PROCEEDINGS

OF

2010 SOBIE ANNUAL MEETINGS

April 13-16, 2010
Destin, Florida

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Proceedings of the Society of Business, Industry and Economics (SOBIE) Annual Meetings

April 13-16, 2010
Destin, Florida

PAPERS

ABSTRACTS

Challenges and Opportunities for Developing Countries from Medical Tourism

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Abstract

Wikipedia defines "Medical Tourism" as the act of traveling to other countries to obtain medical, dental and surgical care. Rapid expansion of facilities for patients abroad has helped to spur this industry's growth. Regardless of the destination, U.S. citizens are increasingly embracing the benefits of medical tourism. Previously, "inbound" medical tourism was more prevalent where patients from other countries traveled to U.S. to receive advanced medical care. Today, "outbound" medical tourism is becoming equally prevalent where U.S. patients are traveling abroad for medical care due to the impact of dramatically rising U.S. healthcare costs. Medical care in countries such as India, Mexico, Thailand and Singapore can cost as little as ten percent of the cost of comparable care in the U.S. Currently, patients from U.S., Canada, Europe, Australia and the Middle East appear to be traveling to destinations in Asia such as India and in South America such as Mexico for various medical and surgical procedures. Medical tourism can offer opportunities to developing countries to make improvements in their country and the host country can enjoy the economic benefit from medical tourism. However, there are some challenges they face in the wake of medical tourism such as dealing with the insurance company in another country, handling of post surgical complications, security of patients (hostage taking, terrorism, kidnapping, etc.), quality and safety of transportation, etc. Can developing countries maximize the benefit in spite of the challenges?

Introduction

What is medical tourism? Deloitte Center for Health Solutions (2008) defines Medical tourism as a process of leaving home for treatments and care abroad or elsewhere domestically. Wikipedia defines "Medical Tourism" as the act of traveling to other countries to obtain medical, dental and surgical care. A Healthcare Magazine in India says "Medical Tourism can be broadly defined as provision of cost-effective private medical care in collaboration with the tourism industry for patients needing surgical and other forms of specialized treatment."

Rapid expansion of facilities for patients abroad has helped to spur this industry's growth. Regardless of the destination, U.S. citizens are increasingly embracing the benefits of medical tourism. Previously, "inbound" medical tourism was more prevalent where patients from other countries traveled to U.S. to receive advanced medical care. For years many medical tourists came to the United States to obtain care that was not available in their country or to obtain quicker access to services (Fried, 2009). He reports an estimated 400,000 patients coming to United States annually to obtain medical care. Today, "outbound" medical tourism is becoming equally prevalent where U.S. patients are traveling abroad for medical care due to the impact of dramatically rising U.S. healthcare costs. According to Fried (2009), such patients include patients who have limited or no insurance or lost their insurance; patients working for selected

self-insured organizations with connections to facilities abroad; patients whose insurance companies take advantage of foreign facilities; and patients seeking care that may not be available in the United States for regulatory reasons such as ban on abortions, etc. He reports an estimated 750,000 Americans traveled abroad for care in 2007 and claims this number is expected to increase to 6 million by the end of year 2010. Currently, patients from U.S., Canada, Europe, Australia and the Middle East appear to be traveling to destinations in South and Southeast Asia such as India and in South America such as Mexico for various medical and surgical procedures.

Frequently performed medical procedures and medical services in Medical Tourism include plastic surgery, ophthalmology (such as cataract removal), cardiothoracic surgery, joint replacement, dermatology procedures, dentistry and dental surgery, orthopedic surgery, certain transplants and nuclear medicine. The various specialties covered by Medical Tourism are dermatology, neurology, neurosurgery, ophthalmology, oncology, orthopedics, rheumatology, endocrinology, ENT, pediatrics, pediatric surgery, pediatric neurology, nephrology, gynecology and even psychiatry. To some extent general medicine and general surgery disciplines are also included.

Reasons for Increase in Medical Tourism

Medical care in countries such as India, Mexico, Thailand and Singapore can cost as little as ten percent of the cost of comparable care in the U.S. The price is remarkably lower for a variety of services and often includes airfare and stay in a resort hotel making interest in medical tourism strong and positive (Keckley and Underwood, 2008). For example, in 2005 the average cost of a procedure such as the "Heart Bypass" was $27,000 in the U.K, $23,000 in France, $24,000 in the U.S. while the cost in India was only $7600 as reported by a student in his unpublished class project on healthcare costs in 2007. The average cost of hip replacement was reported to be $16,000 in the U.K, $14,000 in France, $28,000 in the U.S. while the cost in India was $5700. For a procedure such as the cataract surgery, the cost was $5,000 in the U.K, $3,000 in France, $4,000 in the U.S. while the cost in India was only $1200. This clearly shows that cost savings could be easily achieved if a person is willing to travel for medical care.

Other reasons for the increased medical tourism could be the improvement in the quality of medical facilities and related infrastructure, reputation of the Asian medical professionals, physician specialties along with the cost savings. Both countries offer a variety of tourist and pilgrim destinations. India also offers holistic healthcare management addressing the mind, body and spirit along with a warm reception to western foreigners.

Current Status of Medical Tourism in India

Medical tourism in India generated approximately $333 million in the year 2003. About 150,000 foreigners from various parts of the world visited India specifically for receiving medical care, the recovery and the tourism. It was estimated by the government of India that this industry will grow to anywhere between $1.2 billion to $2.4 billion by the year 2012. The domino effect of medical tourism in India has also been enormous. For example, the domestic air travel, hospitality, domestic tourism, shopping of other goods by foreigners on the way home, all significantly increased.

Why India or Mexico?

Fried (2009) suggests that management and medical expertise are rapidly improving in some of the developing countries. This seems to be true of India and to some extent of Mexico. India is not a third world country with an underdeveloped economy anymore (Chopra, 2009). Since its independence in 1947, the quality of Indian medical schools, medical education and

medical facilities has steadily improved over the years. They are producing better graduates who are helping them earn excellent reputation in the world medical community. Many have migrated to Europe and the United States for their medical careers. Salsberg and Grover (2006) report that International Medical Graduates (IMGs) represent 25 percent of all new physicians entering the residency programs in the U.S. and represent approximately a quarter of practicing physicians (Association of American medical Colleges, 2007). It is easily seen that the reputation of the Indian medical professionals, the physicians, the specialists, nursing and other supporting staff has been on the rise during the last decade.

Both India and Mexico offer a variety of tourist destinations which are appealing to many people all over the world. India has many heritage hotels which are palaces converted into hotels with the western style amenities and food, and other services such as concierges, tour guides, etc. Mexico offers easy convenient access across the border at many points for U.S. travelers. Both offer a friendly political climate. In addition, most foreigners visiting the country receive a warm reception with friendly helping attitude from businesses as well as the locales.

Another reason is the language. There is no language barrier for U.S. or many European travelers who speak English – English is widely spoken in India. Also, there are many foreign language institutes that have sprung up in India recently that promote languages like German, French, Spanish, Chinese, Japanese and Russian. Most professional in Mexico have a working knowledge of the English language.

In addition, India offers holistic healthcare addressing the mind, body and spirit. There are many centers throughout the country that offer training and practice of Yoga and the meditation, reported to promote better health. India also offers access to other Indian systems of medicine such as "Ayurvedic medicine," and clinics for body cleansing and promoting better health.

Challenges and Opportunities

Medical tourism can offer opportunities to developing countries to make improvements in their country. Economic gains from medical tourism can be very big incentives for a country to invest in improvements to the infrastructure, rural and urban planning and for improving medical facilities as well as the supporting services required to provide a quality experience to the medical tourists coming to the host country. This may result in a great benefit for the host country itself. To a small extent, medical tourism may help the host country keeping their medical graduates in the land. Fried (2009) reports that of the IMGs practicing in the United States, 60 percent are from lower income countries and these are the countries that can not afford to export their healthcare workforce (Fried and Harris, 2007). Although the host country can enjoy the economic benefit from medical tourism there are some challenges they face in the wake of medical tourism such as:

a) Maintaining quality of healthcare service: pre-, during, and post-surgery
b) Maintaining quality and training of medical staff
c) Maintaining quality of medical facilities
d) Handling of post-surgery or post-procedure complications or side effects
e) Handling of negligence, malpractice or false advertising
f) Handling of a patient death. What is the jurisdiction? Home or host country?
g) Sharing of financial burden. Insurance company in the home country.
h) What is covered under the insurance plan? Handling of paper work.

Dealing with the insurance company in another country can be a challenge or at least at times may not be simple and easy. Security of patients during the tourism part of the visit can

also pose a challenge due to possible hostage taking, terrorism, kidnapping, etc. In addition, quality and safety of transportation, security and safety at the hotel where the medical tourists are staying must also be evaluated. Also, the issue of accreditation can not be ignored. Joint commission on accreditation of Healthcare Organizations emphasizes focus on patient rights and quality of medical and nursing staff. The host country must constantly ensure that the patient rights are honored and quality is maintained.

Another challenge is "dealing with the criticism of medical tourism." From the point of view of the social effects of medical tourism, some argue that it has an impact on the quality and delivery of medical services to the local population. There are times when some local patients "get put on the back burner." Some have criticized medical tourism for subsidizing the patients from wealthier industrialized nations at the cost of local patients. This delicate issue, although a challenge, needs to be examined very carefully by the host country.

What needs to be done?

Is there a need for a watch-dog agency to supervise this uncontrolled industry? Is there a need for bi-lateral or multi-lateral agreements or arrangements among countries to assure the quality and performance of medical tourism services? We would think so. The initiative must come from the host country government.

To promote medical tourism, the host country can undertake improvements in infrastructure, transportation, security etc. How can the government establish priorities? Which cities get attention first? Different cities probably get different number and type of medical tourists requiring different medical services. The host country government can look at not just the number of medical tourist visiting the city or the region but their net economic impact on the city or the region. Then, the "A-B-C analysis" approach in operations management can be employed to create category "A," category "B" and category "C" cities or regions with highest priority going to category "A" listing. Priorities established then can be used for allocation of resources for improving infrastructure, facilities, and tourist spots, and for improving security and safety of visiting medical tourists. The eventual goal should be to cover cities and regions in all three categories.

The host country can also initiate research on the experiences of the past patients who had visited the country for medical tourism. The focus of such studies should be on various aspects of the medical treatment they received such as:

a) Patient recovery – how good was the recovery, how quick?
b) Post-surgery side effects – temporary, short-term, long-term
c) Patient prognosis
d) Level of patient satisfaction – pre and post surgery/medical service
e) Level of patient satisfaction with medical and support staff
f) Level of patient satisfaction with medical facilities

In addition the studies should also investigate "Level of Satisfaction" with the Tourism part with questions regarding:

a) Satisfaction with immigration upon arrival
b) Satisfaction with hotel/boarding
c) Satisfaction with transportation, infrastructure
d) Opinions about personal safety

Medical tourism appears to be here to stay. The host country government can develop a set of standards by collaborating with non-governmental organizations. A strategic alliance of hospitals, domestic/international tour operators, airlines, insurance providers, accreditation

agencies and government agencies can be important for the "Medical Tourism" industry to operate effectively and efficiently. Will a close monitoring of the industry by the government be a good idea? May be if they let the free market play out. This may help the host countries maximize the benefit of medical tourism in spite of the challenges.

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Examining the Predictive Nature of Trusting Intentions toward Trust-Related Behavior in Electronic Commerce

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Abstract

Lack of consumer trust is a significant barrier to the growth of the electronic commerce industry and the importance of researching trust and its antecedents has been widely demonstrated in the literature. Efforts to conceptualize online trust have resulted in numerous frameworks. However these studies, which are primarily quantitative in nature, fail to examine the main construct of interest which is actual *behavior* and, in turn, fail to provide evidence regarding the dynamics of this association. Without this evidence, future findings in similar studies will remain assumptions. This study analyzes existing frameworks and explores mixed methods research as a viable alternative for examining both trusting intentions and trust-related behavior in an effort to provide empirical support regarding this relationship. The paper concludes with recommendations for future research on trust-related behavior in electronic commerce.

Introduction

The concept of trust has been studied extensively across multiple disciplines. It has been extended into the electronic commerce domain where user trust may be more complex to understand, compared to brick-and-mortar transactions, due to higher levels of uncertainty and risk often associated with the online environment (Rigelsberger, Sasse, & McCarthy, 2003; Wang & Emurian, 2005). Given the lack of typical human interaction often associated with the online environment, concerns exist about trust and the lack of trust (Hoffman, Novak, & Peralta, 1999; Mitra, 2002). Lack of consumer trust is a significant barrier to the growth of the e-commerce industry and the importance of researching trust and its antecedents has been widely demonstrated in the literature (Gefen & Straub, 2002; Grabner-Krauter & Kaluscha, 2003; Koufaris & Hampton-Sosa, 2004; Lee & Turban, 2001; McKnight, Choudhury, & Kacmar, 2002; Nah & Davis, 2002; Pavlou, 2003; Wang & Emurian, 2005).

Existing Frameworks

Efforts to conceptualize online trust have resulted in numerous models (Ang, Dubelarr, & Lee, 2001; C. C. Corritore, Kracher, & Wiedenback, 2003; Egger, 2001; Gefen & Straub, 2002; Kim, Song, Braynov, & Rao, 2005; Koufaris & Hampton-Sosa, 2004; Lee & Turban, 2001; Yang, Hu, & Chen, 2005). The most widely cited model is McKnight, Choudhury, and Kacmar's (2002) Web of Trust Model (See Figure 1) adapted from an earlier study on initial trust formation (McKnight, Cummings, & Chervany, 1998). The model draws upon concepts from psychology, sociology, and social psychology and integrates it within the framework of Theory of Reasoned Action (Fishbein & Ajzen, 1975) modified by Davis (1989). The high level constructs for this model are disposition to trust (general willingness to trust others), institution-based trust (perceptions of the medium), trusting beliefs (perceptions of the trusting object and

its attributes) and trusting intentions (intentions to engage in trust-related behavior with the trustee). The model suggests that disposition to trust and institution-based trust are antecedents to trusting beliefs and intentions. Furthermore, the model proposes trusting intentions predict trust related behavior; however, the study does not examine actual behavior and provides no evidence of this association.

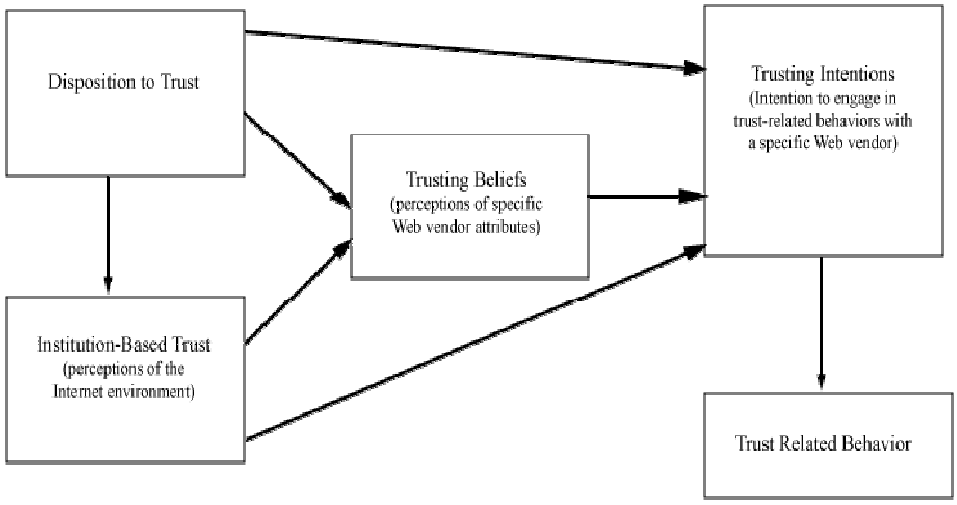

Figure 1: Web Trust Model - McNight, Choudhury, & Kacmar (2002)

The general link between intention and behavior has been investigated in prior research. The theory of reasoned action (TRA) asserts that behavior is determined by intentions to act (Fishbein & Ajzen, 1975). Sheppard, Hartwick, and Warshaw (1988) examined the effectiveness of the behavioral model by using meta-analyses. The average correlation for the intention-behavior relationship was .53, providing support that intentions are strong predictors of behavior. Davis (1989) also found a correlation between intention to use and usage behavior.

However, later studies investigating the predictive utility of intentions found significant variation between reported intention and actual behavior (Chandon, Morwitz, & Reinartz, 2005; Fogg et al., 2002; Jamieson & Bass, 1989; Jensen et al., 2005). Fogg et al. (2002) found a mismatch between the results what users claim are important interface elements when gauging web site credibility and what they actually notice when assessing web site credibility. Similarly, Jensen, Potts, and Jensen's (2005) findings, in an experimental e-commerce scenario, indicate that the privacy indicators users stated were important were not the same privacy indicators users considered during the decision-making process. Credibility and privacy, while distinct, are related to trust, therefore it is reasonable to question the assumption that trusting intentions accurately predict trust-related behavior. At minimum, these results warrant further investigation into the predictive nature of trust intentions toward trust behavior.

There are a few possible explanations for the discrepancy between intentions and behavior. In an effort to resolve this discrepancy, Fogg (2003) proposes the Prominence Interpretation Theory. To summarize, users first notice elements of the site and then proceed to

make judgments about the site and its content. There are five factors that may affect what users notice; involvement, topic, task, experience and individual differences. Fogg (2003) suggests the dominant variable is user level of involvement.

Expanding on the work of Fogg (2003), Ferebee (2006) examined the influence of user involvement level on the web site elements noticed when assessing the credibility of finance web sites. Both enduring involvement level (level of interest in a topic) and situational involvement (absence or presence of decision-making behavior) were analyzed. Ferebee found that level of involvement does play a significant role in what users notice when assessing the credibility of web sites. For example, when enduring involvement level was low with no situational involvement (users were not interested in the topic and there was no decision-making behavior associated with the task), users noticed more web site medium elements (organization, information design, design look) than source elements (identity, name recognition, reputation). However, when enduring involvement level was high with situational involvement (users were interested in the topic and a decision-making behavior was associated with the task), users notice more web site source elements than web site medium elements.

The level of user involvement adds significant insight into the discrepancy between intentions and behavior while also supporting the imperative need to examine online trust in context; analyzing the intentions and behavior of actual users doing real tasks. Both Fogg et al. (2002) and Jensen, Potts, and Jensen (2005) noted a limitation of the current work was that the user sampling was not representative of actual users. This is a common limitation cited within the existing body of literature that has not adequately been addressed.

Trust-related Behavior

There is dearth of information regarding actual trust behavior in the existing literature. Trust behavior may include acting on the advice of a web site, sharing personal information, making purchases, or initiating contact with the vendor. McNight (2002) suggests trusting intentions are predictive of trust behavior but fails to examine trust behavior and provides no support for this assumption; a noted limitation of the study. The authors suggest an opportunity for future research would be to conduct a study in which the "ultimate outcome of interest – trust related behavior- is directly measured" (p. 353). Similarly, Riegelsberger, Sasse, and McCarthy (2005) state that future research in online trust should include studies with behavioral measures. A review of over 20 studies on trust in the field of electronic commerce and found the majority of studies tested trusting intentions yet failed to examine trust behavior.

Wang (2005) has similar conclusions after reviewing the existing body of knowledge on trust, noting that most studies are purely quantitative and fail to investigate user behavior. Wang stresses concerns regarding the existing body of literature from which researchers and practitioners derive and expand upon guidelines for developing trustworthy e-commerce sites. The foremost concern is that the literature is primarily based upon self-reported survey data reflecting the intentions of users and what they say they will do rather than their actual behavior. The author concludes there is an "obvious need" to expand research in online trust beyond the survey-based methodologies.

Grabner-Krautner & Kaluscha (2003) provide a cumulative analysis following a comprehensive review of empirical literature on trust in electronic commerce. The authors note that while trusting intentions were commonly investigated, only two studies investigated trust-related behavior. Intentions do not imply behavior and therefore, it cannot be assumed that the

results from studies investigating trusting intentions will mirror the results of studies investigating trust related behavior.

This deficiency in the literature regarding trust intentions and trust behavior is concerning given the number of quantitative studies using trusting intention scales as a measure of "trust". For example, prior research on trust within the Human Computer Interface (HCI) domain have mainly focused on developing an understanding of trust cues, elements of the interface that may induce trust, and therefore, trust behavior. In an attempt to determine the relationship between trust cues and trust, studies often require participants to complete quantitative trust intention scales. In Grabner-Krautner and Kaluscha's analysis (2003), study methodologies include an experiential survey approach, a basic survey approach, or mix of the two. The existing body of literature on trust is comprised of these quantitative studies that do provide a basis for understanding how various trust cues influence user' perceptions regarding what they believe they will trust but provide little understanding of what users actually do trust and what influences this trust-related behavior. These are two perspectives that need to be explored and brought together in a meaningful way.

The gap of knowledge between trusting intentions and trust-related behavior may be directly related to implementation of survey-based methodologies in trust studies (Jensen, Potts, & Jensen, 2005; Nah & Davis, 2002; Shankar, Urban, & Sultan, 2002; Wang & Emurian, 2005). The quantitative nature of survey-based methodologies is limiting our current understanding of online trust because it only provides part of the story and by itself, is inadequate in addressing the research question. As Fogg, Marshall, Laraki, Osipovich, Varma, Fang, & Paul (2001) note, it is difficult to quantitatively examine actual behavior. Similarly, Jensen (2005) challenges the overreliance on survey data when a primary goal of the research is to understand user behavior. The author calls for the "reevaluation of the role of surveys in the study of Internet behavior" (p. 224) noting surveys provide insight into attitudes, perceptions, and intentions but fail to shed light on behaviors and experiences. Therefore, examining two separate sub-constructs of trust, trusting intentions and trust-related behavior, requires the collection of both quantitative and qualitative data. More importantly, the data must be mixed using a systematic approach that brings the strengths of each approach together to provide a deeper understanding of the research problem (Crewell & Clark, 2007; Johnson & Onwuegbuzie, 2004).

Mixed Methods Research

The two primary methods of research lack the ability to address the problem presented in this research and it has only been with the past few years that mixed methods has emerged as a third approach and recognized as a legitimate design in educational research (Bryman, 2008; Creswell & Clark, 2007; Johnson & Onwuegbuzie, 2004; Tashakkori & Creswell, 2007)

Grabner-Krautner and Kaluscha (2003) assert a need exists for an integration of quantitative and qualitative empirical research in an effort to explore the multi-dimensional concept of trust at a deeper level. One level might differ from evidence looked at from other levels. Using only one approach to address the predictive nature of trusting intentions toward trust related behavior would be deficient. Therefore, a mixed methods design best fits this problem (Crewell & Clark, 2007). In Rieglesberger and Vasalou's (2007) discussion on the future of trust research, the authors welcome "methodological diversity" because it allows the researcher to study the phenomenon more precisely.

Using a mixed methodological base to examine trusting intentions and trust related behavior would address two significant deficiencies in existing literature; however, it is equally as important that trust behavior be explored in context. The majority of studies on trust use convenience samples consisting of undergraduate/graduate students. Studies note this limitation; however there is little evidence that it has been addressed. Issues of validity can be raised when using students rather than actual users. For example, Corritore, Wiedenbeck, Marble, Kracher, & Chandran (2005) propose a instrument for measuring online trust of websites but note that items were eliminated, speculating the lack of fit could be due to using a general context versus specific context and using students versus actual users.

A suggested avenue for future research would be to examine how the self-reported trust intentions of users in the online purchasing converge with observed trust related behaviors. This type of study could employ a mixed methods design. Researchers recognize mixed methods as a separate design for collecting, analyzing, and reporting research that combines the respected designs of quantitative surveys/experiments with the qualitative approaches of ethnographies, grounded theory, and case studies (Clark & Creswell, 2008). Specific study designs have been identified in the literature and it is suggested a design methodology be guided by one of these designs. In addition, visual models of procedures and the specific criteria utilized in deciding the design should be provided in the study approach.

The type of study design that may be the best fit for the proposed research is the Triangulation Design (Figure 2). This is a one phase design in which well-established quantitative and qualitative methods are implemented concurrently and with equal weight.

Different but complementary data are collected on the same topic to compare data from two divergent perspectives. An adoption of McKnight et al. (2002) instrument could be used to measure trusting intentions. Concurrent with this data collection, qualitative data would be required to measure trust-related behavior. Qualitative data regarding behavior would then be quantified and interrelated with the quantitative measures for trusting intentions to discover the predictive nature of trusting intentions toward trust-related behavior.

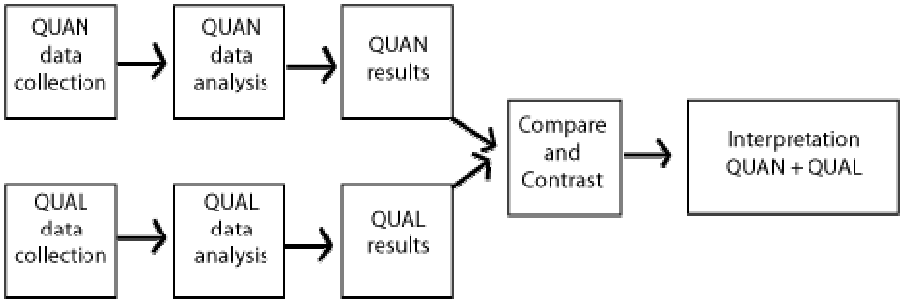

Figure 2: Triangulation Design: Convergence Model (Creswell & Clark, 2007)

Conclusion

Prior research has used trust intentions as a predictor of trust behavior when quantitatively examining the relationship between interface trust cues and trust; however, there is

little evidence to support the relationship between trust intentions and trust behavior. Without this evidence, the relationship between interface trust cues and trust-related behavior remains largely unexplored.

Researchers may have been limited in the past by research methodology. Numerous quantitative studies and qualitative studies have been conducted investigating trust in online purchasing. However, it has usually been one approach or another and neither have the ability, separately, to provide the evidence to address the problem in this study. Measuring perceived trusting intentions and observing trust-related behavior requires a convergence of both quantitative and qualitative data. Mixed methodology is now recognized as the third methodology approach that provides the researcher confidence in the ability to address a study of this nature. Additional research is needed to examine both intentions (quantitative) and actual behavior (qualitative) using a mixed methods design in order to provide the empirical evidence needed that will either support the existing frameworks or call for a reexamination of the association between these two constructs.

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Another Look at the Phillips Curve

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Abstract

The classical and more recent offshoot Phillips Curve tradeoffs are re-investigated. An empirical analysis is done using annualized quarterly data from 1978 – 2009, which again confirms there is no long run tradeoff between inflation and unemployment. Further, an empirical search for the short run, textbook, Phillips Curve is undertaken. Perhaps surprisingly, there appears to be no statistically significant textbook relationship between inflation and unemployment – even in the short run – over the past thirty or more years, whether the relationship is the classical one between inflation rate and unemployment rate; or the original Modigliani-Papademos NAIRU difference between current and lagged inflation rate and the gap between actual and the natural rate of unemployment; or the Friedman-Phelps-Lucas expectations-augmented one between the difference of actual and expected inflation rate and the gap between actual and the natural rate of unemployment.

In search of other theoretically relevant variables, a continuously equilibrating labor market model is posited and solved for the standard Phillips Curve tradeoff. From the labor market underpinnings it is determined that, in theory, changes in the rates of growth of either GDP or employment should impact inflation without impacting long run unemployment rates. The empirical analysis here, however, also fails to confirm statistically significant relationships for these two new variables.

Last, the interesting tradeoff between unemployment rates and the CPI, rather than the inflation rate, is presented.

Introduction

While the long run Phillips Curve was dismissed by the 'team' of Phelps (1967), Friedman (1968), and Lucas (1972) over forty years ago, the short run Phillips relationship between inflation rate and unemployment rate has seemingly endured. Its endurance is proved by the fact that it is commonly found in popular macroeconomic textbooks such as Olivier Blanchard's *Macroeconomics, 5e* (2006) or Richard Froyen's *Macroeconomics: Theories and Policies, 9e* (2009) and in well known money and banking textbooks such as Laurence Ball's *Money, Banking, and Financial Markets* (2009) or Frederic Mishkin's *Money, Banking, & Financial Markets, 2e* (2010).

The historical evolution of the Phillips Curve relationship from long run to short run and bringing in NAIRU has also been well documented. For instance, very recently the Federal Reserve Bank of Richmond devoted an entire issue of its *Economic Quarterly* (2008) to the Phillips Curve and its implications for monetary policy, and in that *Quarterly* King (2008) gives the readers a well-researched historical tour. Lesser historical expositions can also be found in many of the textbooks listed above.

[1] The author received valuable assistance with data collection and preliminary regression runs from Florida Southern College students Brett Erwin, Roman Schirmaier, Senka Softic, and Joel Tillman.

But it appears that the Phillips relation has unfortunately devolved into present forms based as much upon political-macoreconomic proclivities as a neutral scientific stance. For instance, we generally find the new classical/classical models almost unchanged from the Lucas-type model posited in the early 1970s: forecasted inflation is a function of an output gap and rationally expected inflation—the Lucas Supply curve (see equation (1) below).

(1) $\pi_t = \pi_t^e + \delta(y_t - y^*) + \epsilon$

where, π_t is the inflation rate at time *t*; π_t^e is the expected inflation rate for period *t* that was formulated in period $t-1$, generally thought to be rationally determined; y_t is the rate of growth of GDP at time *t*; *y** is the targeted policy GDP rate of growth such that the difference between the two, the output gap, now is a proxy for the unemployment gap in earlier Phillips Curve versions; and ϵ is a stochastic error term.

New Keynesian models, on the other hand, are generally of the Calvo-type (1983) function where some aggregate marginal costs of production (*MC*) and a random exogenous shock, ξ, are added, taking the place of the output gap. (See equation (2) below and where all variables are rates of change). No explicit unemployment rates are in this form either.

(2) $\pi_t = \gamma\pi_t^e + \lambda(MC_t) + \xi$

Note that these different approaches are not necessarily incompatible, but they are approaching the Phillips relation from a different angle. It is possible that the output gap is reflective of the marginal costs that firms face in the aggregate; however, it does not necessarily have to be (as Mishkin (2010) points out). Equation (1) is suggestive that inflation is a demand-pull phenomenon, whereas equation (2) is suggestive of a cost-push approach. In either case there is the important possibility that relevant variables have been left out of these functions.

Our task in this paper, however, is not to determine which of these models is better; ours is simpler: to determine if there is truly a short run, textbook relationship at all. If so, what is the nature of the relationship? And if not, what are the macroeconomic policy implications?

Our Empirical Journey; Regression Results for Textbook Models

Many texts and academic papers have purported to show empirical evidence for the Phillips relation, but is there really any evidence for the relationship even in the short run? Here we empirically check for four main forms of the textbook Phillips relation within different time periods between 1978 and 2009.

In an attempt to compare and contrast both models and time periods, regressions were run as outlined below. Each decadal time period has four different models: the classic tradeoff between unemployment and inflation, the introduction of the NAIRU (which introduces the output gap away from the natural rate of unemployment) with simple adaptive and rational expectations approaches, and finally, a model that is developed mathematically below.

(3) *The Classic Phillips Curve:* $(\pi_t) = f(U_t)$

(4) *The simple adaptive expectations (Modigliani-Papademos) Phillips Curve:*
$(\pi_t) = f(\pi_{t-1}, U_t - U^*)$

(5) *The simple expectations augmented (Friedman-Phelps) Phillips Curve:*
$(\pi_t) = f(\pi_t^e, U_t - U^*)$

(6) *The Phillips Curve derived here:* $(\pi_t) = f(\pi_t^e, dy, dn, U_t - U^*)$.

The 1980s

The following simple OLS regressions were run with quarterly 1980s data for a total of 40 observations. The data were culled from the Federal Reserve Bank of St. Louis's FRED and Michigan Survey except for natural rates of unemployment, which were gleaned from Robert Gordon's (2006) *Macroeconomics 10e*. All data are in annualized percentage form.

The Classic Phillips Curve: $(\pi_t) = f(U_t)$.

$\pi_t = 6.81387 - 0.22478\ U_t$; $\quad R^2 = 0.0073$

$(\ t = -0.5303\ )$

The simple adaptive expectations Phillips Curve: $(\pi_t) = f(\pi_{t-1}, U_t - U^*)$.

$\pi_t = 2.3589 + 0.5653\ \pi_{t-1} - 0.2256\ (U_t - U^*) \quad R^2 = 0.345$

$(\ t = 4.384\ ) \quad (\ t = -0.6509\ )$

The simple expectations augmented Phillips Curve: $(\pi_t) = f(\pi_t^e, U_t - U^*)$.

$\pi_t = -0.225 + 0.3472\ \pi_t^e - 0.07763(U_t - U^*) \quad R^2 = 0.7066$

$(t = 9.405\ ) \quad (t = -1.338\ )$

The Phillips Curve developed here: $(\pi_t) = f(\pi_t^e, dy, dn, U_t - U^*)$.

$\pi_t = -1.406 + 1.475\ \pi_t^e - 27.0879\ dy_t + 1.307\ dn_t - 0.2168\ (U_t - U^*)$

$(9.405\ ) \quad (-0.85\ ) \quad (1.343) \quad (-0.926)$

$R^2 = 0.732$

Even a cursory look at these 1980s regressions will reveal that neither unemployment rates nor gaps in unemployment rates have anything to do with inflation. No statistical significance is seen for any of the four equations. Of the variables chosen, only expected inflation shows strong statistical significance as an explanatory variable for inflation.

The 1990s

The following regressions were run with quarterly 1990s data for a total of 40 observations. The data were also culled from the Federal Reserve Bank of St. Louis's FRED and Michigan Survey except for natural rates of unemployment, which were gleaned from Robert Gordon's *Macroeconomics 10e*, and all data are in annualized percentage form.

The Classic Phillips Curve: $(\pi_t) = f(U_t)$.

$\pi_t = 1.556078 + 0.24022\ U_t$; $\quad R^2 = 0.0223$

$(\ t = .9316\ )$

The simple adaptive expectations Phillips Curve: $(\pi_t) = f(\pi_{t-1}, U_t - U^*)$.

$\pi_t = 2.7325 + 0.0745\ \pi_{t-1} - 0.0873\ (U_t - U^*)$; $\quad R^2 = 0.0067$

$(\ t = .4528\ ) \quad (\ t = -0.2556\ )$

The simple expectations augmented Phillips Curve: $(\pi_t) = f(\pi_t^e, U_t - U^*)$.

$\pi_t = -1.42186 + 0.7159\ \pi_t^e - 0.0282(U_t - U^*) \quad R^2 = 0.6095$

$(t = 7.5916\ ) \quad (t = -0.241\ )$

The Phillips Curve developed here: $(\pi_t) = f(\pi_t^e, dy, dn, U_t - U^*)$.

$\pi_t = -5.7018 + 2.860\ \pi_t^e - 58.1749\ dy_t - 0.096\ dn_t + 0.0191\ (U_t - U^*)$

$(6.7608\ ) \quad (-1.9088\ ) \quad (-0.1011) \quad (0.0907)$

$R^2 = 0.650$

Once again, neither unemployment rates nor gaps in unemployment rates appear to have anything to do with inflation during the 1990s. And once again, just as through the 1980s, only expected inflation shows strong statistical significance as an explanatory variable for inflation.

The 2000s

The following regressions were run with quarterly 2000s data. Some regressions have been run with more data than others due to a lack of data for natural rates of unemployment past 2004. Each regression reports the time periods used. The data were once again culled from the Federal Reserve Bank of St. Louis's FRED and Michigan Survey except for natural rates of unemployment, which were gleaned from Robert Gordon's *Macroeconomics 10e*. All data are in annualized percentage form.

The Classic Phillips Curve: $(\pi_t) = f(U_t)$ (from 2000.1– 2009.2)

$\pi_t = 8.3373 - 1.10564\, U_t$; $R^2 = 0.0806$

$(t = -1.1776)$

The simple adaptive expectations Phillips Curve: $(\pi_t) = f(\pi_{t-1}, U_t - U^*)$ (from 2000.1 – 2004.4)

$\pi_t = 3.7796 - 0.42065\, \pi_{t-1} - 0.8848\, (U_t - U^*)$; $R^2 = 0.217$

$(t = -1.887)$ $(t = -1.5657)$

The simple expectations augmented Phillips Curve: $(\pi_t) = f(\pi_t^e, U_t - U^*)$ (from 2000.1 – 2004.4)

$\pi_t = -0.9927 + 0.2008\, \pi_t^e + 0.0598(U_t - U^*)$ $R^2 = 0.386$

$(t = 3.0356)$ $(t = 0.434)$

The Phillips Curve developed here: $(\pi_t) = f(\pi_t^e, dy, dn, U_t - U^*)$.

(from 2000.1 – 2004.4)

$\pi_t = -7.3669 + 3.6094\, \pi_t^e - 49.2233\, dy_t - 3.296\, dn_t + 0.6224\, (U_t - U^*)$

(3.017) (-0.8607) (-1.3403) (1.0063)

$R^2 = 0.462$

Through the 2000s the trend we saw earlier continues with neither unemployment rates nor gaps in unemployment rates have anything to do with inflation during the 2000s although in the simple adaptive expectations Phillips Curve the *t*-stat is hovering closer to statistical significance (*p*-value was .076). And once again, just as through the 1980s and 1990s, only expected inflation shows a strong statistical significance as an explanatory variable for inflation.

The Microfoundations of the Phillips relation

Our empirical investigation of several different forms of both the long run and short run Phillips curves suggests that much of the excitement about the relationship between inflation and unemployment is unwarranted, even in the short run. Perhaps other variables are missing? In order to find out, the Phillips relation is derived here from market models, and we again empirically test for statistical significance of the Phillips curve [those tests are shown above under the heading *The Phillips Curve developed here:* $(\pi_t) = f(\pi_t^e, dy, dn, U_t - U^*)$].

First, we derive a Phillips relation from an equilibrium labor market and show that, as we would expect, no long run Phillips curve exists in this framework. More importantly, we find several variables that impact the short run Phillips relation but that have been omitted from most theoretical and empirical studies. It is clear that changes in the speed with which these variables

equilibrate the labor market may significantly impact the relationship between unemployment and inflation. Thus, in the appendix we re-design the short run Phillips relation by assuming that there exist various frictions that inhibit instantaneous adjustments to AD/AS equilibrium. This introduces a dynamic time path back to equilibrium from exogenous shocks to the model and produces short-run Phillips-like behavior within the model specifications.

The Labor Market-Based Model

To begin we posit a simple model of the labor market that, for now, will be in constant equilibrium.

(7) $$W^d = P\left(\frac{dY}{dN}\right)$$

(8) $$W^s = W_0 + \alpha_0 N - \alpha_1 LF + \alpha_2 P^e, \text{ and}$$

(9) $$W^d = W^s = W^*$$

where W^d is wage demand, W^s is the wage supply, P is the price level, Y is real income, N is the level of employment, LF is the labor force and P^e is the expected price level. If we put all of these in log form and take the time derivative we obtain rates of change for the variables, which are shown in lower case except the inflation rate, π:

(10) $w = \pi + (dy) - (dn)$, from equation (7), and

(11) $w = w_0 + \alpha_0 + n - \alpha_1 - lf + \alpha_2 + \pi^e$ from equation (8).

Setting (10) and (11) equal and solving for π gives

(12) $$\pi = w_0 + \alpha_0 - \alpha_1 + \alpha_2 + (dn) - (dy) + \pi^e + [n - lf]$$

Looking only at the last two terms (those in brackets) in (12), we may rewrite as

(13) $-[lf - n]$, which can be written in discrete time form as

(14) $$-\left[\left(\frac{LF_t - LF_{t-1}}{LF_{t-1}}\right) - \left(\frac{N_t - N_{t-1}}{N_{t-1}}\right)\right]$$

Multiplying through by (LF_{t-1}) and by (N_{t-1}) we get

(15) $$[LF_{t-1}N_t - LF_tN_{t-1}],$$

Since the current unemployment rate, U_t, is defined by

(16) $$U_t \equiv \frac{LF_t - N_t}{LF_t},$$

we may divide (11) by LF_t in order to acquire U_t in a different form:

(17) $$U_t \equiv \frac{[(LF_tN_t) - (LF_tN_{t-1})]}{LF_t}$$

If we then multiply through by one in the form, $\frac{LF_t - N_t}{LF_t - N_t}$,

this leads to

(18) $$\left[\left(\frac{[(LF_tN_t) - (LF_tN_{t-1})]}{LF_t - N_t}\right)U_t\right].$$

Recall that we have ultimately multiplied through by $\frac{LF_{t-1} - N_{t-1}}{LF_t} > 0$ for the entire process. We may denote this expression θ. Thus, from (12) and (18) we now have

(19) $$\pi = \varphi + (dn) - (dy) + \pi^e - \frac{1}{\theta}\left[\left(\frac{[(LF_tN_t)-(LF_tN_{t-2})]}{LF_t-N_t}\right)U_t\right]^2$$

where $\varphi = w_0 + \alpha_0 - \alpha_1 + \alpha_2$.

The expression (19) is in simple linear form and is much like the textbook models. The slope term is ambiguous, but does have a positive denominator and is defined. All of the intercept terms are the shift components for this function, so if φ changes the corresponding inflation rate will rise or fall based on the sign of the coefficient and time of adjustment. Having been derived directly from the labor market, the resulting Phillips curve is more like a New Keynesian Phillips Curve because it fails to explicitly bring in the aggregate demand side of the economy.

Long run insight

To summarize (19), the usual Friedman-Phelps-Lucas long run result is included, that an increase in expected inflation will shift the curve upward in a 1-1 ratio, i.e., expected inflation is equal to actual in the long run. A reasonable test, then, is to check for the inflation expectations coefficient to be unitary. Our empirical results above do not show anything near a 1-1 ratio; on the other hand, the expected result doesn't come about in the standard textbook models either. Also, the conventional result that autonomous upward shifts of the labor supply curve (shown by w_0) will shift the long run Phillips Curve upward is included as well. Finally, the ambiguous slope is a reflection of the long run Phillips Curve being vertical, which is empirically supported here.

Short run insight

But some of (19) is new. For instance, α_0, the wage response to increases in employment, shows a positive impact on inflation as the response rate increases; α_1, the wage response to increases in the labor force, shows a negative impact on inflation as the response rate increases; similarly, the wage response to increases in expected inflation, α_2, also pushes inflation higher as the coefficient rises. But more importantly, as the rate of employment speeds up, (dn) > 0, this has a positive impact on inflation, and as real GDP grows at a faster rate, (dy) > 0, this has a negative inflationary impact.

One of these last two results has been long known from the famous equation of exchange but seems to have been forgotten or pushed aside as the economic fraternity has moved to the standard NAIRU view. To reiterate, theory suggests that, if anything, faster growing GDP *lowers* the rate of inflation, it does not increase it. It is interesting that this same conjecture comes from a completely different theoretical underpinning.

New to this paper we theorize that faster growing employment *increases* inflation, it does not lower it, *ceteris paribus*. To the extent that these two variables, GDP growth rates and employment growth rates, are positively correlated and cointegrated but have opposite impacts, the final reflection on inflation remains to be seen.

Our Continuing Empirical Journey; Scatter Plots

[2] It is perhaps unusual to use inflation rather than the unemployment rate as the dependent variable, but we do not presume to know the causality here and either one can be used to describe the simple equation of a line; moreover, this form is in keeping with the usual graphical portrayal and is common to many earlier expressions.

Often a picture is worth a thousand words (or regressions), so we have included four differing scatter plots to show possible long or short run connections between inflation and unemployment. The four types of functional relationships are shown below.

