (Andrews 2007). Madsen and Turnbull (2008) identified a honing of business- specific skills including "effective communication skills; relationship of course content to organizational strategy; problem solving, time management and networking skills; analysis, synthesis, and evaluation; consequences of their own decisions; cultural awareness and diversity; teamwork, interaction, interpersonal, and communication skills; conflict resolution and leadership skills, and learning how to learn" (p. 727). Steven Papamarcos suggests that service learning may in fact be the most effective tool available for professors in the area of business, and he describes it as (2002) "a complex, comprehensive pedagogy that requires a

dramatic rethinking of the dynamic of learning, from static listening to participatory engagement."

Service learning can be executed in a number of ways, and a one of these methods is through group or teamwork. These integrative projects involve assignments based in the community that are much too large for an individual to complete in the given time (Papamarcos, 2002). Group experiences give students the opportunity to increase involvement, deepen understanding, and improve thinking. (Jaques, 2000, pg 52). Group-based service learning is also known to develop students' ability to work with others and their tolerance for diversity (Dumas, 2002). David Jaques (2000) suggests that "groups are a valuable vehicle for learning about the skills and concepts of a subject discipline, but are also a way of learning about groups: developing abilities in cooperative work for later life."

Service learning has proved to have a positive impact particularly on students' confidence in skill and personal ability. McClam, Diambra, Burton, Fuss, and Fudge (2008), found an increase in confidence in reviewing post-service learning reflections, which significantly emphasized students' "feelings of confidence related to personal and professional development". Madsen and Turnbull (2006) noted not only growth in "perceived learning and skills acquired", but also a growth in confidence as one student stated "it [the project] became easier" as it progressed. As confidence in skill increases, many students feel affirmation of their career selection (Madsen & Turnbull, 2006). Madsen (2004) observed "most students started out with uncertainty and hesitation, and all finished the project with positive feelings about themselves and their accomplishments" (p.330).

Positive outcomes such as these tend to span across various disciplines and courses, including business and management:

> "Providing these [service learning] experiences for students in human resource or management curriculum can provide opportunities for them to improve confidence, enhance self-efficacy, experience accomplishment, feel valued, learn more in-depth knowledge and skills, act with professionalism, practice citizenship, and generally feel better about themselves because they are serving others" (Madsen, 2004).

Porter and McKibben (1988) purported that business students entering into the workforce lacked "breadth and real world experiences" (Madsen, 2004, p. 328). There was a lack of opportunity to practice skill sets learned in the classroom in the real work setting. Through service-learning opportunities, students not only have the opportunity to gain the "real world" experiences, but also develop confidence in the skill sets required in the workplace.

RESEARCH QUESTION

The purpose of this study was to determine the impact of service learning in the area of group cohesiveness and personal skill sets for business students at the undergraduate level. We sought to identify the differences and relationships among the following three areas: confidence in personal skills, perception of group experiences, and positive feelings toward a service learning experience. Before analyzing the data received in regard to this question, we will describe the student population surveyed in the study and also the type of service learning project in which they were involved.

DESCRIPTION OF SERVICE LEARNING SITE AND RESEARCH PARTICIPANTS

The service learning component for the student research participant group studied was an eight week teaching assignment wherein students are assigned to teach Junior Achievement Economics curriculum in classrooms within the local community.

The Junior Achievement program uses "hands-on experiences to help young people understand the economics of life" and is modified "to meet the needs of the at-risk youth" ("Junior Achievement", 2008). Specifically, the Economics curriculum focuses on "concepts of micro- and macro- economics by having students explore the basic characteristics of the U.S. economic system, and how economic principles influence business decisions. It also introduces students to career opportunities, consumer issues, and helps reinforce important academic and leadership skills, including: research and data analysis, problem-solving and critical thinking" ("Junior Achievement Economics", 2008).

The student participant group was composed of eighty undergraduate students enrolled in an upper division business course. Participants were divided into twelve groups (mean group size of six) and assigned to deliver the age-specific curriculum to local high school students. They were responsible for creating group contracts to illustrate their roles and responsibilities, reviewing and organizing curriculum materials, revising lesson plans (creativity was encouraged), and then delivering the lesson plans in various classrooms in the local schools. Classroom assignments remained constant throughout the length of the service learning assignment.

Although guidance was available upon request, participants carried a great deal of responsibility in seeing this project to fruition. Much of their grade hinged on their participation and evaluations given by peers in the group, and for eight of the fourteen weeks one class per week was dedicated to time in the classroom.

All research participants were enrolled in Organizational and Administrative Behavior during the Spring 2008 semester and were required to participate in the service-learning component as a part of the course curriculum. Organizational and Administrative Behavior (BUSI 448) is a required 400 level business course comprised primarily of junior and senior level business students.

The student population that participated in this study was enrolled at Azusa Pacific University (APU), located in Southern California. Azusa Pacific University has 3,924 full time undergraduate students (61% female and 39% male). Ethnic demographics include 4.7% Black, non-Hispanic, 7.2% Asian or Pacific Islander, 14.4% Hispanic, and 63.1% White, non-Hispanic. Approximately 67% of full time undergraduates receive need-based financial aid from the federal government and/or institution.

The service-learning component took place at high schools located in Azusa, California—an urban suburb of Los Angeles. The total population of the city of Azusa, CA is 44,172 (49.9% male and 50.6% female) with a median age of 27.1. The race demographics are Hispanic/Latino 63.8%, Not Hispanic/Latino 36.2% with housing occupancy of 50.5% owner-occupied versus 49.5% renter-occupied.

The local school district, Azusa Unified, has a reflective population demographic: 62.1% Hispanic/Latino and 37.9% Not Hispanic/Latino. Of the 11,353 students in Azusa Unified, 34.9% are English-Language Learners, 61.2% qualify for the Free/Reduced Price Meal program, and 46.8% qualify for the Compensatory Education program.

The student participant group executed their service-learning requirement at the Ninth Grade Academy—a part of Sierra High School—in Azusa, California. The Ninth Grade Success Academy is "a school-within-a-school uniquely designed to provide ninth graders with the …support they need". This aids in "easing the transition" into high school for at-risk youth and serves as a "bridge... enabling students to cross the threshold into high school and continue on, better prepared academically and socially for the rigors of high school and post-secondary education" ("Ninth Grade Academy", 2008).

Research has established that youth in urban high schools have a 33 percent chance of dropping out of high school by their senior year ("Ninth Grade Academy", 2008). The majority drops out by the end of their freshman year due to intellectual and emotional difficulty transitioning from middle school into high school. In order to remedy this epidemic, Azusa Unified School District has chosen to implement this new program.

Students who attend the Ninth Grade Academy either volunteer to attend or are referred by the Azusa Unified Placement Committee. Approximately 120 students attend, with a teacher to student ratio of 20 to 1. "Teachers have been specifically selected for their expertise and knowledge" and "[have] received extensive training and on-going support" ("Sierra High School", 2008).

Based upon the 2005-2006 Sierra High School Academic Performance Index (API) data, demographic breakdown includes 86% Hispanic, 13% White, Non-Hispanic, and 1% Filipino. English language learners comprise 40% of the student population and 61% participate in the Free or Reduced-Price Lunch Program. The average parental education level is 1.81, with 1 representing not a high school graduate and 5 representing completion of graduate school.

Parental and social support is essential to the successful completion of the Ninth Grade Academy program and is highly emphasized. Extra counseling services are offered by an on-site counseling office, psychological services through the Family Center, and social services in collaboration with social work majors from Azusa Pacific University ("Ninth Grade Academy", 2008). Close relationships are encouraged between the students and their homeroom teachers. Parents are also encouraged to volunteer and provide support for the program.

Upon completion of the Ninth Grade Academy, students will have completed 60 credits and enter into mainstream 10^{th} grade courses ("Ninth Grade Academy", 2008). The students' curriculum is composed of an elective reading course, Algebra support, English I, Algebra I, and PE. A teen living course is also offered to improve leadership skills and decision-making. The Junior Achievement Economics curriculum was presented by the research participants during the teen living class period.

METHODOLOGY

The method utilized for answering our research question was a survey questionnaire administered to each of the students participating in the class. It was given in paper format with a thorough explanation of the formatting. The survey was administered on November 20, 2007, and 100% of the students in the class agreed to participate in the study.

The survey was comprised of 13 questions with four addressing confidence in personal skills and ability, seven relating to the group experience, and one based on the impact of the service learning project itself. Sample questions from each of the areas include are found below, and the entire questionnaire is available in the appendix.

Figure 1. Sample Research Questions

Area of Focus	Sample Question
Confidence in skills and personal ability	This class is giving me the opportunity to develop my project management skills…
Group experience	This class has helped me in dealing with group conflict…
Service Learning	I believe the service learning component of this class contributed to my development in understanding the factors of cohesiveness within a team…

Each of the answers utilized a scale for measurement based in experience and opinion. Possible answers included one of the following sets: no experience, very little experience, some experience, and extensive experience; or strongly disagree, disagree, agree, and strongly agree. The questions were designed to identify their experiences at this point in the course (11 weeks) and the service-learning project (6 weeks).

RESULTS

After collecting and compiling the results of the survey, we found several relationships among the questions. Due to low reliability for specific questions, four were thrown out entirely. The remaining nine questions had a reliability of .73.

Raw data was also gathered on the gender and ethnicity of each of the participants. We found no significant difference between the male and female gender and no significant difference among the ethnicities of Caucasian, African American, Hispanic, Asian, and other.