(1) *The Classic Phillips Curve:* $(\pi_t) = f(U_t)$

Figures 1, 5, 9, and 13 are all of this form.

(2) *The Hybrid-Classic Phillips Curve:* $(\pi_t) = f(U_t - U^*)$

Figures 2, 6, 10, and 14 are all of this form.

(3) *The simple adaptive expectations (Modigliani-Papademos) Phillips Curve:*

$$(\pi_t) = f(\pi_{t-1}, U_t - U^*)$$

Figures 3, 7, and 11 are all of this form.

(4) *The simple expectations augmented (Friedman-Phelps) Phillips Curve:*

$$(\pi_t) = f(\pi_t^e, U_t - U^*)$$

Figures 4, 9, and 12 are all of this form.

CPI and Unemployment Rates

Finally, in Figure 15 we include a graphical view of the curiously interesting relationship between unemployment rates and the CPI. One is struck by the impression that the left turns of the unemployment rate are more rounded, while the right turns are more abrupt. That is, it appears that going into an economic downturn is slower and less abrupt than a recovery from a downturn. Moreover, the idea of hysteresis immediately springs to mind as you look at Figure 15. Perhaps this warrants further investigation.

Summary and Conclusions

We have found that for over thirty years there has been no statistically significant relationship between any of the usually mentioned variables associated with a Phillips Curve. Indeed, the model we derived here also fails to bring to light any new relevant variables. Only expectations of inflation consistently showed statistical significance irrespective of the models that we tested. And yet our newest books in the field such as Fontana and Setterfield's *Macroeconomic Theory and Macroeconomic Pedagogy* (2010) use a three-equation supposed, "new consensus," New Keynesian model that incorporates the Phillips Curve as one of the three equations. Why?

Using models that are known to have no empirical basis has no place in determining policy. Perhaps the aggregate demand side emphasis of Keynesian models have cowed the field into using the Phillips relation; either aggregate supply shocks must be regularly occurring enough for any empirical relationship between inflation and unemployment rates to dissolve, or aggregate demand management does not work in any standard textbook manner, perhaps due to crowding out or aggregate supply feedback effects.

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Graphical Expositions of the 1980s

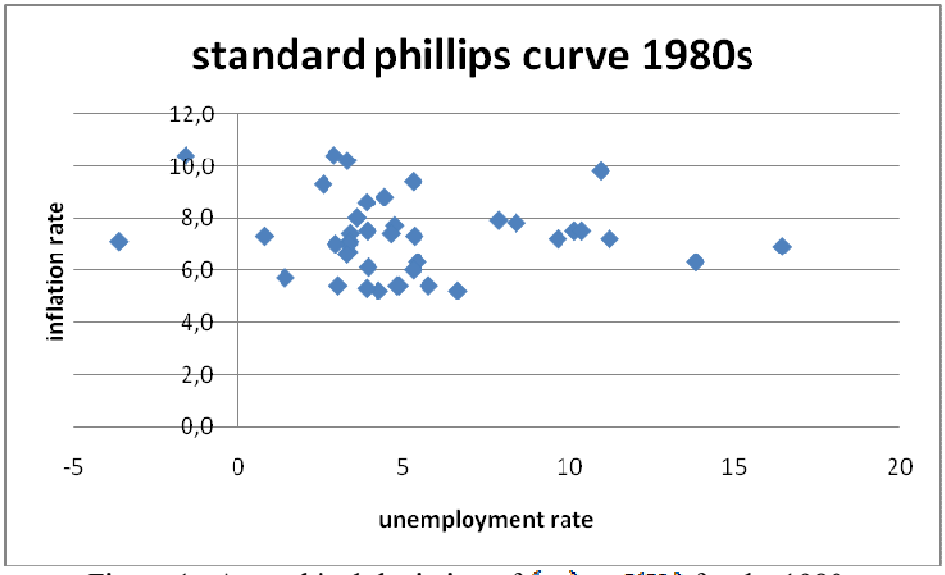

Figure 1 A graphical depiction of $(\pi_t) = f(U_t)$ for the 1980s

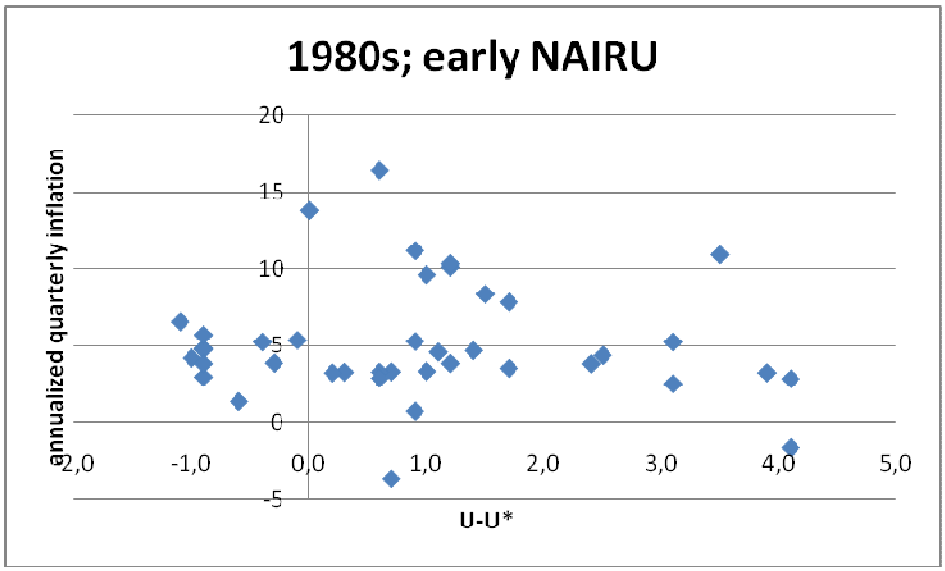

Figure 2 A graphical depiction of $(\pi_t) = f(U_t - U^*)$ for the 1980s

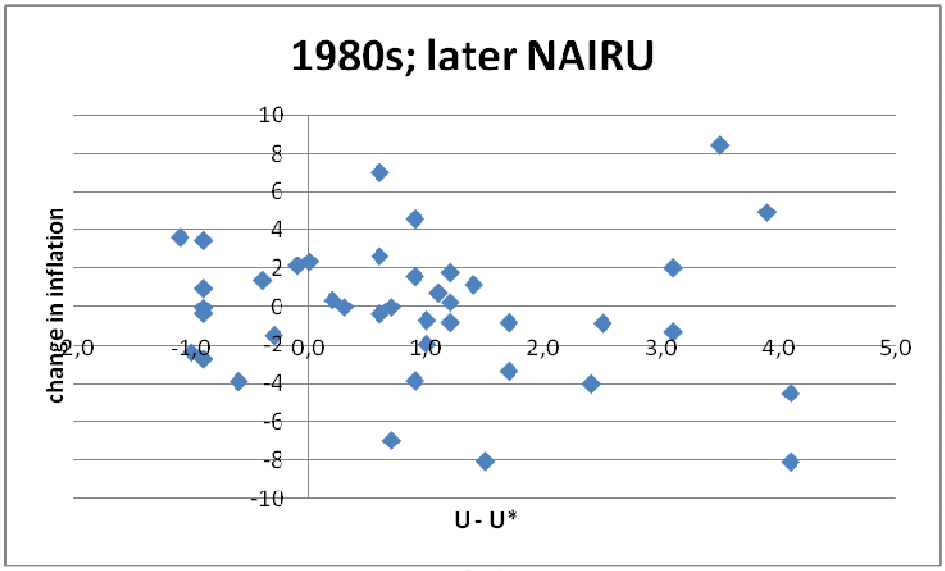

Figure 3 A graphical depiction of $(\pi_t) = f(\pi_{t-1}, U_t - U^*)$ for the 1980s

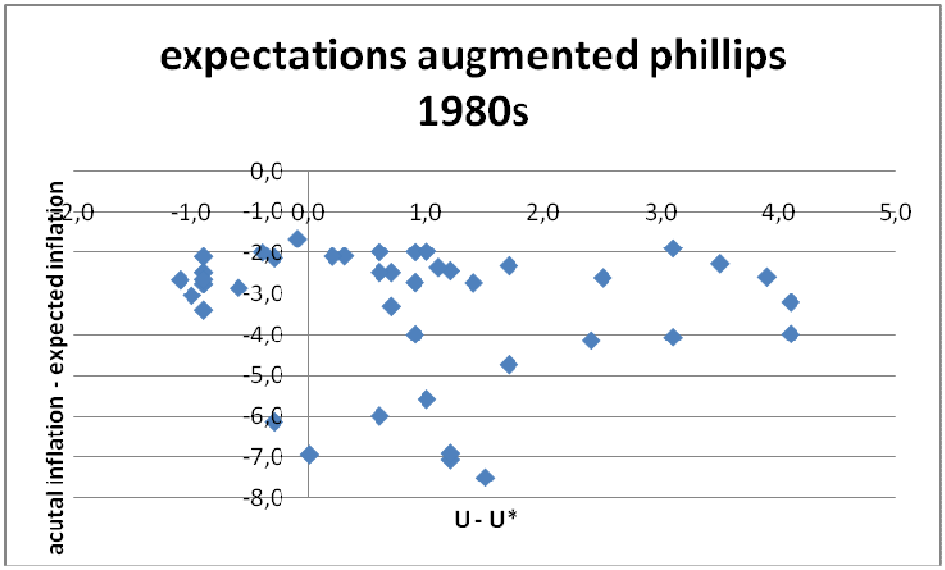

Figure 4 A graphical depiction of $(\pi_t) = f(\pi_t^e, U_t - U^*)$ for the 1980s

Graphical Expositions of the 1990s

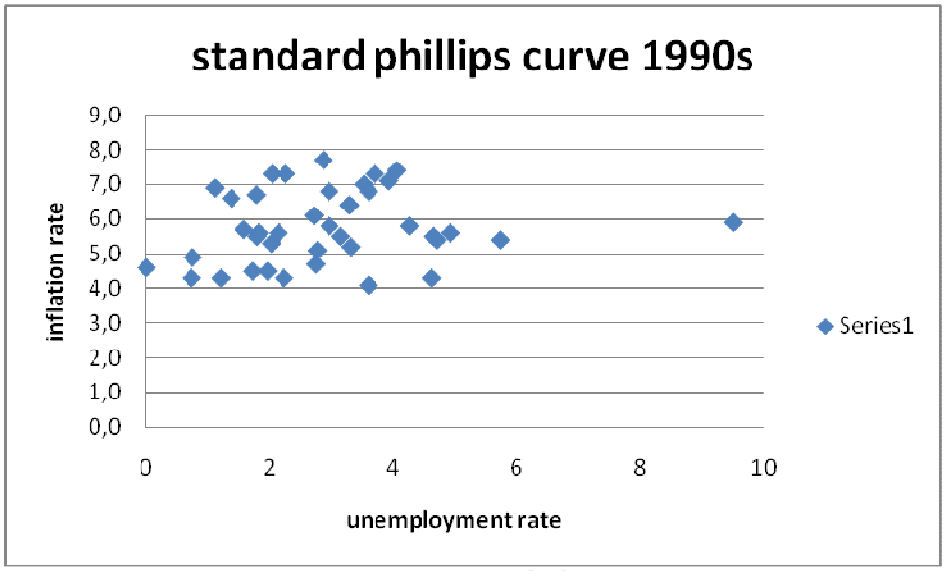

Figure 5 A graphical depiction of $(\pi_t) = f(U_t)$ for the 1990s

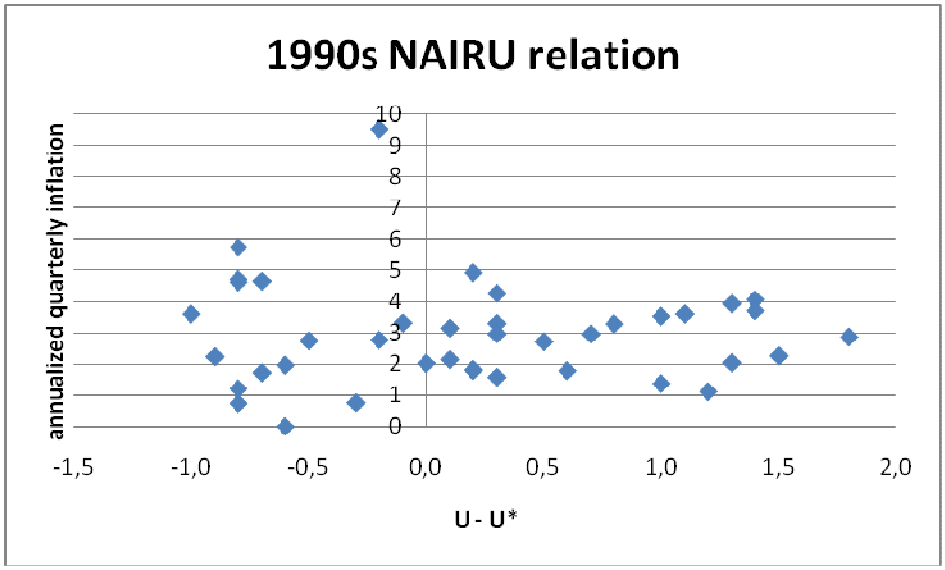

Figure 6 A graphical depiction of $(\pi_t) = f(U_t - U^*)$ for the 1990s

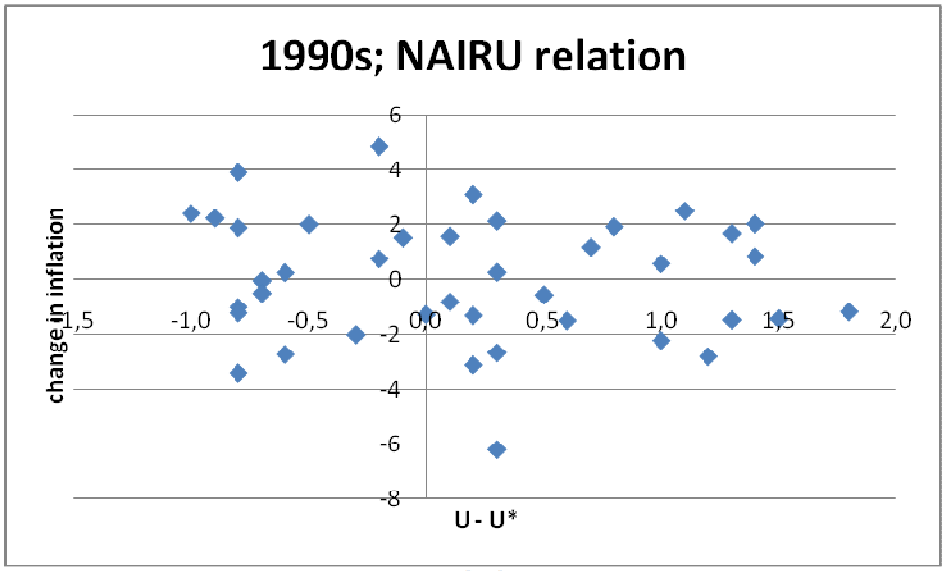

Figure 7 A graphical depiction of $(\pi_t) = f(\pi_{t-1}, U_t - U^*)$ for the 1990s

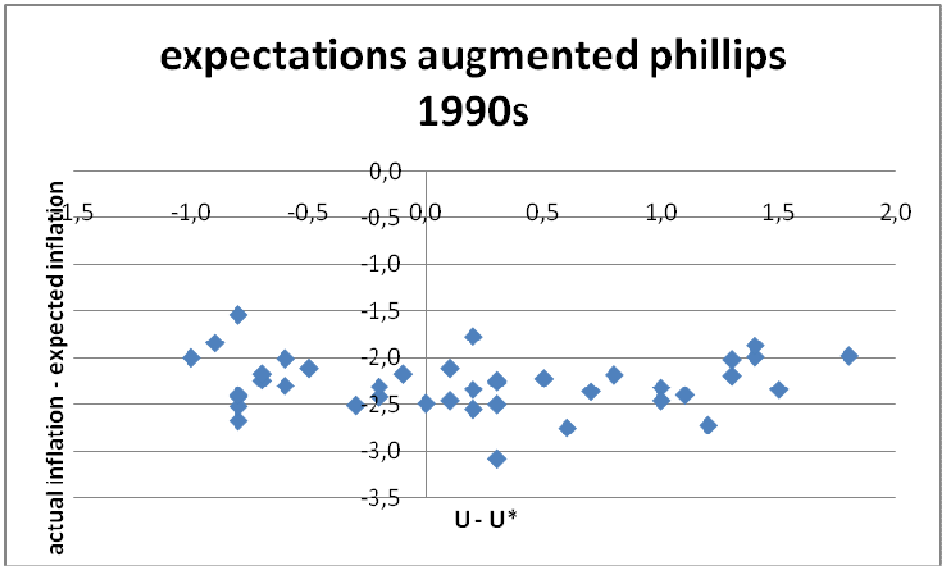

Figure 8 A graphical depiction of $(\pi_t) = f(\pi_t^e, U_t - U^*)$ for the 1990s

Graphical Expositions of the 2000s

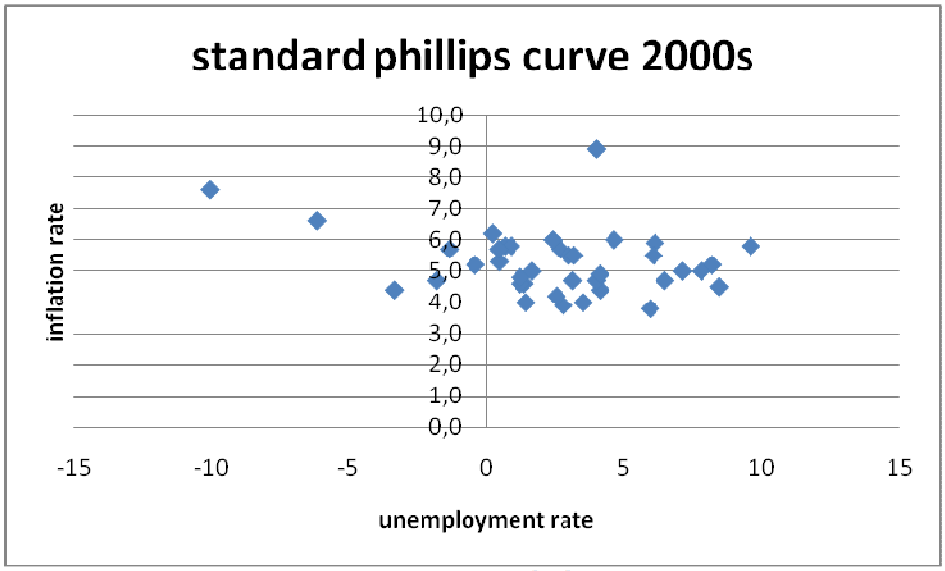

Figure 9 A graphical depiction of $(\pi_t) = f(U_t)$ for the 2000s

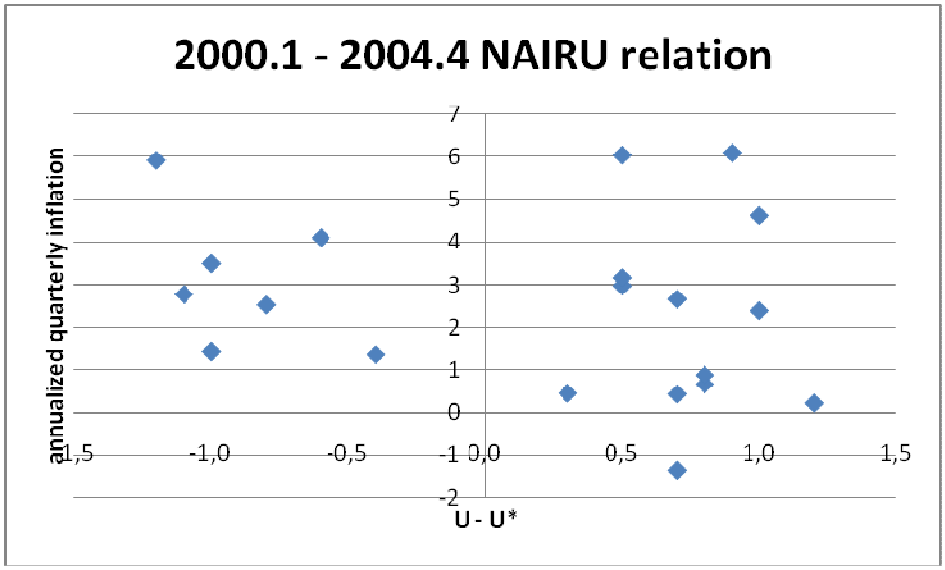

Figure 10 A graphical depiction of $(\pi_t) = f(U_t - U^*)$ for the 2000s

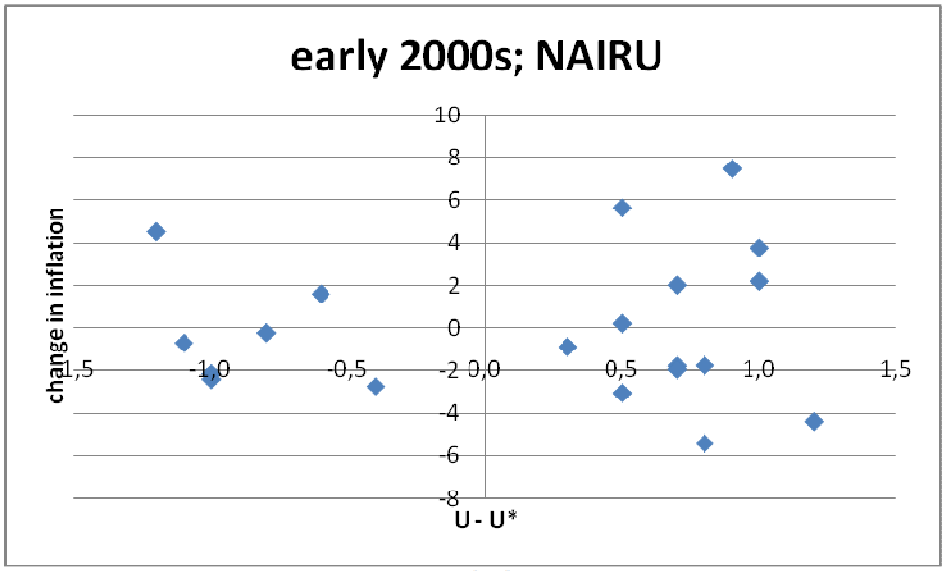

Figure 11 A graphical depiction of $(\pi_t) = f(\pi_{t-1}, U_t - U^*)$ for the 2000s

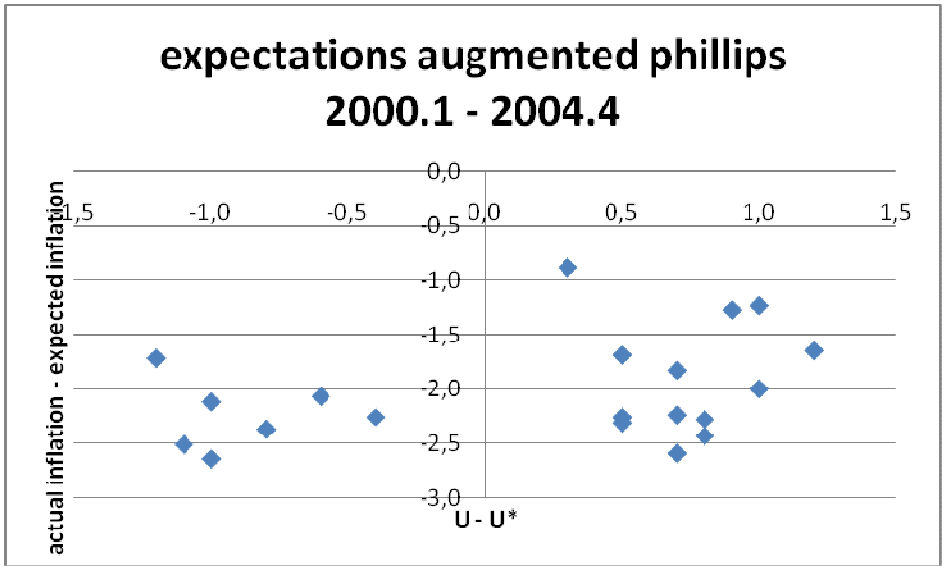

Figure 12 A graphical depiction of $(\pi_t) = f(\pi_t^e, U_t - U^*)$ for the 2000s

Graphical Expositions of the 1978.2 – 2004.4

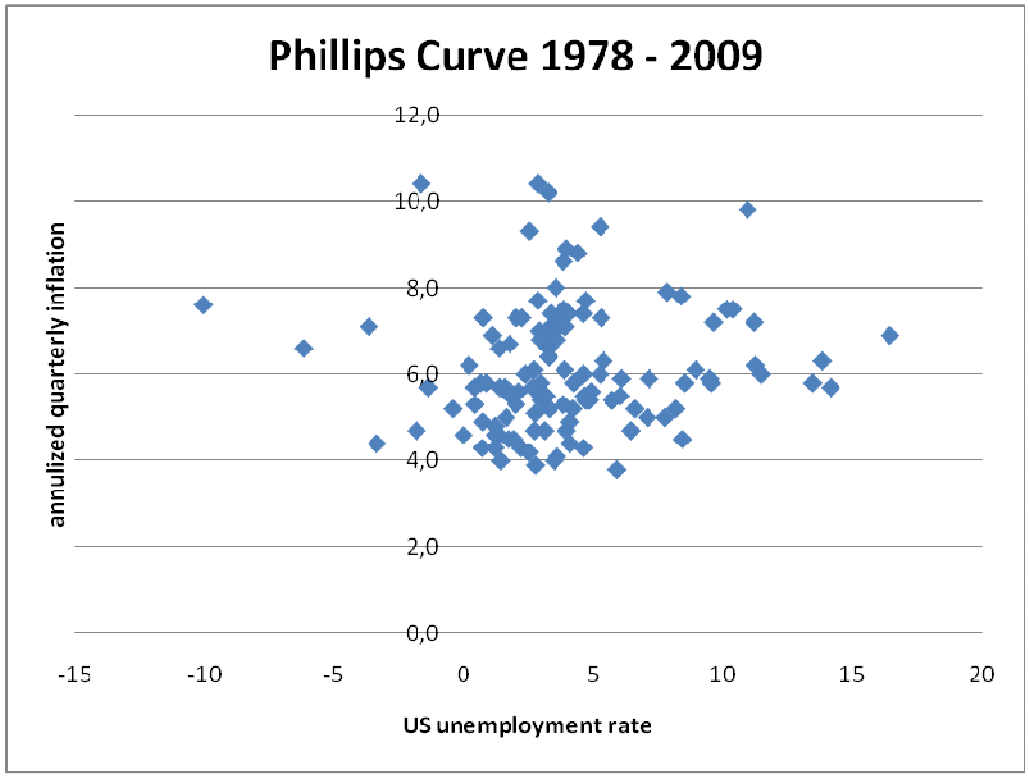

Figure 13 A graphical depiction of $(\pi_t) = f(U_t)$ for the entire period, 1978 - 2009

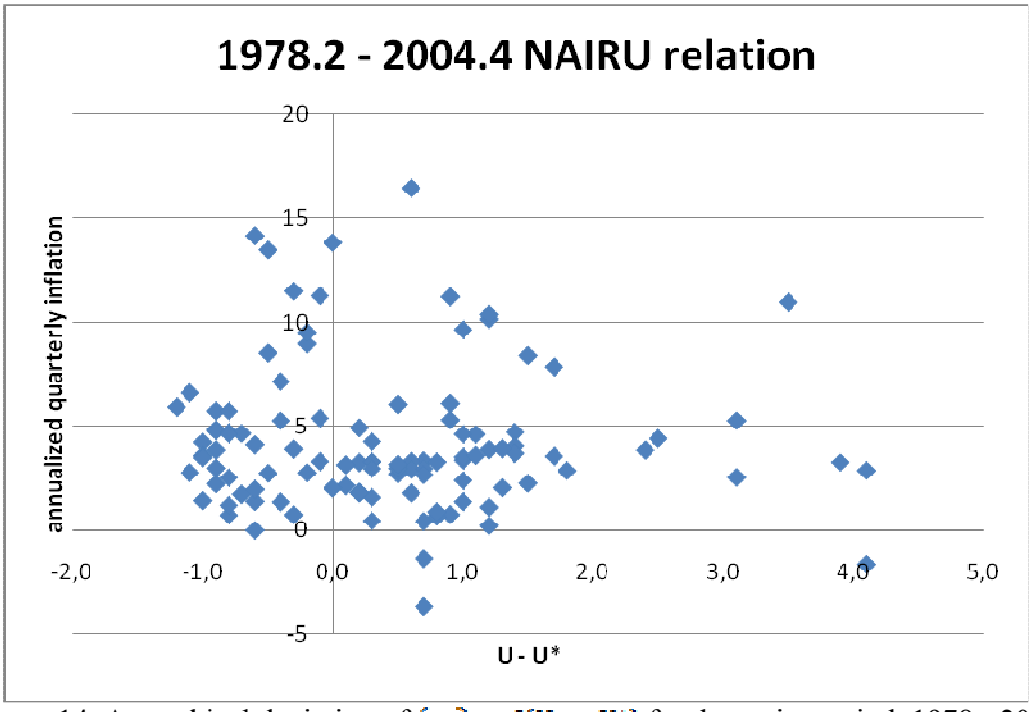

Figure 14 A graphical depiction of $(\pi_t) = f(U_t - U^*)$ for the entire period, 1978 - 2009

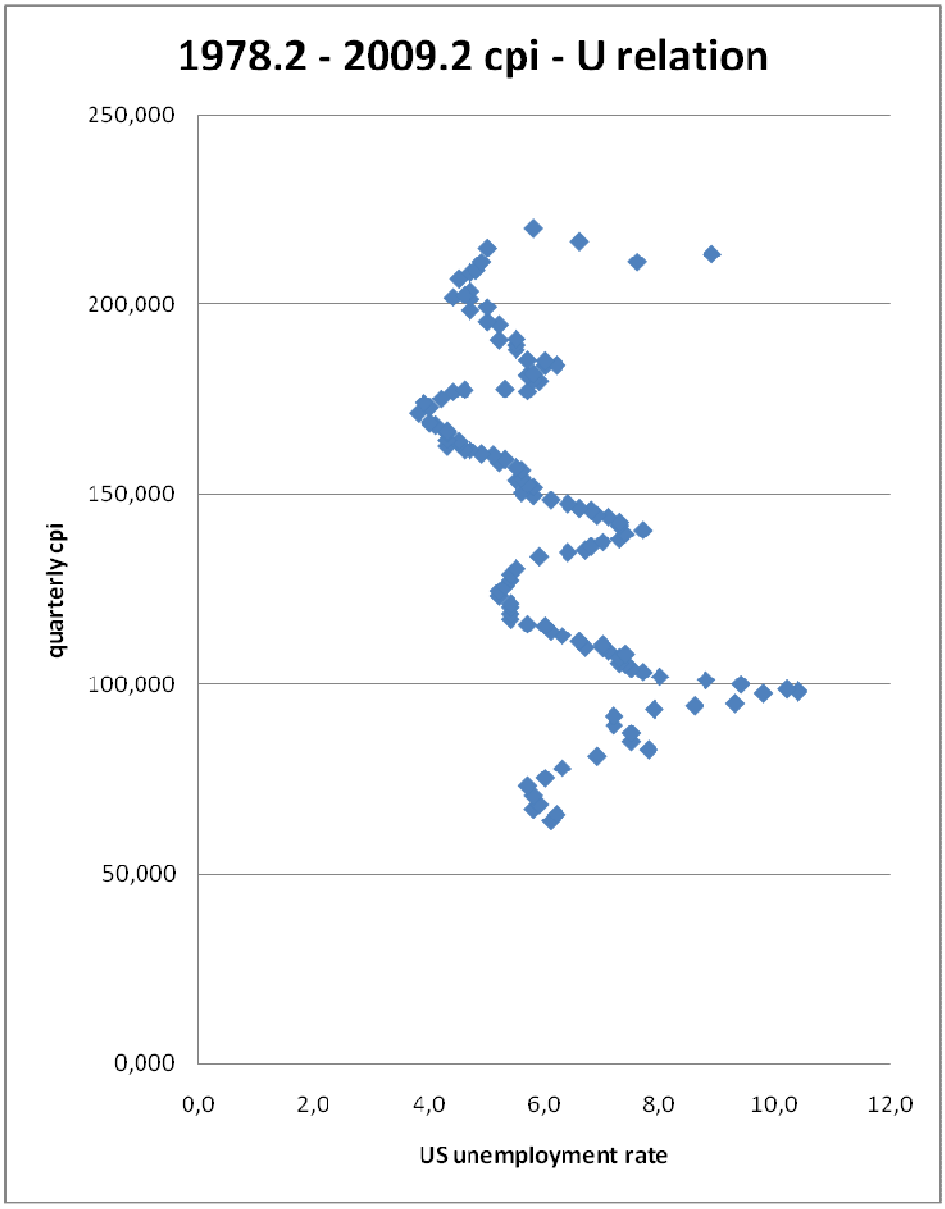

Figure 15 A graphical depiction of the curious relationship between CPIs and unemployment rates from 1978 to 2009; the function $(CPI_t) = f(U_t)$

Appendix 1: An AD/AS-Based Phillips Curve Model

Aggregate Supply

Assume the following simple model of aggregate supply (AS)

$$Y = a_0 + a_1 N + a_2 \Omega + a_3 R$$

$$w^s = w_0 + \beta_0 N + \beta_1 P + \beta_2 P^e$$

$$w^d = w_1 - \gamma_0 a_1 N + \gamma_1 P$$

$$w^d = w^s$$

Where, Y = real output (GDP), N = employment, Ω = technology, R = resources, w^s = nominal wage (supply), w^d = nominal wages (demand), P^e = expected price level, and P = price level.

With some mathematical manipulation we can solve for the AS curve as:

$$Y^s = \alpha_0 + \alpha_1 \left\{ \left(\frac{w_1 - w_0}{\gamma_0 \alpha_1 + \beta_0} \right) - \left(\frac{\beta_2}{\gamma_0 \alpha_1 + \beta_0} \right) P^e + \left(\frac{\gamma_1 - \beta_1}{\gamma_0 \alpha_1 + \beta_0} \right) P \right\} + \alpha_2 \Omega + \alpha_3 R,$$

which can be written, instead, as

$$Y^s = b_0 + b_1 P$$

where,

$$b_0 = \alpha_0 + \alpha_2 \Omega + \alpha_3 R + \alpha_1 \left\{ \left(\frac{w_1 - w_0}{\gamma_0 \alpha_1 + \beta_0} \right) - \left(\frac{\beta_2}{\gamma_0 \alpha_1 + \beta_0} \right) P^e \right\}$$

and

$$b_1 = \alpha_1 \left(\frac{\gamma_1 - \beta_1}{\gamma_0 \alpha_1 + \beta_0} \right) P$$

Aggregate Demand

Assume the simple model for aggregate demand (AD) via IS-LM. The first set of equations make up the IS curve and are the same equations used for the familiar Keynesian Cross presentations.

$$Y = C + I + G$$

$$C = C_0 + b(Y - T) - \theta P$$

$$T = T_0 + tY$$

$$I = I_0 + iY - er$$

$$G = G_0 + gY$$

The second set of equations comes from the LM curve in the money market.

$$L = L_0 + kY - mr$$

$$M = M_0$$

$$M = L$$

Where, Y = real output (GDP), C = real consumption, P = price level, r = real interest rate, G = real government expenditures, I = real investment expenditures, T = real tax receipts, M = money stock, and L = Liquidity Preference (money demand).

With some mathematical manipulation the equations reduce to the expression for AD:

$$Y^d = \frac{1}{\left(\frac{m(1 - \lambda + \lambda t - i - g)}{e} + k \right)} \left[(M_0 - L_0) - \frac{m}{e} \left(C_0 + I_0 + G_0 - bT_0 - \eta P \right) \right]$$

This function can be re-written in simple linear form as:

$Y^d = a_0 - a_1 P$

where

$$a_0 = \frac{1}{\left(\frac{m(1-\lambda+\lambda t-i-g)}{e}+k\right)}\left[(M_0 - L_0) - \frac{m}{e}\left(C_0 + I_0 + G_0 - bT_0\right)\right], \text{ and}$$

$$a_1 = \frac{1}{\left(\frac{m(1-\lambda+\lambda t-i-g)}{e}+k\right)}\left[-\frac{m}{e}(-\eta)\right], \text{ or more simply as}$$

$$a_1 = \frac{\left(\frac{m\eta}{e}\right)}{\left(\frac{m(1-\lambda+\lambda t-i-g)}{e}+k\right)}$$

Now, assume the following standard time-sensitive inventory adjustment model of those aggregate supply and demand functions, that allows for disequilibrium (see equation (3)) while still possessing forces that continually push toward equilibrium.

(1) $Y_t^d = a_0 - a_1 P_t$

(2) $Y_t^s = b_0 + b_1 P_t$

(3) $P_t = P_{t-1} - \theta(Y_{t-1}^s - Y_{t-1}^d)$, where $\theta > 0$.

Equation (3) is, of course, much like the usual modern textbook portrayal of the Phillips Curve but without the inflation expectations augmentation. Thus the Phillips curve is part of a larger system rather than being the final equation and, more importantly, it does not assume that there exists a fixed or even targeted rate of output. Instead, the equilibrium level of real GDP is completely determined by market forces. We need to solve equation (3) for all its components.

We may reduce the set of three equations to a first difference equation. Following Hess[3] (2002) we obtain,

(4) $P_t = P_{t-1} - \theta\{(b_0 - b_1 P_{t-1}) - (a_0 + a_1 P_{t-1})\}$

(5) $P_t = P_{t-1} - \theta\{(b_0 - a_0) + (b_1 - a_1)P_{t-1})\}$

(6) $P_t = P_{t-1} - \theta(b_0 - a_0) - \theta(b_1 - a_1)P_{t-1}$

(7) $P_t = [1 - \theta(b_1 - a_1)]P_{t-1} - \theta(b_0 - a_0)$

Equation (7) can be written in the general first difference equation form, $y_t - ay_{t-1} = b$:

(8) $P_t - [1 - \theta(b_1 - a_1)]P_{t-1} = -\theta(b_0 - a_0)$

Solving the General First Order Difference Equation

The general first order difference equation is often shown in its basic form as $y_t - ay_{t-1} = b$. We solve this equation below by steps. The first step is to solve for the particular solution.

The Particular Solution

[3] Hess, Peter, *Using Mathematics in Economic Analysis*, Pearson Education, Inc., Prentice Hall, 2002, pp. 77 – 83. This section is adapted from his presentation.

If we make the assumption that all period y values are equal, i.e., $y_t = y_{t-1} = y_{t-2} = ... = y_{t-n} = \bar{y}$, then we may write the general equation as $\bar{y} - a\bar{y} = b$. By factoring out $\bar{y}$, $\bar{y}(1-a) = b$ and solving for $\bar{y}$ we get

(9) $\bar{y} = \dfrac{b}{1-a}$. This is our *particular solution*.

The General Solution

In order to arrive at the general solution we first find the complementary function, y_c. The complementary function is found by solving the general first order difference equation when $b = 0$. That is, $y_t - ay_{t-1} = 0$. It is easy to determine that the general solution to this complementary function is dependent upon the initial value of y, y_0.

$y_1 = ay_0$	$y_1 = ay_0$
$y_2 = ay_1$	$y_2 = ay_1 = a(ay_0) = a^2y_0$
$y_3 = ay_2$	$y_3 = ay_2 = a(a^2y_0) = a^3y_0$
.	.
.	.
.	.
$y_n = ay_{n-1}$	$y_t = a^t y_0$

Thus, we know that y_t is a function of the initial value of y, y_0, or more generally,

(10) $y_c = (a)^t A$.

In (10) A represents both the initial value of y, and the unseen component, b, still to be considered. In order to find the general solution, then, we add equations (9) and (10) together in the form, $y_t = \bar{y} + y_c$ and evaluate at $t = 0$. So,

(11) $y_t = \bar{y} + y_c$

(12) $y_t = \dfrac{b}{1-a} + (a)^t y_0$

Setting $t = 0$, we obtain

(13) $y_0 = \dfrac{b}{1-a} + (a)^0 A$, where, again, A is the general constant that is unknowable, that includes both y_0 and b.

The Definite Solution

We can use the result in equation (13) to find the definite solution, which requires solving for A while still assuming $t = 0$.

From $y_0 = \dfrac{b}{1-a} + (a)^0 A$

(14) $(a)^0 A = y_0 - \dfrac{b}{1-a}$

(15) $A = y_0 - \dfrac{b}{1-a}$, (because $(a)^0 \equiv 1$)

(16) $$A = y_0 - \frac{b}{1-a} = y_0 - \bar{y}\text{, (from (9)).}$$

Thus, from equation (11), $y_t = \bar{y} + y_c$, and from the particular solution (equation 9), $\bar{y} = \frac{b}{1-a}$ and from the general solution (equation 10) $y_c = (a)^t A$, we arrive at:

(17) $$y_t = \frac{b}{1-a} + (a)^t A$$

From (16) we can substitute in for A to get

(18) $$y_t = \frac{b}{1-a} + (a)^t \left[y_0 - \frac{b}{1-a} \right]\text{, which is the definite solution.}$$

And, finally, the definite solution (18) can be reduced to

(19) $$y_t = \bar{y} + \left[y_0 - \bar{y}\right] \cdot (a)^t .$$

Taking the original first order difference equation that we solved for at the beginning, namely,

(8) $$P_t - \left[1 - \theta(b_1 - a_1)\right] P_{t-1} = -\theta(b_0 - a_0),$$

we can now find its definite solution. Letting $a = -\left[1 - \theta(b_1 - a_1)\right]$ and $b = -\theta(b_0 - a_0)$, the definite solution to our original set of AD/AS equations is

(20) $$P_t = \frac{-\theta(b_0 - a_0)}{1 + \left[1 - \theta(b_1 - a_1)\right]} + P_0 + \left[\frac{-\theta(b_0 - a_0)}{1 + \left[1 - \theta(b_1 - a_1)\right]} \right] \cdot \left(1 - \theta(b_1 - a_1)\right)^t$$

where, once again,

$$a_0 = \frac{1}{\left(\frac{m(1 - \lambda + \lambda t - i - g)}{e} + k \right)} \left[(M_0 - L_0) - \frac{m}{e}\left(C_0 + I_0 + G_0 - bT_0\right) \right]$$

$$a_1 = \frac{\left(\frac{m\eta}{e} \right)}{\left(\frac{m(1 - \lambda + \lambda t - i - g)}{e} + k \right)}$$

$$b_0 = \alpha_0 + \alpha_2 \Omega + \alpha_3 R + \alpha_1 \left\{ \left(\frac{w_1 - w_0}{\gamma_0 \alpha_1 + \beta_0} \right) - \left(\frac{\beta_2}{\gamma_0 \alpha_1 + \beta_0} \right) P^e \right\}$$

$$b_1 = \alpha_1 \left(\frac{\gamma_1 - \beta_1}{\gamma_0 \alpha_1 + \beta_0} \right) P$$

As can be seen, the dynamic expression in equation (20) is complicated but all of the AD/AS elements are now represented. By importing these four components into the definite solution we can theoretically get a time path back to equilibrium. That time path is the true dynamic Phillips relation incorporating all of the relevant economic variables.

Lean Accounting in the Information Age

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Abstract

It has become common to see news reports of a United States based company shutting down a factory it has operated for decades. Meanwhile, foreign manufacturers are profitably opening and running brand-new plants in their place. One reason cited for these newer plants is, instead of using tradition standard cost variance analysis to control per-unit costs while maximizing production capacity, these foreign companies have adopted a build-to-order production strategy that focuses on maximizing value to their customers by removing non-value added wasteful practices. Known as Lean Production, this shift in process management has resulted in the development of Lean Accounting. This paper examines how Lean Accounting has evolved to serve the needs of firms in the Information Age.

Introduction

It has become common to see reports of one of the Big-Three auto companies shutting down a factory located in the United States it has operated for decades. Meanwhile, foreign manufacturers are profitably opening brand-new plants to take their place. While some pundits claim the use of non-union labor is the reason for their success, there appears to be a much deeper reason. Instead of narrowly focused/top-down management efforts aimed at controlling per-unit costs by maximizing production, foreign manufacturers have adopted strategies that focus on maximizing value to their customers by removing wasteful practices. Known as Lean Production, this shift in process management has resulted in a corresponding challenge to the accounting profession to learn and understand how Lean Production works. This study examines some of the major differences between traditional and lean accounting with a view toward gaining an understanding of how the profession can meet these challenges.

What is lean production?

Definition

Perhaps fortunately, a standardized definition of "Lean Production" ("Lean") has so far escaped the pedagogical lasso and has not yet been rounded up into an academic cliché fit for a textbook. It simultaneously known as: The Toyota Production System, Just-In-Time, Continuous Improvement, Kaizen, Total Quality Control, and Six Sigma by some, and a "Total Waste of Time" by others. Regardless of the label affixed to a particular theology, the hallmarks of Lean are a "build-to-order" production system that emphasizes decentralized control and simplicity as a means for eliminating waste from the value-added (from the customer's perspective) production process.

A frequently cited five-step view of Lean is:

1. Specify value from the standpoint of the end customer by product family.
2. Identify all the steps in the value stream for each product family, eliminating whenever possible those steps that do not create value.
3. Make the value-creating steps occur in tight sequence so the product will flow smoothly toward the customer.
4. As flow is introduced, let customers pull value from the next upstream activity.
5. As value is specified, value streams are identified, wasted steps are removed, and flow and pull are introduced, begin the process again and continue it until a state of perfection is reached in which perfect value is created with no waste. [Womak and Jones 2003]

Said another way, by Taichi Ohno, who is generally credited as the founder of the Toyota Production System:

All we are doing is looking at the time line from the moment the customer gives us an order to the point when we collect the cash. And we are reducing that time line by removing the non-valued wastes. [Ohno 1998].

The result is a production system that maps the value added, as measured by the end customer, to raw material as it moves through the system and eliminates or minimizes activities that do not add value. The key is understanding the primal focus on the customer. It all boils down to transforming materials and labor into a finished product the customer is willing to buy with the minimum amount of waste. This laser focus on maximizing customer value is in sharp contrast to traditional mass production systems, which typically use standard cost variances to minimize per-unit costs while maximizing production capacity

History

I plan to cut down on the slack time within work processes and in the shipping of parts and materials as much as possible. As the basic principle in realizing this plan, I will uphold the "just in time" approach. The guiding rule is not to have goods shipped too early or too late. Kiichiro Toyoda, Founder of Toyota Motor Company, 1938. [Liker 2004].

It all started with looms. After much trial and error, Sakichi Toyoda developed a "mistake-proof" loom that he sold in 1930 for 100,000 English pounds and used this to back his son, Kiichiro Toyoda, to open the Toyota Motor Corporation.

Hampered by initial poor quality, Kiichiro visited Ford Motor Company to study Henry Ford's system in the early 1930s. However, his biggest insight came from visiting a Piggy Wiggly grocery store where he marveled over how they keep a limited amount of inventory on the shelf that was replaced only as it was sold. From this, Kiichiro developed the idea of using customer demand to "pull" production through the system instead of "pushing" production in order to maximize capacity.

Because World War II decimated Japan and Toyota, the Company had no choice but to cut costs and remove waste wherever possible to survive. Out of necessity, Toyota developed what became known as the Toyota Way.

Since Toyota's founding we have adhered to the core principle of contributing to society through the practice of manufacturing high-quality products and services. Our business practices and activities based on this core principle created values, beliefs and business methods that over the years have become a source of competitive advantage. These are the managerial values and business methods that are known collectively as the Toyota Way. Fujio Cho, President Toyota, 2001. [Liker 2004].

Leveraging off its collaboration with Dr. Edwards Deming's Plan-Do-Check-Act (PDCA) Cycle, Toyota developed the following 14 principles, which are now known as "The Toyota Way." [Liker 2004].

The Toyota Way:

Section I: Long-Term Philosophy

1. Base your management decisions on a long-term philosophy, even at the expense of short-term goals.

Section II: The Right Process Will Produce the Right Results

2. Create continuous process flow to bring problems to the surface.
3. Use "pull" systems to avoid overproduction.
4. Level out the workload *(heijunka*).
5. Build a culture of stopping to fix problems, to get quality right the first time
6. Standardized tasks are the foundation for continuous improvement and employee empowerment.
7. Use visual control so no problems are hidden.
8. Use only reliable, thoroughly tested technology that serves your people and processes.

Section III: Add Value to the Organization by Developing Your People and Partners

9. Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others.
10. Develop exceptional people and teams who follow your company's philosophy.
11. Respect your extended network of partners and suppliers by challenging them and helping them improve.

Section IV: Continuously Solving Root Problems Drives Organizational Learning

12. Go and see for yourself to thoroughly understand the situation (genchi genbutsu).
13. Make decisions slowly by consensus, thoroughly considering all options; implement decisions rapidly (*nemawshi*).
14. Become a learning organization through relentless reflection (*hansie*) and continuous improvement *(kaizen*).

As more and more companies started adopting the Toyota Way into their own processes, it became known as Lean Production. [Womack et al 1991]

Summary

Lean Production is a paradox. Viewed from the top down it is a highly centralized management philosophy for satisfying customers. There is no other way than the Toyota Way. Adopting Lean theology is a light switch. You either use it throughout the entire organization or you do not use it at all.

However, when viewed from the shop floor, Lean Production is a highly decentralized work process that empowers its workers to constantly add to the value stream map by engaging in continuous improvement. Because work is typically organized in cells or teams, members are constantly challenged to add value and remove waste.

While there are as many variations on implementing a Lean Production system as there are practitioners, one suggested format is:

Step 1: Define the value stream.

Step 2. Controlling the value stream.

Step 3: Managing the value stream.

Step 4: Improving the value stream.

Step 5: Planning the value stream. [Maskell et al 2007]

Due to the critical nature of accurately reporting the financial impact of a Lean Production system, accountants, as discussed next, must play a crucial role in understanding, implementing and supporting lean thinking throughout the system.

What is lean accounting?

What it is not

Just as Lean Production has not been decomposed into a convenient sound bite, trying to define Lean Accounting is similar to putting smoke back into a bottle. Other than to say that the purpose of Lean Accounting is to support Lean thinking [Maskell and Baggaley 2004], one way of defining Lean Accounting is by clarifying what it is not:

1. Lean Accounting is not concerned with traditional standard cost standard costing and overhead allocations because measuring capacity usage is no longer a concern. [Maskell and Baggaley 2004]. You will not see fixed overhead volume variances in Lean Accounting.
2. It is not Activity Based Costing for overhead pools. Because Lean seeks to remove all non-value added waste, refining how we allocate wasteful overhead is no longer a concern.
3. Because Lean Production cares more about value mapping than determining "fair" intra-company transfer prices or divisional returns on investment, Lean Accounting does not lead itself to making arbitrary allocations of overhead.
4. Given the goal of "Just-In-Time" ("JIT") inventories, Lead Accounting plays little attention to ending inventory valuations.
5. Lean Accounting is generally not view as focused on removing waste solely from the accounting function, although reducing wasteful procedures is a byproduct of Lean thinking

Advantages

We can however, identify that Lean Accounting:

* Provides information on better lean decision making, which improve revenue and profitability.
* Reduces time, cost, and waste by eliminating wasteful transactions and systems.

* Identifies the potential financial benefits of lean improvement initiatives and focuses on the strategies required to realize those benefits.
* Motivates long-term improvement by providing lean-focused information and statistics.
* Addresses customer value directly by linking performance measurement to the drivers of value creation and driving changes to maximize this value. [Maskell and Baggaley 2004]

Definition

Pulling all this together results in the following definition of Lean Accounting:

Lean accounting supports Lean Operations by accurately reporting the financial impact of Lean improvement in a way that is clear, understandable, and actionable. Lean Accounting provides decision-making tools focused on lean value streams; it identifies areas where improvement projects will improve financial results, and it furnishes powerful planning tools for capacity requirements and much more. [Maskell et al 2007].

The information age

The third wave

Alvin Toffler in his book, *The Third Wave*, [Toffler 1980] identifies the three main epochs of wealth creation as: (1) The First Wave from 8,000 BCE to roughly 1650 where humans transitioned from a hunter-gather existence to a farming economy; (2) The Second Wave consisting of three hundred years of the Industrial Revolution lasting from 1650 to 1950; and (3) The Third Wave of information synthesis which is just now beginning.

Accounting during the First Wave was single-entry accounting that concentrated on totaling revenues. Second Wave accounting gave us debits and credits and a corresponding focus on the balance sheet. While the impact of the Third Wave on accounting is still uncertain, early indications are that focusing on productivity, as reported on the income statement, will take priority over static balance sheet valuations.

Anybody who has ever taught intermediate cost accounting will be able to recall the difficulty in explaining fixed overhead volume variances. In addition to the usual glassy-eyed stares from our students, we wait for the evitable question, “But I thought fixed costs were called fixed costs because they did not change with production levels?” We then struggle to explain that, while fixed costs are not variable in nature, they can change on a per-unit basis based on what assumptions are made as to capacity. In other words, in our lingo, the issue is the hoary old dominator problem. In practice, a fixed overhead volume variance means the firm did not produce exactly what the budget called for it to produce. In other words, the plant did not meet quota.

The fact that accountants measure fixed overhead variances is proof that Second Wave managers tried to, “...optimize cost with ‘economies of scale.’ They run large-scale plants as fast and as full as possible, to achieve the highest possible throughput for the existing level of costs.” [Johnson and Broms 2000]. The early economies of scale made possible by mass production were staggering when compared to the merger output of First Wave master/apprentice production systems. By producing more, Second Wave economies of scale lowered unit costs (and unit sales prices) that lead to more consumer demand, which triggered even more production.

Taiiche Ohno, who is widely credited with founding the Toyota Production System ('TPS") [Liker 2004], however, adopted the credo that managers should, "...avoid doing anything in excess of what it takes to produce what could be sold and no more." [Johnson and Broms 2000]. The result is a Just-In-Time ("JIT") production system that uses a build-to-order model to pull production through the system to fill a single unit of customer demand instead of a mass production/push process that attempts to maximize capacity and, thus, reduce per-unit costs.

Lean, therefore, focuses on the continuous flow of those life-cycle costs necessary to satisfy customer demand while using the minimum of resources. Thus, Lean Production seeks to increase those cost functions that add value to the customer, while minimizing those that do not. As a result, the idea of determining a traditional per-unit cost at any one point in time is foreign to Lean. The view, instead, is on Value Stream Costing that looks at the flow of costs necessary to eliminate waste. As a result, traditional standard costing and overhead allocations are no longer necessary because measuring capacity usage is no longer a concern [Maskell and Baggaley 2004].

Put into accounting lingo, in Lean Accounting all debits flow to the income statement. Allocating costs to inventory and, thus, the balance sheet goes away. Consequently, elegance in accounting for overhead costs, e.g. activity-based costing, is dropped in favor of eliminating wasteful overhead costs.

Integration with the information age

Upper management challenges

As should be clear by now, traditional accounting measurements do not work well in a Lean system. With its focus on balance sheet valuations and cost control, old school cost accounting simply misses the boat.

Moving to Lean, consequently, requires a performance measurement framework that asks three questions:

1. What should we measure?
2. How often should we measure? And
3. How do we provide feedback and control? [Maskell and Baggaley 2004].

Because Lean Production focuses on value streams, answering what to measure means we must break down company-wide strategies by customers, and then by value stream, and next by each cell within that value stream, and finally, the goals of each cell must be linked to all cells within the network. The result is a causal-based measurement system that tracks inputs into the value stream and uses results to control the process. [Maskell and Baggaley 2004].

How often we measure is a function of our estimates of random versus systemic errors inherent in the system. If we measure each second, we might end up chasing random errors and miss fundamental problems that would become apparent if we measured by the day or week.

Example: Do you remember the clip where Lucille Ball tries decorating cakes as they come down an assembly line? The line keeps going faster and faster until she eventually fails. If we measure too quickly, we might focus on her inability to decorate each cake. However, if we hold off measuring, the root problem quickly becomes apparent.

Accordingly, the ideal measurement interval is a function of how rapidly a system changes compared to how long it takes to change the system. In some cases, the interval might be minutes. In others, the span might be weeks. In almost no case, would we want to wait a month before measuring. [Maskell and Baggaley 2004].

Many associate Lean control with statistical techniques such as Six Sigma process controls that are designed to eliminate deviations from target before they result in defects. While statistical analysis is a valuable tool, it should not be confused with hands on problem solving. The "CA" of PDCA requires management to think about the root causes of statistical deviations, not merely to analyze them. [Liker and Meier 2006]

Ultimately, going Lean requires management to shift away from historical accounting cycles to a hands-on analysis of the facts embedded in the entire value added process, from the plant to the value stream to the cell, with a view toward fixing problems before they occur.

Standard Costs v Reduced Risk. One common consequence of going Lean is a higher standard cost per unit when computed on a batch basis.

Example: Before remapping, a company had a standard cost per unit of $21.50. The units were made in batches of 2,500 units that required 10 days to complete, with a lead time of 6 weeks, an average days in inventory of 25 days, and an 82% on-time delivery rate.

After remapping the process to reduce the batch size to 250 units, which could be completed in one day, the lead time dropped to 2 days, average days in inventory fell to 5 days, and on-time delivery rose to 98%. The standard cost per unit, however, rose to $25.50.

A traditional manager might say that Lean is a bad idea because standard costs went up by 18.6%.

A Lean practitioner would respond by saying: (1) it is more profitable in the long run to focus on average cost per unit through the value stream than per-unit batch costs; and (2) the long-term financial risk to the firm will be lower under Lean due to a lack of unsold inventory losing value daily on the company's balance sheet.

Said another way, Lean requires managers to (1) take a longer view of product costs, and (2) consider the impact of excess inventory upon the firm's survival.

*Using a Box Score.*Because Lean remapping improvements sometimes do not immediately show up in the financial reports, e.g., increasing on-time delivery, many Lean managers have adopted a Box Score approach, which combines financial and non-financial results into one report. [Maskell and Baggaley 2004]. The financial section might include current and future columns for:

* Inventory value
* Revenue
* Material costs
* Conversion costs
* Value stream profit

The operational section may show:

* Dock-to-dock days from receiving raw materials to shipping finished goods
* First time through equals the percentage of units without defects
* On-Time Shipment
* Floor space
* Sales per person in the value stream
* Average cost per unit for a period
* A resource section measuring use of productive space.

An indirect cost report can show Cost per employees for each cost pool such as customer service, purchasing, testing, shipping and so on.

The point being is, just as Lean remaps operations, management will need to remap how it uses Lean Accounting information.

Control Through Prevention. Historically, management relied on detailed inspection of all transactions to make sure they are accurate and within predetermined control boundaries. This control via inspection typically required multiple approvals and internal control checkoffs, regardless of the materially of the transaction.

Lean, however, focuses on creating accountability on the shop floor where transactions are begun, instead of subsequently them inspecting after the fact. [Maskell and Baggaley 2004]. By reducing the number of suppliers and requiring daily delivery of exactly what is ordered, for example, Lean can prevent errors in accounts payable from occurring. Giving cell members credit cards for small purchases to reduce the number of purchase orders that must be verified is another example. Using master purchase orders and paying by electronic funds transfers even further reduces after-the-fact verification steps.

The key is management must adequately plan the work so the cells can work the plan. If management ensures that the design specifications are exact and the flow of work is standardized, the cell members can then negotiate supply-chain agreements with outside vendors, which are designed to prevent problems. Moreover, Lean Production empowers cell member to fix problems as they occur, instead of after the fact.

Sales, Operational and Financial Planning (SOFP). Instead of the traditional (and wasteful) closed-loop annual budgeting process, Lean Management uses an open-loop, interactive process that cycles on at least a monthly basis. Called SOFP, Lean uses a team approach to anticipate customer orders and plan the value stream necessary to accommodate the planned flow of work so when the order comes in, the system pulls the order through the value stream in an orderly and flexible manner. [Maskell and Baggaley 2004].

The critical factor of SOFP is that it focuses on the operational plan, not the financial plan as in traditional annual budgeting processes. Accordingly, management has to unlearn how to game the budget process and focus instead on networking with other team members to develop a real-time operational plan that begins with sales and marketing and ends with an integrated game plan. Once management completes the first SOFP cycle, it will be time to reload and do it over and over again.

*Target Costing.*Traditionally, most manufactures develop products aimed at a target market. They next engage in market studies to gauge customer reactions. Product teams are then formed, and, if the idea demonstrates a sufficient spread between projected sales prices and budgeted costs, it get green lighted for production. Engineering and design develops the technical specifications. Purchasing develops the cost budget. Production lines are assembled. The button is pushed, and marketing begins spending money to create customer demand. Sales is then charged with convincing potential customers that what they want to buy is the same as what the company has to sell.

Lean companies, on the other hand, develop new products or ideas by working closely with existing or potential new customers and understanding how they can add value to them. After gaining a profound understanding of what their customers want, a Lean firm then analyses how providing this additional value will affect the profitability of the value stream. Called Target Costing, the idea is to offer new products when the value added to customers (i.e., the sales

price) exceeds the company's estimate of the additional costs incurred in the value stream. [Maskell and Baggaley 2004]

Sounds simple. But in practice, Target Costing requires cross-functional processes that:

1. Establish the value created for the customer by the company.
2. Determine the maximum cost for the products within the value stream, based upon the value created for the customer and the company's expectations of the value stream profitability.
3. Create a practical, cross-functional action plan to increase the value created for the customer and to achieve required value stream profitability. [Maskell and Baggaley 2004].

Once engaged, Target Costing is repeated endlessly on an open-loop basis to ensure the company maximizes customer value.

Once again, Target Costing requires traditional management to unlearn old ideas and embrace the concept of starting and ending with the customer.

Becoming part of the team

Shifting from Reacting to Acting. In Lean, the real control is on the shop floor. Management can lend its expertise and knowledge to suggest ways of removing waste, but it is up to the members of each cell to actually do it. If accountants are to become an integral part of the value stream (and they should), they will need to first eliminate wasteful bookkeeping and administrative practices so they will have the time to participate in waste removal.

The first step toward removing accounting waste is to shift to simple cash-basis accounting reports and by asking simple questions:

* Why is that report necessary?
* Do we really need to keep doing things just because we always have?
* If we eliminate a report or procedure, what is the risk of error?
* Can we benchmark other companies that have eliminated these controls? [Maskell and Baggaley 2004].

The idea is not to perform wasteful transactions more efficiently. We want to eliminate the need for them.

*Cell Performance Measurements***.** The key principles of Lean Cell Measurements are:

* Cell measurements are few and provide guidance toward meeting the company's lean goals.
* Information is gathered and used in the cell. It is typically presented in a visual format that can be readily seen by all members of the cell.
* The measurements are simple and understand. The data is usually gathered by the team members of each cell and reported by them on a white board or other display.
* The team members develop the measurements based on the company's strategy and contribute toward meeting those goals. [Maskell and Baggaley 2004].

Typical performance metrics are:

* Day-by-the-hour production, which tracks the cycle time pull rate (takt time).
* First Time Through Report, which shows the percentage of completed products made without defects.
* WIP to SWIP measures the effectiveness of the actual work in progress to the standard pull rate of production.

* Operational Equipment Effectiveness (OEE) measures the throughput rate of each machine taking into account down time for effective maintenance and rework.
* Cross-Training tracks the amount of cross-training within a cell.
* 5S is a workplace organization methodology for maintaining an orderly work area.
* Safety Cross Calendar, which tracks safety incidences.
* Absenteeism tracks each member's absences.
* Set-Up Times showing change over times.

Cell measurements are self reporting by the cell members, and they are prominently displayed within the work area.

Six tips for ensuring that cell performance measurements work are:

1. The visual display reports must be observed regularly and systematically by all managers, operations personnel, and administrative staff. Because waste removal works best at the site of the problem, absentee management is ineffective.
2. Eliminate any other measurements. If the administrative staff find it necessary to run off-site reports, they should not show them to anyone on the floor.
3. The measurements must be easy to do and self reported by the team members. Using automated counting devices is acceptable, but the data gathering must be done by the cell.
4. Listen to the users. They know best what needs to be measured. If a measurement become obsolete, delete it.
5. Provide a no-blame workplace. You cannot discover root problems if members believe it necessary to cover up mistakes.
6. Summarize the data for use in the continuous improvement process. [Maskell and Baggaley 2004].

The overriding message is accountant can eliminate wasteful financial control transactions only when we know the work flow is under control and consistent. Instead of constantly fighting fires, accountants are free to join other cell members in focusing on continuous improvement to the value stream.

Maturity path to lean accounting

The maturity path is the best route for a successful implementation and sustainability of a Lean Accounting process. [Maskell et al 2007] Achieving this path will require the accountants to fully understand how Lean Production works by participating in training and continuous improvement programs. That is, they must "learn by doing."

To ensure that Lean is implemented in a sound manner that maintains financial control and discipline most practitioners use the following maturity path:

Stage 1 sees pilot lean production cells where work flows and processes are in place.

Stage 2 is characterized by the linking of cells into a value stream network where there are fully functioning continuous improvement teams.

Stage 3 occurs when the company becomes a functioning lean enterprise that extends Lean thinking to its outside value chain partners. [Maskell et al 2007].

The ultimate challenge, for which accountants are unquestionably qualified for, is to see that it gets done in a manner that ensures financial controls will be maintained.

Academic challenges

Perhaps the biggest challenge is for accounting academia. Based on a non-random sample of cost accounting textbooks, there appears to be little or no mention of Lean Accounting. Standard cost variance analysis, budgeting and planning controls, and Activity Based Costing, just to name a few traditional cost topics is explicitly and implicitly woven through out every book. The concern is if we do not teach Lean Accounting principles to our students, who will?

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Using Illusions in the Classroom: Practices, Principles and Planning

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Abstract

Illusions or magic in the classroom is a growing trend with educators at all levels, but especially at the K-12 level. A number of websites are popping up that facilitate this movement. Some educators use illusions for pure entertainment while others use them to make a point about the material being discussed. The question that is often asked is, does the use of illusions add value to the student's learning? Additionally, there is little guidance on the proper use of illusions. This paper will attempt to answer this question and go on to provide principles and guidance for the use of illusions in the classroom.

Introduction and Background

Illusions or magic has been a growing trend in classroom activities, especially at the K-12 grade level. This paper will attempt to explore the benefits of using illusion in the classroom. In addition, it will investigate current practices and principles and go on to establish a list of best practices. While the focus of this discussion is college business classes, the same best practices can apply to other disciplines.

Magic tricks or illusions have been around for centuries. The earliest know illusion was performed in Egypt around 1700 B.C. (Fact Monster, n.d.). The word "magic" comes from Magi and was used in Iran in the early eighteenth century (Olson, 2009). Illusions are certainly very popular today. Beyond entertainment, illusions have been used in occupational therapy, treatment of behavioral disorders and with ADHD, special education and autistic students (Healing, n.d.). Research has been conducted into the use of magic for healing including the following titles (Healing, n.d.):

- Use of Magic: Creative Means for Psychosocial Rehabilitation
- Do You Believe In Magic? Teaching magic tricks to patients as an adjunct to their rehabilitation program
- Exploring Ludotherapy And Magic Tricks: "Show me how you play; I'll tell you how you feel."
- Magic Arts Counseling: The Tricks of Illusion as Intervention

David Levin and Kevin Spencer (Healing, n.d.) when working with students theorized that students benefited in the following ways:

- Rapport building – connecting with the student and delivering a lesson.
- Empowering the child and self-esteem – teaching the child the "secret" of the trick.
- Instilling hope – can symbolize optimism, possibility of change and indicate that solutions are not always as complicated as they appear.
- Metaphor – bring to the surface unspoken thoughts and feelings.

- Reframing – teaching the skill of reframing can help students look at things from a different point of view.
- Interpersonal skills – modeling appropriate interpersonal skills during the illusion and then allowing the student of practice the illusion using the same skills.
- Group cohesion – effective icebreaker for new groups.
- Assessment tool – used to assess learning disabilities.
- Academic learning – practice cognitive skills such as following complex directions, problem solving, etc.
- Trust building – revealing the "secret" can help a student open up during counseling.
- Recognition of boundaries – setting clear expectations about the illusionist's personal space and equipment.

In their therapy, students actually are taught to perform some of the magic as well as observe it.

A growing use of magic is in children's religious services, often called "gospel magic." It creates anticipation on the part of the learner, keeps their attention and helps illustrate abstract concepts (Linn, n.d.). A well established use of magic is to teach science and mathematics (Swan, 1998). Some of those using illusions to teach statistics see the benefits of student engagement, a focus on conceptual understanding, development of critical thinking and an opportunity to reflect upon the role of assumptions and estimates of probability (Lesser and Glickman, 2009). Dr. Benjamin Krevsky of Temple University uses illusions to teach medical students (Temple Times, n.d.) fundamentals of some bodily processes. He believes illusions reduce boredom and relax students during class.

Some studies indicate the number of visual-spatial learners in the classroom is increasing (Stokes, 2001). One study found that 63% of students were visual-spatial learners (Silverman, 02). Furthermore, we tend to retain more when lectures are both oral and visual in nature (Teach by Magic, 2009). The use of illusions can create the visual anchor for learning and, when supported by an oral explanation of the concept, connect with a larger percentage of the students.

The Basics: Practices, Principles and Planning

Three general categories of illusions are; close-up, stage and platform. Close-up illusions, sometimes called table magic, are performed in small groups usually no more than ten-feet from those observing or while sitting at a table (Wilson, 1988). Stage illusions are performed, as the name implies, in front of larger audiences at a distance (Hopkins, 1990). Often stage illusions are performed to large audiences which can involve elaborate props and often assistants. Parlor illusions are generally performed to smaller audience and fit somewhere between stage and close-up illusions in terms of audience size (Hollingworth, 2008). This paper will only discuss stage and parlor illusions that are appropriate for the classroom. Illusions from both categories can be suitable.

Illusions can be used to energize a class, get their attention or to make a point about the material being discussed. When energizing a class or getting their attention, the illusion does not have to relate to the material being presented, although it can. Simply doing the illusion will refocus students (Deubelbeiss, n.d.). When performing an illusion, it is important to have some kind of "patter." Patter is simply defined as "what you say while you're doing the trick." (Pogue, 1998, p. 10). Patter can take many forms. According to Pogue (1998)

"If you can't think of anything clever, just describe what you are doing…. Sometimes you may be able to create a story line that goes with your trick… Make it funny, make it serious and mysterious, make it New Age and life-affirming – just say something." (p. 10)

Often illusions purchased at magic supply stories will have a scripted patter.

Beginners at illusions should start with easy tricks. There are literally hundreds of self-working devices (Forgaard, n.d.). The effect is built into the device. These tricks do not generally require great skill and work with some manipulation by the performer. Most are very simple, but can be quite mysterious and astounding. However, this does not mean you don't need to practice. One of the best ways to find illusions is to visit a magic supply shop (Pogue, n.d.). Most shops have sales staff that can perform the illusions, make suggestions and train you on how to use the device. However, they <u>will not</u> reveal the "trick" until after you purchase the illusion.

The use of illusions in the classroom should be based on the following simple principles:

1. The illusion should not overpower the lesson (Linn, n.d.) – Know what you are teaching and find a trick that will enhance the message. There is some danger here since some students will spend time trying to figure out the trick rather than listening to the discussion. You can perform an illusion prior to break or just before the end of class which will reduce this possible negative impact.
2. Practice and then practice some more (Wilson, 95) – Practicing will help you both prefect the illusion and the accompanying message (the patter). Andi Gladwin recommends practicing using a digital movie camera (Gladwin, n.d.). He goes on to recommend viewing your performance from different audience angles.
3. Never repeat a trick for the same audience (Wilson, 95) – Repeating an illusion for the same audience increases the chance they will "catch you." Additionally, often illusions are based on similar concepts and techniques (Linn, n.d.).
4. Never reveal the secret (Wilson, 95) – Revealing the "secret" is one of the cardinal mistakes that a beginning illusionist makes. It is really a disservice to your audience since it eliminates the mystery, excitement and fun of the illusion.

Illusions can be used for many purposes, but using them to get attention and draw the audience back and make a point about the lecture seems to be most appropriate for instruction. With the increasing use of alternative educational delivery systems such as extended meeting times (e.g., all-day Saturday classes) or compressed teaching sessions (e.g., mini-mesters), students can become bored and drift off. Instructors need to become more creative in keeping and regaining the student's attention (Gleason, n.d.). With new studies suggesting that the average attention span of college students is just ten minutes (Richardson, 2010), it is very important to re-energize the classroom. Magic can be one tool in regaining attention.

For those interested in including illusions in the classroom, visiting a good magic shop can get you started. Most magic shops will help you with selecting an illusion that supports your topic. However, as pointed out earlier, they will not reveal how the trick is performed until you purchase the illusion. Additionally, they can tell you if an illusion is easy or difficult to perform. Most beginners look for illusions that are easy to perform but have the "Wow" factor for the audience. Wayne Kawamoto has the following advice when getting started in magic (Kawamoto, n.d.):

1. Read a few books on magic and learn a few tricks from the books.
2. Select the appropriate trick for your skill level.
3. Learn from other magicians.

4. Read reviews of magic tricks. Many tricks can be seen on YouTube (see http://www.youtube.com/).

The following books and internet links are a good place to learn about performing illusions:

- Magic for Dummies (1998) published by Hungry Minds: New York
- The Complete Idiot's Guide to Magic Tricks (1998) published by Alpha Books: New York
- Mark Wilson's Cyclopedia of Magic: A Complete Course (1995) published by Running Press: Philadelphia
- About.com: Magic & Illusions http://magic.about.com/od/beginningmagic/a/act.htm
- Parlor Magic (beginners) http://www.selfworking.com/parlor.htm

Selecting tricks for classroom use should be done with care. Once you have decided to use a certain illusion, purchasing it can be expensive. Not all suppliers of illusions (including local magic shops) are price competitive. Here are two that are believed to be price competitive and responsive to customers.

MagicTricks.com http://www.magictricks.com/

Daytona Magic http://daytonamagic.com/

While doing illusions in the classroom, no one wants to fail or embarrass themselves. However, some tricks do fail. The device breaks or jams, you drop something or you simply forget the steps. If this happens do not worry. It happens to the best of illusionists. Sometimes it is this fear of failure that keeps instructors from trying illusions. Here are some things to say if failure happens (Pogue, 1998):

- "I forgot to compensate for the rotational effect of the earth."
- "Hmm. It worked in the magic store."
- "The real magician will be here shortly."
- "It doesn't look that bad from my side."

If you fail, make a joke out of it. Students are generally forgiving and sometimes think it is "cool."

Conclusion

In conclusion, the use of illusions in the classroom is a break from the ordinary. When used properly, they are entertaining and funny and help to get and maintain the student's attention as well as make a point. Begin with one or two simple illusions, build your confidence and skill and then move to more difficult ones. However, keep in mind that some of the most amazing illusions are very simple to perform. Students seem to connect better with the instructor when illusions are used in the classroom. They come to class asking if there will be any magic today and disappointed if there is none.

Little research has been done into the use of illusions in the classroom and more formal research should be conducted. Specifically the following questions should be explored:

- Are illusions an effective tool in getting students attention?
- Are illusions more distracting than beneficial?
- Which course topics are enhanced by illusions?
- How often should illusions be used in a semester?

- Are illusions more effective when class times are extended (3 hours and greater)?
- Do illusions enhance the relationship between the student and instructor?
- Does the use of illusions improve the student's evaluation of instructors?

The use of illusions in the classroom may not fit everyone's instructional style. If it does, use it and have fun.

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A Sensitivity Analysis Leveraging AHP Model for Logistics and Supply Chain Risk Management

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Abstract

Global pharmaceutical supply chain risk mitigation has become an important issue in the corporate board room. This paper reports on the sensitivity analysis for logistics and supply chain risk management in the pharmaceutical industry. The empirical findings suggest that decision makers attach great importance to counterfeit and Food and Drugs Board. With respect to risk mitigation strategies, risk reduction is considered most important followed by risk avoidance. Dynamic sensitivity analysis with respect to change (increase) in Food and Drugs Board did not result in any change in the ranking of the risk treatment option, while change (increase) in counterfeit resulted in a change in the ranking between risk reduction and risk avoidance. Risk reduction ranked number one followed by risk reduction.

Introduction

Nowadays, C-suite marketing executives in all types of industries face ever growing risks within and across global manufacturing operations, including counterfeits, government and regulation, currency and exchange rate, among many others. Unmanaged risks can lead to production and distribution delays which in turn can take a significant toll on corporate marketing and financial performance, shareholder value and/or diminish supply chain confidence among stakeholders. As a result, logistics and supply chain risk management more than ever has become one of the most important topics discussed in the popular press and on top C-level executives' agendas in recent years. It can offer firms greater opportunity to enhance their understanding of the potential sources of a disruption, and, most importantly, the potential marketing and financial effect due to the impact. For firms to maximize their marketing and financial performance, it "requires ongoing analysis of the key risks spanning the entire [logistics and supply chain] that connects suppliers, manufacturers, distributors, retailers and customers" (Lowery, 2004). According Breen to (2008), pharmaceutical supply chain risks can be associated with shortages or discontinuation product, poor performance, patient safety/dispensing errors, and technological errors. However, in developed countries, growing pressure from regulatory bodies, changing legislation, customers, and cut-throat competition are compelling many global pharmaceutical organizations to implement supply chain risk management. Supply chain risk management benefits include better decision making, an improved balanced between risk (threat) and opportunity, enhanced competitive position (O'Brien and Joyce, 2007), achieve greater mutual understanding of the interests and problems of all supply chain members. Lack of appropriate risk mitigation can erode public health confidence and reputation, patients' health and safety, and reduction in profit margin and shareholder value.

However, in recent years, there has been a growing body of research in global logistics and supply chain risk management (e.g., Manuji and Mentzer, 2008; Gaudenzi and Borghesi,

2006; Hendricks and Singhal, 2005; Cavinato, 2004; Kleindorfer and Saad, 2005; Towill, 2005; Barry, 2004; Christopher and Lee, 2004; Harland and Brenchley; 2001, Zsidisin et al., 2004; Spekman and Davis; 2004; Hallikas et al., 2002; Johnson, 2001; Souter, 2000). All types of risks exist within supply chains (Lee et al., 1997) and organizations face them whenever they seek goods and services to meet their goals and objectives (Zsidisin et al., 2004). Based on the review of relevant literature and interview, counterfeit, regulatory agencies, intellectual property infringement, currency fluctuation, exchange rate, supplier failure, legislation, underdeveloped product pipeline, and legal liability are some of the risks that can disrupt pharmaceutical supply chain performance Hillman and Keltz, 2007; Chan et al., 2002; KPMG, 2005; WHO, 1998). Bandyopadhyay et al. (1999) reported that key components of risk management include 1) risk identification, 2) risk analysis, 3) risk reduction, transfer and acceptance, and 4) risk monitoring. Pharmaceutical supply chain risk mitigation strategies considered in this paper includes avoiding, reducing, accepting, transferring (sharing) risk. For the Ghanaian pharmaceutical firms to prosper and flourish in today's risky global business environment, they must implement logistics and supply chain risk management.

The organization of the rest of the paper is as follows. Section 2 presents a brief review of literature. Section 3 briefly discusses the research methodology. Section 4 describes the data collection and analysis. Section 5 discusses the general research findings. Section 6 reports on the sensitivity analysis findings. Finally, section 7 presents the conclusions and managerial implications. This paper contributes to the literature by shading light on the relevance of supply chain risk management in an emerging market's pharmaceutical industry. The result of this paper confirms that AHP model can enable logistics and supply chain managers to develop a priority hierarchy for risk treatment strategies. Also, it will help logistics and supply chain managers as well as marketing and sales with a step-by-step approach to identify, assess, manage and manage risks in their pharmaceutical supply chains.

Research methodology

A decision-making environment can entail multiple objectives called multi-criteria decision making. Evaluation and risk management in the pharmaceutical industry supply chain is a typical MCDM problem that entails multiple criteria that can be both qualitative and quantitative. An example of MCDM selected to model risk management in pharmaceutical supply chain is AHP developed by Saaty (1980). It is selected because it allows decision-makers to model a complex problem in a hierarchical structure portraying the relationships of the overall goal, criteria (objectives), sub-criteria (sub-objectives), and alternatives. Research that have used AHP include supplier selection (Lee et al., 2001); international business management (Atthirawong and MacCarthy, 2005), operations and supply chain management (Gaudesi and Borghesi, 2006; Min, 1992), marketing (Dyer and Forman, 1992), pharmaceutical marketing and management (Ross and Nydick, 1994).

For the present study, a total of five objectives (risks) were identified. Based on the five objectives and four decision alternatives, the decision hierarchy for the Ghanaian pharmaceutical industry supply chain risk mitigation is depicted in Figure 1.

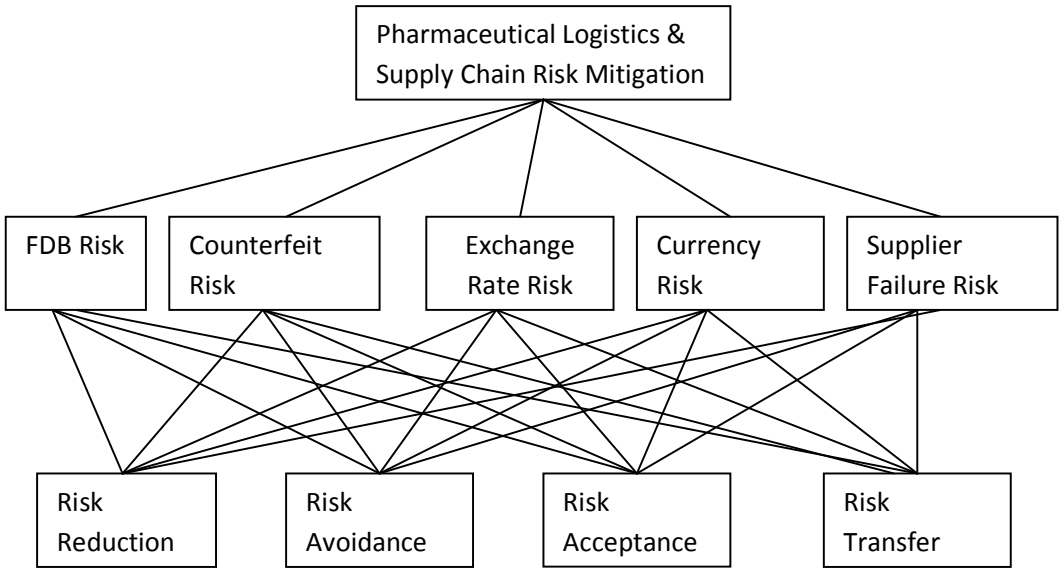
Data collection and analysis

Data were obtained via the use of survey questionnaires. The survey questionnaire was derived from the information obtained from the literature review. The survey questionnaire was bifurcated into three major categories. The first category solicited logistics and supply chain management experts to make pairwise comparisons of the five decision objectives. The second category elicited experts to make pairwise comparisons of the decision alternatives (risk reduction/control, risk avoidance, risk acceptance/retaining, and risk transfer/funding) with respect to each of the five objectives (i.e., FDB, counterfeit, currency, exchange rate, and supplier failure). For this study, a total of six questionnaires were sent to logistics and supply chain managers, distribution managers, and marketing and sales managers who work for the six major pharmaceutical firms in Ghana. Of this number, two questionnaires were returned. The analysis was conducted using the Expert Choice Software (11.5) developed by Expert Choice, Inc.

Saaty's AHP

For AHP application, Saaty (1980) suggested the following steps: 1) define the problem and determine its goal. The goal is the decision to mitigate risk in the Ghanaian pharmaceutical supply chain; 2) structure the hierarchy (see Figure 1) from the top (decision-maker's objectives) to the bottom level (decision alternatives); 3) construct a set of pairwise comparison matrices (n x n) for each of the lower level with one matrix for each factor in the level immediately above by using the fundamental scale

Figure 1: Decision Hierarchy to Mitigate Pharmaceutical Supply Chain Risk



measurement. The fundamental scale of relative importance of pairwise comparison is accomplished by assigning a weight between 1 (equal importance) and 9 (absolutely more important) to the more important objective, and the reciprocal of this value id then assigned to other objective in the pair. The pairwise comparisons are accomplished with respect to which factor dominates; 4) n (n – 1)/judgments are needed to develop a set of matrices in step 3. And

reciprocals are assigned in each pairwise comparison automatically; 5) hierarchical synthesis is utilized to weight the eigenvectors by the weights of the objectives and the sum is taken over all weighted eigenvector entries corresponding to those in the next lower level of the hierarchy; 6) After completing all the pair-wise comparisons, the consistency can be evaluated using the eigenvalue (λ_{max}), to derive the consistent index (CI). Specifically, CI for each matrix order *n* is determined by CI = (λ_{max} – n)/n – 1, where n is the matrix size. Expert judgment consistency can be examined by determining the consistency ratio (CR). Specifically, CR = CI/RI = [(λ_{max} – n)/n – 1]/RI, where RI is random index. CR is acceptable, if its value is less than or equal to 0.10. However, if it is greater than 0.10, the judgment matrix will be considered inconsistent. To rectify the judgment matrix that is inconsistent, decision-makers' judgments should be reviewed and improved.

Research findings

Table 1 reports on the alternative risk treatment options, objective priorities, and the overall priority weights for the risk treatment option priority. The consistency ratio for the four objectives is 0.05 < 0.10. Similarly, the consistency ratio for each of the objective with respect to risk treatment options is less than 0.10 as shown at the bottom of Table 1. Thus, suggesting that the experts' opinions are reliable.