Pearson Correlation tests were run with the data, and used to identify the correlations between the group experience, the individual confidence in skills, and the positive service learning experience. The strongest correlation was found between the group experience and the positive service learning component, and it was a positive, significant correlation ($r = .684$, $p < .01$). The correlation between confidence in skills and positive service learning was also positive and significant ($r = .488$, $p < .01$). The correlation between confidence in skills and group experience was once again positive and significant ($r = .480$, $p < .01$).

Multiple linear regression was used to predict group experience and confidence in skills and confidence against service learning. The results to this test were significant in predicting a positive service learning experience from a positive

overall group experience $f(1, 54) = 44.17$, $p<.01$. Using confidence in skill set to predict positive service learning was positive, but not significant $f(1,54) = .215$, $p = .061$. Therefore, skill set is not a reliable predictor of the service learning experience.

DISCUSSION

When paired with the results of previous research, the findings of this research can be very useful in developing service learning programs at the undergraduate level. Previous research confirms the positive impact of service learning in the teaching environment (Andrews, 2007; Govekar & Rishi, 2007). Based on the importance of the service learning style of teaching, it is important to understand how to better use this vehicle for discovery.

David Jaques (2000) suggests that group experiences give students the opportunity to increase involvement, deepen understanding, and improve thinking (pg 52). This theory was confirmed through this study by the positive, significant relationship between group experience and a positive service learning experience. The practical application of the relationship is found in the emphasis placed on group experience by the teacher. Interestingly, confidence in skills is an aspect of classroom teaching upon which most teachers focus, but it may not necessarily be an essential element for a strong service-learning component. Though the skills can be taught in a class, it is the group experience that gives the student an opportunity to apply the information and take away something from the class.

Having realized the significant, positive relationship between group experience and service learning, it is important for professors administering service-learning activities to include opportunities for group growth. Methods for improving group experience range depending on the type of class and the service-learning project, but it is essential that group members take ownership in their relationship with their peers and the project itself in order to reach the full learning potential. Additional research is necessary in order to determine what types of group guidance can be most beneficial. Some of the methods used in this project included instituting a group contract, providing personal and group inventories, and giving weekly group feedback.

CONCLUSION

As recent research in the area has proven, the potential impact for service learning in the business curriculum is quite large (Papamarcos, 2002). As teachers find new and innovative ways for students to learn and apply the curriculum, new opportunities will constantly arise. Educators should pursue these opportunities with fervor, but they must not neglect the fundamental aspects of creating a successful service-learning project. As Madsen and

Turnbull (2006) note, "service learning can be messy and unpredictable" and is not for all instructors or students (p. 727).

Based on the study performed with the Organizational and Administrative Behaviors class, creating a strong group experience is a key factor in helping students realize a positive service learning project. In fact, the greater the group experience, the greater the likeliness for a positive service-learning project. Although it does not predict the outcome of the service-learning project, it is also important to foster each student's confidence in his or her own skills. These areas may overlap at times, but they can also be addressed individually. Additional research is necessary in determining the most effective ways to improve group experience and the confidence students have in their own skills.

REFERENCES

Andrews, C.P. (2007). Service-learning: Applications and research in business. Journal of Education for Business, *83(1),* 19-27.

Azusa Pacific University. (2008). Financial aid. In Office of Institutional Research Common Data Set*: 2007-2008*. Retrieved July 29, 2008 from http://www.apu.edu/ir/commondata/2008/h/

Azusa Pacific University. (2008). Enrollment and persistence. In Office of Institutional Research Common Data Set*: 2007-2008*. Retrieved July 29, 2008 from http://www.apu.edu/ir/commondata/2008/b/

Azusa Unified School District. (2006). Azusa unified school district strategic achievement plan. In Education Services: Ninth Grade Academy. Retrieved July 17, 2008, from http://www.azusausd.k12.ca.us/sppdf/9th/sitedata.pdf

Azusa Unified School District. (2008). Sierra High School. Retrieved July 17, 2008 from http://azusausd.k12.ca.us/schools/sierrahigh.html

Barth, M., Godemann, J., Rieckmann, M., & Stoltenberg, U. (2007). Developing key competencies for sustainable development in higher education. International Journal of Sustainability in Higher Education, *8(4),* 416-430.

California Department of Education. (2007). California high school exit exam (CAHSEE) results for mathematics and english language arts (ELA) by gender and ethnic designation for sierra high. In CAHSEE Results. Retrieved July 17, 2008, from http://cahsee.cde.ca.gov/

California Department of Education. (2006). School report: Demographics characteristics. In *2005* Academic Performance Index (API) Base Report. Retrieved July 17, 2008, from http://api.cde.ca.gov/apibase3006/2005BaseSchD.aspx?allcds=19-64279-1931765

California Department of Education. (2007). School report: API growth. In *2006* Academic Performance Index (API) Growth Report. Retrieved July 17, 2008 from http://api.cde.ca.gov/apibase2006/2006GrowthSch.aspx?allcds=1964279 1931765

Christensen, E. (2006). Learning to serve: College students combine experience with Service. Knight Ridder Tribune Business News. Retrieved July 17, 2008 from Proquest database.

Dumas, C. (2002). Community-based service-learning: Does it have a role in management education? International Journal of Value-Based Management,*15(3),* 249.

Education Data Partnership of California. (2007). District profile: Fiscal year 2006-2007. In Azusa Unified District Reports. Retrieved July 17, 2008, from http://www.ed-data.k12.ca.us/welcome.asp

Govekar, M.A. & Rishi, M. (2007). Service-learning: Bringing real-world education into the b-school classroom. Journal of Education for Business, *83(1),* 3-10.

Hunt, R. (2007). Service-learning: An eye-opening experience that provokes emotion and challenges stereotypes. Journal of Nursing Education, *46(6),* 277-282.

Jaques, D. (2000). Learning in Groups (3rd ed.). London: Kogan Page.

Junior Achievement. (2008). Economics. In High School Programs: Overview. Retrieved July 17, 2008 from www.ja.org/programs/programs_high_econ.shtm

Junior Achievement. (2008). Junior Achievement. Retrieved July 17, 2008 from http://www.ja.org/default.

Madsen, S.R. & Turnbull, O. (2006). Academic service learning experiences of Compensation and benefit course students. Journal of Management Education,*30(5),* 724-742.

McClam, T., Diambra, J.F., Burton, B., Fuss, A., & Fudge, D.L. (2008). An analysis of a service-learning project: Students' expectations, concerns, and reflections. Journal of Experiential Education, *30(3),* 236-249.

Papamarcos, S.D. (2002). The "next wave" in service-learning: Integrative, team-based engagements with structural objectives. Review of Business, *23(2),* 31-39.

U.S. Census Bureau. (2000). Profile of general demographic characteristics: Azusa city, california. Washington, D.C.:U.S. Census Bureau. Retrieved July 17, 2008 from http://censtats.census.gov/data/CA/1600603386.pdf

Van Wynsberghe R. & Andruske, C.L. (2007). Research in service of co-learning: Sustainability and community engagement. Canadian Journal of Education, *30(1),* 349-376.

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PRINT vs. TELEVISION: A CROSS-MEDIA-AND-MESSAGE EXPLORATION OF ADVERTISING EFFECTIVENESS USING A HIGH INVOLVEMENT PRODUCT

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ABSTRACT: A between-subjects experimental design was used to examine two media and two message formats on individuals' attitudes toward an ad, attitudes toward a brand, cognition, and purchase intentions. The initial hypotheses were not supported; however, a closer analysis revealed that the comparative television ad evoked a higher response than the comparative print ad for attitude toward the brand. Further, the noncomparative television ad evoked a higher response than both the comparative television and comparative print ads for purchase intentions.

INTRODUCTION

By 2004, U.S. advertising spending increased to a record level of $141.1 billion. Print and television advertising accounted for over 75 percent of total ad spending (Bachman, 2005). Companies like Procter & Gamble, General Motors, and Johnson & Johnson ranked among the top advertisers supporting this unprecedented level of spending, heavily promoting their products and services through print and television advertising. The significant growth and level of advertising spending continues to challenge companies and researchers to better understand the influence of media choice and message format on advertising effectiveness. Given this ongoing massive investment in advertising across industries and given marketing literature's equivocal findings, a key issue in advertising research is resolving the inconsistency between industry and academic research findings regarding media choice, message format, and overall advertising effectiveness (Barry, 1993).

The challenge in understanding the relative effectiveness of advertising's comparative and noncomparative formats is that marketing's academic research has failed to align with the past or present realities of the marketplace. For instance, in the past 30 years, comparative print and broadcast ads have increased

as percentage of overall advertising. Advertisers have been more enthusiastic about this message format than those in the academic community, as evidenced in sometimes controversial assessments from many researchers in favor of the noncomparative format (Barone and Miniard, 1999; Barry, 1993; Pechmann and Ratneshwar, 1991). In addition, the academic research has tended to focus its research on print ads and convenience goods (Barry, 1993). In fact, we were unable to identify a single study that examined advertising effectiveness of print and broadcast media for high involvement products. Further, the literature suggests the futility of such a cross-media examination for high involvement products. Though never empirically substantiated, television has traditionally been viewed as an inappropriate medium for advertising high involvement products (Belch, 1981; Dahlen, Rasch and Rosengren, 2003; Etgar and Goodwin, 1979). This assumption clearly conflicts with the common occurrence of its use to promote automobiles and other high involvement products in the marketplace.

The purpose of this study is to explore advertising effectiveness for a high involvement product across two media (television and print) and two advertising message formats (comparative and noncomparative). A between-subjects experimental design will be used to examine the impact of these media and message formats on individuals' attitudes toward an ad, attitudes toward a brand, cognition, and purchase intentions. The topic is worthy of exploration given the lack of consensus between industry and academicians on the most appropriate media choice and message format for high involvement products like automobiles, pharmaceuticals, and skilled services. This study will be limited to television and print media, since these media continue to account for the bulk of advertising spending in practice.