Table 1. Alternative Risk Options, Objective Priorities, and Overall Priority Weights for the Risk Treatment Option

	Objective Priority					
Alternative Risk Treatment Option	**Counterfeit (0.453)**	**FDB (0.264)**	**Exchange Rate (0.112)**	**Currency (0.089)**	**Supplier Failure (0.082)**	**Overall Priority**
Reduce Risk	0.406	0.462	0.202	0.333	0.440	0.394227
Avoid Risk	0.477	0.301	0.255	0.306	0.325	0.377989
Transfer Risk	0.073	0.103	0.474	0.235	0.146	0.146236
Accept Risk	0.044	0.134	0.069	0.125	0.088	0.081377

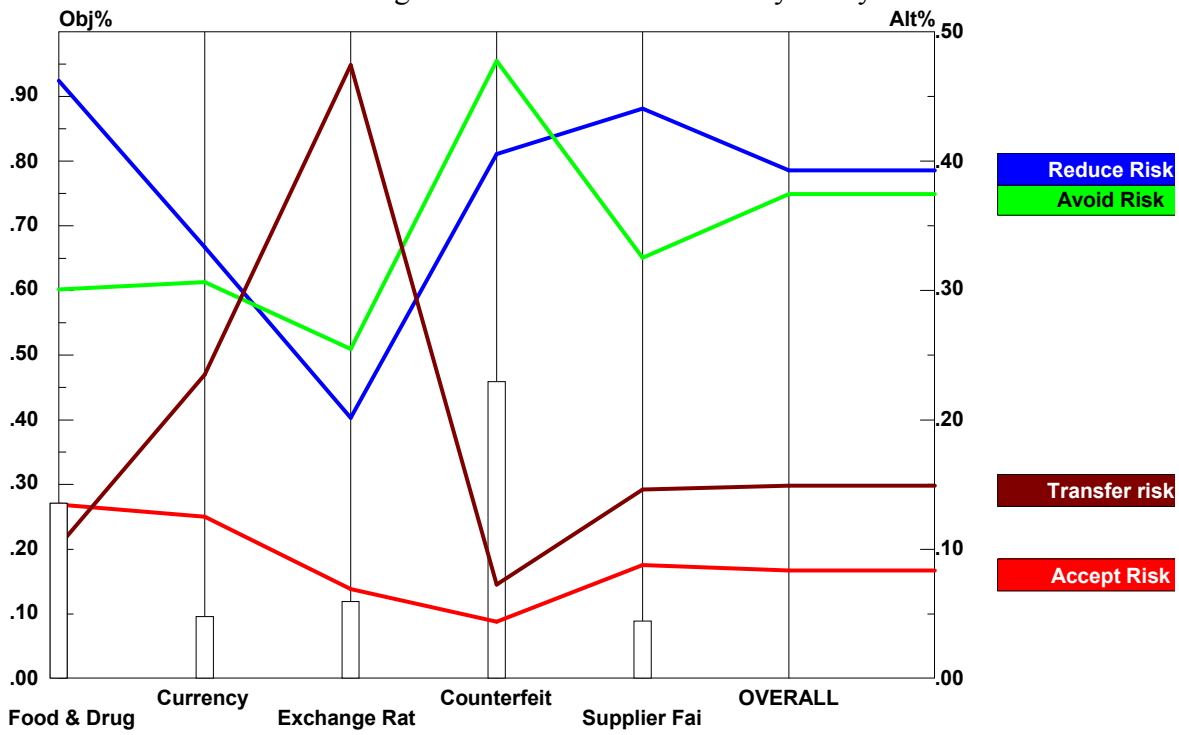
CR: 0.02<0.10; CR: 0.05<0.10; CR: 0.03<0.10; CR: 03<0.10; CR: 02<0.10

The empirical findings also indicate that counterfeit risk (0.453) is considered more important followed by FDB (0.264), exchange rate (0.112), and so forth. With respect to risk treatment option, risk avoidance (0.477) is considered more important for counterfeit followed by risk reduction (0.406); risk reduction/control (0.462) is more important for FDB followed by risk avoidance (0.301). The composite or overall priority indicates that risk reduction (0.394) is overall considered more important followed by risk reduction (0.378).

Performance Sensitivity Analysis

Figure 2 is the performance sensitivity analysis. It portrays how the risk treatment options are prioritized relative to others with respect to each objective as well as the overall risk.

Figure 2. Performance Sensitivity Analysis

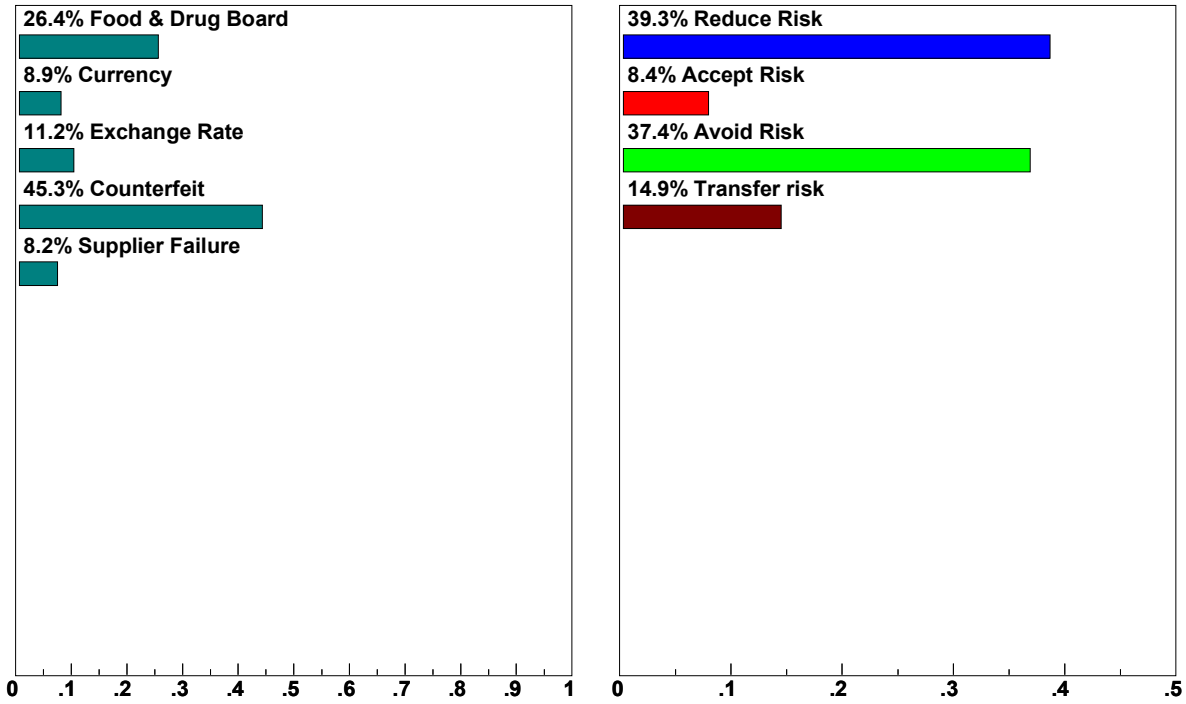


Risk avoidance treatment option is the best with respect to counterfeit risk followed by risk reduction treatment option with respect to Food and Drugs Board. Risk reduction ranks as the top risk treatment option. Risk transfer shows superiority with respect to exchange rate, while risk acceptance is advantageous with respect to Food and Drugs Board.

Dynamic Sensitivity Analysis

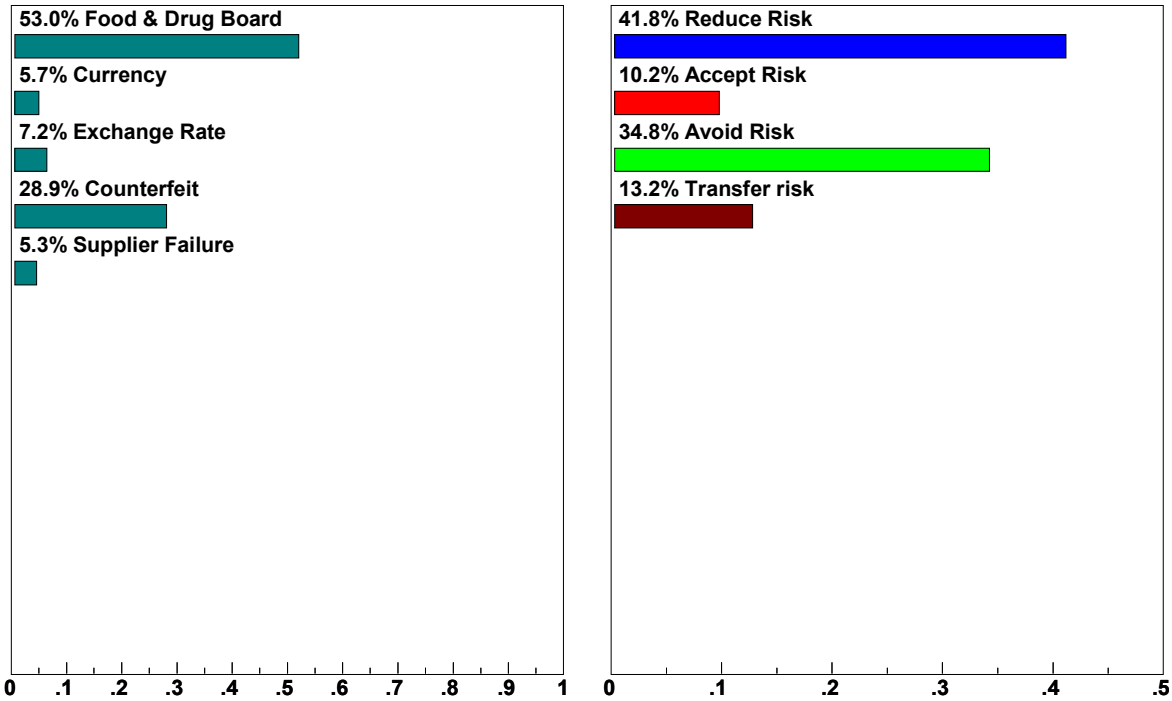
The dynamic sensitivity analysis in Figure 3 is employed to dynamically change the priorities of the objective to evaluate how these changes can influence the priorities of the alternative risk treatment options. A decision-maker can utilize sensitivity analysis to compare a "what-if" scenario by increasing or decreasing the objective's priorities on the left column to observe if there will be changes in the priorities of the alternative risk treatment options on the right-hand side column as shown in Figure 3.

Figure 3. Dynamic Sensitivity Analysis for Nodes below the Goal



Because of limitation of space only dynamic sensitivity analysis was considered for Food and Drugs Board and counterfeit risks. Figures 4-5 shows two sensitivity scenarios. As shown in Figure 4 (scenario 1), when the relative importance of FDB risk is increased from 26.4% (Figure 3) to 53.0%, the alternative risk treatment options' ratings or rankings were insensitive. Risk reduction remained the best risk treatment option.

Figure 4. Scenario 1- Dynamic Sensitivity of Analysis for FDB Risk (Increase)



In Figure 5 (scenario 2), when the relative importance of counterfeit risk increased from 45.3% to 70.2%, the risk mitigation responses were sensitive. Risk avoidance previously ranked as number two now ranked number followed by risk reduction. This means that decision makers must exercise due diligence to avoid counterfeit. In Figure 6 (scenario 3), an increase in the exchange rate from 11.2% to 24.8% did not result in changes in the risk treatment rankings. Similarly, when the exchange rate was decreased from 11.2% to 5.7%, the risk treatment option rankings remained insensitive.

Figure 5. Scenario 2 -Dynamic Sensitivity Analysis for Counterfeit Risk (Increased)

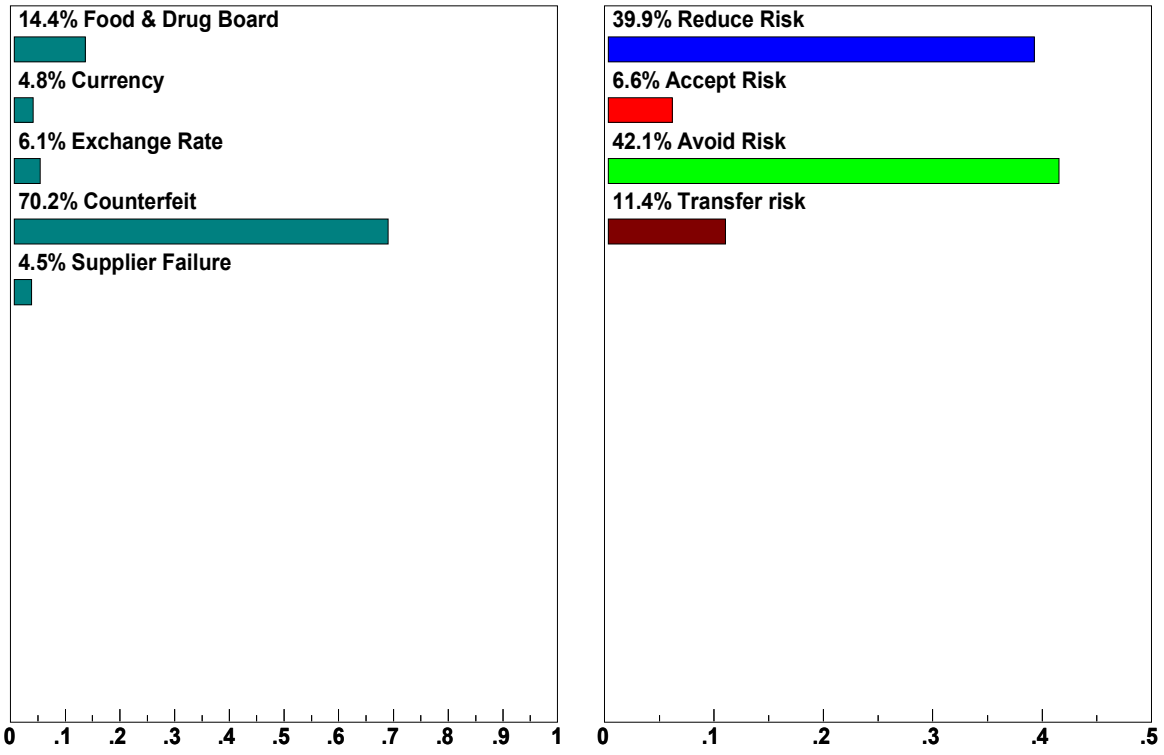
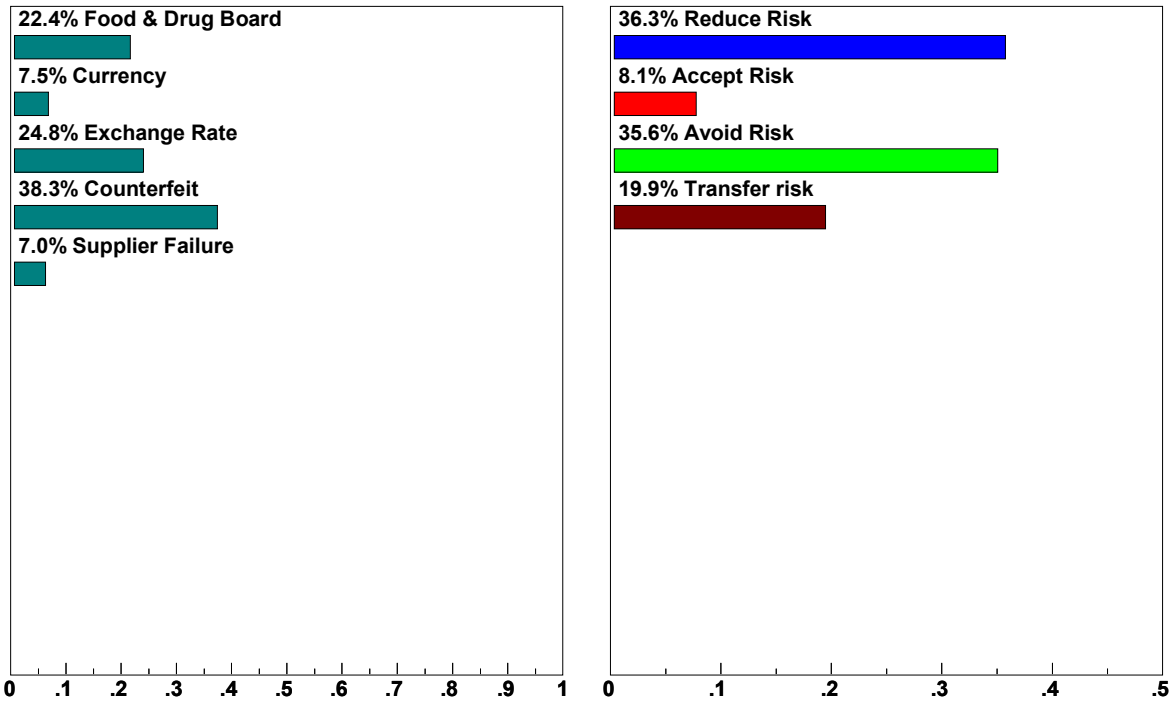


Figure 6. Scenario 3 - Dynamic Sensitivity Analysis for Exchange Rate (Increased)



For the dynamic sensitivity analysis with respect to supplier failure risk, an increase in the supplier failure risk from 8.2% to 20.0% did not change the original risk treatment options' rankings. Similarly, there were no changes in the rankings associated with the risk options when

the supplier failure risk decreased from 8.2% to 3.8%. For the sensitive analysis with respect to currency, there were no changes with the risk options' rankings regardless of increase or decrease in the currency risk.

Weighted Head-to-Head Sensitivity Analysis

Figure 7 shows the weighted head-to-head sensitivity analysis between reduce and accept risk. It indicates that risk reduction is best for counterfeit risk followed by Food and Drugs Board. In Figure 8, the weighted head-to-head sensitivity analysis between reduce and avoid risk indicate changes in the risk treatment for the two prominent risks Food and Drugs Board (risk reduction) Board and counterfeit (risk avoidance). In Figure 9, the weighted head-to-head sensitive analysis between reduce risk and transfer risk indicate that risk reduction option is best for counterfeit risk followed by Food and Drugs Board.

Figure 7. Weighted Head-Head Between Reduce Risk and Accept Risk

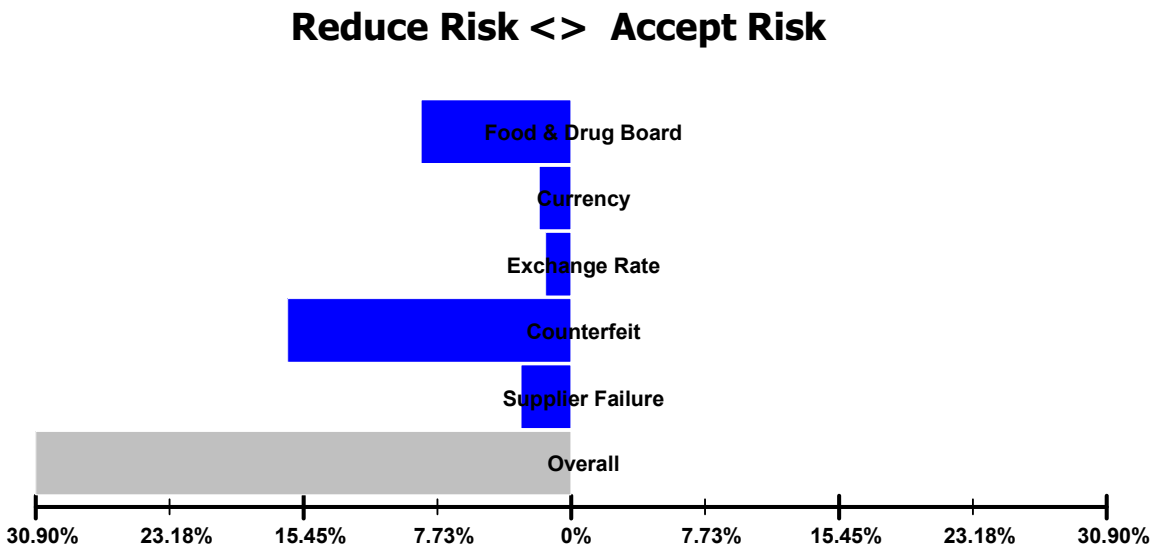


Figure 8. Weighted Head-Head Between Reduce Risk and Avoid Risk

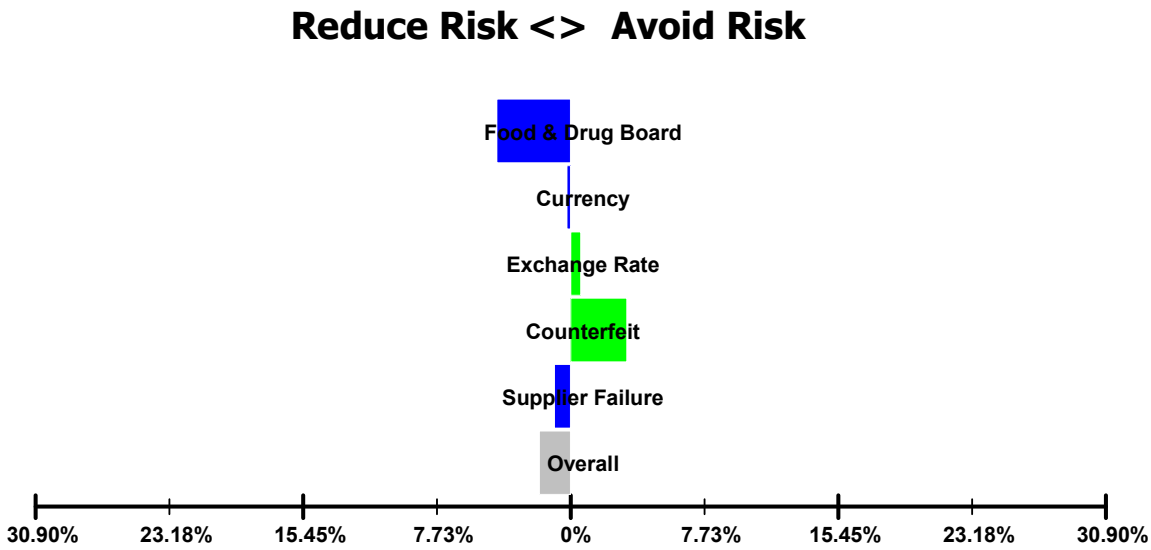
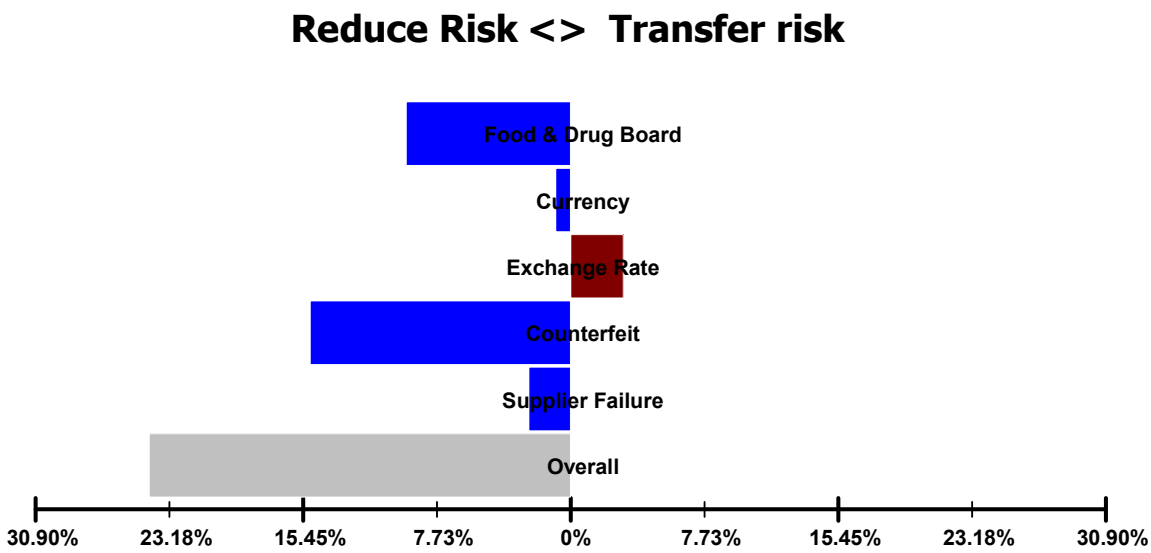


Figure 9. Weighted Head-Head Between Reduce Risk and Transfer Risk



Conclusions and managerial implications

Risk is the quintessential of doing business. However, given the spate in global supply chain risk, risk management has been catapulted to the top of many organizations' agendas. Because risk management can mean the difference between success and failure, it deserves the undivided focus of any organization. The Ghanaian pharmaceutical industry can benefit from risk management. Pharmaceutical supply chain risks are risks due to deviations in the physical and information flows of drugs from the upstream to the downstream. Improved knowledge of the existence of pharmaceutical supply chain risks and their sources can enable decision makers position appropriate mitigation treatments for the identified risk portfolio. Indeed, supply chain managers must be able to understand pharmaceutical risk portfolio completely in order to handle or prevent them. Although pharmaceutical supply chains worldwide more than ever are facing

growing number of risks, counterfeit risk has become more prevalent. The World Health Organization reports that 10 percent of all drugs distributed worldwide are counterfeit. Most importantly, the number catapults as high as 60 percent in developing countries. For example, Ghanaian pharmaceutical firms import 70% of their pharmaceuticals from China and India that are notoriously known for counterfeit drugs (Harper and Gyansa-Lutterodt, 2007).

Refereces

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The Use of SAP Simulation Software: ERPsim

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Kevin Lee Elder, Georgia Southern University

Abstract

ERPsim is a simulation software integrating with mySAP ERP to automate sales, production, procurement, and accounting processes. ERPsim has been adopted by many universities to teach Enterprise Resource Planning (ERP) concepts since 2007. The use of ERPsim is not limited to ERP related subjects. Management information systems (MIS) course is one of the core courses of business major. Information systems (IS) educators usually use case studies, lectures, and games to deliver the course. Students' complaints of the course are: boring lectures, dry materials, lots of technical jargons, lack of interactions, etc. The authors believe that the best way to teach information systems is to use information systems. ERPsim is one of the best teaching tools that IS educators can use to deliver MIS courses in order to improve student interactions and bridge the gap between technology and business. This paper will describe different simulation games available for teaching: sales, marketing/advertisement, and production.

Introduction

Many college students have extensive experience with personal computers but have little knowledge about business use of computing technologies. Teaching Management information systems (MIS) concepts for undergraduate business students is a challenging task since most of them have limited business experience. Students in MIS classes get bored with those technical jargons that deter students from hooking to the use of information technology in business (Kroenke, 2009). To increase student engagement, educators have experimented different methods: case discussion, problem-based learning, and active learning (Anderson & Morrice, 2000; Eikaas, Foss, Solbjorg, & Bjolseth, 2006; Hoffmann, 2009).

Any instructional method to engage students in the learning process is defined as active learning (Bonwell & Eison, 1991; Prince, 2004). Active learning usually refers to activities introduced into the classroom. The major elements of active learning are student activity and engagement. These activities vary from game playing, role playing, to simulation. Students' performance of active learning is not always better than the traditional teaching but student engagement in active learning is always better (Page & Donelan, 2003; Hannan, 2009; Sindre, Natvig, & Jahre, 2009).

Many IS educators agreed that the best way to teach technologies is to use technologies and simulation games have been used to teach different IS subjects (Connolly, Stansfield, & Hainey, 2007; Merrick & Maher, 2007; Ben-Zvi, 2007). Leger (2006) used a simulation game (ERPsim) to teach enterprise resource planning (ERP) concepts. ERPsim is a simulation software worked with mySAP ERP to create a close to real-life business environment. The authors extend the use of ERPsim from ERP concepts to MIS issues. This paper describes the use of ERPsim in MIS class to provide students with hands-on experience and to link IS concepts with IS practice.

The remainder of this paper is organized into three sections. Section 2 explans ERPsim system requirements and layout. Section 3 describes the use of ERPsim in MIS class. Section 4 offers some concluding remarks.

ERPsim

ERPsim was developed by ERPsim L@b at HEC Montreal, Canada. ERPsim is a Java-based simulation program to communicate with mySAP ERP ECC 6.0. ERPsim automates the procurement, manufacturing, and sales processes of a real-life ERP system (ECC 6.0), generates standard and customized SAP reports (sales, production, inventory, marketing, and financial). Students analyze those SAP reports and make business decisions in order to increase profitability of their operations (Leger, 2006). ERPsim L@b offers two versions of simulation games: manufacturing and distribution. Manufacturing game covers comprehensive business processes from procurement, production, marketing, and sales. Participants of the manufacturing game need to purchase participant's guide: an e-book with license key to play the game. Distribution game is a complimentary service from ERPsim L@b. Distribution game is a simplified simulation game covered procurement, marketing, and sales processes. ERPsim can compress and expand the time scale of the simulation games to fit into different class sessions. The following description of ERPsim focuses on distribution game only.

ERPsim System Requirements

To run ERPsim games, participants need accessing to mySAP ERP server as members of SAP university alliance program. Five to six students form a team to operate a bottled water trading company. Each student plays a role in the company: sales, marketing, inventory, procurement, and finance. Students log on to SAP account to perform their tasks. Instructor needs accessing to SAP server as administrator and ERPsim simulator as host to manage the simulation game. Instructor also needs simCID (simulation certification ID) to run the game. The simCID can be obtained by attending ERPsim training.

ERPsim Layout

The companies of ERPsim simulation game are operated in Germany. Each SAP client accommodates 26 teams/companies. Each team/company can have maximum eight accounts/students. The German market has 3 different sales regions: North, West, and South. Each team carries six different products (3 different bottled water with 2 different sizes). The maximum length of the distribution game is 3 quarters (see Figure 1). Each quarter has 20 virtual days (roughly a business month, 4 weeks, from Monday to Friday). The first quarter is the sales game. ERPsim will purchase 1000 cases of all six products for every team. In the first quarter, students' main task is to sell those products with the highest profit margin. In the second and third quarters, students need to replenish their inventory. To replenish, students need to forecast the product quantity (planning), run MRP, and generate purchase order to complete the procurement process.

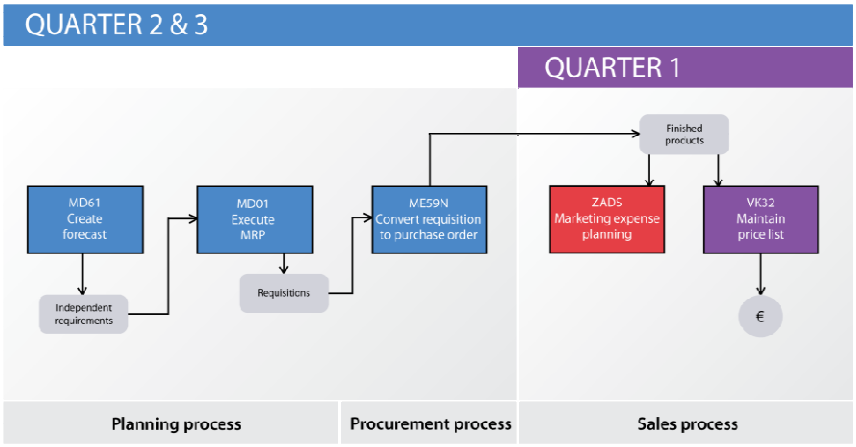

Figure 1: ERPsim Layout

Applying ERPsim to MIS Class

The authors ran ERPsim in one of their MIS classes. Students learned basic SAP navigation before the simulation games. The SAP navigation covers steps to perform different tasks: change sales prices, make marketing investment, check inventory report, analyze detailed/summarized sales reports, display financial statement, determine forecast quantities, run MRP, and generate purchase order. After the SAP navigation lab, the authors ran four simulation games. In the first simulation game, the authors ran only one quarter and slow down the temple of the game (each quarter had 30 minutes) that allowed students to get use to the learning curve of using SAP functions and playing the game. In the second simulation game, the authors ran two quarters (1st and 2nd) and set each quarter to 25 minutes. In the third simulation game, the authors ran three quarters and set each quarter to 16 minutes so the simulation game so the game can be finished within 75 minutes (before the session ended). The first three games were practice round to prepare students for the simulation competition. The fourth simulation game was the simulation competition. The setting of the fourth game was the same as the third except each team assigned a new set of accounts to compete from scratch.

Simulation Lab Tutorial

The following is a sample of simulation lab tutorial and assignment.

SAP simulation game has the following features:

- To show how the ERP system supports business strategies
- To develop a hands-on understanding of the concepts underlying enterprise systems
- To experience the tangible benefits of enterprise integration firsthand
- To develop technical skills at taking decision using an enterprise software

You'll play distribution game.

- In groups of at most 6 participants, each group operates a bottle distribution company.
- Using standard reports, participants have to make business decisions to ensure the profitability of their operation

Your company is located in Germany. Each company has

- 6 products (boxes of 12x1L and 24x500mL)
- 3 regions with distinct marketing accounts (Figure 2)
- One distribution channel : 14

- Market size of about € 6,000 per company per day

Figure 2: Regions of Sales

The 6 products are composed of three different bottle water and two different sizes (see Table 1).

Product Code	Product Description	Units in box	Cost of boxes
$$-F01	1L ClearPure	12 bottles	11.99
$$-F02	1L Spritz	12 bottles	14.99
$$-F03	1L Lemon Spritz	12 bottles	16.99
$$-F04	500mL ClearPure	24 bottles	16.99
$$-F05	500mL Spritz	24 bottles	19.99
$$-F06	500mL Lemon Spritz	24 bottles	22.99

Table 1: Products of the distribution simulation

Each quarter is 20 days. Each quarter last about 20 minutes. Each minute, in real time, is about 1 day in the simulation game.

In this lab, you will play only 1 quarter. The first quarter is sales game. Your objective is to maximize profit.

Rules of the game

- Each quarter will be of 20 virtual days (a bit more than 1 min per day)
- End-of-quarter inventory is carried over to the next quarter
- You can sell a product only if you have it in stock
- You compete against the other teams and importers

SAP Navigation Menu

Each member of your team needs to use mySAP ERP to play the game. Each one plays a role and each role needs to perform certain SAP task(s) to do one's job.

You can use User Menu (Figure 3) to do your task

The user menu is design to make the SAP navigation easier to play the simulation game. The menu is grouped by quarter and function.

- Quarter 1 is the sales game. The simulator procures all the products for each team automatically. Each team can change product prices and advertise your products in the 3 regions (promotion). The functions of quarter 1 have two parts: change and report.
  - Change:
    - Modify product prices. You can increase or decrease sales prices based on sales and marketing research/analysis
    - Place advertisement. You can do some promotion for products in different regions. The number you put in is the daily advertisement cost.
  - Report:
    - Inventory report shows the current inventory level for all the products.
    - Price market report shows the current average price for all the products.
    - Summary sales report shows the sales summary.
    - Sales report shows the sales details of your company.
    - Financial statement shows balance sheet, income statement, and profit/loss.
- Quarter 2 and 3, each team needs to replenish manually.

Figure 3: SAP menu for the simulation game

Each team can assign the following roles to all the members.

- Sales: in charge of product pricing.
- Marketing: responsible for assigning advertisement budget to product promotion
- Inventory and procurement: monitoring the current inventory level and replenish when inventory is low.
- Sales/marketing analyst: analyzing sales history and market situation to provide recommendations for sales and marketing.
- Manager: monitoring the performance of the team and giving directions/orders to all the other members.

Simulation Lab Assignment

1. Every member should have 1 or 2 role(s) in the simulation game.
2. Play the game to maximize your team profit.
3. Write a 3-paragraph reflection to a Word file.
4. The first paragraph should state your name, your role(s) in this game and describe the SAP tasks (such as maintain price list, run financial statement, etc.) you did to play the game.

Simulation game results

The authors ran the first simulation game with only one quarter. Figure 4 displayed the financial statement at the beginning of the simulation game. The financial statement showed every team had different amount of assets, liability, and net income.

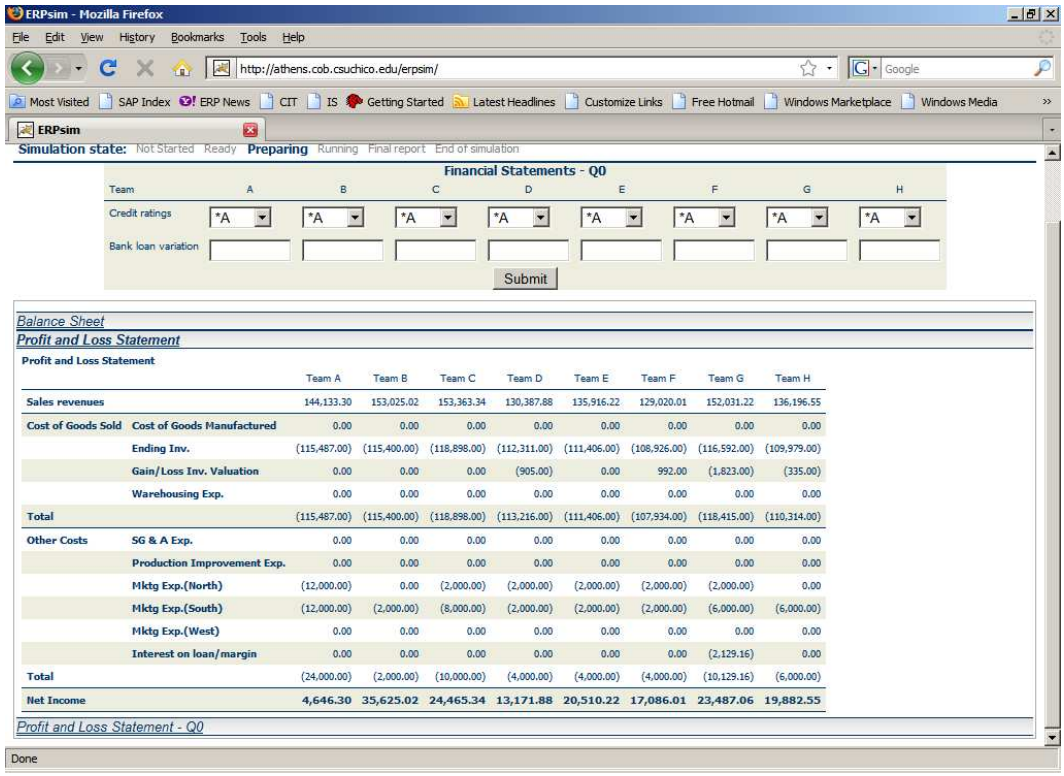

Figure 4: Financial statement at the beginning of the simulation

Figure 5 displayed the financial statement at the end of the simulation game. The net income of all the team were still in black but some of the team already lose money because their net income dropped.

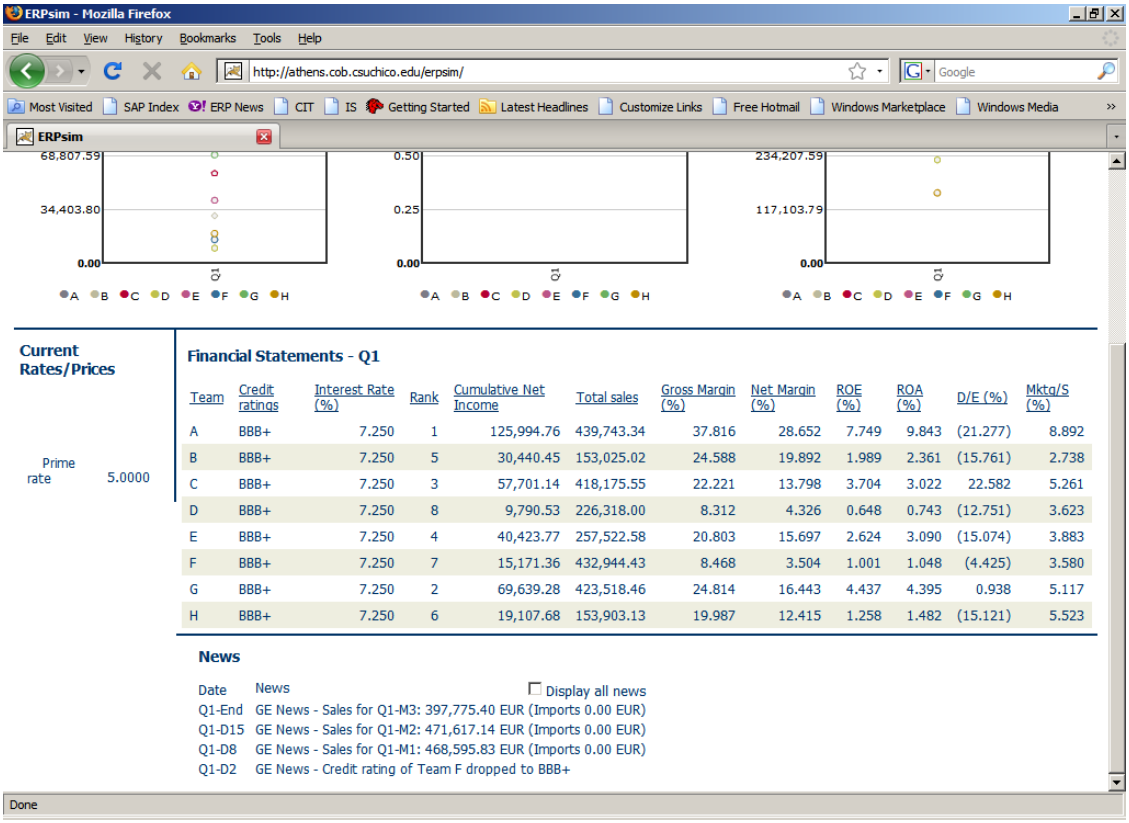

Figure 5: Financial statement at the end of the simulation

Student Reflection Samples

Students had to write a reflection after each simulation game to show their learning stretch from the game. Students learned from their success or failure of each simulation game and tried to find strategies to make come back or sustain their success in the next game. The followings are reflections from two students in the first simulation game.

"This lesson was important to learn how the different functions of ERP need to be combined to make a successful team. Market analysis must be in constant communication with both the sales person and marketing. Marketing can raise the advertising in region where sales are low and lower marketing where products are already selling fine. Sales have basically the same role. The manager must give the strategy and give direction as to how he wants the roles to respond to certain situations. He must also keep a good eye on the financial statement. I do see how these concepts could be used in a real world scenario."

"After doing the first quarter of the SAP simulation game, I would definitely use SAP with a future business down the road. With each member of our group assigned to different tasks we were able to communicate quickly change marketing plans, the pricing of products, and the management of our inventory levels. With all this working together it was very easy to track our sales and profit."

Conclusion

ERPsim has been adopted by many universities for ERP courses. The simulation game has potential to be adopted by many IS courses. This paper shows only one possible

implementation of the game. Students like the ERP simulation game based on their anecdotal comments. Some possible extensions of the ERPsim application are: 1) use the simulation results as case assignments to investigate the success and failure of each team/company, 2) discuss IS implementation issues based on students' own learning experiences of using mySAP ERP, 3) investigate the impact of team work and communications issues to company profitability based on the simulation results, and 4) explore data security issues based on students' ERP experiences.

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A Comparison of Two Operating Leisure Oriented Mega-Malls and The Xanadu Project: Looking Into the Crystal Ball

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Abstract

This paper utilizes a case study and secondary data approach to investigating and analyzing success factors of two highly successful Mega-Malls and the possibilities for the future of the financially plagued Xanadu Mega-Mall Project in the New Jersey Meadowlands. The paper looks at propensity for tourists to visit facilities, infrastructure contributions, store mix and other factors that seem to contribute to the success of such facilties. The probabilities for the success of the Meadowlands project are discussed in the conclusion of the paper.

Introduction

In the early late 1970's this author began to write articles about such coined terms as "leisurized marketing" and "leisuremalls". The term "leisurized marketing" was used to define such ideas as selling merchandise in leisure or entertainment environments, corporate sponsorship of events, and leisure themes in advertising. The term "leisure malls" was used to describe a continuing trend toward more and more leisure and entertainment in the shopping mall setting with a continuing emphasis on increasing entertainment and recreational facilities within the mall mix. The ultimate goal was to see if a so called "Shopping Mall" could become predominately a mall that had more entertainment and recreational facility square footage than shopping. These facilities were not necessarily envisioned to be in the mode of theme parks alone, but facilities that offered a large number of recreation and entertainment facilities within an interconnected indoor environment. In 1981 the first such project which had a decidedly leisure bent was the West Edmonton Mall. In 1992 the Mall of America made its debut in Bloomington, Mn. located within an approximately ten minute light rail line from the Minneapolis-St. Paul "Twin Cities" airport. Both of these malls are now controlled by the Triple Five Group although U.S. shopping mall giant Melvin Simon owns an interest in Mall of America and participates in its on site management. These are the only two malls in North America that emulate the "Mega-Leisure Mall Model", but in other parts of the world there are facilities with similar compositions including the Xanadu in the Madrid, Spain area and Lotte World owned by the Lotte Store Chain in the Seoul, Korea area.