ADVERTISEMENT EFFECTIVENESS

Advertisement effectiveness is typically understood through measuring the type(s) of responses elicited. Different communications media can be utilized to elicit different consumer information processing and responses (Hill and King, 2001). Hill and King (2001) emphasize that comparative and noncomparative advertisements are primary examples of message formats that provide advertisers with different inherent message properties, as well as the ability to potentially evoke different types of information processing. Comparative advertising involves the direct or indirect naming of a competitor in order to compare selected attributes within an advertising medium, while noncomparative advertising focuses on a sponsoring company's product attributes but does not reference or make comparisons to a competitor (Shao, Bao, and Gray, 2004). The effects of these advertising message formats have received significant attention in the marketing literature.

A key issue regarding media choice is that most effectiveness studies have focused on the print medium, though this may in part be a function of

research convenience, since print advertisements have traditionally been easier to access and manipulate. For example, Golden (1979), and Gorn and Weinberg (1984) focused their comparative advertising research on print advertising for low-involvement, convenience items even though a significant number of comparative ads are television ads for high involvement products (Barry, 1993). Johnson's (1983) comparative advertising study found that comparative television ads provide greater recall and perceived informativeness than the noncomparative format. However, significant differences between noncomparative ads (in terms of attitude toward the ad or the product and perceived believability of ad claims) were not found.

Much research has provided evidence for the conditions under which comparative advertising can be more effective than noncomparative advertising (Barry, 1993; Belch, 1981; Byer and Cooke, 1985; Demirdjian, 1983; Droge, 1989; Etgar and Goodwin, 1977 and 1982; Gorn and Weinberg, 1984; Grewal, Kavanoor, Fern, Costley and Barnes, 1997; Pechmann and Esteban, 1994). Grewal et al. (1997) contends that comparative advertising is most effective when a sponsored brand is new to the product category and when the comparison brand is the market leader. Gorn and Weinberg (1984) indicate that comparative advertising by a challenger leads to increased brand similarity between the challenger and the leader, regardless of presence or absence of an ad for the leader. Alternatively, Barry (1993) contends that comparative ads may not be more effective than noncomparative ads, noting that they may be risky for advertisers, resulting in product/brand confusion, no increase in awareness, reduced credibility, deception, and free exposure for competitors.

There has been continued debate over the most effective advertising medium for certain products, which is further complicated by message format. Low-involvement products typically include convenience goods frequently purchased with little risk involved and requiring little information (Sullivan, 1990). High involvement products typically include durable goods requiring extensive thought and information search, given their higher price and increased purchase and/or social risks (Rothschild, 1979). The matter of television viewing as a low-involvement activity and not appropriate for high involvement product messages has been generally accepted in the marketing literature since Krugman (1965). However, research in social psychology holds the alternative view of television as a medium as being more involving than print (Worchel, Andreoli, and Eason, 1975). Nevertheless, marketing scholars have tended to follow Krugman's view. McDougall (1976) proposes that comparative print ads may have substantial advantages over comparative audio-visual ads, since comparative advertising messages include relatively more information than traditional supportive messages. Because of their greater complexity, comparative messages may be communicated more effectively via print, since the consumer can spend time with the message on their own terms. In the case of television ads, message-consumer interaction time is restricted.

Ray (1976) and Webb (1979) question television commercials' ability to affect attitudes and purchase intentions by arguing that television viewing does not provide the opportunity for one to go through the processing procedure that would result in a positive impact for such a complex message. Belch (1981) echoes the concerns about television advertising's limited exposure and lack of viewer control by calling for more research on the effects of television as a message medium.

Klein (1981) proposes that television and print be approached as very different advertising media, specifically in terms of the appropriate content for each. He reasons that if television viewing is the low-involvement activity Krugman (1965) and Robertson (1976) suggest, then the level of information complexity presented over it should be relatively low. Television advertising should be most appropriately utilized for creating or sustaining product awareness or interest, and print advertising would be most appropriately utilized for presenting highly complex messages (Klein, 1981). Hence, our first hypothesis is as follows:

H1: *Comparative print advertisements for a high involvement product will generate more positive results than comparative television advertisements for a high involvement product for: (a) attitudes toward the advertisement; (b) attitudes toward the brand; (c) cognition; and (d) purchase intentions.*

Celsi and Olson (1988) suggest that advertisements for high involvement products should be directed toward an audience prepared to devote time and effort to seek and process information about the product. Ads for low-involvement products should be reserved for an audience not particularly interested in learning more about a product and not willing to spend much time and effort seeking and processing information about it. This means that advertisements for high involvement products should be processed longer and more actively than advertisements for low-involvement products. Even though message complexity may be reduced with a noncomparative advertisement, Celsi and Olson's (1988) view implies a high involvement product adds complexity to the task of processing the message and forming attitudes and behavioral intentions. The active processing of high involvement product information is expected not to surface during television advertising, since the exposure is brief and consumers cannot control it (Dahlen et al., 2003). Hence, our second hypothesis:

H2: *Noncomparative print advertisements for a high involvement product will generate more positive results than noncomparative television advertisements for a high involvement product for: (a) attitudes toward the advertisement; (b) attitudes toward the brand; (c) cognition; and (d) purchase intentions.*

METHODOLOGY

A 2 x 2, between-subjects experimental design was used to explore advertising effectiveness for a high involvement product across two media (television and print) and two message formats (comparative and noncomparative). The impact of these media and message formats was measured on individuals' attitudes toward the ad, attitudes toward the brand, cognition, and purchase intentions.

One hundred twenty-four students from a mid-south University in the U.S. were recruited to participate in the study. Sixty-two percent of the subjects were male and the age range was 18-45 years. Participants were informed that their voluntary participation would include a brief exposure to an advertisement, followed by the completion of a short survey. They were informed that they would not be compensated, and that their information would be kept confidential. All 124 remained to complete the survey.

Consumer decision-making and advertising strategy often depend on a consumer's level of product involvement. Product involvement affects the time spent looking for and processing product information (Laurent and Kapferer, 1985). The cognitive effort devoted to processing information and advertisements is another consequence of product involvement (Celsi and Olson, 1988). Petty and Cacciopo (1986) assert that product involvement affects our decision processes and the type of information we seek (Dahlen et al., 2003). This study utilized an ad for a high involvement product. An automobile was chosen because its obviously durable nature, high price, and potential to reflect on one's social image (Berkowitz, Crane, Kerin, Hartley, and Rudelius, 2003).

Using simple random sampling, 124 subjects were selected from a pool of 188 students using sampling without replacement. These subjects were then randomly assigned to one of four groups using sampling without replacement. Each group was then randomly assigned to one of four treatment conditions: (1) comparative ad/television; (2) comparative ad/print; (3) noncomparative ad/television; and (4) noncomparative ad/print. Each group was then taken to a separate room based on the pre-determined treatment condition corresponding to the number drawn. All treatment groups received the same scripted introduction and instructions and were given the opportunity to withdraw from the experiment at any time. Each group was then shown an advertisement for the same high involvement product but the type of message (comparative or noncomparative) and type of medium (print or television) varied.

Actual noncomparative print and television advertisements were obtained from a national automobile manufacturer. The ads were selected based on their visual similarity to one another. To further maximize similarity across all treatments, the ads were professionally edited to ensure equality of message

content. These edited pieces served as the noncomparative television and print treatments. Using the edited noncomparative ads as a template, comparative print and television advertisements were created by adding a direct, comparative statement naming two of the manufacturer's competitors with respect to the key competitive element (customizability) of the primary brand. The television ads were 35 seconds in length, and the print ads were in full color produced on high quality, 8.5″ x 11″ paper.

To control for exposure and repetition effects across the four conditions, each group was exposed to their respective treatment for 35 seconds. Those in the television treatments viewed a 35-second video. Those in the print treatment conditions groups were each issued a face-down print copy of the ad and then instructed as a group to view the ad. After 35 seconds, they were instructed to turn the ad face down, and all ads were collected. Immediately following the exposure, all groups completed a questionnaire to measure the study's dependent variables and respondents' key demographic characteristics. Following the experiment, the respondents were fully debriefed.

In comparing ad message formats, advertising effectiveness has been primarily operationalized using the hierarchy of effects model (Lavidge and Steiner, 1961). This model provides a common framework for much of comparative advertising effectiveness research with an emphasis on attitude toward the advertisement, and attitude toward the brand, cognition, and purchase intentions. The literature provides extensive support for these constructs and provides assessment for comparative and noncomparative advertising across different media (Biehal, Stephens, and Curio, 1992; Gardner, 1985; Gresham and Shimp, 1985; MacKenzie and Lutz, 1989; Mitchell and Olson, 1981; Shimp, 1981).

Existing scales were adopted to measure individuals' attitudes toward the ad, attitudes toward the brand, cognition, and purchase intentions. Attitude toward the ad ($\alpha = 0.86$) was measured with a four-item, seven-point Likert scale (Holbrook and Batra, 1987). Attitude toward the brand ($\alpha = 0.92$) was measured with a four-item, seven-point Likert scale adopted from Mitchell and Olson (1981), and Holbrook and Batra (1987). Cognition ($\alpha = 0.78$) was measured using a three-item, seven-point scale (Baker and Churchill, 1977; Perrien, Dussart, and Francoise, 1985). Finally, purchase intentions ($\alpha = 0.96$) were measured on a five-item, seven-point scale adopted from Spears and Singh (2004).

To ensure results were not confounded by brand familiarity or automobile interest, questions were included in the survey for manipulation check purposes. Since the experiment used actual brands in the ads, subjects rated their familiarity with the primary brand on a single-item scale of one to

seven. Likewise, subjects rated their general interest automobiles, since involvement in this product category could confound the results.

RESULTS

Independent sample *t*-tests were used to test the hypotheses since we were interested in examining differences between two equal treatment groups at a time: comparative print versus comparative television; and noncomparative print versus noncomparative television. Hypothesis 1 stated that comparative print ads would generate more positive results than comparative television ads for each of the dependent variables measured. H_{1a} through H_{1d} was not supported. While the mean for the comparative print ad treatment was more positive only for attitude toward the ad, the difference was not statistically significant. Contrary to what was expected, the comparative television ad generated a statistically significant [t (60) = 2.19, p = 0.03], more positive result than the comparative print ad for attitude toward the brand.

Hypothesis 2 stated that the noncomparative print ad would generate more positive results than the noncomparative television ad for each of the dependent variables. However, no parts of H2 were statistically significantly supported. While the means were in the expected direction, the differences were not statistically significant. Unexpectedly, the noncomparative television ad treatment generated a higher mean for purchase intentions (m = 2.86) than the noncomparative print treatment (m = 2.47). However, this difference was not statistically significant.

To explore the possibility of confounded results, manipulation checks for level of brand familiarity and automobile interest were performed using analyses of variance (ANOVA), as well as an internal analysis. First, ANOVAs were performed for brand familiarity F (3,120) = 0.41 and general interest in automobiles F (3,120) = 2.38. Neither was statistically significant. In addition, an internal analysis was performed using a technique advocated by Aronson, Ellsworth, Carlsmith, and Gonzales, (1990). The response variables brand familiarity and level of automobile interest were each measured on a seven-point scale but were re-coded to indicate high or low levels for each variable. The dataset was divided into two groups for each of the variables, where responses 5-7 indicated high familiarity or interest and responses 1-3 indicated low familiarity or interest. Independent sample *t*-tests were performed for each of the response variables. Neither case revealed significant differences between the groups (see Table 1).

TABLE 1 - MANIPULATION CHECKS

Dependent Variables		***t-value***	***df***	***Sig.***
Attitude Toward Ad	Brand Familiarity	-0.09	97	0.93
	Auto Interest	0.09	108	0.93
Attitude Toward Brand	Brand Familiarity	1.06	97	0.29
	Auto Interest	-0.39	108	0.70
Cognition	Brand Familiarity	-0.42	97	0.68
	Auto Interest	0.11	108	0.92
Purchase Intentions	Brand Familiarity	-1.12	97	0.27
	Auto Interest	1.17	108	0.24

A closer examination of the data revealed the unexpected finding of the noncomparative television ad yielding significantly higher [t (60) = 2.18, p = 0.03] results than the comparative television ad for purchase intentions. An even more surprising finding was that the noncomparative television ad treatment result was significantly higher [t (60) = 2.53, p = 0.01] than that of the comparative print ad treatment for purchase intentions. A final finding of note was a statistically significant difference in purchase intentions between 18-24 and 25-34 year olds [t (118) = 2.16, p = 0.03]. A consideration when interpreting this final result, however, is that the majority (89.5%) of the subjects fell into the 18-24 age range.

DISCUSSION

Past advertising effectiveness studies have tended to examine one medium at a time. Our cross-media study tested for the effects of comparative and noncomparative advertising messages for a high involvement product across print and television media. We expected print to be significantly better than television across all of the four dependent variables, but this was not the case. While the hypotheses were not supported, we did uncover some interesting results. With respect to H_1, the comparative television ad treatment produced higher results for attitude toward the brand. Although attitude toward the brand is only one component of how researchers tend to assess advertising effects, this finding is significant, given the marketing literature's position on television advertising's limited effectiveness (Klein, 1981; Krugman, 1965; Robertson, 1976).

Since our hypotheses were not supported, the data was further explored by examining all treatment conditions against one another. Most unexpectedly, the noncomparative television ad treatment yielded statistically significantly better (higher) results than both the comparative television and comparative print ad treatments for purchase intentions. Our findings contradict past researchers' contentions that television commercials cannot affect higher order responses like attitudes and purchase intentions (Ray, 1976; Webb, 1979). Since our experiment utilized a high involvement product (automobile), these findings also contradict

the notion that the active processing of high involvement product information will not surface in television advertising (Dahlen et al., 2003). These unexpected findings suggest there is room for debate about the effectiveness of television advertising and its ability to effect brand attitudes and purchase intentions.

LIMITATIONS AND FUTURE RESEARCH

In terms of generalizing the study findings, since random sampling was implemented, the results may be generalized only to other undergraduate University students in the mid-south U.S. Further, in using only one product, it is difficult to say whether the results are generalizable to high involvement products other than automobiles. However, the results indicate that the product featured in the ads was relevant to our participants since 18-24 year olds had significantly higher intentions to purchase the product than the 25-34 year olds.

Other limitations include the ads themselves. For example, while the message content and images were held constant across the media treatments, the television version by nature is fluid and dynamic with moving images and sound. Alternatively, print ads are static and not accompanied by sound. Future research should include controlling for sound to assess whether our results hold in that context. We also recommend extending the study to include online and radio media. Extended cross-media advertising studies should be undertaken to further validate our study findings.

In our study, message content was controlled by professionally editing the advertising message to have equal content communicated in the same way (text) across the two media. In essence, we created integrated marketing communications (IMC) ads for the purpose of our study. Our unexpected findings indicate that television can evoke a higher response for attitude toward the brand and purchase intentions. Since our hypotheses were not supported and additional findings were contrary to what the literature would expect, perhaps in our study there was not enough message content for the print piece to evoke the responses as expected. Future research should utilize actual IMC pieces in their original formats to see if similar results can be obtained. As well, we encourage exploration of the quantity of content in advertising messages to determine whether there is some threshold required to impact attitudes and behavioral intentions.

Our study empirically tested what has long been assumed in marketing's literature – that television advertising is not as effective as print advertising in many important respects. Though we were unable to support the favored hypothesis, we believe our study makes a contribution to marketing's literature by systematically testing the assumption (King, Keohane, and Verba, 1994). Following past researchers who have uncovered somewhat controversial findings, we recognize the need for a replication study. Further research may

eventually bridge the gap between practitioners and academicians on the appropriateness of television advertising for high involvement products and relatively complex messages.

REFERENCES

Aronson, Elliot, Phoebe Ellsworth, J. Merrill Carlsmith, and Marti Hope Gonzales (1990). Methods of Research in Social Psychology. Boston, MA: McGraw-Hill.

Bachman, Katy (2005, March 8). Media Ad Spending Grew 9.8% in 2004. Adweek.com, [On-line]. Available:www.adweek.com/aw/search/article_display.jsp?schema=&vnu_content_id=1000829127.

Baker, Michael J., and Churchill, Gilbert A. (1977). The Impact of Physically Attractive Models on Advertising Evaluations. Journal of Marketing Research, 14(4), 538-556.

Barone, Michael J., and Miniard, Paul W. (1999). How and When Factual Ad Claims Can Mislead Consumers: Examining the Deceptive Consequences of Copy X Copy Interactions for Partial Comparative Ads. Journal of Marketing Research, 36 (February), 58-74.

Barry, Thomas E. (1993). Comparative Advertising: What Have We Learned in Two Decades. Journal of Advertising Research, 33, 19-25.

Belch, George E. (1981). An Examination of Comparative and Noncomparative Television Commercials: The Effects of Claim Variation and Repetition on Cognitive Response and Message Acceptance. Journal of Marketing Research, 18 (August), 333-49.

Berkowitz, Eric, Frederick Crane, Roger Kerin, Steven Hartley, and William Rudelius (2003). Marketing 5ed. Toronto, ON: McGraw Hill Ryerson Limited.

Biehal, Gabriel, Stephens, Debra, and Curio, Eleonora (1992). Attitude Toward the Ad and Brand Choice. Journal of Advertising, 21(3), 19-35.

Byer, William J., and Cooke, Ernest E. (1985). Comparative Advertising's Dilemma: How to Attack the Competition Without Alienating His Customer. Journal of Consumer Marketing, 2(3), 67-71.

Celsi, R. L., and Olson, J. C. (1988). The Role of Involvement in Attention and Comprehension Processes. Journal of Consumer Research, 15, (2), 210-24.

Dahlen, Micael, Rasch, Alexandra, and Rosengren, Sara (2003). Love at First Site? A Study of Website Advertising Effectiveness. Journal of Advertising Research, 43(1), 25- 34.

Demirdjian, Zohrab S. (1983). Sales Effectiveness of Comparative Advertising: An Experimental Investigation. Journal of Consumer Research, 10 (December), 362-64.

Droge, Cornelia (1989). Shaping the Route to Attitude Change: Central Versus Peripheral Processing Through Comparative Versus Noncomparative Advertising. Journal of Marketing Research, 26 (May), 193-204.

Etgar, Michael, and Goodwin, Stephen M. (1977). Comparison Advertising: Issues and Problems. In Advances in Consumer Research, Vol. 5, H. Keith Hunt, ed. Provo, UT: Association for Consumer Research, 63-71.

---- and ---- (1979). Planning for Comparative Advertising Requires Special Attention. Journal of Advertising, 8(1), 26-32.

---- and ---- (1982). One-Sided Versus Two-Sided Comparative Message Appeals for New Brand Introduction. Journal of Consumer Research, 8 (March), 460-45.

Gardner, Meryl Paula (1985). Does Attitude Toward the Ad Affect Brand Attitude Under a Brand Evaluation? Journal of Marketing Research, 22 (May), 192-198.

Golden, Linda L. (1979). Consumer Reactions to Explicit Brand Comparisons in Advertisements. Journal of Marketing Research, 16 (November), 517-32.