This paper examines the dynamics of the new Xanadu project in the East Rutherford, New Jersey (Meadowlands Sports Complex) which is approximately seventy-five percent or more (depending on who you talk to and how you measure completeness) completed as the writing of this paper commences. The project has had a sordid history and it hasn't even opened yet. It was originally supposed to open in 2007 at a cost of 1.3 Billion dollars and was originally developed by the Mills Corporation, a developer of other what would have to be referred to as "leisure oriented" outlet malls in various locations throughout the United States. It's properties included Sawgrass Mills in Florida, Potomac Mills in Virginia, Franklin Mills in Pa., and Ontario Mills in California to name a few. The Mills Company became embroiled in financial scandal and its assets were mostly sold off to the Simon Company, but even Simon apparently knew that

Xanadu spelled a web of mystical trouble as they did not acquire the property as part of their deal and as a result it was acquired by another company called “Colony Capital”.

Xanadu was in trouble right from the beginning and some think that Xanadu should have never been built. In early 2010 the controversy became very public again with the arrival of a new governor and the transition report from the Corzine to Christie administration stated that the original business plan for Xanadu “had failed” and needed some immediate redress. There was some talk that the project would have to be surrendered to the State of New Jersey which would probably mean that the State would get stuck finishing it and operating it which in itself would be difficult and controversial beyond belief. (1)

The evidence is clear that the Christie transition team is correct because if you read the original article about what was supposed to be at Xanadu and what is now supposedly under lease agreement to be there we can see that the business plan has indeed failed and the project as originally stated is not being delivered. In fact, it has become less and less leisure/entertainment and projected to be more and more shopping. One person who was originally involved with the project confidentially told me even before the project got into trouble that the project would eventually have much more shopping than originally projected. Originally the project was to include: The Snow Dome Snowsports Area, The House of Blues, Cheesecake Factory, UnderWater World aquarium, A PBS Kids Pavilion, Bergen Cliff Hawks minor-league baseball team and the Bergen River Dogs professional lacrosse team,. ESPN Skate Park (extreme wheel sports), an indoor surfing wave, a grand movie palace, Wanadoo City (a unique children’s interactive theme park) a small format live entertainment venue, a Wildlife Museum, luxury spa, cooking area and the Meadowlands Area YMCA. (2) As it stands at this writing only the Snow Dome, Cheesecake Factory, Movie Palace and Entertainment Venue remain, but to be fair other facilties including Funplex Family Recreation Center, Lucky Strike Bowling Center, Legoland, and The Pepsi Eye Ferris wheel are currently slated to join the mix. Leasing of all retail space was clearly at a standstill and many merchants including a large entertainment oriented sporting goods store chain called Cabella’s are reported to have recently pulled out of the project.

The controversy and perhaps the failure of the project were predicted by the mixed opinions and reactions that happened when this project was approved. Two other competing finalists competed very strongly for the nod to go ahead with a project including the “Hartz Mountain plan for a convention center (valued at $815 million originally) (that) even drew a campaign-style endorsement from the New Jersey Thoroughbred Horsemen's Association, which said its adjacent Meadowlands Raceway would be helped more by a wave of convention goers than by a flood of shoppers”. The third finalist in addition to Xanadu ($1.2 Billion originally and now approximately $2 Billion) and the Hartz Mountain project was Westfield Corporation a large holder of shopping malls in the USA which proposed a “$989 million complex of offices, hotels and an "urban village" built around a refurbished arena that would offer entertainment events”. (2) This author wrote during the controversial period of consideration for the three projects and stated that although personally I find the Xanadu project thrilling I believed the one that should have been selected due to current market and regional needs was the Hartz Mountain Project. (3) This analysis was due to the fact that it is obvious that we have too much shopping in the region and that we have hardly no large convention spaces in the New York Area where the Javitts Center in Manhattan remains the only larger (and not one of the largest) convention centers in the NYC/NJ metro area and is too expensive for many potential conventions to come to the area. It is believed that the convention center would have been booked solid, open by now, and would have had far less impact on traffic than the Xanadu project will have. This

being said Xanadu is sitting there and the general framework of it must now be dealt with, which is why this analysis may prove important. It is believed that with all the right moves and new investment money this project can still be the economic development jewel that it is intended to be and this article is intended to aid in that quest.(4)

Methodology

This paper synthesizes a variety of secondary data and observations by the author in a case study analysis of the potential market and marketing environment for the Xanadu Project. A wide variety of common factors for comparison were developed by the author from the available data, review of various news and scholarly articles regarding these projects, and personal first hand observations by the author due to his life proximity to the project. The author has also visited the Mall of America about six times over the years and the Edmonton Mall once. Data provided by the Xanadu Projects feasibility studies was important to this analysis. In the analysis the first step was to identify factors that can impact the success of such projects. The next step was to score the factors given observations and data regarding each factor. Factors regarding Xanadu seem to be fluid as no one knows as this is written exactly what will end up in the project. This writing is based on the current information available. A ten point scoring system was used for each factor. A composite total score is then generated for each operating project or in the case of Xanadu project still under construction. Conclusions and recommendations for further study are made.

Factors to Be Analyzed Impacting Success or Chances for Success

A list of 15 factors was developed by the author based on the existing literature and factual observations regarding this project. The factors analyzed are listed (factor name used elsewhere in this analysis is in parenthesis) and described below:

1. Proximity and Ease of Use of Public Transport - How accessible and easy to use is the public transportation system in reference to each of these projects. Necessity to use public transit is also considered. (Transit Proximity)
2. Cost of Public Transport-Actual costs of public transit (Transit Costs)
3. Tourist Environment (Competition)-An analysis of the competitive factors for competing for tourists are made. (Tourist Competition)
4. Local Leisure Environment (Competition)-An analysis of the competitive factors for competing for the local leisure/entertainment dollar is made (Leisure/Entertainment Competition)
5. Shopping Environment (Competition)-An analysis of the competitive factors for competing local shopping sites is made. (Shopping Competition)
6. Ease and Cost of Parking-An analysis of the cost and ease of parking and general accessibility to patrons arriving by automobile. (Parking Costs/Ease)
7. Merchandise Store Mix-Variety-Uniqueness. (Merchandise Store Mix)
8. Leisure/Entertainment Mix-Mix of the leisure/entertainment facilities offered or proposed is analyzed. (Leisure Entertainment Mix)
9. Appropriateness to Regional Goals and Objectives-The appropriateness of the project toward regional development goals and objectives is rated. (Regional Appropriateness)
10. Potential Visitor Population Base for Overnight Tourists (Tourist Population)
11. Potential Visitor Population Base for Residents (Resident Population)

12. Potential Visitor Population Base for Excursionists or Day Trips (Excursionists Population)

13. Blue and other Laws (Restrictions on Operations)

14. Attractiveness to Investors (Investor Availability)

15. Economy at time of inception (State of Economy)

Presentation and Discussion of Secondary Data and Information Utilized or Referred to In This Analysis

There is a variety of information that is useful in this analysis that is presented and discussed below.

Shopping Mall Statistics for North Jersey Region (Table A) (5)

PROJECTS	SIZE (SQ. FEET)	SALES (PER SQ')	% OCCUPIED
Garden State Mall	2,131,059	$732	99%
Paramus Park	771,255	$468	96%
Bergen Town Ctr	1,243,000	$475	100%
Shops at Riverside	745,329	$425	91%
Jersey Gardens	1,303,916	$560	97%
Willowbrook Mall	1,516,940	$545	96%
Mall at Short Hills	1,342,000	$785	94%
Palisades Center	2,154,545	$565	97%
Newport Center	1,149,147	$535	97%

Additional Characterizations/Statistics of Meadowlands Xanadu (6)

1. Estimated average attendance 42.7 million annually for Xanadu, half of which are projected to be tourists. (New York City has an estimated total 47 Million visitors per year) (7) 3.8 Million people visit the Empire State Building (8) each year considered to be New York City's #1 tourist attraction and about 4.8 million visit the Metropolitan Museum of Art (9).

2. Traffic could be greatly complicated as there will be no major increase in access roads and the predicted attendance is astounding.

3. Rail site to property, but it is much more expensive than the Mall of America's rail system and takes around one hour at a cost of about $25 round trip to get there from Newark Airport and will take about 45 minutes to one hour total travel time.

4. Thirty-forty percent of the visitors are estimated to be tourists, however, given the competition for tourist time in the New York City/New Jersey area it is unlikely that these estimates will occur.

5. Mix of space is appears slightly stronger in the recreation/entertainment area than Mall of America, may be equivalent to or slightly less attractive than West Edmonton Mall. Attractions on opening at present include the Snow Dome Snowsports Area, Pepsi Giant Ferris Wheel (Great Views of NYC skyline), Legoland, Lucky Strike Lanes Super Bowling Center, 24 Screen Imax/3D Movie Superplex, Funplex Family Entertainment Center featuring Magiquest (a fantasy role playing game), 3000 Seat Live Entertainment Venue, Live Cooking Stage and Demos, Super Large Big Screen Television with Sports Seating Atmosphere.

6. Retailing tenants are currently indefinite, with a lot of space to be leased. The second phase which includes the complex's only large Department Store will not open on opening along with over 100 other potential retail store spaces. Retailing will not come close to Mall of America or West Edmonton on projected opening.

7. It is assumed complex will eventually have corporate sponsors but none are known at present.

8. Cost of project when fully completed could approach over $2.5 billion or more.

9. Potential population surrounding site is not even comparable to the Mall of America and Edmonton situation. The amount of population to draw from depending on how you measure it is about 15 times larger. The 100 mile radius market for Xanadu exceeds 25 million.

10. Shopping competition in the area is intense with such venues as Jersey Gardens Outlet Mall (closer to Newark Airport and much cheaper to get to) and Woodbury Commons (America's most successful outlet mall and a huge tourist draw) and even Palisades Center (which also has an entertainment/mega-mall slant) all competing. This coupled with all the tourist attractions and other competition in the New York/New Jersey market makes the competitive situation severe in comparison to West Edmonton Mall or Mall of America. (See Table A above for complete run down of shopping venues)

11. Parking situation is greatly complicated by sports and entertainment events held at other venues at the Meadowlands Complex. It is difficult to park cars at the Mall for free due to the need to control attendees at other events from parking for free at Xanadu. Xanadu will charge for parking for all patrons. It is currently projected at about $3 for the first three hours with increasing fees after that period of time.

12. Xanadu will possibly be forced to close on Sundays due to Blue Laws that do not allow retailing in the county that houses this complex. Governor Christie has said that he will eliminate the Blue Laws in a statement issued in March 2010, however, this will mean all area shopping malls will also be open on Sunday.

13. Small number of full service restaurants currently leased.

14. Bigger than both Mall of America and West Edmonton Mall when completed at 4.5 million square feet will be the third largest mall in the world and largest in North America.

15. Feasibility studies for this project contain demographic projections only and do not consider psychographic tendencies for either tourists or local users to utilize such a facility.

Characterizations/Statistics of the Mall of America (10) (11)

1. Approximately 40 million visitors annually.

2. 4.2 Million square feet of space built at a cost of $650 Million.

3. 16 Major Corporate Sponsors Signed for Opening which provided an immediate revenue flow

4. $87 per visitor spent per visit.

5. 4 Major Department Stores on opening

6. Large indoor amusement park in central atrium on opening

7. Although the mall contains many restaurants (full and quick service) and recreation/entertainment including an aquarium, the indoor theme park, Lego Imagination Center, A.C.E.S. Flight Simulation, Nascar Silicon Motor Speedway, Dinosaur Walk Museum, Movie Theaters, it's space mix is decidedly more slanted toward shopping with entertainment amenities rather than somewhat of a balance between the two.

8. Only two miles to the airport with a direct light rail train line for about $2.00 each way. Travel time: ten-fifteen minutes.

9. Forty percent of the visitors are tourists (Mall is the only really major tourist attraction in the area and also can draw a lot of Canadian drive in tourists due to location.)

10. Parking is free of charge

11. Mall is open seven days a week

12. Access with public transportation and local area roads is excellent. Light rail, bus and limited regular local traffic in immediate area of mall.

13. Developed at a recessionary time

14. The original funding was provided by $150 million in public bonds, which paid for the parking, land and infrastructure. Fifty-Five percent of the investment was taken on by the highly conservative Teachers Insurance Annuity Association (TIAA) with the rest coming from two solid Japanese Banks all at the time of going into a recession.

Characteristics/Statistics for the Edmonton Mall

1. Free parking for all customers with over sixty entrances and exits.

2. There is excellent traffic flow in area of the Mall (12)

3. The Mall includes over 800 retail stores, six amusement attractions including a large indoor amusement park, movie theaters, super bowling and billiards centers, and large indoor water park and a 335-room hotel, the Fantasyland Hotel, which includes eleven types of themed rooms, from the Igloo Room to the Bridal Suite. In addition to over 100 restaurants, the mall includes themed streets such as Europa Boulevard and Bourbon Street. West Edmonton Mall in anchored by eight department stores. (13)

4. Total annual visitors is 28.4 million. (14)

5. It is the number one tourist attraction in the area and in many ways the heart of all recreation and entertainment in the region. (14)

6. There are only just under one million people living in the Edmonton Metroplex. (14)

7. Amount and quality of public transportation to the facility is outstanding (14)

8. Local transit fares from almost anywhere in the region are $2.75 or less including the airport. (14)

9. The Mall was developed at a time when the economy was stabile and it appeared to be an attractive investment. Noteworthy inflation has taken place since the time of its development.

10. The lower drinking age for alcoholic beverages of 18 makes the mall a "place to party"

11. The mall cost $1.2 Billion Canadian to build. This amounted to less than $1 Billion American and was until 1994 the biggest indoor shopping mall in the world and now ranks #5 with 3.8 million square feet.(15)

Scoring of the Fifteen Factors and Discussion

Key: X=XANADU M=MALL OF AMERICA W=WEST EDMONTON

1. Transit Proximity

X=4-Although public transit is available the ease of use especially from the airport does not compare to that for the Edmonton Mall or Mall of America.

M=10-Best of the three with a light rail line going right into the mall and terminating there.

W=9-Just under the Mall of America

Further Discussion: The transit situation does not come close for Xanadu in comparison to what the other two facilities enjoy. The time it takes to get from the airport to Xanadu may greatly limit brief stopover trips to Xanadu. The short time it takes to get to Mall of America from the MSP airport one of the largest in the USA and a major hub encourages short stopover

visits to Mall of America. Many Asian visitors who are primary customers for Mall of America pass through the MSP airport.

2. Cost of Public Transportation

X=2-Cost of regional public transportation is expensive and simply not as plentiful as it is for the other two malls.

M&W=10-It costs less than $2.50 to get to both malls and in many cases less than that.

Further Discussion: Public transit is expensive to anywhere from Newark Airport to Xanadu. The $25 round trip cost will deter short trips to Xanadu from the airport. It will also be the same impediment it is to using public transportation for everything in Northern New Jersey.

3. Tourist Competition

X=6-There is so much competition even in shopping that it will be difficult for Xanadu to garner tourists time. It may be noted that the first Xanadu in Spain from which the idea for Xanadu New Jersey was born does not see very many tourist visits. On our visit there we found that few if any tourists were present and shop owners there were very surprised that we were taking our time given all the attractions in Madrid to go visit Xanadu. With all of the other iconic attractions in the NYC area it does not appear likely that Xanadu will appear on many tourists must see lists, however, being the third largest mall in the world does put it on some people's list of sights to see.

M=10-Mall of America is really the only major tourist attractions in the region. It draws a lot of tourists and is the number one tourist attraction.

W=10-There is not much else to do in Edmonton, the West Edmonton Mall is a must see tourist attraction and is the second biggest shopping center in the world. As such, it is a must see for tourists

4. Leisure/Entertainment Competition

X=9-It is believed Xanadu will fair much better in this area especially with locals looking for entertainment and leisure. It will have a few unique recreation/entertainment facilities and it will have a synergistic relationship with the rest of the Meadowlands Complex which includes a large entertainment arena, race track and the new Meadowlands Stadium home to the New York Giants and Jets professional football teams.

M and W=9-It is believed that these facilities are about the same overall in terms of leisure/entertainment attractiveness.

5. Shopping Competition

X=3-Another area where Xanadu can have trouble. There are so many successful shopping malls in Northern New Jersey and in near by Rockland and Orange County New York, that it is hard to see that this will be a preferred shopping location. Also, one can't ignore the impact of the fact that there is very unique shopping opportunities in New York City. (See store mix comments as well.)

M and W=10-There is really no competition shopping wise for both of these giants. The number and variety of stores at these two facilities are staggering. Although other area malls compete these are the giants.

6. Parking Costs/Ease

X=3-Another troublesome area for Xanadu as this mall is not as conveniently located for many of the more affluent shoppers in the area to go to and the traffic in the area may also be a deterrent. Also, the parking charges for such a facility are problematic and will discourage locals from coming to the facility.

M &W=10-Amazingly noteworthy amounts of free parking at both facilities with easy access.

7. Merchandise Store Mix

X=5-Currently the store mix is indefinite at Xanadu. Xanadu is scheduled to only have one anchor department store (which is supposed to open in phase two and not phase one)compared to Mall of America's four and Edmonton's six. Hopefully there will be better stores coming to the mall. Certainly the design of the facility is a very positive one for retailers. In the final analysis though this Mall may not have a store mix given current plans and restrictions placed on it to draw people to it for shopping alone.

M&W=10-Both malls have amazing amounts of stores and variety that make them the number one places to shop in their regions.

8. Leisure/Entertainment Mix

X=8-This is an area where Xanadu does somewhat better at this look. This is perhaps why in part the retail merchandise store mix seems inadequate. It has some pretty good entertainment and leisure facilities in it and the design itself in the interior is something that people should find enticing. It will undoubtingly have the most exciting shopping mall interior of the three projects. In terms of entertainment and leisure facilities the unique snow dome should be a draw as it does well in Xanadu in Spain (even though it really doesn't make any money it draws a lot of people into the mall). The Pepsi Eye well should be pleasing to tourists as well as corporations and locals that want to use the individual gondola cars for dinners and social gatherings. The question is how long will people walk around the mall when they are going to the entertainment facilities that are either in Xanadu or in the aforementioned adjacent Meadowlands facilties. Will a charge for parking cause them to go to events and activities in Xanadu and then head to their cars rather than shop?

M & W=9-The leisure/entertainment facilities are somewhat unsurpassed here and balanced and blended into the shopping/retail environment pretty well but they may not appeal to everyone and every age group, so we took off one point.

Additional Comment on Facility Mixes: It is interesting to note that there have been frequent changes in the mix of retail merchandise stores and entertainment in the existing projects. These changes reflect changing merchandising trends as well as leisure and entertainment trends. Planners for Xanadu should not that during the time it was developed trends have changed dramatically and this is why all plans for Xanadu need to be critically evaluated as it moves forward.

9. Regional Appropriateness

X=6-Probably not the best project to have been selected due to the traffic congestion that already exists along Route 3 and Route 120 (Paterson Plank Rd.) which are main routes into New York City for the daily commuter. Additionally, it does appear that given all the shopping that already exists and the need for convention space one does have to wonder why this project was selected over the convention center project. People may eventually enjoy some of the new leisure/entertainment opportunities that this will provide and uniqueness of the facility.

M &W=9-Big projects like this bring major changes in areas and lifestyles. Overall, it does appear that both of these projects have had positive impact on their surrounding communities and regional economy.

10. Tourist Population

X=6-Although there are many tourists coming to the area it is doubtful that many of them will make this a priority and as such it is unlikely that this will have the tourist draw that some

have predicted that it will. The Woodbury Commons Outlet Mall may draw more tourists than Xanadu even after it opens because of the formidable bargains there. Xanadu was not allowed to have outlet stores which would have helped it a great deal with tourists, especially since it does not have the retail shopping mix of the other two Malls in this analysis. Also, the outlet/off price formula is a proven thing in tourist areas. The problem in doing this is that the nearby Jersey Gardens which is another large outlet mall might have been put out of business if Xanadu had outlet stores which perhaps emphasizes why another shopping mall may not have been a good idea. The shear numbers of tourists in the entire region may help if the Mall management does an excellent job of attracting tours and group business.

M=10-Draws a lot of tourists as the only major attraction in the area and its proximity to Canada. Also, the cold weather environment helps to enhance its attractiveness to tourist during the longer winter periods in this part of the USA. The easy ride from the airport makes it very attractive for short visits from tourists who are even passing through the area.

W=6-Significantly less tourists than Mall of America, but when tourists do come to Edmonton it is a must see and the most major attraction.

11. Resident Population

X-7-On the entertainment side the facility could be a huge draw to residents in the area. The question is whether the lack of free parking, traffic in the area and possibly not the greatest retail mix along with strong competition from other malls will deter locals from coming there.

M=9-Mall of America is a wow for locals looking to cool off in the summer or have a fun day in the artificial outdoors in the winter. It clearly has a great local recreation/entertainment scene, is a place to be seen, and has the most stores of any place in the area. It is easily reachable at cheap costs by locals with public transportation from virtually everywhere in the 25 mile radius.

W=10-Similar conditions exist for this mall like Mall of America, however, the lack of tourists is more than made up by the fact that the Edmonton Mall is the place to be for shopping, leisure and entertainment in this area. There are less competing factors in Edmonton than Bloomington. The winters are even colder and longer here so the Mall is an Oasis during the long winter days.

12. Excursionist Population

X=8-Hopefully regional daytrips will become popular here and perhaps it may even prove more attractive to those traveling a distance to get here for the day than people who live right on top of it and know the local entertainment/leisure scene better than people who live an hour or more away in more rural areas.

M=8-There is a great propensity to travel a distance to this mall for a day trip, however, it does not have the population around it that Xanadu enjoys.

W=7-About the same propensity to travel here as Mall of America but there is simply far fewer people here than in Bloomington.

13. Restrictions on Operations

X=1-Here is a najor problem facing Xanadu. It needs to be open on Sundays. Governor Christie has already said he will remove the Blue Laws that prohibit the Sunday opening. There will be strong countywide and other opposition to this idea. It is necessary to allow Sunday openings for the success of this project. The leisure and entertainment aspects would be allowed to operate on Sunday even under the Blue Law, but the lack of allowing the retail shopping in the facility to operate on Sunday would ruin the synergy in the facility and very much hurt its

success. The lower drinking age in Edmonton is also a noteworthy competitive factor that few have mentioned.

M & W=10-No restrictions on operating hours as well as a lower drinking age in Edmonton.

14. Investor Availability

X=4-Currently there is only one suitor, Steven M. Ross, who is known to specialize in bailouts. It is likely that Mr. Ross will want to make major changes to the facility to make it successful which may be an impediment to him making the investment. The shadowed past of the facility to date has become a problem in attracting additional funding. The original suitor the Mills Company was involved in a financial scandal that forced them into liquidating their holdings. It is believed if Mr. Ross or someone else is given freedom to develop and operate the facility as they see fit their will be funding to complete and open the center. That freedom is needed for the long term success of the project.

M=10-Mall of America had a much lower investment cost and received $150,000,000 million in government funding. The chances for success were so obvious in the investment community that the project drew an investment from the Teachers Insurance Annuity Association one of the best managed and most conservative groups in the world. They took a 55% stake in the intitial project. All of this was as the country was going into a recession.

W=10-Projects like this built in Canada especially at this time seem to have had no problem with funding. We couldn't even find any discussion about the funding for this Mall.

15. State of the Economy

X=3-B-Yes, the economy went into a recession, but that did not stop the Mall of America, so perhaps investors are just not as positive about this venture.

M=10-The economy was not great for the development of this facility either, but nothing seemed to deter investors.

W=10-The economic status did not affect the development of this facility.

Composite Scores for the Analysis

The total scores for the analysis were as follows:

Xanadu: 75 out of 150 total

Mall of American: 144 out of 150 total

West Edmonton Mall: 139 out of 150 total

The scores for the Mall of America and West Edmonton Mall are very similar. Obviously, from this analysis there is a great difference in the situation which now exists for Xanadu from these two facilities.

Conclusions

While the Mall of America and West Edmonton Mall are open and successful they do not have many of the development and operational problems that are facing the Xanadu project. The problems facing the Xanadu Project based on this analysis include:

1. Economic and Investment Problems-Yes, the economic situation has hurt the development of Xanadu, but it appears to have hurt the investment market rather than the potential for customers. Although retailing is off it continues to rebound at this writing. With so many financial problems Xanadu may have to go bankrupt and have more cash drained out of it before it can succeed. (The best scenario would not be for the State of New Jersey to take it over as it is hard to conceive of the State running such an enterprise.) Only time will tell. Further,

entertainment and leisure especially in terms of local spending seems to flourish in a recession. The U.S. Government actually predicts a 15% (4% above average) growth rate in the employment market for leisure and entertainment oriented employment in the next ten years. It now predicts downturns in employment in many other sectors that it did not predict such downturns in before the current recession occurred. (16) Investors may just be afraid of many of the other observations that are made herein. Many of the factors discussed herein are interesting unknowns or uncertainties that need to be answered, but it is believed all can be addressed and Xanadu can be moved forward to success.

2. Environmental Problems-Xanadu is being built in a highly trafficked area on the daily commute route to New York City. Perhaps not the best example of urban planning. The cost and lack of an extensive and convenient public transportation systems and the need to charge for parking are problematic in the overall environmental framework.

3. Retail Store Mix-The retail store mix is deeply hampered by the restrictions placed on the developers. It is difficult to operate a complex of this scope without freedom to lease as one sees fit.

4. Entertainment Mix-Unfortunately, Xanadu has lost some of its plum entertainment tenants due to the overall situation. The facility must open with a reasonable retail and entertainment base or it may lack the synergy needed to attract local visitors and tourists.

5. Overall Concept-The overall concept here may not fit the overall environment. There is a staggering amount more entertainment, recreation and shopping opportunities in the area of this project than there is in the area of either the Mall of America or West Edmonton Mall.

Recommendations and Recommendations for Future Study

1. Project Mix-The project mix needs to be immediately reexamined and reformulated. Complete freedom should be given to the developers to develop and lease as they see fit. Perhaps an outlet store section with a particular theme(let's say upscale outlets only or those not in Jersey Gardens at present) or more showcase type stores or merchandising that incorporates entertainment elements like Cabella's does needs to be attracted to the project. Turning the second phase into a convention center should be seriously considered as there appears to be a strong need for convention and meeting space in the region and the synergistic qualities of a convention center with the rest of the project would be excellent. This would also enable the retailing and entertainment facility space to be more valuable and would attract more restaurants to the project and possibly could seed hotels and other economic growth in the area far better than the Xanadu without such facilities would bring.

2. More Research-More research is required to capture the propensity of potential users to come to the facility. Original feasibility studies based on demographic projections and comparisons to the Mall of America and Edmonton Mall are not appropriate to this situation as the market environment as demonstrated by this paper is completely different at these two projects than for Xanadu. There also needs to be research to investigate the calling for a convention center as mentioned above. There is also the possibility of doing further research within the format of this study.

3. Blue Laws-Xanadu must be allowed to be open on Sundays with all facilties and services operating. It is time for Bergen County to give up its Blue Laws. Those that don't want to work on Sunday should simply be given the right not to work on Sunday. New Jersey and

Bergen County can not afford to continue to endure the economic losses that occur from the Sunday Blue Laws especially in light of this attraction that could conceivably draw a lot of tourists if it was open on weekends.

4. Parking-Parking needs to be made free. On event days at the New Meadowlands Stadium or Izod Arenas that are adjacent to Xanadu the parking garages should charge for parking for anyone that stays in the Xanadu garages over three hours or some similar scheme that would discourage event attendees from parking in the garages for free. Any parking charge would be a strong deterrent for local visitors who are so used to free parking at all local shopping malls and entertainment facilities.

5. Special Public Transit Ticket-There needs to be a special $10 or less New Jersey Transit Ticket for people going from Newark Airport to Xanadu for trips of less than five hours total time. This would greatly encourage stopover visitors to hop on the train to visit Xanadu. A free baggage check should be included at Newark Airport for those wanting to engage in this activity or go to the nearby Jersey Gardens Mall Perhaps the special ticket could also include the bus service to Jersey Gardens to be fair to the competition.

6. Greater Public Awareness-The public needs to be convinced that traffic will flow well around the project and that it will indeed be a great benefit to have this facility in the area.

7. Greater Tourism Promotion-The Meadowlands Chamber of Commerce has already established a Visitor's and Convention Center in part to help promote Xanadu. A strong tourism promotion effort needs to be conducted on behalf of the Meadowlands Region which includes the Xanadu project.

8. Save Xanadu-In the final analysis a $1.5 billion dollar building is sitting on Route 3 in New Jersey. This project must be saved and must be put on firm footing to succeed. The low scores shown for this project in many of the categories utilized are well stated for comparison purposes using a case study approach. They indicate the current weaknesses of this project. The bright spot is clearly the huge number of possible customers in the area. Xanadu must capture these customers by being all it is capable of being. Xanadu will exist in one form or another. Let's hope the form that emerges will indeed be successful. The investors and the people of New Jersey need to succeed.

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SAP in the MBA Curriculum

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Abstract

SAP is fairly widely used in the undergraduate business curriculum but it is not as widely used in the business graduate curriculum. This paper describes how any university would be able to incorporate SAP into the MBA curriculum. SAP has a University Alliance program that encourages universities all over the world to cooperate in the use of SAP in the curriculum. SAP maintains an SAP University Alliance Community web page that lists major SAP applications developed by various universities and these applications are made available to all members of the SAP University Alliance. In these times of shrinking budgets and tight employment opportunities for business school graduates we feel that many universities should be considering using SAP in the MBA curriculum. Our paper will be a guidebook or framework for how to accomplish that.

Introduction

Enterprise Resource Planning (ERP) software is software that runs entire companies like Coca Cola or Georgia Pacific and this kind of software runs most of the fortune 500 companies in the United States. The leading ERP company is SAP, which is the world's largest software company. SAP employs more than 47,000 in more than 50 countries and the SAP software is available in more than 40 different languages. Because SAP is such a large company with their software widely adopted all over the world, SAP is constantly in need of additional people who know how to use SAP software.

There has been quite a bit written and published concerning introducing and using SAP in the undergraduate information systems programs (Andera, F. & Derringer, D. W., 1998; Hawking, P., Ramp, A. & Shackleton, P., 2001; Hawking, P., McCarty, B. & Stein, A., 2004; Abdinnour-Helm, S. & Chapman, B., 2006; Boyle, T., 2006; MacKinnon, R., K.L. Elder,2009). Since 1999 there has been an increase in articles written about expanding the use of SAP across the undergraduate business degree (Gust, D. D. & Hayen, R. L., 1999; Corbitt, G. & Mensaching, J., 2000; MacKinnon, R., 2004; Andera, F ., 2004; Andera, F. & Hayen, R., 2006A; Andera, F. & Hayen, R., 2006B). We have found no articles discussing the use of SAP in the MBA curriculum. That is what we are proposing in this paper.

Mastor of business administration (mba) degree

The MBA (Master of Business Administration) is a postgraduate degree that is awarded to students who have mastered the study of business. The MBA degree is thought to be one of the most prestigious and sought after degrees in the world. Students of MBA programs study the theory and application of business and management principles. This type of study equips students with knowledge that can be applied to a variety of real world business situations.

The Masters of Business Administration (MBA) is one of the most popular graduate degrees available. Perhaps this is because of its relevance in this world of ever-increasing business opportunities, or the ways in which the skills learned in class can be applied to the larger world of business in the expanding globalized economy about which so much attention is being paid these days. Or maybe it's because the MBA degree can often lead to lucrative careers in the public and private world of business. Whatever it is, one thing remains clear: Earning an MBA degree is one of the surest ways to further your career, jump-start a new one or set yourself up for the corporate position you've always dreamed of.

Of course, there are myriad options within the world of MBA's, and the area you choose to focus on will have just as much of an impact on your professional prospects as the fact that you have earned it in the first place. Since Windsor and Tuggle (1982) there has been a myriad of papers purporting to redesign the MBA curriculum. And that is the beauty of an MBA, it will not only give you the tools you need to succeed in the business world, but it will also open doors that might have remained closed before in many different degree programs. Therefore, we propose implementing the use of SAP across the MBA curriculum.

The MBA core curriculum offered at most business schools includes combinations and variations of the following courses:

* Accounting
* Business Strategy
* Economics
* Finance
* Human Resources
* Marketing Management
* Manufacturing and Production
* Operations Management
* Statistics
* Technology and Information Systems

While there will certainly be some variation in the programming from school to school, and while there will certainly be some courses that are offered in one place but not another, the general course of study will encompass similar topics and classes. The goal, after all, is to prepare students for the world of high-end business which they will likely enter following graduation from their MBA program.

SAP university alliance (SAPUA)

In order to have a continuing supply of educated university graduates knowledgeable about SAP software, SAP created an association with universities called the SAP University Alliance (SAPUA). SAP Education Alliances are designed to:

- Develop graduate and undergraduate learning programs that enable teaching and understanding of integrated business processes
- Encourage technically sophisticated graduates who can apply SAP solutions and technology to pursue careers in real-world business environments
- Create a network of university researchers who contribute to the body of knowledge and innovative applications of SAP solutions
- Provide the needed resources to help ensure a successful integration of SAP into the classroom, including curriculum materials and functional experts (Source: SAP Website: http://www.sap.com/usa/company/citizenship/education/index.epx)

As you can see from Figure 1, SAPUA members benefit from access to:

- A collaborative global network
- Professional development, research, and industry collaboration
- Forums, blogs, and Wikis
- Articles
- Curricula development workshops and events
- Curriculum materials

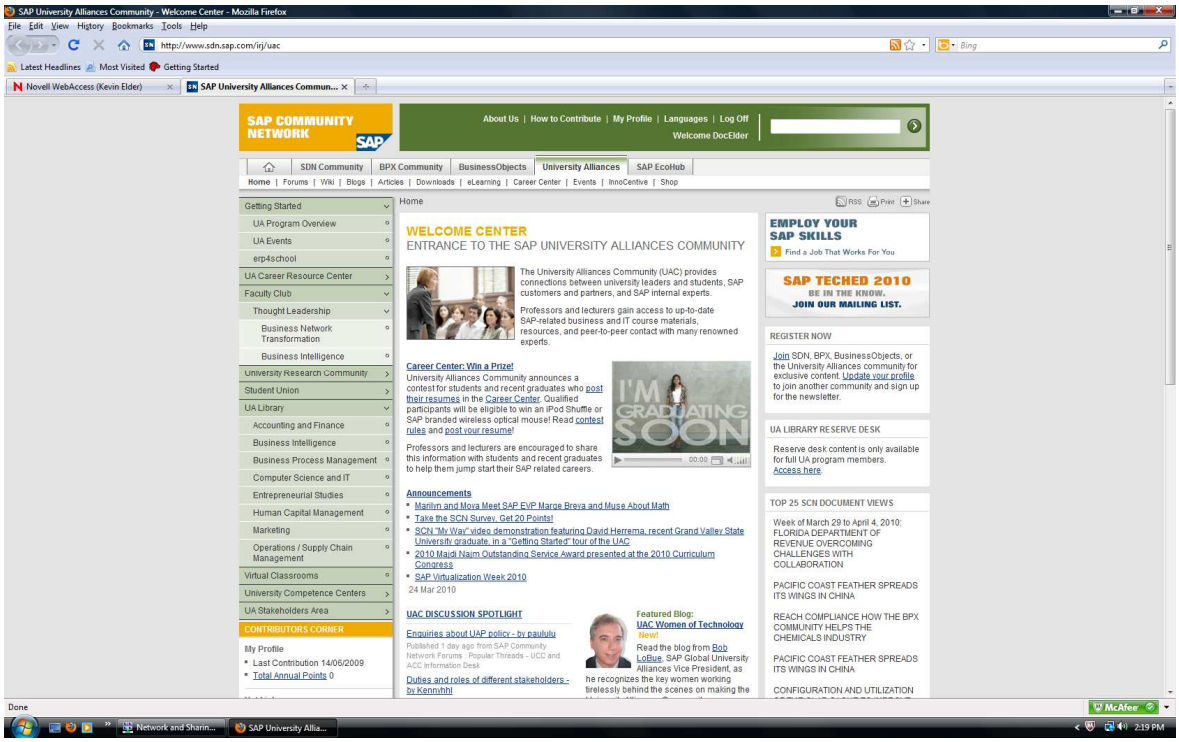

Figure 1 – SAP University Alliance Welcome Page.

Faculty members at SAPUA member institutions can click on the Library tab and view curriculum material from other member institutions as depicted in Figure 2 and 3. Faculty can attend SAP-sponsored workshops and SAP customer training classes at no cost. Faculty at SAPUA member schools also access to information on SAP events, research, and downloadable curriculum materials all throughout the year and as you can see it is not limited to information systems topics. You can find curriculum material right off the library page for:

* Accounting
* Business Intelligence
* Finance
* Business Process Management
* Human Capital Management
* Marketing Management
* Supply Chain Management, Manufacturing and Production
* Operations Management
* Computer Science, Technology and Information Systems

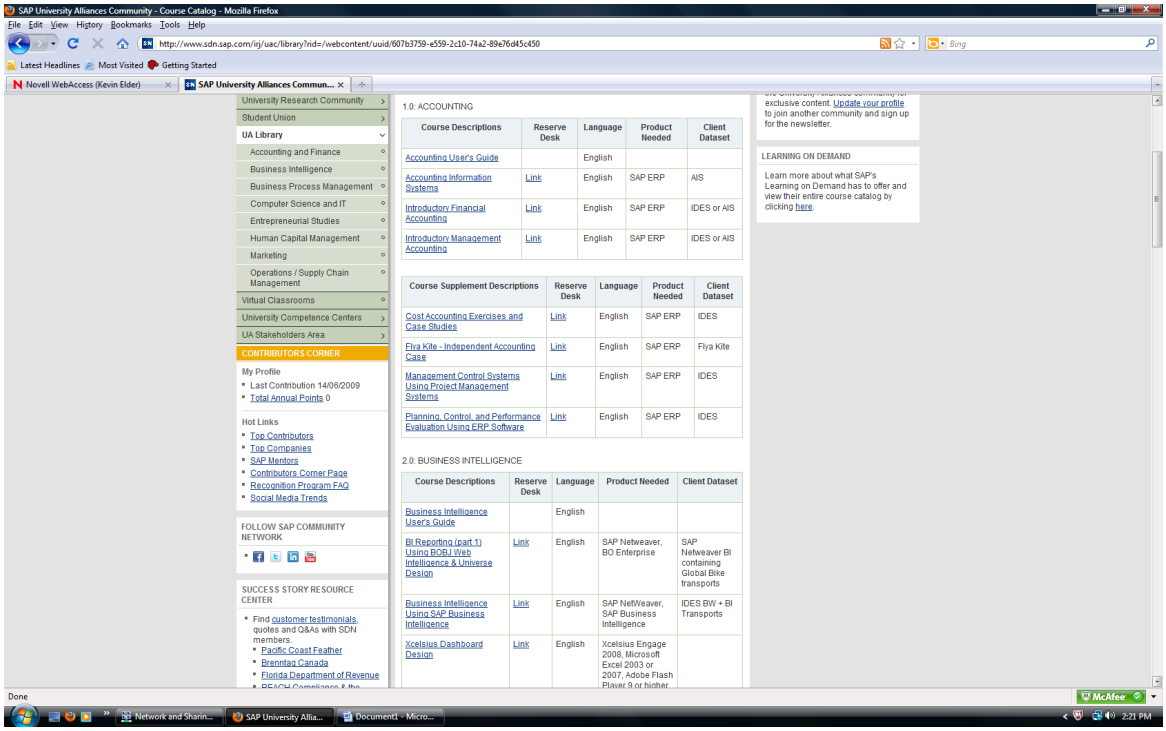

Figure 2 – Accounting, Finance and Business Intelligence Curriculum Material

On this web page there are more than 59 applications in these various areas. Many of the applications that the SAP University Alliance makes available to universities are being incorporated into undergraduate business programs and could be incorporated into the MBA curriculum as well. For example, if a university wanted to incorporate an introduction to ERP in their MBA curriculum the Global Bike application includes SAP navigation, a SD (sales and distribution) case study, a MM (materials management) case study, a PP (production planning) case study, a FI (financial accounting) case study, and a CO (managerial accounting) case study. These applications are fully documented and include step by step instructions on how to complete the SAP application. As an added bonus, any university that has a 30% SAP content in 3 MBA courses can offer an SAP certificate to their students. Fees for annual program membership vary by country. In the U.S., the current annual SAPUA membership fee is $8,000.

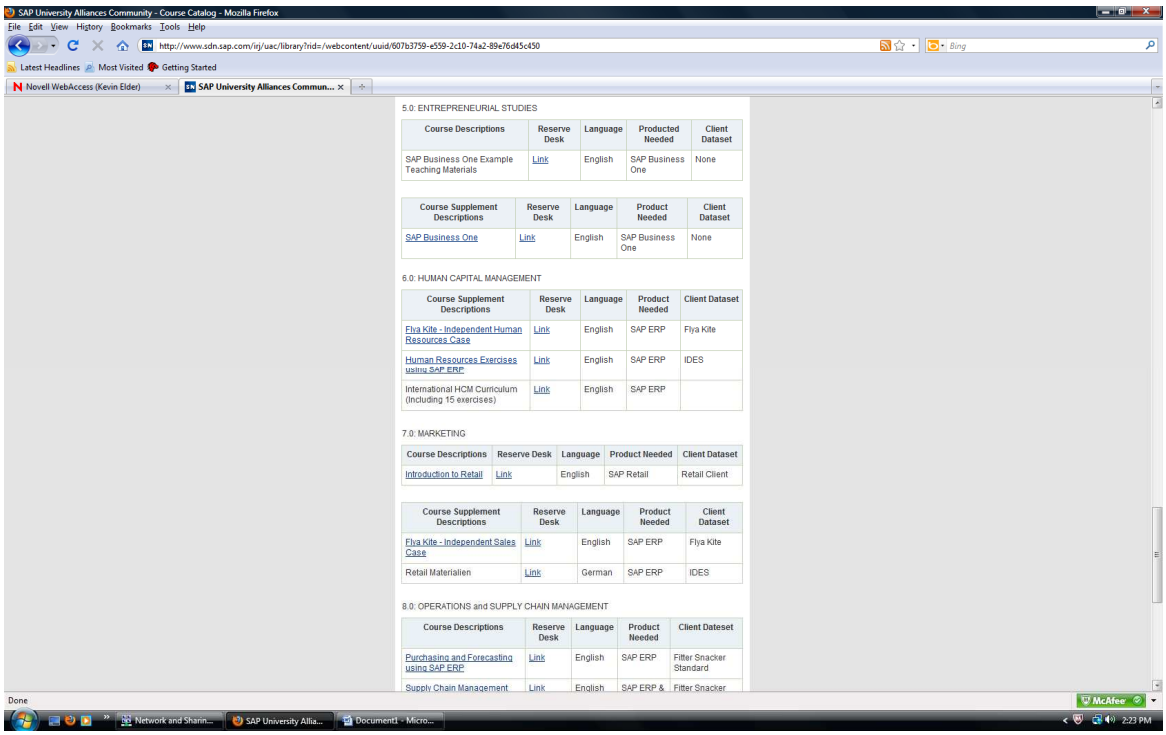

Figure 3 – Entrepeneurial, Human Capitol, Marketing Curriculum Material

SAPUA membership can be a focal point for university program differentiation and distinction. It has the potential to improve student recruiting, to enhance the university's reputation, and to improve the marketability of its graduates. It may also assist in attracting educators whose primary interests lie in enterprise systems and integrated business process solutions (MacKinnon, R., K.L. Elder,2009).

For students, SAP's University Program provides a vehicle for gaining hands-on experience with SAP solutions. Those that graduate with UA certification increase their chances of finding employment with SAP user organizations via clicking on the student union tab from the welcome page (Figure 1), they will be taken to Figure 4. From this site they can post their resumes, view open SAP positions, learn more about further SAP education and training opportunities and more. The SAP certification is rapidly becoming one of the most useful certifications and students can earn one from your university by taking a minimum of three SAP courses at an SAP University Alliance member institution. These courses are not limited to information systems courses and as you can see from the few examples shown here, almost all of your MBA courses could be SAP courses.

From Figure 1 you can see that there is so much more that the SAP program has to offer your faculty, from articles, to forums, to research opportunities too numerous to mention in this paper. Simply go to the SAPUA site for much more information (www.sdn.sap.com/irj/uac).

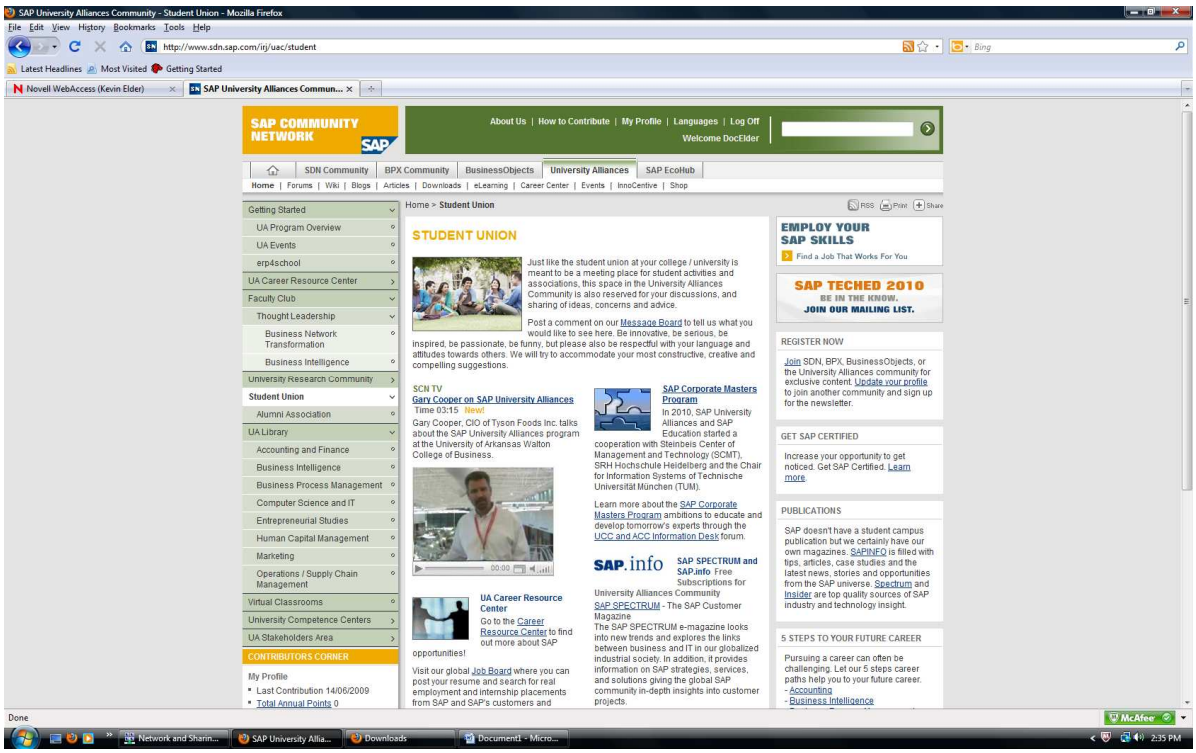

Figure 4 – Student Union Page for students

Another benefit of the SAP University Alliance program is the fact that they provide University Competence Centers (UCC). These UCCs not only host the SAP software for the member institutions, they also provide technical support. While Information Systems faculty may not need this support very often, the non-technical oriented faculty in other disciplines will find this a valuable resource bundles in with their membership. This makes the entire program more accessible to other disciplines as we outlined for a typical MBA program.

Conclusion

A university looking for something new to offer that could attract new students should seriously investigate the SAP University Alliance and offering at least some of the courses mentioned above. The SAP curriculum resources made available through the University Alliance program could and should be used in the MBA program as well. Companies are constantly looking for new hires with SAP experience, combine that with your MBA degree and you have a lethal combination. For universities just considering the implementation of SAP in their MBA curriculum, we hope this paper can be used as a guide for how to proceed.

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SAP Certifications

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Abstract

SAP is the world's leading provider of business software with 95,000 customers and more than 47,000 employees in 50 countries. Enterprise Resource Planning software is the major software produced by SAP and it is used by 85% of Forbes 500 companies and 70% of Global 500 companies.

SAP has several levels of certifications. This paper will describe three levels of certifications available to universities from SAP. The first level can be available to any university that is a member of the SAP University Alliance (SAPUA). This paper will describe the SAPUA policy of permitting a university to create a certificate signed by SAP and the Dean of the participating university for completing 3 courses with at least a 30% SAP content. The second level consists of the TERP10 certificate. The TERP10 certification requires that students take a SAP boot camp from 8 AM to 5 PM for 10 days then take a comprehensive exam. The people who pass the exam are then certified by SAP. The third level consists of certifications available from SAP at the associate and professional level. SAP offers training in 11 areas to prepare to be certified. This paper will identify these 11 areas. SAP has 3 certification focus areas. These certification focus areas are application certification, technology certification and development certification. This paper will discuss these certification focus areas.

SAP University Alliance (SAPUA)

SAP Education Alliances are designed to:

"Develop graduate and undergraduate learning programs that enable teaching and understanding of integrated business processes

Encourage technically sophisticated graduates who can apply SAP solutions and technology to pursue careers in real-world business environments

Create a network of university researchers who contribute to the body of knowledge and innovative applications of SAP solutions

Provide the needed resources to help ensure a successful integration of SAP into the classroom, including curriculum materials and functional experts."

(Source: SAP Website: http://www.sap.com/usa/company/citizenship/education/index.epx)

The SAP University Alliance (SAPUA) is one of SAP's Education Alliances. According to SAP, the University Program offers the higher education community the same SAP business solutions used by thousands of companies to run their businesses (http://www.sap.com/about/citizenship/education/universityalliances/index.epx).

"SAPUA members benefit from access to:

Curricula development workshops

Curriculum materials

A collaborative global network

Professional development, research, and industry collaboration

SAPUA membership enables faculty and students to learn about SAP solutions. Member institutions access SAP applications that are hosted at University Competency Centers (UCCs). This arrangement enables faculty and students to focus on SAP use rather than maintenance and relieves universities from having to make large technology investments to provide access to SAP solutions.

SAPUA membership can be a focal point for university program differentiation and distinction. It has the potential to improve student recruiting, to enhance the university's reputation, and to improve the marketability of its graduates. It may also assist in attracting educators whose primary interests lie in enterprise systems and integrated business process solutions.

For students, SAP's University Program provides a vehicle for gaining hands-on experience with SAP solutions. Those that graduate with UA certification increase their chances of finding employment with SAP user organizations.

SAPUA member schools gain access to the SAP Business Suite family of solutions including SAP ERP. SAP sponsors professional development and networking opportunities including the annual Curriculum Congress. Faculty members at SAPUA member institutions can attend SAP-sponsored workshops and SAP customer training classes at no cost. Faculty at SAPUA member schools also access to information on SAP events, research, and downloadable curriculum materials via the Innovation Watch Web site.

Fees for annual program membership vary by country. In the U.S., the current annual SAPUA membership fee is $8,000."

SAP Certifications

There are 3 certifications that are of interest to universities. The first certification is when a university shows SAP that they after at least 3 courses with a 30% SAP content. Once this is established, SAP will approve these courses as counting towards a university SAP certification. The university can design the certificate and the dean of the appropriate college at the university and SAP sign the certificate, once a student has passed 3 SAP This is the easiest certificate to acquire and is a big help for students looking for a job.

These certifications are described by SAP at http://www.sdn.sap.com/irj/uac/certification.

At Georgia Southern University there are 5 courses that have at least a 30% SAP content that have been approved by SAP. These courses are listed in Table 1 below.

Table 1 Courses That Count Towards an SAP Certificate at Georgia Southern University

Course	**Course Title**
HR 4333	Human Resources IS
CISM 4237	Business Intelligence
CISM 4334	Introduction to ERP Using SAP
CISM 4335	ABAP Programming For SAP
CISM 4434	Enterprise Systems Configuration

TERP10

The second level of SAP certifications is called the TERP10. It is basically a 10 day boot camp for SAP. Students go to class from 8 AM to 5 PM every day for 10 days than take an online exam from SAP.

SAP describes the TERP 10 below

- "Duration: 10 days
- Delivery Type
- Instructor-led Classroom
- Audience
- This course is appropriate for:
  - Customers and consultants who are new to the SAP ERP solution
  - Customers and consultants with expertise in a specific ERP business process area who want to expand their general knowledge of all business processes
  - IT professionals who will be supporting the business processes used by their organizations.
  - Project team members, who need an understanding of the key integration points between business disciplines supporting business process cycles.
  - Power/Super Users and End Users who want a better understanding of the total business process cycle.
- Prerequisites:
- Essential Conceptual or practical knowledge of how companies manage their
- businesses.
- SAP ERP system navigation
- Recommended Basic knowledge in at least one SAP ERP application area
- Goals
- At the end of this course you will be able to:
  - Explain the organizational structures used in each business process
  - Identify the key master data which must be maintained to execute each business process
  - Discuss the ERP transactions required to complete each business process cycle
  - Identify the key integration points between the different business disciplines supporting each business process cycle
- Course Based on Software Release
- Presentations, demonstrations, and practice exercises were carried out using:
  - SAP ERP 6.0
  - SEM 4.0
  - BW 3.5"
- "Gain a significant competitive advantage in the marketplace by becoming SAP certified.
- Around the world, specially-trained lecturers and professors are teaching the universally-recognized professional SAP certification program, TERP10, to their students.
- Graduates of this program enjoy the many benefits and opportunities of being an SAP certified expert including the advantage of belonging to a global community with a highly-valued qualification, promoting their proficiency in understanding of SAP software solutions.
- **IT Skills on the Rise The More Reason to Learn SAP**
- According to Foote Partners, publishers of the esteemed quarterly IT Skills and Certification Pay Index, there has been a definite demand for SAP and enterprise applications skills over the last six months. CIO Insight has combined these findings into a list of the top 20 IT Skills on the Rise. View the slide show.

- 26 Mar 2010
- **TERP10 Certification The Global Baseline Certification**
- The certification academy (TERP10) serves as the global baseline certification standard for the SAP University Alliances program. This hands-on certification provides students with more breadth and a deeper understanding of all functional areas within SAP software.
- From TERP10 a student has roadmaps to continue their SAP education depending on specific skills, work experiences, and interests.
- If you would like to bring TERP10 to your university please contact your local University Alliances program representative.
- **SAP Certification Levels**
- To help you drive the most value from certification opportunities, SAP is now offering multi-tiered certification paths for specific subjects.
- In addition, employers can assign resources based on more clearly-defined benchmarks, which are mapped and validated on the basis of job tasks.
- **Don't Have the Time or the Budge for Traditional Classroom Based Courses?**
- SAP Education is now offering eAcademies and Virtual Classroom Training. These opportunities allow for cutting-edge training without the travel and more flexibility."

TERP10 Content

SAP describes the content of TERP10 as follows.

- **"Through instructor presentations, system demonstrations, hands-on exercises, and be introduced to:**
  - The basic structures; organizations, master data, etc.: used throughout SAP
  - NetWeaver as a technology infrastructure supporting ERP business processes
  - NetWeaver Business Intelligence (BI) as a reporting and analysis tool
- **learn the basic business processes used in:**
  - Financial Accounting
  - Management Accounting
  - Human Capital Management
  - Procurement
  - Inventory Management
  - Material Planning
  - Manufacturing Execution
  - Plant Maintenance
  - Customer Service
  - Lifecycle Data Management
  - Sales Order Management
  - Program & Project Management
  - Strategic Enterprise Management On the last day of this course you will take the C_TERP10_05 certification exam."

Certification Focus Areas

Beyond the TERP10 certification, SAP offers hundreds of courses in various focus areas and SAP has recently changed their certifications so that there are levels of certification. A person can achieve Associate Certification of professional certification. These certifications are described below.

"**To help you drive the most value from certification opportunities, SAP is now offering an ascending certification path for specific subjects.**

Certification Level

With a focus on multi-tiered certification, you can benefit from the opportunity to validate your advanced skills within a given subject area. In addition, employers can assign resources based on more clearly-defined benchmarks, which are mapped and validated on the basis of job tasks.

- *Associate certification* – This certification covers the fundamental knowledge requirements for a consultant, or project team member ensuring the successful acquisition of broad SAP solution knowledge and skills. With associate-level certification, you can:
  - Gain an externally-recognized mark of excellence that clients seek
  - Differentiate yourself in a crowded marketplace
  - Execute your tasks with confidence and skill
- *Professional certification* – This advanced certification requires proven project experience, business process knowledge, and a more detailed understanding of SAP solutions. With professional-level certification, you can:
  - Demonstrate both your experience and your expertise through a rigorous testing process
  - Promote a more globally applicable accreditation with higher billable rates
  - Lead as well as execute tasks and engagements

Certification Focus Areas

- Focus areas are designed to help you find the certification that is right for you. They allow you to refine your search by an area of concentration and still see the full range of solutions that may interest you. All three levels of certification – associate, professional, and master – apply to the three focus areas for which you can achieve SAP certification: application, technology, or development.
- **Application certification** – This certification is available for specific SAP solutions. You can take the certification exam after completing the appropriate solution academy course and case study, or the equivalent SAP standard curriculum. If you already have significant experience implementing an SAP solution, you can take the exam without attending the course but participation is highly recommended.
- **Technology certification** – If you complete the solution academy or SAP training classes, you can take the technology exam to become certified. If you already have significant experience with SAP technology, you can take the exam without attending the course but participation is highly recommended.
- **Development certification** – This certification is available for individuals who are developing applications for SAP solutions. If you already have significant experience with SAP development, you can take the exam without attending the course but participation is highly recommended. "

How to Prepare for Certification Exams

As you can imagine it is a huge task to prepare for SAP certification. However SAP provides several resources to help a student prepare for the certification exams. Here are the recommendations from SAP to prepare for these certification exams.

- "Every certification comes with its own set of preparation tactics. To help you prepare, we recommend that you review the "Competency Areas" portion of Web pages that describe individual certification exams, where you'll learn more about recommended course

work and useful content. Many of the new exams also have helpful Quick Guides and sample questions which you can find here.

- In addition you can find some useful certification guides written by leading consultants in your field available via SAP Press here, and here.

Please note that there are no specific prerequisites to sit for a certification exam. For example, you are not required to complete an associate-level exam to qualify for a professional-level exam, and course work is recommended, but not required."

Conclusion

Membership in the SAP University Alliance is an excellent way to become familiar with all the educational opportunities offered to universities by SAP.

For universities, the 3 course certification is a great way to encourage students to take ERP/SAP courses and provides a high profile for SAP at the university. Having an SAP certification on a student's resume is a real attention getter when students apply for a job. Students with this certification usually are offered higher salaries than students without this certification.

The TERP10 workshop is sometimes referred to as a SAP boot camp and students are much more employable with this official certification. However, it should be noted that this course is expensive and is a challenging experience for students.

The regular topic certifications are what SAP professionals must achieve to keep up to date in their discipline and employees using SAP are expected to continually upgrade their SAP skills via these courses.

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SAP Focus Areas, http://www.sap.com/services/education/certification/levels/index.epx

Trade Liberalization, Welfare and Negative Externalities

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Abstract

We use a three country – one good Cournot oligopoly model to investigate effect of Free trade agreement (FTA) between two of the three countries on tariff and environmental policy. Using a linear demand, constant marginal cost and damage functions and a welfare function which is a sum of consumers' surplus (CS), profits, tariff revenues and tax revenues minus damage caused by pollution, we derive optimum tariff and environmental tax before and after an FTA is formed. We show that tariffs and taxes imposed by all countries after FTA is formed are lower than those that prevailed in pre FTA regime. In fact, optimum tariff imposed by the country that does not participate in FTA is negative.

Keywords: FTA; Optimum tariff; Environmental tax; Welfare; Imperfect Competition
JEL Classifications Codes: F10; F13; F15

Introduction

Recent literature on strategic environmental policy has analyzed the impact of trade liberalization on environmen_tal policy (see Kennedy (1994), Barrett (1994), Walz and Welish (1997), Tanguay (2001), Hamilton and Requet (2003), Burguet and Sempere (2003). Many authors such as Barrett (1994) and Kennedy (1993) have argued that trade liberalization may lower environmental standard by lowering environmental tax. This phenomenon has been called "Ecological Dumping". These authors have used Brander-Krugman (1983) and Brander-Spencer (1985) model of reciprocal dumping to argue that national governments have an incentive to use environmental tax as a substitute for tariff or subsidy. Therefore, in the absence of tariff or subsidy under trade liberalization, environmental tax may act as a rent extracting instrument. They conclude that trade liberalization will lead to a lower than efficient environmental tax. In other words, by lowering tax environmental policy is being used as a substitute for trade policy to give domestic firms a competitive advantage. According to Hamilton and Requate (2004), optimal tax in Barrett (1994) and Kennedy (1994) is lower than efficient level (i.e, marginal damage) because under internalizing marginal damage gives firms an implicit export subsidy to capture rent in the international market. This is a compromise between pollution control and competitive advantage. They have shown that if production is organized through vertical contracts this outcome does not obtain. In the absence of vertical contracts, it was necessary for government to use subsidy or tariff to extract rent. However, with vertical contracts firms can commit to a price of inputs through a decentralized contract design that makes export subsidy unnecessary. As Hamilton and Requate (2004) have shown, under both quantity and price competition optimal tax is efficient (Pigovian tax). Burguet and Sempere (2003) and Tanguay (2001) have analyzed the effect of a reduction in tariff on environmental tax and welfare. While Tanguay (2001) has shown that free trade may lead to lower environmental tax and lower welfare (due to higher pollution) Burguet and Sempere (2003) have argued that both environmental tax and welfare may increase under certain conditions. A bilateral reduction in

tariff will increase output and lower price. But it also increases damage to the environment. This reduces the incentive for government to use environmental policy strategically to gain competitive advantage and increases incentive for higher environmental protection. On the other hand, lower tariff revenue reduces appeal for import and increases that of export and thus reduces incentive for environmental protection. The effect on environmental tax depends on these two opposite effects. As Burguet and Sempere (2003) have shown, either of these effects can dominate.

In this paper we extend the reciprocal dumping model by incorporating a third country and analyze the effect of trade liberalization on tariff and environmental tax. In particular, we show that when two of the three countries reach a free trade agreement (FTA), tariff imposed by members of the FTA on the nonmember will decrease. Furthermore, FTA among two of the three countries will lead to a lower environmental tax under some very reasonable conditions. In other words, presence of environmental tax does not alter "tariff complementarity effect". Also, under FTA all three countries have an incentive to use environmental policy strategically.

The paper is organized as follows. In the second section we present the model. In the third section, we, first, derive optimal tariff and tax when all three countries restrict imports by tariff. This is followed by analyzing the effect of FTA on optimal tariff and tax. In the final section we offer some concluding remarks.

The Model

We consider a reciprocal dumping model of trade (see Brander-Krugman (1983) and Brander-Spencer (1985)) with three firms located in three countries, Home (1), Foreign (2) and Rest of the World (3). Each firm sells in all three countries. In each of the countries, demand for the good is given by an inverse demand function,

$P_j = A_j - \sum_i q_j^i$, i,j = 1, 2, 3, where q_j^i represents output sold by firm i in jth market.

In each country government maximizes welfare by choosing environmental tax, e^i and import tariff, t^i with i = 1, 2, 3. We assume that d_i, for i = 1, 2, 3, represents damage caused by pollution emitted by each unit of output. We simplify the analysis by assuming constant and identical marginal costs of production and marginal damages in all three countries given as follows:

$c_i = c$ and $d_i = d$ for i = 1, 2, 3.

We also assume[1] that $(A_j - c - d) > 0$ for j = 1, 2, 3. Following Burquet and Sempere (2003), Hamilton and Requaet (2004) and Tanguay (2001), we consider a two-stage game. In the first stage Home, Foreign and Rest of the world governments choose e^i and t^i for i = 1, 2, 3. In the second stage, after observing the choices of the first stage, firms choose their output.It needs to be pointed out that while Burguet and Sempere (2003), Hamilto and Requate (2004) and Tanguay (2001) use a two-country model with Hamilton and Requate (2004) introducing an intermediate good our paper extends their model to include a third country but does not include intermediate good.

Main Results

(3.1) Optimal Tariff and Tax.

As is customary, we solve the second stage first. Firm j chooses q_i^j for i, j = 1, 2, 3 by maximizing profit, π^j, given t^i and e^j where $\pi^j = \sum_i [A_i - Q_i - c_i] q_i^j - \sum_{i \neq j} t^i q_i^j - e^j Q^j$ for i , j =1, 2, 3. Note that $Q_i = \sum_j q_i^j$, $Q^j = \sum_i q_i^j$, e^j and t^i represent consumption in ith nation, production in jth nation, environmental tax in jth nation and tariff imposed by ith nation respectively. Given t^i and e^j , i , j = 1, 2, 3, first order conditions (F.O.Cs) yield the following solutions for q_i^j :

$$q_i^j = \frac{1}{4}\left\{A_i - c - 2t^i - 3e^j + \sum_{i \neq j} e^j\right\}$$

$$q_i^i = \frac{1}{4}\left\{A_i - c + 2t^i - 3e^i + \sum_{i \neq j} e^j\right\} \quad (1)$$

Finally, note that $\pi^j = \sum_i (q_i^j)^2$ for i , j=1, 2, 3.

Government, in the first stage, maximizes welfare, W_i , and chooses t^i and e^i where,

$W_i = CS_i + \pi^i + TR_i + e^i Q^i - d Q^i$

Note, for all i, j =1, 2, 3, $CS_i = \frac{1}{2}(A_i - P_i)Q_i = \frac{1}{2}Q_i^2$, $TR_i = t^i \sum_{i \neq j} q_i^j$, $e^i Q^i$ and dQ^i represent consumers' surplus, tariff revenue, tax revenue and environmental damage respectively.

Using (1), FOCs yield the following solutions for optimum tariff and tax.

$$t^i = \frac{1}{224}\left\{53(A_i - c) + 5\sum_{j \neq i}(A_j - c) - 63d\right\}$$

$$e^i = \frac{1}{224}\left\{-46(A_i - c) + 2\sum_{j \neq i}(A_j - c) + 266d\right\} \quad (2)$$

Finally, substituting t^i and e^i from (2) in (1) we get, for i , j, k =1, 2, 3, $i \neq j$, $j \neq k$, and $i \neq k$,

$$q_i^j = \frac{1}{896}\left\{68(A_j - c) + 132(A_i - c) - 60(A_k - c) - 140d\right\}$$

$$q_i^i = \frac{1}{896}\left\{472(A_i - c) - 40\sum_{j \neq i}(A_j - c) - 392d\right\} \quad (3)$$

Therefore, using (3), we get,

$$Q_i = \frac{1}{896}\left\{608(A_i - c) + 32\sum_{j \neq i}(A_j - c) - 672d\right\}$$

$$Q^i = \frac{1}{896}\left\{736(A_i - c) - 32\sum_{j \neq i}(A_j - c) - 672d\right\} \quad (4)$$

From (2), (3) and (4) it is clear that higher (resp. lower) marginal damage will result in higher (resp. lower environmental tax and lower (resp. higher) domestic output. Also, higher (resp. lower) marginal damage will lead to lower (resp. higher) optimum tariff. Note that

relatively higher marginal damage will make domestic production relatively less attractive and import relatively more attractive. Hence, government has an incentive to encourage import by lowering tariff. In fact, if marginal damage is high enough, optimum tariff may be negative. In other words, an import subsidy may be optimum.

(3.2) Regionalism, Tariff and Environmental Tax.

In this section we analyze the impact of regionalism on tariff and tax where two of the countries form an FTA among themselves. Suppose, without loss of generality, countries 1 and 2 form an FTA where they remove tariff on import from each other while maintaining tariff on import from country 3. We denote tariff imposed on imports from country 3 by countries 1 and 2 by t_F^1 and t_F^2 respectively. Also, t_F^3 represents tariff imposed on imports from countries 1 and 2 by country 3. We let, for i = 1, 2, 3, Q^{iF}, Q_{iF}, q_{iF}^j and e^{iF} represent consumption, production, output and tax respectively under FTA. In the second stage firms maximize profit under FTA, π_F^i, given by, for i , j = 1, 2,

$$\pi_F^i = \sum_j (A_j - Q_{jF} - c)q_i^j - (A_3 - Q_{3F} - c - t^3)q_{iF}^3 - e^{iF}Q^{iF} \text{ and}$$

$$\pi_F^3 = \sum_i (A_i - Q_{iF} - c - t^i)q_i^3 - (A_3 - Q_F^3 - c)q_{3F}^3 - e^{3F}Q^{3F}$$

FOCs yield the following solutions for i , j =1, 2 and k = 1, 2, 3,

$$q_{jF}^i = \frac{1}{4}(A_j - c - 3e^i + \sum_{k\neq i} e^k + t^j)$$

$$q_j^3 = \frac{1}{4}(A_j - c - 3e^3 + \sum_{k\neq j} e^k - 3t^3)$$

$$q_{3F}^3 = \frac{1}{4}(A_3 - c - 3e^3 + \sum_i e^i + 2t^3) \qquad (5)$$

For i = 1, 2, 3, letting CS_{iF} and TR_{iF} denote consumers' surplus and tariff revenue respectively under FTA, governments choose tariff and tax, t^{iF} and e^{iF} respectively, by maximizing W_{iF}, welfare under FTA. Optimal tariff and tax are given as follows. For i,j =1,2 and $i \neq j$,

$$t_F^i = \frac{1}{12019}\{1137(A_i - c) - 984(A_j - c) + 765(A_3 - c) - 918d\}$$

$$t_F^3 = \frac{1}{12019}\{306(A_1 - c) + 306(A_2 - c) - 3060(A_3 - c) - 3672d\}$$

$$e_F^i = \frac{1}{12019}\{-2871(A_i - c) - 750(A_j - c) - 76.5(A_3 - c) + 15716.5d\}$$

$$e_F^3 = \frac{1}{12019}\{-187(A_1 - c) - 187(A_2 - c) - 1870(A_3 - c) + 14263d\} \qquad (6)$$

Substituting t_F^i and e_F^i for i =1, 2, 3, from (6) in (5) we get, for i, j = 1, 2, $i \neq j$

$$q_{jF}^i = \frac{1}{48076}\{20832(A_i - c) - 1792(A_j - c) - 2187(A_3 - c) - 18088d\}$$

$$q_{iF}^{j} = \frac{1}{48076}\left\{12348(A_i - c) + 6692(A_j - c) - 2187(A_3 - c) - 18088d\right\}$$

$$q_{iF}^{3} = \frac{1}{48076}\left\{5548(A_i - c) - 108(A_j - c) + 6867(A_3 - c) - 8602d\right\}$$

$$q_{3F}^{3} = \frac{1}{48076}\left\{-2448(A_1 - c) - 2448(A_2 - c) + 10906(A_3 - c) - 18700d\right\} \qquad (7)$$

From (6), it is clear that higher (resp. lower) marginal damage leads to lower (resp. higher) tariff and higher (resp. lower) tax. Therefore, relation between marginal damage on the one hand and tariff and tax on the other does not change from the pre-FTA regime. However, to determine whether tariff and tax are higher or lower we assume, following Burquate and Sempere (2003), that all three countries have identical demand. That is

$A_j = A$ for j = 1, 2, 3. Then, using (6) and (2), we get, $t_F^i = \frac{918}{12019}(A - c - d)$ for i =1, 2, and $t^i = \frac{63}{224}(A - c - d)$ for i = 1, 2, 3. Hence, $t_F^i < t^i$ for i = 1, 2. This is well known tariff complementarity effect (Bagwll and Staiger(1997) and Bond et all(2004)). When two members of an FTA reduce their tariffs to zero on one another, they each find it attractive to lower tariff on imports from the non-member country. Also, note that $t_F^3 = \frac{1}{12029}\left\{-2448(A - c) - 3672d\right\} < 0$. Hence, $t_F^3 < t^3$.Not only bilateral free trade agreement between countries 1 and 2 lowers optimum tariff imposed by country 3 but also $t_F^3 < 0$. It should be noted that in the absence of environmental tax as a policy instrument tariff imposed by country 3 does not change when countries 1 and 2 form an FTA. Therefore, optimum trade policy instrument for country 3 is an import subsidy. Finally, comparing optimal tax rate, we observe that since (A-c-d)>0, $e^{iF} < e^i$ for i = 1, 2, 3. Hence, optimal tax rate is lower for all three countries under bilateral free trade agreement between countries 1 and 2. In spirit, this result is similar to the ones obtained by Barrett (1994), Kennedy (1994) and Tanguay (2001).

Conclusion

In the literature on strategic environmental policy, the debate has mainly focused on whether free trade lowers environmental standard by lowering environmental tax. In this paper we consider a model with three countries (Home, Foreign and Rest of the world) and analyze the impact of regionalism (where two of the three countries form an FTA) on environmental tax. We conclude that even when all the countries do not participate in an FTA environmental tax is lower. In other words, all the countries have an incentive to use environmental policy strategically. This is consistent with the results obtained by Barrett (1994), Kennedy (1994) and Tanguay (2001) but it differs from the conclusion derived by Hamilton and Requate (2004). Also, we found that optimal tariffs imposed by all three countries are lower under FTA. Therefore, tariff complementarity effect holds even in the presence of environmental tax. In fact, result is somewhat dramatic for the country does not participate in the FTA in the sense that optimum tariff for nonmember country is negative. This implies that optimum trade policy for the nonmember country is import subsidy. This is different from the results found in the literature on preferential trade agreement (see Bagwell and Staiger (1997) and Bond et al (2004))

where tariff imposed by the country that does not participate in preferential trade agreement does not change.

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Perceptions of leadership amongst college students studying at a medium-sized private university

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Abstract

Leadership is a key construct in the study of organizations and education. Many universities offer leadership specializations within MBA programs. As we attempt to understand and educate the 'new millennials', an understanding of students perception of what constitutes leadership is an important starting point. The results of an investigation of the leadership construct as perceived by Business professors, college freshman and college seniors in a medium sized southern private university is presented. Dimensions of leadership investigated included integrity, dedication, generosity, humility, openness, creativity, fairness, assertiveness and sense of humor. Initial findings suggest that student perceptions of leadership change through their college career to become more like the University Professors.

Introduction

Leadership is a key word that carries much weight in various facets of life. Leaders are the men and women with authority, and they are understood to be the ones controlling all the important decision of the world. The perceived need for more and better leadership in the United States has led to the inclusion of leadership development programs in some 800 American colleges and universities (Berg, 2003).

A CEO is responsible for the direction of a company and thus the company board carefully selects a CEO that will lead them successfully. Throughout the business world and all throughout the political realm, quality leadership is desired and individuals put forth effort in order to achieve the label of a quality leader. In his Harvard Business Review article, "Don't Hire the Wrong CEO" Warren Bennis (2000), points out that, "leadership is a combination of personal behaviors that allow an individual to enlist dedicated followers and create other leaders in the process. Real leaders…are great because they demonstrate integrity, provide meaning, generate trust and communicate laws. "

Across the globe leaders are fulfilling their roles as respected figures; however leadership has come to represent many different things to many people. Leaders of the United States have different values than those in the United Kingdom, who have different leadership qualities from leaders on the continent of Africa. Black Economic Empowerment in South Africa will carry a different definition of leadership than leaders in the newly established capital markets of China. Drawing focus back to the United States, Babara Kellerman, Harvard Business Review, states that, "most of the hugely successful scholars argue, often with passion, that effective leaders are persons of merit, or at least of good intention." This statement refers to an integrity quality which lays a foundation for leadership, representing a general definition of the word.

There is extensive literature on characteristics of successful leaders in all walks of life today. As the western world is experiencing massive retirement of existing leaders (of the baby

boomer generation), it is fitting to attempt to identify what qualities will be displayed in the leaders of tomorrow. What will the 'new millennials' bring to the table and how will their leadership qualities leave an impact on the United States of America? Lawrence Summers (2001), Harvard University President, states, "In this new century, nothing will matter more than the education of future leaders". According to Gerstein & Agne (2008) Millennials and Gen-Xers and are already creating a new political and social dynamic in America.

There is no shortage of literature highlighting the difference between the baby boomer generation and the Millenials, the first of whom are now entering positions of management and leadership. However there is very little research referring to the leadership characteristics of this generation.

Characteristics of Millenials shows that they are more social, relational, team oriented rather than leader oriented and typically reject formal leadership. Words like community, teams, relationships and achievement are repeatedly associated with this generation. (Wenge 2006, Orrill 2009). Moving the time even further forward, a recent nationwide survey of girls and boys found that a majority of children and youths in the United States have little or no interest in achieving leadership roles when they become adults, ranking "being a leader" behind other goals such as "fitting in," "making a lot of money" and "helping animals or the environment." (Schoenberg J et. al., 2008). Millennials display an across-the-board rejection of the country's current leadership and dominant institutions. Whether it's Congress, the federal government, major corporations, or organized religion (Greenberg &Weber, 2008).

Research Aim and Questions

Against this background of difference between baby boomers and millennials one would expect Millennials to see leadership as a different construct than the boomers. The aim of this research is 'to investigate the perceptions of leadership characteristics of a group of millennials and to determine if those perceptions differ from the baby boomers (professors), in the same geographical area'.

Research questions include:

1. Do Millennial students differ from their baby boomer professors in their perceptions of the importance placed on specific leadership characteristics?
2. Is there any difference between freshman and seniors in their perceptions of importance placed on specific leadership characteristics?
3. Is there any difference between identified senior student leaders and the general senior student population in their perceptions of the importance placed on specific leadership characteristics?
4. Do student perceptions of leadership become more like their college professors as they progress from freshman to senior levels?

Literature review

The knowledge base on the topic of leadership is immense including many types of leadership styles, structures, follower relationships, determinants of success and so forth spread across time and cultures. The literature focus for this study will be dimensions of leadership, or alternately stated, character traits that define a successful leader. This literature together with the research aim and context will form the theoretical base for the research design.

With ‘leadership’ having no clear generally accepted and overall understood definition, it is useful to observe some of the character traits that leaders actively demonstrate. Is there a possible string of qualities that specific individuals possess that thrust them into the greatness of leadership? Can leaders’ behavior be identified or at least branded by a community? The following discussion investigates some such possible behaviors and characteristics.

Integrity

According to Yoh (2008), “Integrity is the bedrock of our culture… It speaks to our ethics, honesty, transparency, and accountability.” Integrity represents morals for decision making and forms the basis of ethical decision making. Bennet (2000) lists integrity as an essential characteristic of a successful leader. This may translate in the student community to the student who turns down the opportunity to cheat. As the leader is the chief decision maker it is reasonable to propose integrity as a characteristic of a successful leader. Certainly lack of integrity of leaders has been proven to be the demise of companies such as Enron and Worldcom (Thomas et.al., 2004).

Dedication

The term ‘dedication’ takes on a whole new meaning to scholars in graduate or undergraduate studies. Dedication is an attribute that seems to separate scholarly success and commitment. In ‘Building a sound company culture,’ Steven (2000) states that, “Dedication is the value that means always giving more than people expect.” If dedication is represented by the act of exceeding people’s expectations, it could very well be tied to behavioral practices of successful leaders. Offerman et al. (1994) studied people's naive conceptions, or “implicit theories,” of leadership and found 'dedication' to be a relatively stable component of effective leadership across populations studied.

Generosity

Held as a world leader, the United States of America is viewed by some as the hand of generosity to lesser developed nations. This same behavior can be scaled down to an individual level with a leader acquiring the quality of generosity and representing a heartfelt concern for others. The ‘MIT Sloan Management Review’ referenced ‘generosity’ by stating that, “Real prosperity combines economic development with social generosity.” This statement closely ties generosity to those leaders who are guiding the economic track that our future relies on.

Humility

Arrogance has its place in sports, schools and business too, yet humility remains a driving force behind great leadership. A leader who is able to divert success toward others will be edified and appreciated by colleagues and subordinates. In Morris' et. al. (2005) article ‘Bringing humility to leadership’, humility is said to have several leadership functions, the first of which is to “influence leaders to behave in a manner that is primarily other-enhancing, rather than self-enhancing.” Therefore the leadership value of humility is found in the ability to enhance performance in others. Therefore, humility appears to be a good candidate for a successful leader.

Openness

Openness in leadership relates to beneficial transparency that shares knowledge to profit the group or the company. There is a special skill to being ‘open’ to the right depth with the right people. In his article ‘Hard listening and straight talking,’ David Pollitt says that “Trust is impossible without early, accurate and reliable communication, so we strive for “brutal” openness and honesty”. Openness seems to bring people together and provides the opportunity for leaders to generate deeper relational levels with those whom they communicate with.

Creativity

Creative use of technology in business processes and business process redesign will partially shape the future generations. Those who are able to generate new ideas and grasp new concepts will excel in the global economy. In 'A place for Creativity in Management?' McLean states that, "...in the 21st Century, creativity is a crucial factor in organizations gaining and sustaining a competitive advantage. It (creativity) is vital to the generation of new ideas, new products, services and processes, and importantly, the exploitation of new knowledge." With creativity and change running parallel to one another, Harding (2010) says, "In short, imagining change requires creative thought and leading change requires creative behavior." This quality of creativity suppies leaders with the ability to ignite change and direct future thought and understanding for the millennial generation.

Fairness

A basic, yet sometimes overlooked quality of a leader is fairness. This mundane temperament of fairness has become commonplace in corporate organizations, yet its value remains vital to operational structure regarding subordinate employees. An excerpt from Tatum's et. al. (2003) 'Leadership, decision making, and organizational justice,' reads, "Many of the decisions that leaders are required to make in an organization revolve around policies and issues of fairness and just treatment of people." For a leader to be fair, creates power with respected subordinates along with a cooperative and cohesive company that is well equipped for critical decision making. Berry (2007) states that "Leaders nurture teamwork by recruiting team players, by modeling teamwork, and by avoiding a "star" system where individuals succeed at the expense of others.

Assertiveness

An assertive leadership style would be represented in a confident individual who believes in their purpose and voices their point of view. An assertive style of leadership holds the potential to define leaders in their ability to implement and direct projects, thoughts, and activities. Assertivness is a behavior that enables a person to act in his own best interest and to stand up for himself without denying the rights of others (Lwehaburs, 2000). A leader is responsible to make the right decisions based on his judgment. So being assertive is a key value for any leader, as it demonstrates the confidence of his communication to others. In her article 'Assertiveness and effective leadership,' Santora states, "...perhaps a particular level of assertiveness may mean the difference between leader success and failure."

Sense of Humor

A leader with a 'Sense of Humor' differs from the typical leader's character of being noticeably pressured. Humor, when used in the appropriate manner, has the ability to lighten the tension and reduce the distaste for unpleasant and mundane tasks that face students in college or company employees in the corporate environment. "Specifically, full report was found for the hypothesis that leaders' use of humor was positively related to followers' creative performance" (Arendt, 2006).

The main reason that leaders are so powerful is due to the quality and the numbers of people that follow them. Ultimately, people are the ones who decide which superior they wish to follow. People are the ones who place leaders in power and the question now stands as to what leadership style the millenials are going to exalt.

There are many other traits associated with successful leadership however these few appear separately and collectively (Hakala, 2008) in successful leader characteristics list and as such appear to provide a reasonable bases for further study.

Research Design

The aim of this research was to investigate perceptions of leadership characteristics as demonstrated by millennial college students and their baby boomer professors. In order to obtain a clear result within the time constraints of the research project, the study was conducted as descriptive research. An attempt was made to construct a survey instrument that encapsulated current thinking on what constitutes a successful leader and respondents asked simply to choose the most important characteristic to successful leadership rather than to create a totally new list of characteristics. Surveys were distributed to 4 different groups. The two major groups were college students and college professors. Firstly, the college students were separated into two groups, freshman and seniors. This was done for two reasons, to see if the freshman differed from seniors due to either the time of birth (placement within the generational scale), or education (3 years of college). Secondly a select group of students identified by the College of Business professors as senior 'student leaders' was selected, to determine if those students actually practicing leadership differed from those of the general population and if they were more like the baby boomers than their own generation. The final group selected for survey was a targeted group of professors of the baby boomer generation.

The first section of the survey instrument contained demographic questions of age, home state, country of origin, and 'major' questions. The remaining section asked the respondent to select which characteristic best described an effective/successful (student) leader, selecting from integrity, dedication, generosity, humility, openness, creativity, fairness, assertiveness, and sense of humor.

Data Collection and Analysis

The survey was administered via email to 811 university freshman and 1126 university seniors. This represented the total class population for each class level (except for the 23 seniors selected to be part of the special leadership group). The survey addressed to the student leadership group was hand delivered and collected. As college professors are notoriously difficult to access, a particular group of professors was targeted for the survey. The group targeted was the College of Business Administration faculty who are recognized for their knowledge in the area of leadership. The faculty respondents had a mean age 54.7. All but one respondent would be considered to be of the baby boomer generation (born 1946-1964). Twenty surveys were hand delivered to this group in an attempt to ensure a better response rate. The response rate for the freshman group was 32% and 41% for seniors. The response rate for the senior student leaders was 100%. The response rate for faculty was 70%. Data Analysis was via simple descriptive statistics. Survey results were tabulated and cumulative percentages calculated.

Limitations

It is acknowledged that the difference in findings between the student and baby boomer group may be influenced by the difference in education levels between the millennial and the baby boomer population but that is intrinsically part of the equation of difference. The inclusion of the senior group of students who have almost completed a 4 year degree may help clarify this issue. If the seniors respond in a more simliar fashion to the professors, it indicates that the difference is due at least in part to education rather than date of birth. To clarify this point beyond dispute a much larger study across all classes, and educational levels of baby boomers would be required. In this study we accept the current literature, or collective wisdom on what

constitutes a good leader as generally representative of the baby boomer thinking. It is acknowledged that the sample population of professors may not be representative of the entire baby boomer population and that the millennial population studied may not be representative of the entire millennial population of the United States. However the student population of the university chosen for this study is comprised of students from all states of America, except Maine.

Results

Results will be organized around research questions and from the highest level of collectivity. Bar charts are created firstly from tabulated data and secondly from cumulative percentages. As there are nine possible answers it is expected that no one item will score extremely high.

Research Question 1

Do Millennial students differ from their baby boomer professors in their perceptions of the importance of leadership characteristics?