Gorn, Gerald J., and Weinberg, Charles B. (1984). The Impact of Comparative Advertising on Perception and Attitude: Some Positive Findings. Journal of Consumer Research, 11 (September), 719-27.

Gresham, Larry G., and Shimp, Terence A. (1985). Attitude Toward the Ad and Brand Attitudes: A Classical Conditioning Perspective. Journal of Advertising, l4 (l), 10-17.

Grewal, D., Kavanoor, S., Fern, E.F., Costley, C., and Barnes, J. (1997). Comparative Versus Noncomparative Advertising: A Meta-Analysis. Journal of Marketing, 61(3), 1-15.

Hill, Mark E., and King, Maryon (2001). Comparative vs. Noncomparative

Advertising: Perspectives on Memory. Journal of Current Issues and Research in Advertising, 23(2), 33-52.

Holbrook, Morris B., and Batra, Rajeev (1987). Assessing the Role of Emotions as Mediators of Consumer Responses to Advertising. Journal of Consumer Research, 14 (3), 404- 421.

Johnson, Ronald D. (1983). Psychological Type and Comparative Advertising. Proceedings of the 1983 Convention of the American Academy of Advertising, Donald W. Jugenheimer (ed.), 165-169.

Kahle, Lynn R., and Homer, Pamela M. (1985). Physical Attractiveness of the Celebrity Endorser: A Social Adaptation Perspective. Journal of Consumer Research, 11 (4), 954-61.

King, G., Keohane, R.O., and Verba, S. (1994). Designing Social Inquiry: Scientific Inference in Qualitative Research. Princeton, NJ: Princeton University Press.

Klein, Gary (1981). Relative Advertising Channel Effectiveness: A Test of Learning vs. Involvement Orientations. Current Issues & Research in Advertising, 4(1), 71-84.

Krugman, Herbert (1965). The Impact of Television Advertising: Learning without Involvement. Public Opinion Quarterly, 29 (Fall), 349-356.

Laurent, G., and Kapferer, J. (1985). Measuring Consumer Involvement Profiles. Journal of Marketing Research, 22 (1), 41-53.

Lavidge, Robert J., and Steiner, Gary A. (1961). A Model for Predictive Measurements of Advertising Effectiveness. Journal of Marketing, 25 (October), 59-62.

Levine, Philip (1976). Commercials That Name Competing Brands. Journal of Advertising Research, 16 (December), 7-14.

MacKenzie, Scott B., and Lutz, Richard J. (1989). An Empirical Examination of the Structural Antecedents of Attitude Toward the Ad in an Advertising Pretest Context. Journal of Marketing. 53 (April), 48-65.

McDougall, G.H.G. (1976). Comparative Advertising: An Empirical Investigation of its Role in Consumer Information. Working Paper #167, School of Business Administration, The University of Western Ontario, London, Canada.

Mitchell, Andrew A., and Olson, Jerry C. (1981). Are Product Attribute Beliefs the Only Mediator of Advertising Effects on Brand Attitudes? Journal of Marketing Research, 18, 318-331.

Pechmann, Cornelia, and Ratneshwar, S. (1991). The Use of Comparative Advertising for Brand Positioning: Association Versus Differentiation. Journal of Consumer Research, 18 (September), 145-60.

---- and Esteban, Gabriel (1994). Persuasion Processes Associated With Direct Comparative and Noncomparative Advertising and Implications for Advertising Effectiveness. Journal of Consumer Psychology, 2 (4), 403-32.

Perrien, Jean, Dussart, Christian , and Francoise, Paul (1985). Advertisers and the Factual Content of Advertising. Journal of Advertising, 14 (1), 30-37.

Petty, Richard E., and Cacioppo, John T. (1986). The Elaboration Likelihood Model of Persuasion. In Advances in Experimental Social Psychology, Vol. XIX, Leonard Berkowitz, ed., Orlando, FL: Academic Press, 123-205.

Ray, M.L. (1976). Consumer Initial Processing: Definitions, Issues and Applications. In Consumer Information Processing, G. David Hughes and M.L. Ray, eds. Chapel Hill: University of North Carolina Press, 145-156.

Robertson, Thomas (1976). Low Commitment Consumer Behavior. Journal of Advertising Research, 16 (April), 19-24.

Rothschild, Michael L. (1979). Advertising Strategies for High and Low Involvement Situations. In Attitude Research Plays for Higher Stakes, J. Maloney and B. Silverman, eds. Chicago, IL: American Marketing Association.

Shao, Alan T., Bao, Yeqing, and Gray, Elizabeth (2004). Comparative Advertising Effectiveness: A Cross-Cultural Study. Journal of Current Issues and Research in Advertising, 26 (2), 67-80.

Spears, Nancy, and Singh, Surendra N. (2004). Measuring Attitude Toward the Brand and Purchase Intentions. Journal of Current Issues and Research in Advertising, 26 (2), 54-66.

Shimp, Terence A. (1981). Attitude Toward the Ad as a Mediator of Consumer Brand Choice. Journal of Advertising, 10 (2), 9-15.

Sullivan, Gary L. (1990). Music Formats Effects in Radio Advertising. Psychology & Marketing, 7 (2), 97-108.

Webb, Peter (1979). Consumer Initial Processing in a Difficult Media Environment. Journal of Consumer Research, 6 (December), 225-236.

Worchel, S., Andreoli, V., and Eason, J. (1975). Is the Medium the Message? A Study of the effects of Media, Communicator and Message Characteristics on Attitude Change. Journal of Applied Social Psychology, 5, 157-172.

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A NEW EXCESS PROFITS TAX?

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ABSTRACT: The U.S. Congress is aggressively looking for additional tax revenues because of record government spending. Since 2005, there have been more than 15 bills proposed in Congress that include a windfall or excess profits tax. The idea of an excess profits tax is not new; the first Federal tax appeared early in the 20th century. The excess profits tax has disappeared and comeback at various times since and always as a means to finance wartime expenditures. In 1980, a windfall profit tax was adopted into law and later repealed in 1988. This paper reviews the history of excess profit taxes and windfall profit taxes and outlines current proposals for similar new taxes.

INTRODUCTION

Current proposals calling for a windfall or excess profits tax on large oil companies can be traced to excess profits tax which first appeared in the U.S. as a federal tax in the early 1900s. The tax has historically been used to raise money to support wartime expenditures and was focused on companies that would unduly profit from the war. In the 1980s, a "windfall" profit tax was imposed on a specific industry to prevent that industry from unfairly benefiting from a direct act of Congress to deregulate oil prices.

THE FIRST EXCESS PROFITS TAX - REVENUE ACT OF MARCH 3, 1917

The first excess profits tax was enacted by the Federal Government in the Revenue Act of March 3, 1917 (March 3, 1917 Act). It applied to both corporations and partnerships, but not to proprietorships. It was enacted to fund the huge expenditures associated with World War I. The tax imposed was 8% on income in excess of $5,000 plus 8% of invested capital (Wells, 1951).

The March 3, 1917 Act was modified on October 3, 1917 (October 3, 1917 Act) to extend the excess profits tax to include income from proprietorships. The method used for computing the tax was also changed. After the March 3, 1917 Act became law, debate ensued about the appropriate way to calculate the tax. The House wanted to retain the computation from the March 3, 1917 Act and tax all profits in excess of a specified rate of return on invested

capital. The Senate Committee wanted more of a "war profits" approach whereby average prewar profits would be calculated and the tax would be assessed based on the excess above the prewar average. The October 3, 1917 Act imposed the tax on income in excess of an exemption amount ($3,000 for corporations and $6,000 for others) plus a rate on "normal" invested capital (not less that 7% or more than 9%) earned during the pre-war period from 1911-1913. Thus, a portion of the tax was based on the concept of taxing all "excess profits" while another portion taxed "war profits" (Wells, 1951). Table 1. shows the tax rate imposed on invested capital (war profits).

Table 1. Excess Profits Tax 1917

Income as a Percentage of Invested Capital	**Tax Rate**
Up to 15%	20%
15-20%	25%
20-25%	35%
25-33%	45%
Over 33%	60%

In 1918, the Treasury Department recommended changing the excess profits tax based upon its belief that war profits were not effectively being taxed by the October 3, 1917 Act. The Revenue Act of 1918 (1918 Act) imposed a direct war profits tax for 1918 only. In the 1918 Act, companies were taxed on amounts exceeding the sum of average income during the pre-war period from 1911-1913. The 1918 Act also retained the excess profits tax calculation from the October 3, 1917 Act. The 1918 Act applied the taxes only to corporations.

Following the end of World War I, the excess profits tax became an important political issue. Business leaders demanded repeal of a tax they regarded as unfair and difficult to apply. Treasury Secretary Glass and later, Treasury Secretary Houston recommended repeal of the tax. Outspoken critics of the excess profits tax included tax policy expert Thomas S. Adams, who served as advisor to both Democratic and Republican administrations. Adams was one of the original proponents of the tax, but called for its repeal in 1920. Adams argued that the tax had become burdensome, complicated, and inequitable. The Bureau of Internal Revenue also found the tax difficult to administer (Wells, 1951). The excess profits tax was repealed in 1921 based upon the recommendation of Treasury Secretary Mellon. The revenues lost from repeal of the tax were offset by increasing the corporate tax rate from 10% to 12.5% (Wells, 1951). The revenue collected from the excess profits tax is depicted in the Table 2.

Table 2. Excess Profits Tax Revenues 1917-1921

Year	Excess Profit Tax Collections
1917	$1,638,748,000
1918	2,505,566,000
1919	1,431,806,000
1920	988,726,000
1921	335,132,000
Total	$6,899,978,000

After the repeal of the excess profits tax in 1921, considerable discussion took place in the Congress of how to prevent companies from profiteering in the event of another war. More than 150 bills and resolutions pertaining to wartime profits were introduced in Congress during the period from 1921-1939. In the early 1930s, several proposals called for wartime taxes that would absorb all profits earned in excess of normal returns as determined by Congress (Wells, 1951). In 1934, Congress passed the Vinson-Trammell Act to tax excess profits on naval contracts for ships and aircraft. Profits under the Act were limited to not more than 12% of contract amounts. The Act was later repealed with enactment of the Revenue Act of 1940.

THE SECOND EXCESS PROFITS TAX - REVENUE ACT OF 1940

The Revenue Act of 1940 (1940 Act) included an excess profits tax. President Franklin Roosevelt stressed the importance of calling for the elimination of excess profits in his speech to Congress in July, 1940. He concluded that no one should profit from war and recommended "the enactment of a steeply graduated excess profits tax, to be applied to all individuals and corporate organizations without discrimination" (Roosevelt, 1940). The tax applied to corporate excess income over an exempt amount of $5,000 plus an excess profits credit of either 95% of the average base period income (for the years 1936-1939) or 8% of invested capital. The tax rate ranged from 25% on the first $20,000 of excess profits to 50% on excess profits beyond $500,000.

The tax rates were then increased by the Revenue Act of 1941 (1941 Act). The new tax rates ranged from 35% to 60%. In addition, the 8% rate on return of capital was reduced to 7% on amounts in excess of $25,000. The highest corporate income tax rate was 31%. However, since the excess profits tax was deductible for income tax purposes, the highest combined effective corporate tax rate was 72.4%.

Direct U.S. involvement in World War II began with the Japanese attack on Pearl Harbor on December 7, 1941. There was an immediate need for additional revenues to finance wartime expenditures. President Franklin Roosevelt called for a 100% excess profits tax. The Treasury Department also recommended an increase in the excess profits tax. The Revenue Act of 1942

(1942 Act) passed by Congress included a flat rate of 90% on excess profits. In addition, the 1942 Act changed the method of integrating the excess profits tax and the normal income tax. The taxes were imposed so that no amount was subject to both income taxes and excess profit taxes (Wells, 1951). The normal tax rates were up to 40% and the excess profits were subject to a 90% tax rate.

The rapidly escalating wartime expenditures forced Congress to explore additional revenue sources in 1943. On October 4, 1943, the Treasury Department submitted a proposal to Congress that would generate an additional $10.5 billion in revenues. As passed, the Revenue Act of 1943 raised the excess profits tax rate from 90% to 95%.

At the end of World War II, critics of the excess profits tax called for its immediate repeal. The Committee on Post War Tax Policy stated that the tax strangled productive efforts, penalized small and growing companies, and contributed to inflation. It was also difficult to administer and based on philosophy that was fallacious (Fairchild, 1950). The Revenue Act of 1945 (1945 Act) repealed the excess profits tax on corporations effective for tax years beginning after 1945 (Wells, 1951).

THE EXCESS PROFITS TAX OF 1950

The U.S. became officially involved in the Korean Conflict on June 25, 1950. President Truman had already started the process of identifying revenue sources to offset increased military expenditures. Advocates of a new excess profits tax cited an earlier statement by Roy Blough “The excess profits tax has a semantic advantage over all other taxes, for definitions of excess include beyond sufficiency (or) necessity,' 'immoderateness,' and 'superfluity.’ The public is likely to be led by the name of the tax to conclude that the 'excess profits' are necessarily excessive in fact as well as to name, and to believe that a special tax on these profits must be a good tax and the higher the rate the better" (Blough, 1944). Opponents vehemently argued that the tax was not effective in World Wars I and II and therefore, the past mistakes should not be repeated by re-instituting the tax.

The Revenue Act of 1950 included an excess profits tax of 30% on corporate profits that exceeded 85% of the average three highest years since 1946. The tax was intended to raise $4 billion annually. Senator Richard Nixon concluded that the excess profits tax had broad appeal stating “In wartime, there is no excuse or justification for allowing an individual or corporation to increase their profits as a result of war while men are dying” (Thorndike, 2008).

As early as December 1952, opponents of the excess profits tax called for its repeal. One study conducted by the Tax Foundation (1952) identified five negative outcomes of the excess profits tax. These outcomes included penalizing

small and growing companies, discouraging plant expansion, detrimentally impacting competitiveness, limiting capital available for re-investment, and discouraging outside investors. In addition, the Foundation highlighted the negative impact on the economy and the difficulty in administering the tax. The excess profits tax was repealed effective December 31, 1953.

THE CRUDE OIL WINDFALL PROFIT TAX OF 1980

From 1953 until 1979, the U.S. did not impose an excess profits tax. The corporate tax rate consisted of a base tax rate plus a surcharge tax rate. The concept of taxing excess profits appears in the literature in the mid 1970s to specifically address the excess profits that might be earned by oil companies from the deregulation of oil prices. In 1974, President Ford proposed a tax to target oil company profits resulting from price decontrols. This proposal targeted an industry perceived as receiving "unearned, excessive profits" (Lazzari, 2006). In August of 1975, the Senate Finance Committee approved a windfall profit tax based on oil price deregulation. Congress, however, did not deregulate oil prices. In 1977, President Carter proposed a crude oil equalization tax based largely upon the Ford administration proposal. These proposals were predecessors to the Crude Oil Windfall Profit Tax of 1980 (WPT 80).

In June 1979, the Carter Administration phased out oil price controls. The Administration also resurrected its windfall profit tax proposal from 1977 in order to "prevent unearned excessive profits" by the oil industry. President Carter signed the WPT 80 on April 2, 1980. It is important to note that the WPT 80 tax did not evolve in direct response to wartime revenue needs. The tax was projected to collect approximately $393 billion in revenues. The tax was imposed on the selling price per barrel of oil compared to the controlled price per barrel of oil. Thus, the tax was imposed on excess revenue per barrel rather than an excess income or excess rate of return on capital.

The WPT 80 is largely viewed as unsuccessful. It failed to generate its revenue projections; in fact, the actual amount of revenue raised was less than $80 billion. The tax imposed an administrative burden to the Internal Revenue Service and a compliance burden on oil companies. The windfall profit tax has been identified as a key factor in reducing American oil production in the 1980s, thus resulting in greater reliance on imported oil (Lazzari, 2006).

Soon after enactment of WPT 80, there were proposals to repeal the tax. President Reagan included repeal of the tax as part of his presidential campaign platform. A proposal to repeal the tax was included in the proposed 1986 Tax Reform Act but was eliminated before being passed by Congress. The WPT 80 was finally repealed in August 1988. In August 2005, Congress passed the Energy Policy Act of 2005 (EPACT 05) which increased oil company subsidies, but also imposed additional excise taxes on the industry.

CURRENT PROPOSALS

Over the past 5 years, oil and gas prices have increased and the petroleum companies have recorded record profits. Profits of the largest petroleum companies increased by 85% from 2003-2007. Many people believe the increase in profits over this period represents a windfall that should be taxed. Some policymakers questioned why petroleum companies should receive any subsidies while enjoying record profits. Many proposals to increase the tax burden on these companies were made in Congress. Some of the proposals include removing all subsidies, amending or reforming certain laws that give these companies disproportionate tax benefits, and even a new windfall or excess profits tax (Lazzari, 2008).

Congressional interest in an excess profits tax intensified with many bills being introduced in the 109th Congress (January 2005-January 2007). The bills would either impose a tax similar to the WPT 80 or would calculate an excess profits tax similar to those imposed during wartime.

Recent bills have proposed taxing windfall profits based on the price of oil above $40 per barrel (adjusted for inflation). None of the bills of this type have actually been passed by Congress (Lazzari, 2008). Other types of bills followed a model similar to the excess profits tax imposed during wartime. None of these bills have been passed by Congress. A third approach suggests forming a Special Commission that would determine reasonable levels of profits for oil companies and impose additional taxes on excess amounts (Lazzari, 2008). None of these bills have been passed by Congress.

The 110th Congress convened in January 2008 with renewed enthusiasm for taxing what some regarded as excess profits of oil companies. Two bills proposed by Senator Clinton would tax excess profits of oil companies at a rate as high as 50%. Senator Reid proposed two bills in 2008 which would tax excess profits at a rate of 25%. None of these bills became law. The recent economic challenges and government spending programs may lead to renewed interest in these types of tax proposals.

CONCLUSION

The idea of an excess profits tax is again in the spotlight as the Federal Government looks for additional revenues. The excess profits tax has its origins in the early 1900s as a way to tax excess profits earned by companies during times of war. The windfall profits tax of the 1980s has as its origin taxing what was regarded as unreasonable profits. This paper reviews the history of the excess profits tax and the windfall profits tax and should provide a foundation for further discussion of new tax proposals.

REFERENCES

Blough, Roy (1944). Postwar Tax Structure, Staff Memo, Division of Tax Research, Treasury Department, December 5.

Fairchild, Fred R., et al. (1950). Financing Defense: Is An Excess Profits Tax the Solution? Report from the Committee on Postwar Tax Policy, December 6.

Lazzari, Salvatore (2006). The Crude Oil Windfall Profits Tax of the 1980s: Implications for Current Energy Policy, Report for Congress, March 9.

Lazzari, Salvatore, & Robert Pirog (2008). Oil Industry Performance and the Windfall Profits Tax, Report for Congress, September 30.

Roosevelt, Franklin (1940). 67 - Message to Congress on a Steeply Graduated Excess Profits Tax. July 1. Retrieved from http://www.presidency.ucsb.edu/ws/?pid=15974.