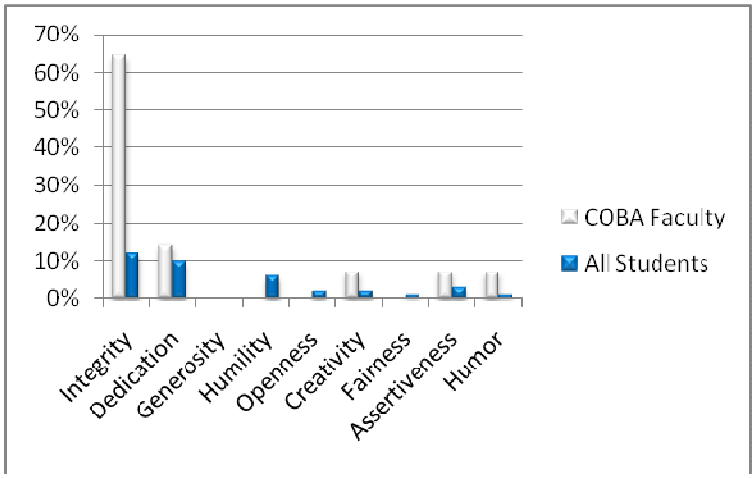

Figure 1. Percentage selection of Leadership Characteristics: Students and faculty

As demonstrated in Figure 1, for the millennial (student) population the most frequently selected characteristic was integrity (34%) closely followed by dedication (27%) and humility (15%). The spread of selected characteritics was quite broad with all but generosity attracting some level of selection. For the faculty population the responses were much more focused with integrity receiving 64% of selections, dedication 14% and creativity, assertiveness and sense of humor 7% each.

Research Question 2

Is there any difference between freshman and seniors in the perception of the importance placed on leadership characteristics?

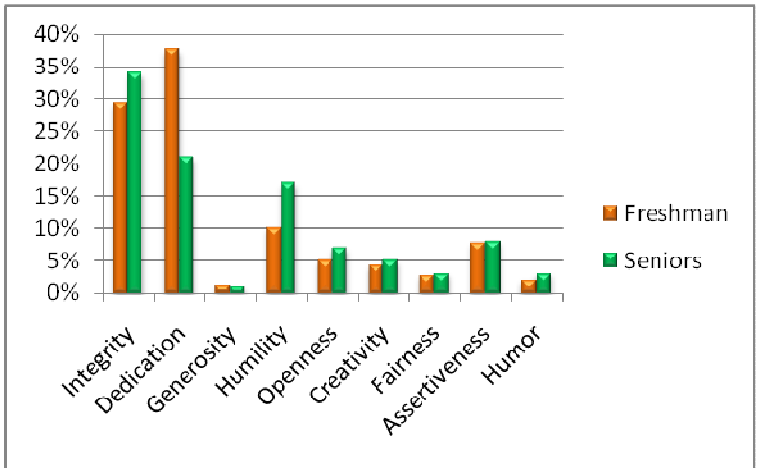

Figure 2. Percentage selection of Leadership Characteristics: Freshman and Senior Students

As demonstrated in Figure 2, of the freshman respondents selected dedication (38%), integrity (29%), and humility (10%) as the most important characteristic. Senior respondents selected integrity (34%), dedication (29%), and humility (17%). All other characteristics received the same responses in the freshman and senior population.

Research Question 3

Is there any difference between identified senior student leaders and the general senior student population in the perception of the importance placed on leadership characteristics?

Of the senior leader population selected integrity (39%), humility (30%) and dedication (17%). The general senior population selected integrity (34%), dedication (24%) and humility (17%). (see figure 3)

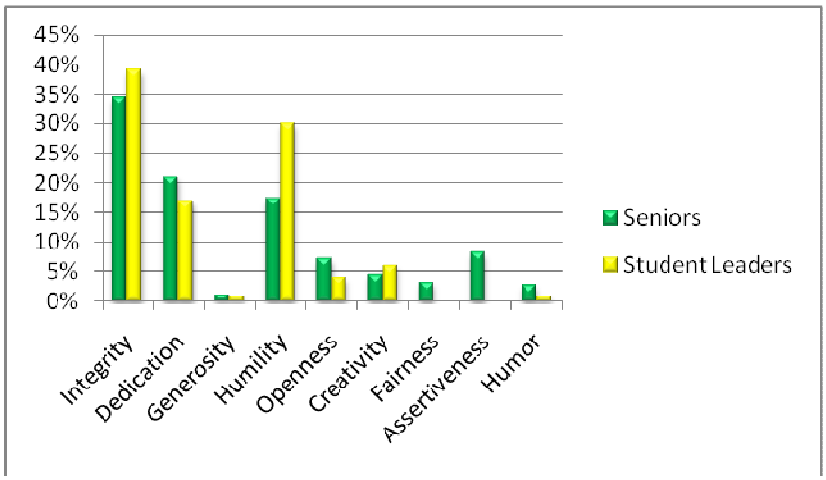

Figure 3. Percentage selection of Leadership Characteristics: Senior student leaders and senior non leaders.

Research Question 4

Do student perceptions of leadership become more like their college professors as they progress from freshman to senior levels? Differences are as follows:

- freshman respondents 38% selected dedication, 29% integrity, and humility 10% as the most important characteristic.

- senior respondents, 34% selected integrity, 29% selected dedication and 17% selected humility
- faculty respondents, 64% selected integrity, 14% selected dedication, and 7% selected creativity, assertiveness or sense of humor (7% each). (see figure 4)

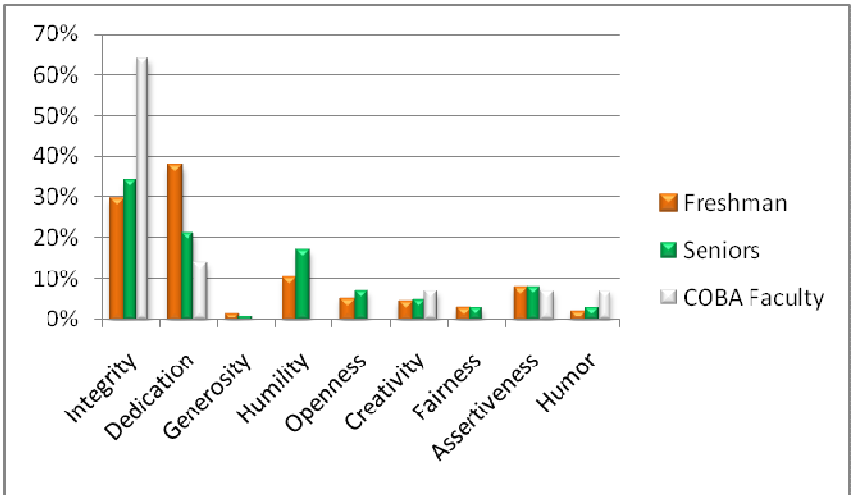

Figure 4. Percentage selection of Leadership Characteristics: Freshman, Seniors and faculty

Discussion

The following section focused around the research questions, attempts to explain the results above and link them to any existing theory.

Research Question 1

Do Millennial students differ from their baby boomer professors in their perceptions of the importance placed on leadership characteristics?

For the general population of Millennials integrity and dedication were the most frequently selected characteristics with there being little difference between the two (12% and 10% respectively. The baby boomers also selected integrity (64%) and dedication (17%) however integrity was by far the most frequently selected. As two possibilities for differences have already been raised, being time of birth in history and education, possible explanations will be discussed within the context of the two alternatives. Firstly, time of birth: Millenials are acheivement focused growing up in a culture where grade point averages are considered important. This may have influenced the higher frequency of dedication in this population. Secondly in the context of education/experience levels, this result may be associated with the limited experience or knowledge of leadership that millenials have. Having made it to college, it could be assumed that a certain amount of dedication (at least to task) would have been required, hence the elevated place of dedication. However the full impact of integrity may not have been experienced by this generation. It would be interesting to see the results of the same survey distributed to the baby boomers when they were of college age.

The other obvious difference in both the two millennial populations versus the baby boomer population is the frequency of selection of the humility trait. This result may be associated with the millenials sense of community and rejection of standard power structures.

Research Question 2

Is there any difference between freshman and seniors in the perception of the importance placed on leadership characteristics? Once again integrity and dedication were the most frequently selected characteristics. The difference being that dedication was most frequently selected by freshman followed by integrity. The seniors most frequently selected integrity followed by dedication. Both these populations are millennial, so time in history of birth is unlikely to provide an explanation for the difference. Education may however be an influencing factor. Most universities have adopted a rigorous stance on plagiarism and copyright infringement and have ethics as core curriculum value. The notion of ethics is of particular importance to the faith based university selected for the study.

Research Question 3

Is there any difference between identified senior student leaders and the general senior student population in the perception of the importance placed on leadership characteristics? Once again both populations are of the same generation and age within that generation. The most obvious difference was that the student leader demonstrated a much greater selection frequency for humilty than their non-leader counterparts.The student leader group had recently been on a leadership retreat where the notion of servant leader was promoted. This may explain what might possibly be a temporary departure from their non leader class mates, however it could also support the notion that humility is important to the millennials as the student leaders value and practice humility. The fact that they are accepted as leaders by their peers implies this value is shared by their peers.

Research Question 4

Do student perceptions of leadership become more like their college professors as they progress from freshman to senior levels? The difference between freshman and seniors is discussed under reserach question 2. Adding the results of the baby boomer faculty to the picture it can be seen that seniors become more like faculty in the perceived importance of integrity (for reasons already addressed). However they become less like their faculty with respect to humility. This is an interesting finding because this value is not coming from the faculty unless the faculty are teaching what they do not believe themselves. The latter is a possibility.

Conclusions

The single most significant finding is the frequency of selection of humility by the millenials and the almost total disregard for this attribute by baby boomers. A much more encompassing population of baby boomers beyond college professors needs to be assessed. If similar results are found this may be a key difference in emerging leadership styles of the millennials. Secondly the relative importance of dedication (higher for the millennials) may also manifest itself in their leadership style.

One other finding of interest is the lack of selection of generosity by the millennials. This appears in contradiction with the previously identified sense of community and concern for their fellowman. It is suggested that more information from a more representative sample be gathered to test these preliminary findings.

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Social Capital, Knowledge Sharing and Intellectual Capital in the Web 2 enabled world

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Abstract

This study explores links between social capitol created through online social networks and Intellectual capitol. It is suggested that intellectual capitol can be generated from social capitol through knowledge sharing, facilitated by web 2 technologies. The benefits of web 2 technologies in the area of knowledge sharing are well documented, however this study suggests that web 2 technologies not only provide the platform to share but also the motivation to share as participants gain and benefit from increased social capitol.

Introduction

It is a time of unprecedented internet access and connections between individuals. There is no shortage of statistics on the exponential growth of web 2 sites. The rapid increase in the number and type of web 2 sites, such as wikis, online social networks, blogs, Flickr, YouTube, discussion forums, mashups, and so forth makes it almost pointless to quote usage statistics, as by the time this article is published these figures will have changed significantly. However quotes such as "The number of blog sites doubles every 150days, approximately150,000new blogs are added every day, wikipedia has 217million unique visitors every month, social networking sites such as Facebook have 175 million active users with 180 million photos uploaded each month" and so forth. (Casarez 2009) are sufficient to make the point that this is no temporary fad and hence warrants investigation.

Nie (2001), argued that Internet use detracts from face-to-face time with others, which might diminish an individual's social capital. However, this perspective has received strong criticism (Bargh & McKenna, 2004). Some researchers have claimed that online interactions may supplement or replace in-person interactions, mitigating any loss from time spent online (Wellman, Haase, Witte, & Hampton, 2001). This paper suggests that online interaction can increase most forms of social capital, including those that facilitate intellectual capital building.

The body of knowledge on both social and intellectual capital is immense. The literature suggests a sound theoretical link between these two constructs and knowledge sharing. This paper intends to examine these links highlighting aspects that are of particular significance to the knowledge sharing environment provided by web 2 tools.

The basic proposition of this paper is that web 2 tools facilitate increased knowledge sharing by not only providing an excellent platform for exchange, combination and creation of new knowledge, but also by stimulating motivation for knowledge sharing through the development of bonding and bridging social capital.

The research method used in this paper is primarily literature synthesis involving inductive interpretation of qualitative research to establish associations not previously known. The paper structure will be as follows. Firstly definitions and literature on social capital, intellectual capital and web 2 technologies pertinent to the proposition will be introduced.

Secondly the literature will be summarized highlighting potential relationships between the constructs and a model reflecting the nature of these relationships constructed.

Literature Review

1 Definitions

Web 2.

'Web 2' technologies refer to the range of interoperable technologies that facilitate communication in multiple formats, information sharing and critique, social exchanges, community and collective wisdom (Casarez 2009). These include social network sites such as Facebook and Myspace, wikis, blogs, flickr, youtube, discussion forums, mashups, wikis, micro-blogging and so forth.

Social capital

Social Capital is the shared accumulated resources that exist across social networks. The social network can be seen as the structure or system of connections between nodes. Bourdieu and Wacquant (1992) define social capital as ''the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition'' (p. 14).

Bonding Social Capital

Bonding is horizontal, among equals within a community. Bonding capital is localized which is defined as being found among people who live in the same or adjacent communities. It is also the form of social capital associated with thick trust (Anheier and Kendall 2002).

Bridging Social Capital

Bridging is said to be vertical between communities (Dolfsma and Dannreuther 2003; Narayan 2002; Narayan and Pritchett 1999) Bridging capital extends to individuals and organizations that are more removed. Bridging social capital is associated with thin trust,

Intellectual Capital

Nahapiet and Ghoshal (1998) define "intellectual capital" as the "knowledge and knowing capability of a social collectivity, such as an organization, intellectual community, or professional practice". Jar-Der (2005), refer to intellectual capital as the knowledge possessed by groups that is more than the aggregation of individual groups.

2 Social capitol and Social networks

In order to establish a context the following section briefly defines social capital, notes benefits derived from social capital and examines social capital in the virtual space.

Social capital is a somewhat elastic term with a variety of definitions in multiple fields (Adler & Kwon, 2002), and is conceived of as both a cause and an effect (Resnick, 2001; Williams, 2006). As stated above, Bourdieu and Wacquant (1992) define social capital as ''the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition'' (p. 14). The resources from these relationships can differ in form and function based on the relationships themselves. Social capital broadly refers to the *resources accumulated through the relationships* or connections among people (Coleman, 1988). Some authors distinguish between various forms of social capital and others refer to it as collective term.

Generally speaking social capital has been linked to a variety of positive social outcomes, such as better public health, lower crime rates, and more efficient financial markets (Adler &

Kwon, 2002). Moreover, social capital researchers have found that various forms of social capital, including ties with friends and neighbors, are related to indices of psychological well-being, such as self esteem and satisfaction with life (Bargh & McKenna, 2004; Helliwell & Putnam, 2004). Vertovec (2001) highlighted the benefits of using social networks, by explaining how interpersonal relations cut across boundaries such as neighborhood, workplace, kinship or class and could be abstracted on an individual basis (Vivian and Fay 2003)

Even though most of the research on social capital focuses on the collective benefits of social capital as discussed above, Bourdieu and Coleman (1991), provide conceptualization at the individual level. They believe that social capital exists between individuals and can be studied at the individual level. Social capital is said to reside in the relations (links) among the nodes (individuals) of a network and 'just as physical and human capital facilitate productive activity, social capital does as well' (Coleman, 1988, p 101). Social capital is said to exist between individuals and by extension can be accumulated by the individuals. Such a view of social capital rests on the premise that '*my connections can help me'* (Cross and Cummings, 2004) and is all about establishing relationships purposefully and employing them to generate intangible and tangible benefits in short or long terms. Hence it is suggested that the study of individual connections may provide insight into the development of the social network and resulting social capital.

In a *virtual setting,* social capital is said to be a common social resource that facilitates information exchange, knowledge sharing, and knowledge construction through continuous interaction, built on trust and maintained through shared understanding (Daniel, Schwier & McCalls, 2003). It is assumed this refers more to the bonding social capital as bonding has more to do with trust (Nahapiet and Ghoshal (1998). Huysman and Wulf (2005), propose that the higher the level of social capital, the more members are *stimulated to connect and share knowledge*. This sharing aspect challenges individuals to *draw upon and provide value for themselves* and the community, with obvious benefits to both parties. This notion is in a way a demonstration of the purposeful establishment of relationships for mutual benefit suggested by Cummings and Cross (2004) above.

Ellison et al (2007), investigated the linkages between Facebook usage and various types of social capital and found a positive relationship between certain kinds of Facebook use and the maintenance and creation of social capital including bridging (between communities) and to a lesser extent bonding social capital (among individuals within a community). Recently, researchers have emphasized the importance of Internet-based linkages for the formation of weak ties (temporary and contingent), which serve as the foundation of bridging social capital and suggest that it is possible that new forms of social capital and relationship building such as bridging social capital will occur in online social network sites (Ellison et al., 2007).

3. Social capital and knowledge sharing in the web 2 environment

Social capital is the shared accumulated resources that exist across social networks. Knowledge is the primary resource shared and accumulated in the network. Social relations, often established for other purposes, constitute information channels that reduce the amount of time and investment required to gather information. (Nahapiet and Ghoshal 1998). As mentioned above the amount and nature of what is being shared depends on the type of social capital. For example, there is mounting evidence demonstrating that where parties trust each other, they are more willing to engage in cooperative activity through which further trust may be generated (Fukuyama, 1995; Putnam, 1993; Tyler & Kramer, 1996).

Studies of knowledge sharing in the web 2 era have ventured down some different paths than in the 'pre' web 2 studies. For example, in relation to social technologies 'connectivists' assert that knowledge is distributed across a network of connections, and therefore that learning consists of the ability to construct and traverse those networks. Some domains of knowledge contain vast numbers of weak interrelations that, if properly exploited, can greatly amplify learning by a process of inference (Siemens, 2004; Downes 2006). This sounds very similar to 'accumulated shared resources' or social capital. These authors refer to learning specifically, but knowledge sharing/transfer is a precursor to learning..

4. Social capital and intellectual capital

Nahapiet and Ghoshal 1998 define "intellectual capital" as the "knowledge and knowing capability of a *social* collectivity, such as an organization, intellectual community, or professional practice. They defend their definition in terms of its clear parallel with the concept of human capital, which embraces the acquired knowledge, skills, and capabilities that enable persons to act in new ways (Coleman, 1988). They affirm the notion that social capital facilitates the creation of new intellectual capital (Nahapiet and Ghoshal 1998) through knowledge processes.

5 Intellectual capital and knowledge sharing

Knowledge sharing appears to be the intersection or pivotal point that both social capital and intellectual capital revolve around.

Following Schumpeter (1934), Moran and Ghoshal (1996) have argued that all new resources, including knowledge, are created through two generic processes: namely, combination and exchange. There appears to be a consensus that both types of knowledge creation involve making new combinations either by combining elements previously unconnected or by developing novel ways of combining elements previously associated. This is exactly what the connectivists believe about the potential of the web 2 social network. That through an extensive network of connections/ties knowledge is distributed, remixed and added back to the network in a cyclical fashion as people from diverse back grounds, cultures, disciplines and experiences recombine it with their existing knowledge base and return it to the network. New knowledge creation is said to be created through this process and empowered by social interaction and coactivity. The main thesis being presented here is that social capital facilitates the development of intellectual capital by affecting the conditions necessary for exchange and combination to occur.

Model Building

From the literature above it is proposed that social capital is the *potential* that exists across a social network. "In a similar fashion, Verhagen, (2006) when speaking of the connectivist view of the social web, sees this *potential* "as using knowledge that you do not have at the ready, whose existence and usefulness you are aware of and to which you also have access". The amount of social capital is dependent on the *number* of connections (connectivism) to deliver the potential and the *quality* or nature of those connections. Strong connections will deliver bonding social capital and weak connections tend to deliver bridging social capital which can then in turn through more frequent connection and value gained from those connections, become bonding social capital. Bonding social capital is a higher level of social capital and delivers greater value because of the trust element involved. Intellectual capital has elements of potential also in the knowledge capability aspect. It is more focused on knowledge sharing and

exchange and the outcome is new knowledge. Intellectual capital may develop using the same pathways as social capital and to some extent the same dynamics. Knowledge is shared through the social connections. Thus, the better the social connections the greater the potential for knowledge sharing is. The connectivisits would add, the more extensive and diverse the network the greater the possibility for new knowledge creation sharing and ultimately intellectual capital.

Moran and Ghoshal (1996) propose a mechanism for the development of intellectual capital from social capital via information benefits. These benefits can be amplified via web 2 technologies. Information benefits occur in three forms: access, timing, and referrals.

"Timing" of information flows refers to the ability of personal contacts to provide information sooner than it becomes available to people without such contacts. "Referrals" are those processes providing information on available opportunities to people or actors in the network, hence influencing the opportunity to combine and exchange knowledge frequently include reputational endorsement for the actors involved (such as happens in web 2 technologies through rating systems)-thereby influencing both the anticipated value of combination and exchange and the motivation for such exchange (see Granovetter, 1973, and Putnam, 1993). Much of the evidence for the relationship between social capital and intellectual capital highlights the significance of the relational dimension of social capital.

Figure 1 below shows knowledge sharing as the pivotal element that increases and creates social capital (cause and effect ,see Resnick, 2001; Williams, 2006) It also plays a similar role in the creation of intellectual capital. It is also the process that links social capital with intellectual capital facilitating the creation of new knowledge through exchange and recombination, driven by the ties of social capital. The entire process has been enabled by the web 2 technologies.

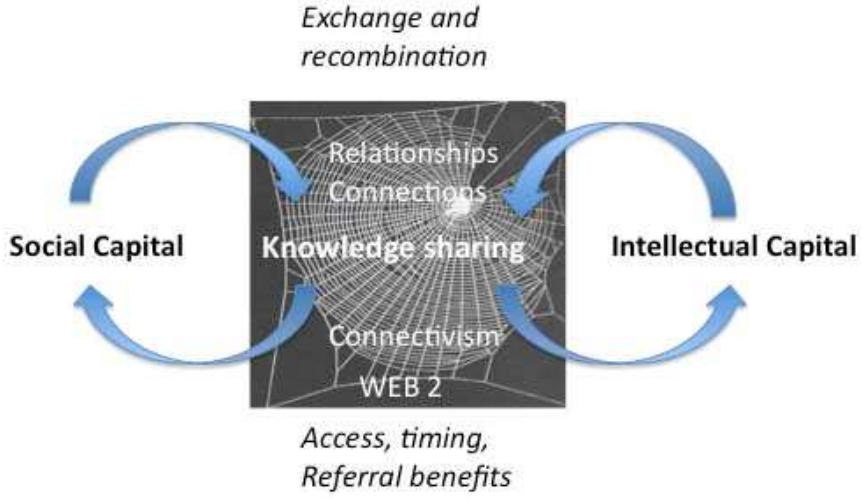

Figure 1 – The relationship between social capital, knowledge sharing and intellectual capital in the 'web 2' enabled environment.

Conclusion

It is generally accepted that the capacity of an organization to innovate lies in its capacity to generate new knowledge (Nonaka and Takeuchi, 1995; Nonaka, Toyama and Byosière, 2003). For this to be possible, knowledge sharing is considered a necessary condition (Nonaka and Takeuchi, 1995; Nonaka, von Krogh and Voelpel, 2006). It is suggested that Web 2 tools facilitate the development of social capital through knowledge sharing which in turn increases the potential to create intellectual capital. Web 2 is an important piece in this equation because it

reinforces the notion that 'my connections help me' as it provides the means by which more connections can be made. It is suggested that organizations consider how they might use web 2 technologies to tap into the power of social capital knowledge sharing and intellectual capital.

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Ethics in the Virtual World: A case study of the suitability of second life to faith based education

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Abstract

As the proliferation of web 2 technologies and virtual forms of communication increase, so does the adoption of these technologies in education. Online education is the fastest growing sector of education and much research is being conducted in an attempt to overcome difficulties associated with the lack of 'face to face' contact of traditional classrooms. One of these areas of research is that of virtual worlds such as second life. This paper presents the findings of a small case study conducted in second life as part of a 'Science and Technology' honors class in a mid sized faith based university. Findings are presented as strengths and weaknesses in the context of the university mission.

Back ground

The context of this study was a Science and Technology honors class taught at Harding University, Arkansas. One of the objectives of the class was to expose students to web 2 and virtual reality technologies, and observe their reactions to these technologies in an attempt to understand their potential and application to faith based education.

The application to education in this study is moderated by that which is in alignment with the goals of the university as expressed in their mission statement (www.harding.edu). As it is quite lengthy the full statement is not included here. The focal point of the statement centers on the integration of faith, learning and living. Sub points include; the development of Christian scholarship and ethics, the development of lasting relationships, the promotion of wellness, and the promotion of citizenship within a global perspective. The code of conduct item relevant to this context is the statement;"students are prohibited from possessing or displaying pornographic materials of any type". As Second Life has elements of 'pornographic material', this tool requires further investigation and analysis to determine if it is appropriate to Harding University. Initial opposition to the use of second life included the concern about pornography with one administrator saying "we have a big enough problem with pornography in our society without piping it to their dorm rooms' and 'there is already concern over the amount of time students spend on non academic related online activities which act as a distraction to their study, do we really need to add another time sink?".

As will be demonstrated in the literature review and findings, second life offers much that could be beneficial to learning, particularly in the hybrid and online environments. The following discussion aims to determine firstly the potential benefits of second life in education and secondly the appropriateness of second life to education offered by a faith based university.

Introduction

The major research aim is ‘to gain an understanding of the strengths and weaknesses of second life as a tool for education at Harding University’.

Research Questions:

1. What are the strengths and weaknesses of Second Life as an educational tool within the context of Harding University?

a. Is Second Life suitable as an educational tool in terms of learning curve?
b. Is Second life suitable as an educational tool in terms of access?
c. Is Second life suitable as an educational tool in terms of graphical clarity?
d. Does Second life engender social interaction amongst students?
e. Is Second life suitable as an educational tool in terms of Harding University constraints?

Literature Review

As virtual worlds are a relatively new phenomenon in terms of their application to learning, there is not a lot of established literature on this topic. Most of the information in this section came from the second life site. Additional information has been retrieved from ‘grey literature’ such as virtual world communities such as Virtual World review.

Simulation software is perhaps a precursor to the virtual world and as we consider the evolution of virtual worlds, it is helpful to first define or describe the defining characteristics of a virtual world.

A virtual world is said to be an interactive simulated environment accessed by multiple users through an online interface. Virtual worlds are also called "digital worlds," "simulated worlds" and "MMOG's." There are many different types of virtual worlds, however there are six features all of them have in common:

1. Shared Space**:** the world allows many users to participate at once.
2. Graphical User Interface**:** the world depicts space visually, ranging in style from 2D "cartoon" imagery to more immersive 3D environments.
3. Immediacy: interaction takes place in real time.
4. Interactivity: the world allows users to alter, develop, build, or submit customized content.
5. Persistence: the world's existence continues regardless of whether individual users are logged in.
6. Socialization/Community: the world allows and encourages the formation of in-world social groups like teams, guilds, clubs, cliques, housemates, neighborhoods, etc. (Virtual World Review 2010)

Simulation software and games have these characteristics but have a predefined environment with a predefined set of conditions and rules that the user is able to interact with. Second Life also adheres to all of the above characteristics. What sets Second Life apart from other virtual worlds is the creativity. Upon installing and creating your avatar in Second Life, you are free to do anything you would like to do. You can visit and participate in worlds created by existing residents or build your own. Very little is predefined. This freedom to create, explore, design, socialize, and learn is very open to the individual. If you would like to create virtual goods, sing at a concert, visit virtual representations of real landmarks, or attend a class, all of these things are available to you.

Second Life was created in 2003 by the Lindens and has enjoyed great success as since its creation. Some interesting statistics gathered from the Second Life website are below:

- 18 million accounts as of Jan 2010
- Total Economy of 567M Dollars(2009)
  - 65% increase from 2008
- Over 200 universities with a virtual campus
- Gross Resident earnings are 55M US Dollars(2009)
  - 11% increase from 2008
- The Linden, the Second Life currency, has an exchange rate that fluctuates between 260L/$1US and 320L/$1US

Educational uses of Second Life

Second life is being used by several universities to amplify existing curriculum and create new models for engaged collaborative learning. According to second life creators 'Linden Labs'. educational institutions and organizations are creating virtual learning environments to deliver a wide range of courses, field trips, and events including:

- Distance and Flexible Education
- Presentations and Discussions
- Historical Recreations
- Simulations and Role-Playing
- Multimedia and Games Design
- Language Learning Practice

Linden Labs claim that:

"Second Life's persistent virtual environments enable students to work together synchronously and then return, individually or as a team. The learning space is *always* available, not just for geographically dispersed groups but even those who meet regularly in the physical world. This is particularly useful when students require more flexible schedules or need to work asynchronously on the same project….. Second Life amplifies learning beyond capabilities afforded by teleconference calls and web presentation tools--but it also creates opportunities for field trips inside virtual organs, machines and other environments that go far beyond the walls of traditional learning spaces. Training simulations are also incredibly powerful in Second Life because they simulate complex, processes in the physical world and avatars can take on different roles to enhance learning".

While the virtual world is most likely to be used in an online environment, application can be made in the traditional classroom as well. Buffalo State University faculty members have held an academic conference in Second Life. The same university's fashion textile technology program has used Second Life to hold virtual fashion shows and to provide an outlet for its students to market a design before they have to spend money producing a sample(Watson, 2010).

Dr. Johnson, an associate dean at the University of New Orleans, is building a new educational system on New Orleans Island, a digital campus in the virtual world of Second Life. Two classes are now held on the island: one in geography, which Johnson is teaching, and the other in Management. The university has plans to broaden its curriculum in Second Life in the spring semester (Foster, 2007). Other universities using second life for teaching include Loyalists College (for training border control agents) and Imperial College (for training medical students).

Research Design

As the study was exploratory in nature a case study approach was appropriate (Yin 200x) . Second life was selected as the virtual world because it is the largest. There were nine participants in the study, none of which had any prior experience with second life. Students were from a variety of discipline areas, including economics, education, art, interactive media, bible, English, Music and general studies. Data was collected via observation of participants and a short answer survey.

Observation of students took place over a period of 4 weeks in the classroom and in a local coffee shop with internet access. The coffee shop environment was necessary as it took a week to get the firewall ports opened so that the students could access Second Life on campus. Observation was guided by the research questions 1 -3 which focused on the nature of the tool itself, and research question 4 which focused on the social capital aspect of the tool. The 'learning curve' research question addresses student's ability to understand the tool as reflected by successful character creation, navigation and so forth, and their enthusiasm/attitude towards using the tool. The access question relates to the time taken to log into the world, and the fluidity of animations (a function of bandwidth and computing power). Restrictions were not put on the students as to what they would be required to learn except that they were to try different things.

The survey was administered as an assignment at the end of the virtual world section of the class. It is acknowledged that the responses received may be effected by the fact that the completion of the survey was required for a grade, however student seemed excited to give their feedback.

Survey Design

The first few survey questions were designed in order to establish whether the student had sufficient experience in the world to be able to give an informed opinion. The second section of the survey dealt with perceptions of second life beginning with 'whether second life was what it claimed to be in accompanying literature and advertisements. The remaining questions were as follows:

1. In what ways could SL be beneficial to your area of study, and what features facilitate this benefit?
2. Do you feel that SL provides an environment that stimulates curiosity and encourages learning (in the general education area)?
3. In what ways can Second Life be used that you feel is beneficial to Harding students in general?
4. What negative things have you experienced in Second Life, and are these experiences enough of a negative impact to detract from the value of Second Life?

Question 1-3 address the research aim of identifying strengths, where as research question 4 addresses weaknesses. Figure 1 below describes the research strategy.

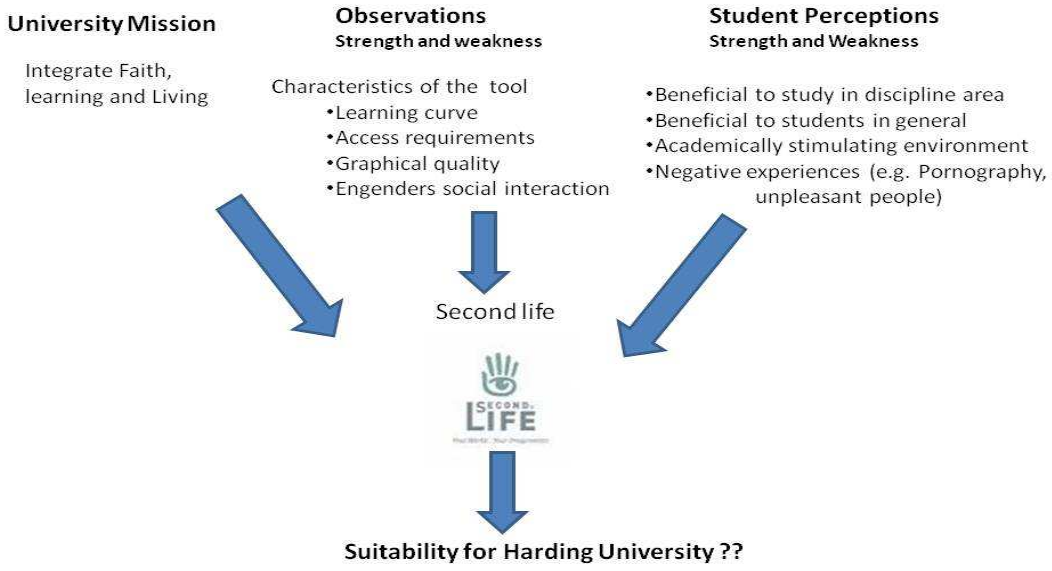

Figure 1. Research Strategy

Data Analysis and Results

Due to the small amount of data collected simple content analysis was applied to the survey. Firstly general observations that relate to the overall research aim are reported. As expected observations did not always align with research questions but an attempt is made to relate the observations to the research questions or research aim. These are followed by student responses to the survey questions which in turn relate to the research aim. The reports from these two sources of data and the university mission statement, address the overall research aim.

Observations

Spending enough time in the beginning explaining and being taught appears to be essential to the success of Second Life. There are many helpful people and locations to explore that assist new avatars with their experience in Second Life. Several of the students attended courses in which they saw introductions to building objects. .

Exploration of the world seemed to be the main focus of the students. Since the majority of the students had never even heard of Second Life, an Introduction to the world was first necessary.

During class time which met 3 times a week, 'sims' and events where explored. Places such as "Africa", "The Eifel Tower", and the "Vietnam Memorial" were visited. Some of these places were very accurate to the actual places. Students who had experienced the real life destination commented on the memory it gave them as they walked around with their avatar. They also commented later that this did not replace going to the location and would never be like the "real thing".

The theme of not replacing the "real thing" was prevalent in several of the comments by students. One student said it best when she commented, "I want to trip over real cobblestones on the Great Wall, I want to stare down a painting inches away to see the brush strokes, I want to feel the temperature of the waves when I swim in the ocean. I want to live." This notion appears to be related to the name of the virtual world, 'second life' suggesting a replacement or substitute for the first or real life. However second life was never intended to do this, but rather at the most an extension of real life or as a compliment/addition to real life, an alternative way to experience a part of real life (see medical training examples above), firmly grounded in principles from real life. It shares this approach with other game and simulation software.

While the students were cautioned on the negative aspects of this virtual world, most of them did not experience this for the most part. One student intentionally visited an adult themed area to see what really was out there. He quickly left stating that, "yes, it does exist." This was a very positive sign. While these students represented the upper echelon of undergraduate students academically, this sample hopefully represents what the larger community would see. It is a choice to visit these places that do not align with the mission of Harding University. Second Life has also tried to create a way to filter some of these areas by creating a rating system. If the student does not include the Adult themed areas in searches, the likelihood of seeing something that they do not want to see decreases dramatically.

Students were initially excited about the adventure second life presented. This is itself is a prerequisite to learning. They seemed quite patient as they created their avatars and learned to move and navigate around, though the 'I am lost' exclamation was quite prevalent. The amount of information required to adequately maneuver and navigate the world can quickly frustrate those that do not acclimate themselves to the world in the first couple of hours. However once the skill set is learned it is transferable across so many activities and subject areas within second life. It was noted that good bandwidth and computing power was essential to the correct functioning of the tool.

Students appeared to become quite attached to their avatars, seeing their avatars persona as an extension of their own. It is not clear at this point what this means in terms of learning but it seems to follow that ownership of their role in the world could enhance participation in whatever task was assigned to be learned or completed in the world. As students discovered exciting places to visit they would invite their class mates to teleport to that location so they could experience the phenomenon together indicating a social component of the experience. Some students met in second life outside of class hours and one student who had to stay at home after surgery suggested that we all meet and have class in second life.

Survey

The students in the course spent various amounts of time in Second Life. The minimum amount of time spent was around 4 hours outside of class while one student spent over 20 hours. The average time in world was 10 hours. In the authors experience 4 hours seems a little inadequate to support comments but 10 hours is quite adequate to at least give a 'first impression' viewpoint.

Question 1

In what ways could SL be beneficial to your area of study, and what features facilitate this benefit?

As expected each discipline area provided different examples of how second life could be used. The art student sited the virtual tours of art galleries and the ability to design and create clothing and accessories. The economics student sited the ability to conduct business and trail a business model without the real world risk associated with the trial. He also sited an interest in the currency aspects of second life and how the second life 'linden' was affected by the fluctuating value of real currency. He also suggested the study of the second life economy both macro and micro. It was interesting to note that this student was initially the most reluctant to embrace new technologies.

The education student sited the ability to take her class on a safari, ride a hot air balloon, to visit world monuments and museums all while interacting with students from different counties and countries.

The interactive media student sited being able to experiment with textures and graphics and see visitor reaction to the product. This student created a dragon skin for his avatar and suggested selling it to other second life residents.

The bible student saw second life as a place to meet people of various religious persuasions and to engage in discussion.

The English student suggested second life as a venue to recite poetry, and tell short stories to gage visitor reaction and acceptance as well as to engage with others of like interests.

The general studies student suggested using second life to establish a popularity base which could then be moved or and operated in conjunction with a real world music career.

The music major found the concerts and music venues interesting, pointing out that practicing and performing in a virtual world could simulate a live audience.

Question 2

Do you feel that SL provides an environment that stimulates curiosity and encourages learning (in the general education area)?

Most students felt that second life did stimulate curiosity and drew the visitor into the world.

Question 3

In what ways can Second Life be used that you feel is beneficial to Harding students in general?

The answers to this question were all positive, suggesting opportunities to learn (as above), share knowledge, be entertained, and collaborate.

Question 4

What negative things have you experienced in Second Life, and are these experiences enough of a negative impact to detract from the value of Second Life?

Only one student reported a negative experience which was in the form of a comment made by another second life resident. No students accidently ventured into pornographic areas.

Conclusion

In light of the research aim "to gain an understanding of the strengths and weaknesses of second life as a tool for education at Harding University", Second Life has a great deal of positive attributes and virtual worlds in general MUST be given consideration in the academic world. The negative aspects, while present and prevalent in these worlds, are a matter of choice. The rating system clearly labels areas in a similar fashion to movie ratings. Visiting pornographic web sites is also a choice. Sites such as 'Facebook' are not restricted to Harding

University students, and students get to choose whatever friends they see fit and post on their wall whatever images, pornographic or not. This appears to be a similar exercise of choice as that which exists in second life. If Second Life is not the world chosen by administrators of faith based universities, it is recommended that others be investigated and incorporated into the on ground, online, and hybrid courses to enhance and amplify the learning experience.

This study showed that students want to experience the world for themselves and don't consider a virtual world as a replacement for interaction and stimulation in the real world. In addition to the advantages identified thus far, these worlds have a particular advantage in online classes in that students can put a face, voice and perhaps social experience to another student whom they may never meet in real life.

Harding University will continue to evaluate the concept of a virtual campus with future case studies and experiments over the course of the summer and fall semesters. If the results continue to be consistent with these findings, then a proposal to start creating a virtual campus and use of this platform will be discussed with administrative staff of the university.

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The NCAA Basketball Betting Market: Tests of the Balanced Book Hypothesis

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Abstract

Sportsbook behavior is tested for NCAA basketball using actual sportsbook betting percentages from on-line sportsbooks. The balanced book hypothesis of the traditional sportsbook models does not appear to hold, as favorites attract more than 50% of the bets. Although there is some slight evidence toward shading the line in these directions, there is also not overwhelming evidence of the Levitt (2004) hypothesis, as sportsbooks do not appear to be actively pricing to maximize profits. In general, the results seem more consistent with the sportsbook pricing as a forecast, content with earning their commission on losing bets as simple strategies win about 50% of the time.

Introduction

A study by Levitt (2004) in *The Economic Journal* challenged the traditional view of sportsbook behavior. In the Levitt hypothesis, sportsbooks set prices to maximize profits, not to balance the sports betting action. This model differs substantially from the traditional models of sportsbook behavior, such as Pankoff (1968), Zuber, et. al. (1985), and Sauer, et. al. (1988), where sportsbooks set prices to balance the book. They achieve this by setting a price which attracts equal dollars on each side of the betting proposition. Under this model, using sports betting data to test the efficient markets hypothesis is straightforward. Under the assumptions of the traditional models, the efficient markets hypothesis could be tested with relative ease as the price represents information from all betting participants. Findings that the efficient markets hypothesis could not be rejected, even in a market where investor (bettor) sentiment is likely to run high, served as a measure of support for this theory (i.e. Sauer, et. al. 1988).

If sportsbooks are not pricing to balance the book, however, comparisons between sports wagering markets and other financial markets (such as stocks or bonds), particularly in the testing of the efficient markets hypothesis, become suspect. If prices are being set by sportsbooks to maximize profits or are set as a forecast of game outcomes, independent of the flow of betting dollars, prices in these markets are no longer formed by the actions of investors (bettors), but by the sportsbook itself.

One common criticism of the empirical findings of Levitt (2004) is the use of a betting tournament to substantiate the theory, rather than use of actual sportsbook data. The tournament in question used a limited number of participants with a fixed entry fee of $250. The results from this tournament could yield vastly different results from an actual sportsbook, which has a large number of participants who place wagers of varying sizes on games they bet.

In a recent article in the *Journal of Prediction Markets*, Paul and Weinbach (2007) used actual sportsbook data to test the hypothesis of Levitt (2004) concerning sportsbook behavior. Actual percentages of dollars wagered on the favorite and the underdog were obtained for every

game of the 2006 NFL season. The results for the pointspread market were consistent with the results of Levitt (2004), as betting did not appear to be balanced, with favorites, in particular road favorites, receiving a greater percentage of betting volume. In addition, the percentage bet on the favorite became greater as the pointspread on the favorite increased. Simple strategies of betting against the public, when the sportsbook was substantially unbalanced (i.e. 70%+ on the favorite) were found to earn positive returns. Similar findings concerning an unbalanced book and bettor preferences for favorites and overs were found in the NBA (Paul and Weinbach, 2008), although evidence of the hypothesis of Levitt concerning pricing to maximize profits was not found.

This paper explores the wagering market for college basketball, using the same data source used by Paul and Weinbach (2007, 2008). Tests of the traditional model of sportsbook behavior compared to the findings of Levitt (2004) are performed. Regression results illustrating the relationship between the pointspread and the percentage bet on the favorite are shown. Betting simulations are also presented to test if the sportsbook purposefully allows a betting imbalance to maximize profits. In addition, the possibility that sportsbooks price as a forecast of the outcome of the game, independent of the actions of bettors, is explored.

Regression and Betting Simulation Results

Data for this paper were gathered from Sports Insights, which sells data to subscribers including the percentage of bets made on each proposition within each game. This data includes the percentage bet on favorites and underdogs in the pointspread market. Sports Insights presents combined data from four sportsbooks to show the percentage of bets on the favorite and underdog for its subscribers. The four on-line sportsbooks are BetUS.com, CaribSports.com, SportBet.com, and Sportsbook.com. Sports Insights reports percentages based on the *number of bets* placed on each side of the proposition. The number of bets is not a perfect measure, as bets do vary in magnitude; however, the number of bets presented in the Sports Insights data appears proportionally similar to the dollars wagered volume in the Sportsbook.com data.