The Tax Foundation (1952). Impact of the Excess Profits Tax of 1950, Retrieved from http://www.taxfoundation.org.

Thorndike, Joseph J. (2005). Historical Perspective: The Windfall Profit Tax-Career of a Concept. Retrieved from http://www.taxhistory.org.

Thorndike, Joseph J. (2008). Stop the War on Windfalls. Barrons, September 8.

Wells, Anita (1951). Legislative History of Excess Profits Taxation in the United States in World Wars I and II. National Tax Journal, 4:3, 237-254.

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THE DESIGN OF THE CORPORATE ACCOUNTING DATABASE: PRACTICE COMPARED TO THEORY

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ABSTRACT: The Resource-Agent-Event (REA) framework is a methodology for designing accounting system databases that is widely taught in accounting information system courses. This paper compares the REA framework to existing accounting systems and reconciles the difference. It finds that REA models the transaction processing component of accounting systems, but that enterprise systems also include financial reporting and decision support functions. Proponents of REA claim that it can fulfill financial reporting and decision support functions. The paper describes why an REA-consistent database does not adequately fulfill those functions, and describes how this applies to accounting and information system practitioners and educators.

INTRODUCTION

The development of relational databases has enabled the adoption of enterprise-wide software systems of which the accounting system is only a portion. Traditional accounting systems make accounting entries in journals from which totals are posted into ledgers. The financial statements are prepared from the ledgers. Enterprise systems allow the integration of accounting systems with operational systems. Accounting researchers have proposed a methodology in designing an accounting system integrated within a enterprise-wide system: REA (Resource-Agent-Event)(McCarthy, 1982). This methodology is very influential in the academic domain of accounting information systems. The *Journal of Information Systems*, a primary research outlet for accounting information systems faculty, regularly publishes extensions to or commentaries upon REA. However, REA is not included in information systems textbooks or practitioner-oriented how-to books. The discussion of REA appears to be limited to the accounting information systems academic domain.

REA is taught in the majority of accounting information system courses (Bradford et al., 2007) and related topics take up a significant portion of accounting information systems textbook pages and course time (Bain et al., 2002; Badua, 2008). McCarthy gives instructions on how to teach REA (McCarthy, 2003), but no other discussion of whether REA should be taught has been published. Although most accounting information system courses include discussion of REA, few accounting practitioners use REA (Bradford et al., 2007). Any instructor deciding whether to teach REA in the classroom should decide whether teaching the database structure of an accounting system is advantageous

to the students, and if so, whether teaching REA is sufficient. This paper seeks to provide information for making these decisions. REA and accounting systems have been compared before (O'Leary, 2004; Weber, 1986), but these studies are either dated or discuss general differences without describing the data structure. This study compares the differences between REA and currently-used systems and suggests why these differences exist.

REA DEFINED

REA is "a framework for building accounting systems in a shared data environment…" (Dunn & McCarthy, 1997). It is an adaptation of accounting to relational databases using entity relationship diagrams as the documentation method (McCarthy, 1979; McCarthy, 1982). At the time it was introduced, relational databases were a relatively new technology. Now most business systems are built upon relational database systems.

Existing accounting systems have a set of fundamental problems which REA is designed to overcome (McCarthy, 1982):

1. Accounting is expressed exclusively financially, which leaves out useful information.
2. Accounting uses inappropriate classification schemes based on the chart of accounts that limit the value of the information to different decision makers.
3. Accounting information is too aggregated, which removes flexibility.
4. Accounting systems are not sufficiently integrated with other areas of an organization.

REA overcomes these weaknesses by removing accounting artifacts and modeling actual business processes. Accounting artifacts are components of accounting that exist only for financial reporting such as journals, ledgers, debits and credits, and a chart of accounts.

An accounting system built using the REA methodology is based on a duality of business events in which business resources are either increased or decreased in exchanges with an outside agent. For example, a sales event in which inventory is reduced when delivered to the customer is paired with a cash receipt in which cash increases. Each event is modeled as a conceptual entity that in a physical database is implemented as a table. Each event is related to two agents, or parties to the transaction: one external agent and one internal agent. For example, a sales entity is related to the customer entity and to the sales person entity. Each event is also related to the resource exchanged, such as inventory or cash. Figure 1 shows an example of an entity relationship diagram created using REA for the sales process.

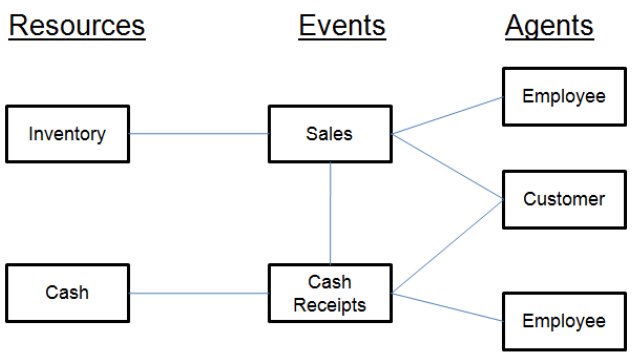

Figure 1 Sample REA Diagram

REA has the advantage over traditional accounting systems of providing flexibility so that users can obtain a view of the data that meets their needs. One need only look at a database design of a general ledger system that does not include events and resources to see value of an REA-consistent database (Parello et al., 1985). An REA system includes a high level of detail and allows storage of non-financial information about transactions. In the sales example in Figure 1, for example, individual sales transactions are included as opposed to summary totals traditionally stored in a general ledger. The types of inventory sold and characteristics of that inventory can be viewed. A simple computerized materialization of a manual accounting system does not include the same flexibility and richness of information

Behavioral research has looked at whether tasks can be performed using REA designed databases as opposed to traditional journal and ledger accounting (Dunn & Grabski, 2001; Dunn & Grabski, 2000). Tasks related to transaction processing are completed more accurately using REA than a traditional accounting system, but tasks related to financial reporting are more accurately completing using a traditional accounting system.

CURRENT ACCOUNTING SYSTEMS

To compare REA to accounting systems in use, the scope of an accounting system must be defined. Accounting systems accomplish several tasks, each of which requires distinct data structures:

1. They prepare financial statements.
2. They process of transactions.
3. They retain information for decision support.

The traditional manual accounting process consists of recording accounting transactions in a journal as debits and credits. Accounts receivable

and accounts payable are tracked in subsidiary ledgers. Account totals from the journals are posted to the general ledger, from which the financial statements are prepared. In Great Plains, an example of a computerized accounting system, a transaction table is basically the same as an REA event table. When a business event associated with an accounting entry is entered into a transaction table, the associated accounting entry is also entered into a distribution table. The distribution table is the computerized version of the accounting journal. At the users' discretion master tables such as inventory and customer are updated for changes in balance. Master tables are the equivalent of accounting subsidiary ledgers. The accounting transactions are then posted to the general ledger, where transactions are summarized by account. In traditional manual accounting systems, transactions were usually posted as monthly summaries. In computerized accounting systems, transactions are often assigned to batches, and batches are posted to the general ledger as summaries.

For example, when a sales invoice is entered in Great Plains, an entry is made in the Sales Transaction Work Table to record the transaction (Whaley, 2005). An accounting entry is made in the Sales Distribution Work Table, with debits to accounts receivable and cost of goods sold and credits to sales and inventory. The Inventory Quantity Master Table and the Customer Master Summary table are updated with new balances. Eventually the GL Transaction Work table is updated with the accounting entries.

A second purpose of an accounting system is to process transactions. The system must effectively support the transaction flow from initiation to finalization. For example, a transaction processing system support sales transactions by storing data and maintaining processes for transforming a sales quote into a sales order, a sales order into a completed sale, and a completed sale into a cash receipt. Before relational databases and enterprise resource planning systems, different categories of transactions were processed by separate systems (Davenport, 2000).

Integrated accounting systems are often to REA, although these applications do not use the REA terminology. For example, SAP as an ERP (O'Leary, 2004) and Great Plains as a mid-level accounting system (Whaley, 2005) both include tables for processing transactions similar to REA. Accounting systems call resource and agent tables master tables and event tables are called transaction tables, but in philosophy, they are similar to REA event, resource, and agent tables.

In Great Plains, a sales transaction is entered into the Sales Transaction table. Balances are updated in the Customer and Inventory tables. When a cash receipt is received, it is entered into a Cash Receipts table and the Customer and Checkbook tables are updated. This set of tables is very similar to the tables that would be expected using the REA methodology. The primary difference is the

lack of recording to an internal agent for all transactions; the same fact has been noticed in SAP (O'Leary, 2004).

The third role of an accounting system is for decision support. Whereas both financial reporting and transaction processing systems involve repetitive structured operations, decision support is mainly provided for upper management and involves constantly changing data views. For that reason, the data structure of decision support systems is significantly different than the data structure for financial reporting and transaction processing systems. Financial reporting and transaction processing systems are relatively normalized to reduce the possibility of data inconsistencies. Accuracy is important, as inaccurate information can upset customers, vendors, and employees and lead to operational mistakes. Data for financial reporting and transaction processing are entered frequently and aggregated rarely.

Because upper management decisions are less repetitive than operational staff decisions, upper management's decision support system must have greater ease of use. Users usually view aggregated data rather than detailed transaction records. Decision relevance is more important than accuracy. The data structure of a transaction processing systems has some weaknesses for decision support. Multiple relationships included in a single query leads to slow query performance, and if the query is run against a transaction processing system, a query can slow transaction processing (Shin & Sanders, 2006). For that reason, data for decision support systems is often segregated from the transaction processing system in a data warehouse. At a regular frequency the data in the data warehouse is refreshed from the transaction processing system. Running queries against the data warehouse does not slow the transaction processing system, and the data structure is optimized for query performance by reducing the number of relationships and including aggregations.

A common data structure for data warehouses is called the star diagram (Berry & Linoff, 2004). It consists of a fact table related to various dimensions. The fact table contains numerical data that can be aggregated on the basis of relevant dimensions. For example, a sales fact table may be related to customer, date, store, and inventory. The data is accessed through ad-hoc queries, OLAP, data mining, or digital dashboards.

Accounting systems often include their own decision support tables. Great Plains, for examples, records amounts in tables such as Inventory Distribution History and Customer Period Summary with each transaction. When a sales transaction is recorded through transaction processing, for example, a period and annual sales total is also saved. All inventory transactions are saved in a decision support table so as to be able to view transactions by inventory item. The interface in which this data is viewed in Great Plains is called Explorer. The data could also be viewed through a report writer or query tool.

Figure 2 summarizes a Great Plains accounting system. When a transaction is entered, it is recorded in data structures used in both financial reporting and transaction processing. When the transactions are posted they are updated to a set of tables used for decision support. Some configurations include regular migrations to a data warehouse. Comparison of Figure 2 with Figure 1 shows that REA is congruous with the transaction processing portion of Great Plains. The existence of tables for financial reporting and decision support is not allowed for in REA, which considers such entities as unnecessary artifacts (McCarthy, 1979). Therefore, accounting systems appear to incorporate database tables consistent with REA but also to include other data structures to support decision support and financial reporting.

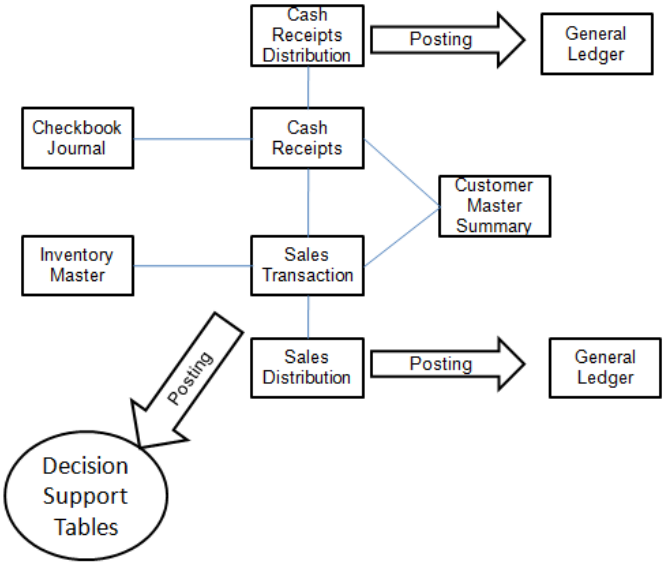

Figure 2 Total set of tables for sales transactions

EXPLANATION OF DIFFERENCES

REA has been recommended as a methodology for developing systems that can support financial reporting, transaction processing, and decision support (McCarthy, 1982; Denna & McCarthy, 1987). As we have seen, accounting systems include data structures in addition to those recommended for REA. A REA-consistent database is used for transaction processing and not for financial reporting or decision support.

Decision support systems and financial reporting systems based on REA-consistent databases would require queries with multiple relationships. REA

proposes using database queries to obtain the same information. Queries require extensive resources. To generate a financial statement, one author proposes twenty-two different queries (Denna & McCarthy, 1987). This number is actually understated. For example, only one query is listed to calculate a cash balance. In actual practice, queries to calculate cash would need to be run against cash receipts, cash disbursements, and payroll. Many more examples multiply the actual number of queries needing to be run to prepare a financial statement. As financial statements and account balances are calculated frequently, it is more efficient to store values each time a transaction is entered than running a set of much more resource-intensive queries.

Distinct decision support tables are created for the same purpose. All of the information for a set of commonly-used questions can be stored in a smaller subset of tables that reduce resources needed to access the data. Ease-of-use is also improved, as the decision-maker has a simpler set of tables from which to obtain information. Anybody that has looked through the data dictionary of a transaction processing system to try to find information can sympathize with the need for simplification of data storage for decision support. Using the number of tables and relationships included in a transaction processing system, a decision maker, especially at upper levels of management in which questions are less structured, would either have to wait for requests from the IS department to be fulfilled or develop advanced database querying knowledge, surely not the best use of an executive's time. It is much easier to navigate OLAP cubes populated from a data warehouse updated from the transaction processing and financial reporting systems.

CONCLUSION

To conclude my review of REA, I provide some quotes from the creator of REA (Dunn & McCarthy, 1997):

"…if existing systems are using the REA model or its constructs in some conceptual or compromised fashion, such implementations must have benefits that exceed their costs." (p. 47)

"One must define specific metrics for evaluated the two models and demonstrate where the previous work falls short," referring to comparing a newer methodology to REA. (p. 46)

These two quotes, used to validate REA, also validate the accounting artifacts currently included in accounting technology. If general ledgers are used in existing systems, they have benefits that exceed their cost, and the implementation of general ledgers in accounting systems is of equal importance to teach and research as REA. If someone proposes differently, the superiority of

REA over general ledger and decision support systems should be demonstrated using some set of metrics with external validity to accounting practice.

McCarthy's original objection to accounting systems of ledgers and journals include items that reflect both on financial reporting standards and accounting system data storage:

1. Accounting is expressed exclusively financially. Although financial reporting requirements do not include operational information, most accounting systems currently include operational data used to process transactions.

2. Accounting uses inappropriate classification schemes. Financial reporting requires the use of account classification. Until financial reporting requirements change, this is done most efficiently by retaining accounting artifacts within accounting systems.

3. Accounting information is too aggregated. Financial reporting is now done using aggregation of financial balances. Decision support can often be improved through aggregation of data (Berry & Linoff, 2004). Accounting systems currently offer aggregated information for financial reporting and decision support and detail information for operational support.

4. Accounting systems are not sufficiently integrated. Current accounting systems combine operational transaction processing and financial reporting. This can be improved by removing some barriers between data (for example, transaction data is sent from module to module rather than always being available to all modules) that exist because of the modulization of accounting systems.

An educator that teaches accounting information systems should examine whether the teaching of database-level accounting systems supports course objectives. If so, other components of database accounting, including financial reporting artifacts, are essential to understanding database use in an accounting system. Whether a practicing accountant would ever need to be aware of the database structure of the accounting system to find answers to operational transaction processing questions is debatable and should be evaluated empirically. Accounting systems usually provide this information at the system users' finger tips.

SAP (O'Leary, 2004) and Great Plains (Whaley, 2005), both market leaders in their market sector, share some characteristics of REA. If an accounting information systems instructor decides to teach the database structure of an accounting system, the instructor needs to also decide whether teaching REA is sufficient. In this case, I would argue that it is not sufficient, because it ignores existing accounting systems as they are. Recording of accounting transactions, posting to master tables, posting to the general ledger, audit trails

within the database, populating decision support tables, and querying information from these sources would be necessary additions to an REA education to prepare students to the world of accounting technology as currently practiced.

REFERENCES

Badua, F. (2008). Pedagogy and the PC: Trends in the AIS curriculum. Journal of Education for Business, 259-264.

Bain, C. E., Blankley, A. I., & Smith, L. M. (2002). The examination of topical coverage for the first accounting information systems course. Journal of Information Systems, 16, 143-164.

Berry, M. J. A. & Linoff, G. S. (2004). Data Mining Techniques for Markeing, Sales and Customer Relationship Management. (2nd ed.) Hoboken, NJ: John Wiley & Sons.

Bradford, M., Richtermeyer, S. B., & Roberts, D. F. (2007). System diagramming techniques: An analysis of methods used in accounting education and practice. Journal of Information Systems, 21, 173-212.

Davenport, T. H. (2000). Mission Critical: Realizing the promise of enterprise systems. Boston: Harvard Business School Press.

Denna, E. J. & McCarthy, W. E. (1987). An events accounting foundation for DSS implementation. In C.W.Holsapple & A. B. Whinston (Eds.), Decision Support Systems: Theory and Application (pp. 239-263). Berlin: Springer-Verlag.

Dunn, C. & Grabski, S. (2000). Perceived semantic expressivenss of accounting systems and task accuracy effects. International Journal of Accounting Information Systems, 1, 79-87.

Dunn, C. & Grabski, S. (2001). An investigation of localization as an element of cognitive fit in accounting model representations. Decision Sciences, 32, 55-94.

Dunn, C. & McCarthy, W. E. (1997). The REA accounting model: Intellectual heritage and prospects for progress. Journal of Information Systems, 11, 31-51.

McCarthy, W. E. (1979). An entity-relationship view of accounting models. The Accounting Review, 54, 667-686.

McCarthy, W. E. (1982). The REA accounting model: A generalized framework of accounting systems in a shared data environment. The Accounting Review, LVII, 554-578.

McCarthy, W. E. (2003). The REA modeling approach to teaching accounting information systems. Issues in Accounting Education, 18, 427-441.

O'Leary, D. (2004). On the relationship between REA and SAP. International Journal of Accounting Information Systems, 5, 65-81.

Parello, B., Overbeek, R., & Lusk, E. (1985). The design of entity-relationship models for general ledger systems. Data and Knowledge Engineering, 155-180.

Shin, S. K. & Sanders, G. L. (2006). Denormalization strategies for data retrieval from data warehouses. Decision Support Systems, 42, 267-282.

Weber, R. (1986). Data models research in accounting: An evaluation of wholesale distribution software. The Accounting Review, LXI, 498-518.

Whaley, R. L. (2005). *Great Plains Information Flow & Posting*. Altamonte Springs, Florida: Accolade Publications.