A simple regression model is tested, which illustrates the actions of the sportsbook. The model to be estimated is as follows for the sides (pointspread) market:

$$(\%\ \text{Bet on the Favorite})_i = \alpha_0 + \beta_1(\text{Pointspread})_i + \beta_2(\text{Dummy for Road Favorite})_i + \varepsilon_i \quad (1)$$

The dependent variable is the percentage of dollars bet on the favorite. The independent variables include an intercept, the pointspread on the game (presented as a positive number – greater favorites have larger pointspreads), and a dummy for teams which are road favorites. If bettors prefer favorites, with stronger favorites being bet more heavily than weaker favorites, the coefficient β_1 should be positive and significant. If bettors overbet road favorites, the coefficient on the dummy variable, β_2, should also be positive and significant.

Table 1 presents the results for the pointspread market for NCAA Basketball. Coefficients on the independent variables are shown, with t-stats in parentheses. Heteroskedasticity was found in the initial regression results, therefore White's heteroskedasticity-consistent standard errors and covariances were used and are presented in the table below.

(Insert Table 1 here)

From the results in Table 1, it appears the results for NCAA basketball are similar to the results in the NFL (Paul and Weinbach, 2007) in relation to the percentage of bets placed on favorites. As the pointspread on the favorite increases, the percentage of bets on the favorite also increases, by 0.4288 percentage points for each additional point on the pointspread. From the regression model, a 10-point home favorite is expected to attract over 60% of the betting action. A 20-point favorite is expected to attract over 64% of the betting action.

Similar to what is described in Levitt (2004), road favorites are also found to be significantly overbet, as the dummy variable for a road favorite is positive and significant. An additional 10%+ of the bets accumulate on the favorite when the favorite is playing on the road. NCAA basketball bettors seem to prefer to wager on the best teams, given the significance and the positive signs found on the pointspread variable and the road favorite dummy.

Given the balanced book hypothesis can be rejected, as bets on favorites are not found to be 50% across the sample, the next step is to determine if sportsbooks set prices (pointspreads) to maximize profits by exploiting known bettor biases for favorites, and in particular, road favorites. An alternative explanation to the balanced book hypothesis and the hypothesis of Levitt, that the sportsbook is pricing as a forecast, is also explored. First, however, basic market efficiency and returns to simple betting strategies are shown.

Betting Simulations of Wagering on Underdogs in NCAA Basketball

Market efficiency has previously been studied for the NCAA Basketball betting market. Paul and Weinbach (2005a) found that the overall market for college basketball appeared efficient, but wagering on a simple strategy of betting big underdogs (defined as double-digit underdogs), and especially home underdogs, was found to reject market efficiency and generate profitable returns. These results were found to be similar to other sports such as college football (Paul and Weinbach, 2003), and the NBA (Paul and Weinbach, 2005b). Wolfers (2006) also showed a similar bias of heavy underdogs winning more than implied by efficiency (defined in his sample as 12 or more point underdogs) and attracted attention with his allegations of pointshaving as the source of this bias.

Tables 2-4 present the results of simple betting simulations of wagering on underdogs in college basketball. Given the results shown in Table 1, the higher the pointspread on the game, the greater the percentage of the bets on the favorite. Therefore, we show the results of wagering on underdogs (the less popular side of the proposition), when they meet certain thresholds, for various categories (ten points or greater, eight points or greater, etc.) and for all games. Results are shown for all favorites, all home favorites, and all road favorites. For each category, favorite wins, underdog wins, the underdog win percentage, and the log likelihood ratio test of a fair bet are shown.

In tables 2-4, none of the win percentages based on these simple strategies could reject the null of no profitability (and infrequently have win percentages greater than 52.38%, the win percentage required to break even), therefore only tests for the null of a fair bet (win percentage equals 50%) are shown. Significant results are noted for the log likelihood ratio tests with * representing significance at the 10% level, ** at the 5% level, and *** at the 1% level.

(Insert Table 2 here)

(Insert Table 3 here)

(Insert Table 4 here)

For the sample of all favorites (table 2), games with larger favorites tend to have the underdog cover the pointspread more than fifty percent of the time. These percentages are not high enough (52-53%) to reject the null of no profitability, but betting the underdog for all favorites greater than 8 was found to reject the null of a fair bet at the 5% level. Betting all underdogs greater than 14 and 16 were also found to reject the null hypothesis of a fair bet at the 10% level.

Table 3 provides the results for road underdogs (home favorites). For this sample, rejections of the null hypothesis of a fair bet were found at the 5% level for the subset of all underdogs greater than 4 and 8. Rejections of the null of a fair bet were also found at the 10% level for underdogs greater than 14 and 16. Table 4 shows the results for home underdogs (road favorites). The null hypothesis of a fair bet could not be rejected for this sample or any of its sub-groupings.

Overall, underdogs win slightly more than 50% of the games. These win percentages, however, do not generally generate profits for underdog bettors. Although favorites, particularly road favorites and big favorites, attract a greater share of the betting action, the closing pointspreads do not appear to be greatly biased, as simple strategies of wagering on the underdog in these situations does not generate statistically significant profits.

Betting Simulations of Wagering Against Public Sentiment

Betting against public sentiment may also be a possible winning strategy in the betting market for college basketball. If large betting imbalances illustrate preferences of bettors for favorites, perhaps sportsbooks respond by shading the pointspread in the direction of this sentiment. This appears to be the case in the NFL (Paul and Weinbach, 2007) and it is useful to know if it also exists in NCAA basketball.

If sportsbooks are setting pointspreads (prices) to maximize profits, as suggested by Levitt (2004), a simple contrarian strategy of placing a wager on the side of the proposition in which the sportsbook is exposed, specifically, wagering on the publically unpopular underdogs, should generate positive returns. If this is not the case, the sportsbook would not be pricing to maximize profits by exploiting known betting biases (such as road favorites in the NFL).

Table 5 shows the results of betting against public sentiment. Results are shown based on a simple strategy of betting against the public in games where the sportsbook is heavily weighted (greater than 80%, greater than 70%, etc.) on the favorite. Win percentages of a simple strategy of bet the underdog is shown along with the log likelihood ratio test for the null of a fair bet.

(Insert Table 5 here)

Betting against public sentiment does not appear to be a profitable venture in NCAA basketball. Win percentages of these strategies tend to hover around 50% for any chosen threshold. No matter how large the imbalance of bets, wagering against (or with) the public money tends to leave the bettor winning about half of his bets and losing the commission on these bets over time.

These results, coupled with the large betting imbalances on NCAA Basketball games, support the notion that sportsbooks are not attempting to balance the betting dollars on favorites

and underdogs, as commonly assumed by the traditional models of sportsbook behavior. There is some evidence the largest favorites are overpriced, as simple betting strategies of betting big underdogs win more often than implied by efficiency, although these win percentages are not significant compared to the null hypothesis of no profitability. In addition, betting against the largest betting imbalances toward the favorite is not found to win often enough to reject the null of a fair bet. This is in contrast with the findings of Levitt (2004) and Paul and Weinbach (2007) for the NFL.

It is possible that the size of the market plays a significant role in whether sportsbooks will attempt to price to maximize profits by exploiting bettor biases. The normal NCAA basketball game is a much less popular betting proposition than the average NFL game, and there are many more NCAA basketball games per season. Therefore, sportsbooks may not be as willing to set prices to attempt to take advantage of common bettor biases in college basketball. Instead, they may attempt to set pointspreads as optimal and unbiased predictors of outcomes of games.

Setting of the pointspread as a forecast, independent of the betting dollar percentages on favorites and underdogs, is consistent with the results, where each side of the proposition wins approximately 50% of the time. Under the assumption of betting as a repeated game, over the course of a season or many seasons, the sportsbook may be content to set the pointspread as a forecast of the outcome of the game. Instead of possibly inviting informed bettors into the fold by inflating prices (pointspreads) on big favorites, the sportsbook may be content to price with the expectations of favorites and underdogs each winning half of the time.

Conclusions

The betting market for NCAA basketball was tested in relation to sportsbook pricing behavior using actual betting percentages from real sportsbooks. The results of these tests were compared to previous results found on betting percentages in the NFL (Paul and Weinbach, 2007) and the NBA (Paul and Weinbach, 2008). Using the betting percentages on each game, support was attempted to be found for the traditional models of sportsbook behavior, where the book is balanced, the Levitt hypothesis, where sportsbooks price to maximize profits, or a hybrid model where sportsbooks price as a forecast, allowing an unbalanced book, but not exploiting known bettor biases to maximize profits.

In general, the traditional model of sportsbook behavior does not appear to be supported as the betting dollars in college basketball are not balanced. Favorites and overs tend to attract a higher percentage of the betting action. These results do not necessarily imply that sportsbooks are pricing to exploit known biases and maximize profits, as Levitt (2004) suggests.

To test if sportsbooks price to maximize profits by exploiting known bettor biases, a couple of simple tests were performed on the data. First, simple betting strategies of betting the underdog and the under were performed. Underdogs won slightly more often than favorites, but the results were not found to be statistically significant in the sample of all games. For all underdogs of 8 or more, 14 or more, and 16 or more, however, statistical significance was found.

When considering betting percentages and calculating the results when the betting public is heavy on the favorite or over (meaning the sportsbook is an active participant on the side of the underdog or under), little in the way of statistical significance was found. The only case where a fair bet could be rejected was in situations where the public had 70% or more on the favorite in an AFL game, where the underdog won more than implied by efficiency. The rest of

the results of these tests could not reject the null of a fair bet. Betting on road underdogs of 4 or more, 8 or more, 14 or more, and 16 or more were also found to win more than implied by efficiency. None of the groupings for home underdogs were found to have significant results. In addition, using the betting percentages and wagering against public sentiment (or with public sentiment) was not found to generate significant returns.

Overall it appears there may be some slight shading of the pointspread toward the favorite, but the returns for the overall sample are not enough to generate profitable returns. Similar to other studies, however, some groupings of large underdogs are shown to have statistically significant returns. Given that the betting action is not found to be balanced, but profitability is not found to a great extent by taking the side of the sportsbook (underdogs and unders), it appears that the sportsbook does not follow the traditional model of sportsbook behavior nor the Levitt hypothesis. It appears that sportsbooks price generally as a forecast, with a slight shade (particularly in obvious cases – big favorites or high totals) toward the more popular side of the proposition. This situation results in findings that are more similar to the NBA (Paul and Weinbach, 2008) than the NFL (Paul and Weinbach, 2007).

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Appendix

Table 1: NCAA Sides Regression 2004-05 to 2006-07 Dependent Variable: Percentage of Bets on the Favorite Number of Observations: 12,644

Independent Variables	Coefficient (T-Statistic)
Constant	56.0024*** (193.7622)
Pointspread	0.4288*** (15.7621)
Road Favorite Dummy	10.2101*** (28.1731)

Table 2: Betting Simulations for All Underdogs – Strategy of Bet the Underdog

All Favorites Greater Than:	Favorite Wins	Underdog Wins	Underdog Win Percentage	Log Likelihood Ratio Test: Fair Bet
20	210	229	52.1640%	0.8226
18	317	355	52.8274%	2.1500
16	490	545	52.6570%	2.9241*
14	752	825	52.3145%	3.3804*
12	1173	1254	51.6687%	2.7038
10	1660	1743	51.2195%	2.0246
8	2271	2420	51.5881%	4.7335**
6	3131	3226	50.7472%	1.4197
4	4077	4222	50.8736%	2.5336
2	5221	5312	50.4320%	0.7862
All	6122	6250	50.5173%	1.3243

The log likelihood test statistics have a chi-square distribution with one degree of freedom. Critical Values are 2.706 (for an α=0.10), 3.841 (for an α=0.05), and 6.635 (for an α=0.01). * is significance at 10%, and ** is significance at 5%.

Table 3: Betting Simulations for All Road Underdogs (Home Favorites) – Strategy of Bet the Underdog

All Home Favorites Greater Than:	Favorite Wins	Underdog Wins	Underdog Win Percentage	Log Likelihood Ratio Test: Fair Bet
20	202	222	52.3585%	0.9437

18	302	343	53.1783%	2.6080
16	465	525	53.1783%	3.6386*
14	708	779	52.3874%	3.3913*
12	1085	1161	51.6919%	2.5722
10	1514	1597	51.3340%	2.2147
8	2015	2170	51.8519%	5.7421**
6	2701	2802	50.9177%	1.8538
4	3365	3544	51.2954%	4.6381**
2	4123	4270	50.8757%	2.5748
All	4635	4794	50.8431%	2.6813

The log likelihood test statistics have a chi-square distribution with one degree of freedom. Critical Values are 2.706 (for an α=0.10), 3.841 (for an α=0.05), and 6.635 (for an α=0.01). * is significance at 10%, and ** is significance at 5%.

Table 4: Betting Simulations for All Home Underdogs (Road Favorites) – Strategy of Bet the Underdog

All Road Favorites Greater Than:	Favorite Wins	Underdog Wins	Underdog Win Percentage	Log Likelihood Ratio Test: Fair Bet
20	8	7	46.6667%	0.06672
18	15	12	44.4444%	0.3340
16	25	20	44.4444%	0.5567
14	44	46	51.1111%	0.0444
12	88	93	51.3812%	0.1381
10	146	146	50.0000%	0.0000
8	256	250	49.4071%	0.0711
6	430	424	49.6487%	0.04215
4	712	678	48.7770%	0.8317
2	1098	1042	48.6916%	1.4656
All	1487	1456	49.4733%	0.3254

The log likelihood test statistics have a chi-square distribution with one degree of freedom. Critical Values are 2.706 (for an α=0.10), 3.841 (for an α=0.05), and 6.635 (for an α=0.01). * is significance at 10%, and ** is significance at 5%.

Table 5: Betting Simulations of Betting the Opposite of Public Sentiment

Percentage Bet on Favorite is Greater Than:	Favorite Wins	Underdog Wins	Underdog Win Percentage	Log-Likelihood Ratio Test: Fair Bet
80%	62	65	51.1811%	0.0709
70%	223	215	49.0868%	0.1461
60%	603	631	51.1345%	0.6354
50%	1350	1384	50.6218%	0.4228
All	6123	6251	50.5172%	1.3241

The log likelihood test statistics have a chi-square distribution with one degree of freedom. Critical Values are 2.706 (for an α=0.10), 3.841 (for an α=0.05), and 6.635 (for an α=0.01). * is significance at 10%, and ** is significance at 5%.

Should You Sell? How to Respond to a Housing Bubble

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Abstract

Should homeowners sell into a falling housing market? The decision depends on a person's housing needs, the future direction of home prices, and the return that can be earned on alternative investments. This study simulates homeowner decisions to downsize and upsize, and analyzes the resulting wealth changes under several future economic scenarios. While a decision to downsize may increase terminal housing-related wealth in pessimistic housing market scenarios, a decision to upsize is profitable in only the most optimistic scenarios, and could lead to financial disaster in the face of declining home values.

Introduction

According to a popular housing index, average home prices more than doubled between January, 2000 and January 2007, making the existence of a housing bubble a topic of speculation and much debate.[1] The general collapse in housing values in the past three years has all but ended the speculation over whether a housing bubble did indeed exist in 2006, but homeowner response to an uncertain housing market is still a topic of interest. In the face of rapidly rising home prices, many home buyers were persuaded to over leverage to buy the largest house possible, or upgrade from a modest dwelling to a more substantial house. Others, whose homes had already quickly and greatly appreciated, saw an opportunity to sell their homes and rent or downsize to a less expensive home.

Could homeowners have greatly profited from advance knowledge of the recent rapid increase and equally rapid decline in housing prices? An examination of this question yields insights into how homeowners might best position themselves in the current housing environment that is extremely uncertain given the possibility of rising foreclosures in the face of increasing mortgage rates and the expiration in 2010 of government subsidies designed to bolster the housing market.

As our analysis shows, the decision to upsize or downsize is neither straightforward nor simple--even if one is confident in his or her prediction of the direction of housing prices.

The following sections present several simulations that illustrate the outcomes of a homeowner's decision to sell a home in favor of purchasing a larger home (upsizing) or a smaller home (downsizing). The various outcomes depend not only upon what ultimately happens to housing prices, but alternative investment returns and the homeowner's housing needs. Decision outcomes are measured by the changes in terminal housing-related wealth.

Simulations

We simulate homeowner upsizing and downsizing decisions under six different economic environments that range from very pessimistic (a bursting housing bubble) to very optimistic (home values continue to climb ever higher). We assume a base-case scenario as a starting point

for the analysis. The current value of the base-case home is $650,000, having risen dramatically from an initial price of $100,000. These amounts give our homeowner the maximum allowable capital gains tax exemption of $500,000 from the sale of a primary residence. A sale at this level results in a taxable gain of $4,500 and a tax liability of $675 at a marginal tax rate of 15%[2]. Selling costs are assumed to be 7% of the sale price, and lower capital gains by $45,500.

Current housing costs, which include hazard insurance and property taxes, are assumed to be $6,000 per year, on an after-tax basis. The base-case scenario assumes there is no existing mortgage, and that the homeowner resides in the home for the next fifteen years.

In each of six subsequent fifteen-year scenarios, the homeowner engages in actions that alter terminal housing wealth. The homeowners may either: 1) upsize or downsize at the beginning of the fifteen-year period, 2) delay upsizing or downsizing for four years while residing in the current home, or 3) immediately sell the home and rent for four years before either upsizing or downsizing. As in the base-case scenario, terminal housing wealth is calculated for various future economic outcomes.

The amount of the mortgage down payment for the upsizing scenarios is derived from the home sale proceeds, and is assumed to be sufficient for the buyers to obtain a mortgage loan necessary to finance the more expensive home. For downsizing scenarios, excess funds are directed toward alternative investments that provide an after-tax contribution to terminal housing wealth. For upsizing scenarios, after-tax funds required by the new mortgage are considered to be an opportunity cost, and their future value is subtracted from terminal housing related wealth. All expenses and investments are compounded to obtain a net terminal value at the end of 15 years, providing a consistent measure by which the base-case scenario and upsizing and downsizing housing decisions can be compared.

Ending wealth is calculated for each decision the homeowner makes for six different economic futures. The first decision is to maintain the status quo. In essence, this is the default decision in which the homeowner stays in the current home for the entire 15-year time horizon. In the second decision, the homeowner either downsizes to a less expensive home or upsizes to a more expensive home for the entire 15-year period. In the third decision, the homeowner delays upsizing or downsizing for four years. In the fourth decision, the homeowner sells his current home, and rents for four years before either upsizing or downsizing.

In both the upsizing and downsizing environments, the sale of the current home can occur immediately or be delayed four years. For both the upsizing and downsizing scenarios, the examples also incorporate the decision to rent for four years after an immediate sale. As a result, there are a total of seven different representative ending wealth outcomes for each of six possible economic futures for housing and other investments. The seven terminal wealth results for each economic scenario are evaluated as two contrasting groups of four outcomes, with the base case included in each group. The rationale for this method of evaluation is the implicit assumption that the sets of outcomes are mutually exclusive; homeowners can either upsize or downsize, but not both. The different housing decisions are listed in Table 1, and grouped according to how they are analyzed.

[Table 1 here]

We assume the value of the downsized dwelling is one-half the value of the current home, or $325,000. If the downsize purchase is delayed four years, the selling price of the current home in four years is allowed to fluctuate according to various specified rates of return.

In either case, there is no mortgage on the purchase of the smaller home because there are sufficient proceeds from the sale of the current home to cover the entire purchase price plus transaction costs. Transaction costs on purchases are assumed to be 3% of the purchase price. Transactions costs of sales are assumed to be 7% of the selling price, and sale proceeds remaining after a subsequent downsizing purchase are reinvested and credited toward ending housing wealth. Annual after-tax housing expenses for the smaller home are assumed to be $4,000.

For upsizing scenarios, the purchase price of the new, more expensive home is assumed to be one-and-one-half times the value of the current home. In situations where the upsizing purchase is delayed four years, both sale and purchase prices reflect the change in home values for each scenario. All of the net proceeds from the sale of the current home are invested in the upsized home. A mortgage is necessary to make up the balance. The ownership expenses of the larger home include an increased estimate for property taxes and hazard insurance. Annual after-tax housing costs for the larger home are assumed to increase from $6,000 to $12,000. When upsizing is delayed four years, rent and insurance is assumed to be $30,000 annually.

Mortgage interest opportunity costs are computed on an after-tax basis; however, caution is necessary to interpret the results because mortgage rates can vary so much depending on the borrower and market conditions. A mortgage interest rate of 6% was used for immediate purchases, and 7% for purchases in four years. The upsizing decision is financed by a 30-year, constant payment, fixed-rate mortgage; estimates of ending housing wealth reflect a payoff of the remaining mortgage balance. Because employing a mortgage to finance a more expensive home deprives the homeowner of monthly cash flows that could otherwise have been invested in alternative investments, the future value of these after-tax, monthly cash flows is subtracted from the terminal housing wealth figures.[3]

Six economic scenarios list potential returns for home values over the near term of four years and the longer term of five to 15 years, and the return on alternative investments over the entire fifteen year time period. Housing rates of return range from -15% per year to +10% per year. We assume a near-term rate of return on housing prices in the first four years that can differ substantially from a longer-term return over the final eleven years. The after-tax rate of return for alternative investments is assumed to be either 5% or 7% per year, and is constant over the 15-year time horizon.

Scenarios 1, 2, and 3 illustrate a market with a housing bubble that does indeed collapse. The first three scenarios portray increasingly severe downturns in the residential housing market. Scenarios 4, 5, and 6 represent markets in which there is no housing bubble, and home prices continue to appreciate. Scenario 4 depicts a modest increases in home values while scenarios 5and 6 are respectively more optimistic regarding returns on home values and invested funds. In summary, scenarios 1, 2, and 3 are increasingly pessimistic, while scenarios 4, 5, and 6 are increasingly optimistic. Terminal housing wealth, computed for each decision within each economic scenario, yields insights into the potential value of each homeownership decision.

Results

The predictions of ending housing wealth for six different economic scenarios are shown in Tables 2 and 3.

[Table 2 here]

[Table 3 here]

Bubble or no Bubble?

The effects of a bursting housing bubble are dramatically illustrated in the base-case decision to hold one's existing home for the next fifteen years. The difference in terminal housing wealth for the most pessimistic scenario, scenario 3, and the most optimistic scenario, scenario 6, is more than one and three quarters million dollars. Ending wealth in the most optimistic scenario is more than six times greater than in the most pessimistic scenario. In the base-case decision, ending housing wealth is mainly dependent on future home prices and tax rates. Since no funds are freed up by downsizing or sacrificed by upsizing in the base-case decision, the rate of return on alternative financial investment is largely irrelevant.[4]

Downsizing

In the event of a housing bubble with declining near-term housing prices, downsizing may greatly increase ending housing wealth. In scenarios 1, 2, and 3, all downsizing decisions result in increased terminal housing wealth relative to the base case decision to hold indefinitely. In an environment where home values are in near-term decline, the decision to sell now and downsize is far better than the decision to wait four years and then downsize. This result is not surprising as the current more expensive home is dropping more in terms of dollar value than the downsized home, even if both homes are declining at the same rate. Under our assumptions, we could not find a scenario where the wait-and-downsize decision was superior to the decision to downsize now.

The decision to sell now, rent four years, and then downsize proved to be the best decision in the pessimistic housing bubble scenarios. A difference in ending housing wealth of nearly three hundred thousand dollars is quite significant in scenario 3, the most pessimistic scenario; however, the rent-first-then-downsize decision produces less impressive gains in the less pessimistic scenarios, and becomes an inferior decision in neutral or optimistic scenarios.

In the most optimistic scenario where housing prices continue to escalate at a higher rate than the return on alternative investments, the decision to downsize will reduce terminal housing wealth. The downsizing decision, however, can produce gains in terminal wealth in even optimistic scenarios when the rate on alternative investments is higher than the expected rates of growth in housing prices. If the return on invested funds is greater than the return on home values, it will generally be a better decision to sell now and downsize rather than to delay selling, or not sell at all (see Table 2). The larger the difference between the return on invested funds and the return on home value, the larger will be the advantage to selling now and downsizing.

In an optimistic housing scenario such as scenario 5, however, where the after-tax return on alternative investments is roughly equal the pretax return on housing, the downsize now decision yields about the same terminal wealth as the base-case hold decision. The relatively small gains achieved by downsizing in scenario 5 are probably outweighed by lifestyle considerations for most homeowners.

In summary, downsizing makes sense in a housing bubble environment where home prices are expected to decline precipitately in the near term. Otherwise, downsizing yields only minor benefits, and probably cannot be justified for most homeowners. The future is uncertain, however, and homeowners who are overextended financially may want to consider downsizing. If there is a housing bubble, they will secure greater ending net housing wealth. If there is no

housing bubble, ending wealth will be largely unaffected. Downsizing can effectively eliminate downside risk.

Upsizing

In the face of a bursting housing bubble, the decision to upsize either now or in four years could have disastrous consequences for homeowners. In the pessimistic scenarios, upsizing results in much lower terminal wealth values than the decision to hold and ride out the housing downturn. In the most pessimistic scenarios, upsizing can result in negative net ending housing wealth. This result, in addition to the decline in the home's value, comes from the fact that the opportunity cost of funds directed toward mortgage payments is so high. The future value of these after-tax mortgage payments, which could have been so much better utilized by alternative investments, are subtracted from the terminal wealth balance at the end of the 15-year investment period.

The decision to sell now, rent, and upsize in four years will produce greater ending wealth than the base-case hold decision, but not because upsizing is the best decision in the face of a collapsing housing bubble. This strategy will be effective in the most pessimistic scenarios because it allows the homeowner to avoid the brunt of the downturn's destruction to the value of his or her current home.

In scenarios 4, 5, and 6, which are optimistic about future housing values, upsizing only creates terminal housing wealth above the hold decision in scenario 6, the most positive scenario. In this scenario, home values outstrip returns on alternative investments by more than enough to recoup transactions costs, and increased property taxes and insurance costs.

Tax Effects

Increasing the tax rate impacted terminal values in some interesting ways, but did not change our overall conclusions. For the base case and downsizing decisions, increasing the tax rate tended to lower terminal housing related wealth. But for upsizing decisions, for the pessimistic scenarios, terminal wealth actually increased with increases in the tax rate. This counterintuitive result is attributable to the decline in the opportunity costs of lost alternative investments. Since the pessimistic economic scenarios were the most disastrous for the upsizing decision, our relative results and conclusions remain essentially unchanged.

Conclusions

Many homeowners have experienced collapsing housing prices, and continue to face a very uncertain and volatile housing market; however, the decision to sell a home to avoid the adverse consequences of a bursting housing bubble is not as straightforward as one might think. In the face of a precipitous near-term decline in housing prices, homeowners may substantially increase their wealth by selling their home and downsizing now or after renting for few years. If there is no imminent collapse in housing, downsizing is not likely to produce large gains in housing-related wealth, but downsizing in these circumstances will not produce large losses either. In an uncertain housing environment, overextended homeowners might be wise to consider downsizing for the financial protection it affords.

Upsizing will only be profitable in the most optimistic economic scenarios. Despite the mortgage interest tax shield, the upsizing investment scenario must overcome high transactions and maintenance costs, as well as the opportunity cost of lost alternative investments.

Endnotes

1.Standard & Poor's/Case-Shiller Home Price Indices measure the growth in value of the residential real estate prices in 20 metropolitan regions across the United States. These 20 indices combine to form the Composite Index which has increased from a base of 100 in January of 2000 to 202.31 in January of 2007. By April, 2009 the Composite Index had declined from its 2006 peak by 32.6%. Historical data and an explanation of the repeat sales pricing methodology used to construct the index may be found on Standard and Poor's website, www.indices.standardandpoors.com.

2.Although we do not report numerical results, we do consider and report on the impact of other marginal tax rates.

3.We recognize that the tax shield provided by the mortgage interest deduction changes with every mortgage payment. The closed-form equation we used to compute the future value of the after-tax mortgage payments is available from the authors upon request.

4.The alternative investment rate does play a slight role in the hold decision as it is used to calculate the future value of the housing-related expenses such as property tax and hazard insurance.

Responsibility and Standard Implementation: A Case Study of County Governments

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Abstract

Extant research has shown that county governments have a greater level of audit findings than municipal governments. It is theorized that the organization of county governments is one of the main causes of the lower level of implementation of accounting reporting standards. To date, however, the literature does not include a study of the implementation of an accounting standard by diversely organized county governments.

This study reviews the implementation of GASB 34 by county governments in three states, Florida, Mississippi and Tennessee. We find that laws altering county government officers' responsibility can influence the county managers' decision on the level of implementation of an accounting standard regardless of the organization of the government.

Introduction and literature review

Martens and Stevens (1994) have shown that often standards are issued in which the cost of information to all stakeholders exceeds the benefit of the information disclosed. In contrast, Barber and Gore (2008) demonstrated that following Generally Accepted Accounting Principles (GAAP) lowered the cost of debt to municipals by 14 to 25 basis points.

Jakubowski (1995) notes that county governments have significantly more material internal control weaknesses than municipal governments. Jakubowski theorizes that the organization of county governments makes improvements in accounting reporting difficult to implement. County governments lacked a chief executive with the direct responsibility to implement accounting changes. Since city governments had a single chief executive, municipals were more likely to implement suggested audit improvements.

Jakubowski further noted that in order for financial management systems to improve, local government managers must perceive that the benefits of corrective action exceed the cost of implementation of the change. As per agency theory (Jensen and Meckling, 1976), government managers will consider not only the cost and benefits to the government entity, but also their perception of the costs and benefits of implementation to themselves personally (including the costs of votes against the government managers because of the information disclosed or because of the failure to disclose the information). When a government official perceives that the cost of implementation is greater than the benefits, the manager is unlikely to implement the accounting standard.

However, Jakubowski was comparing municipals and county governments. As yet, the literature does not include a study of the implementation of an accounting standard by diversely organized county governments. This study contributes to the literature by making such a comparison. The implementation of GASB 34 by county governments in three states (Florida, Mississippi and Tennessee) was reviewed.

GASB 34

In June 1999, the Governmental Accounting Standards Board (GASB) issued Statement no. 34, *Basic Financial Statements—and Management's Discussion and Analysis—for State and Local Governments*. This statement required that government entities implement a completely new reporting model. Prior to the adoption of GASB 34, governments were required to report financial information on a fund-by-fund basis. With the adoption of GASB 34, governments now should include a set of government-wide financial statements in their Comprehensive Annual Financial Reports (CAFR's). These statements should include not only the primary government, but all component units of the government entity as well. Additionally, the standard required governments report the government-wide information on the accrual basis of accounting instead of the traditionally used modified accrual basis of accounting. One major effect of this change was that governments were now required to report capital assets and long-term debt on their financial statements. Implementation of this standard required governments to collect additional accounting data, learn new accounting techniques, and present new financial statements.

Because of the radical change in the reporting model, the GASB gave governmental entities several years to complete GASB 34 implementation (Chase and Triggs, 2001). The implementation of GASB 34 imposed significant costs on local governments. With these increased costs, government managers needed to determine whether the benefit of implementing GASB 34 exceeded these additional costs.

Accountability

GASB Concepts Statement No. 1 states that "accountability" is the cornerstone of all financial reporting for state and local governments and that the citizenry has the "right to know" how public officials are using public resources for operational and fiscal accountability. Operational accountability focuses on the use of resources efficiently and effectively. Fiscal accountability focuses on whether the used resources are in compliance with laws and regulations.

In this study, we found that some county governments were organized as a board and other governments were organized with a chief executive for implementing GASB 34. When a county-wide decision is made by a board, responsibility for that decision is shared. Having shared responsibility for a decision may mitigate the personal cost a board member has for the decision. When a county chief executive was responsible for decisions on financial reporting, the decision was not shared and the costs of that decision were not shared. For example, GASB 34 requires that the cost of capital assets be included in the financial statements. A decision not to incur the cost to include all capital assets in the financial statements may result in a negative (other than an unqualified, i.e. clean) opinion from the auditor. However, when a group of county managers are jointly responsible for the decision, it is more difficult for voters and others to hold any one individual responsible for the decision that resulted in a negative opinion. However, when one executive is held as responsible for that decision, that county executive must bear the complete cost of the decision that resulted in a negative opinion.

Data Collection

The 2007 CAFRs of 192 county governments in Florida (67), Mississippi (60), and Tennessee (65) were collected from various governmental web sites. There are 67 counties in Florida, 82 counties in Mississippi, and 95 counties in Tennessee; therefore, the study's data covers 100% of Florida counties, 73% of Mississippi counties, and 68% of Tennessee counties.

Both Florida and Tennessee have various structures of county governments – board, mayor-board with mayor elected by citizens, mayor-board with mayor elected by the board. Mississippi counties are governed by a board of five elected officers. Our study finds that within a given state, the implementation of GASB 34 was so small that the form of county government had little impact. As the results below indicate, implementation of the standard depended more heavily on the state in which the county was located.

Level of Qualifications

Table 1 – Percentage of Audit Qualifications

	Actual Level of Qualifications
Florida	3.0%
Mississippi	88.3%
Tennessee	72.3%

Table 1 indicates that the majority of the county managers in Mississippi and Tennessee are not completely implementing GASB 34. Almost 90% (88.3%) of the Mississippi counties received a negative opinion. Counties from the state of Tennessee were slightly better; however, 72.3% received a negative opinion from their auditors. In contrast, ninety-seven (97%) of Florida county managers are following the standards. Table 2 explores in greater detail the type of problems experienced by the counties under study.

Table 2 Details of Problems Identified in the Audit Reports

	Florida	Mississippi	Tennessee
Government-Wide Statements not included or all components not included		98%	89%
Records of Assets or Liabilities missing		2%	11%
Lack of Records supporting amounts reported	100%		
Lack of Procedures for Recording certain fees			
	100%	100%	100%

By far, the greatest problems came in preparing the government-wide financial statements. These statements should include financial information for the primary government and the component units of the county. In this study, a strong majority of the county governments in Mississippi and Tennessee ignored this requirement. In Florida, all county governments included the government-wide financial statements.

With the exception of one county, all of the Mississippi counties receiving negative opinions did not implement the government-wide statements. In Mississippi, counties are governed by a legislative board of five supervisors elected form five county districts. Thus, accountabiity of the public officials is diluted. In particular, it can be argued that Mississippi county managers determined that the costs of producing government-wide statements were less than the benefit of including this information.

In Tennessee, 89% of the counties had negative opinions because of failure to implement the government-wide provision of GASB 34. Tennessee counties are govern by a major and

boards consisting of 9 to 25 members. However, county government managers in Tennessee included in their CAFR's that the decision not to implement the government-wide provision of GASB 34 came from the Comptroller of the Treasury of the State of Tennessee. The Comptroller adopted standards by which counties were required to follow GASB 34 as it related to fund reporting but that the full implementation of GASB 34 would not be required by the Comptroller. The majority of the Tennessee counties that received negative opinions did implement the fund standard requirements of the Comptroller. Hence, the Tennessee county managers determined that the benefits (personally and perhaps for the county) of following the Comptroller's recommendations exceeded the costs of receiving a negative opinion.

However, Florida county managers have made the opposite decision. In Florida all counties had a "clean" opinion except for two (2) counties. The Florida law requiring a certain county official to take responsibility for the accuracy of the annual financial report is probably part of the cost and benefit considerations of the county officials. Florida statute Section 218.32 (1)(a) is given below:

218.32 Annual financial reports; local governmental entities.

(1)(a) Each local governmental entity that is determined to be a reporting entity, as defined by generally accepted accounting principles, and each independent special district as defined in s. 189.403, shall submit to the department a copy of its annual financial report for the previous fiscal year in a format prescribed by the department. The annual financial report must include a list of each local governmental entity included in the report and each local governmental entity that failed to provide financial information as required by paragraph (b). The chair of the governing body and the chief financial officer of each local governmental entity shall sign the annual financial report submitted pursuant to this subsection attesting to the accuracy of the information included in the report. The county annual financial report must be a single document that covers each county agency.

The above law makes a specific Florida county government official (Clerk of Circuit Court) responsible for "attesting to the accuracy" of the financial information. These officers can reduce any personal costs of providing the state government with inaccurate reports by having a "clean" audit opinion. Thus accountability has been enhanced.

Conclusions

This study looks at the implementation of GASB 34 by counties in three southeastern states, Florida, Mississippi and Tennessee. This study contributes to the literature showing that standard implementation is greater when one county government official is responsible for financial reporting issues than when several officers are responsible.

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What are the impacts of recent deregulation and financial innovations on the stock market, housing market, and overall economy?

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Abstract

The recent financial meltdown and economic recession has left many people wondering what role did deregulation and financial innovations play in our current financial and economic crisis. There have been several deregulations in the financial and housing markets over the past 30 years. Some of these include The Depository Institutions Deregulation and Monetary Control Act, the Federal Home Loan Bank Board establishing adjustable mortgages, the 1982 Garn-St Germain Depository Institutions Act establishing a secondary mortgage market, the repeal of the Glass-Stegall Act allowing commercial and investment banks to merge, and the SECs deregulation of investment banks in 2004, allowing investment banks to increase their leverage ratio from 12:1 to 30:1.

This paper examines some of the deregulations and financial innovations that led up to our current economic and financial crises and their impacts on the housing market, stock market and overall economy. Using both Chow tests and Cusum Squares tests, this paper examines if there is a structural break in the behavior of the housing market, stock market, and GDP due to each of these events.

Introduction

The recent financial meltdown and economic recession has left many people wondering what role deregulation and financial innovations played in our current financial and economic crisis.

Prior to Bear Sterns and Lehman Brothers collapse the housing market represented by residential fixed investment (RFI), the stock market measured as the Dow Jones Industrial Average (DJIA) and overall real GDP were doing quite well, which can be seen in Figures 1-3 showing each overtime.

These graphs show that there is a tremendous change in all three overtime. The tremendous change in the mean and variation of these variables can also be seen if we examine the mean and standard deviation (S.D.) between different decades. Table 1 below shows that the mean of RFI and GDP overtime has increased greatly, as well as the standard deviation. This hints that there is little stability overtime for housing and the overall economy.

So what lead to the significant changes in the housing market, stock market and GDP? What role did deregulation and financial innovations have in the recent downturn in RFI, DJIA and GDP?

Overview of Deregulations and Financial innovations

To better understand the role that deregulation and financial innovations played in the current financial and economic crisis it is import to examine what these innovations and

deregulations were over the past 30 years. It is important to note, that prior to the 1980s, most home loans were done by savings and loan institutions, with 95% of all home loans being conventional uninsured fixed rate mortgages. So what caused this to change?

Although home mortgage loans during the 1950s came from diverse lending institutions, by the 1960s, Savings and Loans (S&Ls) became the main providers of residential mortgage funds, providing almost all home mortgage loans.[4] Prior to the early eighties, ceiling regulations existed on deposit rates paid by S&Ls, so whenever market interest rates rose above the Regulation Q interest rate ceiling, depositors removed funds to find higher unregulated returns. During episodes of tight monetary policy, funds shifted away from savings and loans toward more attractive direct obligations, such as Treasury Bills. A reduction in S&L deposits reduced available funds for potential borrowers regardless of the price they were willing to pay, creating a climate of "disintermediation." Thus, as S&Ls experienced a sharp outflow of deposits, they restricted mortgage lending and created credit rationing. Credit rationing as reflected in short-run reductions in the ease of borrowing, availability of mortgage funds, or the supply of mortgage credit led to reductions in housing investment. Supply rationing lowered the amount some borrowers received and eliminated potential borrowers who required loans with low down payments.[5]

Early 1980's

In the early 1980s, federal legislative and regulatory actions were undertaken in an effort to eliminate possible supply side credit rationing. By 1983, three government actions combined to effectively eliminate Regulation Q as a significant constraint on the ability of S&Ls to raise funds.[6] In 1980, The Depository Institutions Deregulation and Monetary Control Act (DIDMCA) phased out the interest rate ceilings on time and saving deposits at banks and thrifts over a six-year period and provided nationwide authorization of interest-bearing transactions accounts. Thus, the DIDMCA eliminated Regulation Q that was imposed on Savings and Loan institutions (S&Ls), who were the main provider of home mortgage loans, which allowed S&Ls to take on riskier behavior and allowed more commercial banks to get into the home loan market.

During this time period, the Federal Home Loan Bank Board in 1981 established adjustable federally-insured FHA mortgage loans. These FHA loans were more expensive, but since they were insured, they helped to relax credit constraints and allowed borrowers with higher loan-to-value ratios or lower down payments into the market. In essence, this allowed for more sub-prime mortgages. Once it was approved for FHA loans, the rest of the market for home loans started doing it as well.[7]

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[4] See Martin (1978).

[5] See Jaffee and Rosen (1979).

[6] See Ryding (1990).

[7] Prior to 1981, conventional uninsured fixed rate loans comprised over 95% of all residential mortgages. Federally insured mortgages or mortgage-backed securities guarantee loan repayment to the lending institution, eliminating default risk. This enhanced the attractiveness of holding mortgages in an investment portfolio and potentially lowered the interest rate charged on mortgages. This allowed FHA mortgage loans to relax credit constraints and allow borrowers with higher loan-to-value ratios or lower down payments into the market. Although this made FHA loans more expensive than conventional mortgage loans, fully insuring lenders for the cost of default removed the lenders' incentive for nonprice credit rationing. If there was a class of borrowers who could not qualify for mortgages at the higher fixed-rate, the introduction of adjustable mortgage loans could potentially increase home purchases for a given level of interest rates.

Finally in 1982, the Garn-St Germain Depository Institutions Act provided authorization of money market deposit accounts with unregulated deposit rates.[8] This helped to establish a secondary market (where mortgage loans were bought and sold) that allowed more borrowers and lenders into the housing market. It also allowed S&Ls as well as other banks to buy and sell their home loan mortgages so they were no longer tied to or owned their mortgages.

These reforms were thought to help "complete" the mortgage loan market by better matching the needs of lenders and borrowers. First, deregulation of deposit rates removed the primary cause of financial disintermediation. By allowing S&Ls to price their deposits more competitively with non-deposit securities, it removed the incentive for depositors to move funds from financial intermediaries into purchases in the primary securities markets. As depositors kept more funds in financial intermediaries such as S&Ls, it allowed S&Ls to make more home mortgage loans. Second, the development of secondary markets produced a more "complete" market by allowing more borrowers and lenders into the housing market. Third, the availability of the adjustable mortgage rates allowed payments below fixed rate mortgages, making any given payment-to-income test less binding. Borrowers preferred adjustable rates to fixed rates if they believed their income would fluctuate in the future, and this encouraged more borrowers to enter the housing market.

However, a consequence of these deregulations is that after the early 1980s, S&Ls where no longer the main provider and holder of home loans and that they as well as other institutions were encouraged to take on risky behavior and to provide mortgages with a premium to lower income home buyers.

Following these deregulations, in 1987 Chairman Greenspan replaced Chairman Volker as the Federal Reserve chairman. In contrast to Chairman Volker, Chairman Greenspan encouraged deregulation of the Federal Reserve Bank and its role in overseeing banks, thus again expanding the culture of deregulation in the financial and housing markets.

Late 1990s

During the mid to late 1990s, there were also tax changes and strong encouragement from the government to help expand the demand and access in the housing market. First, in 1997 President Clinton eliminated the capital gains tax on the primary residence. Prior to this change, a couple could only receive a one-time tax exemption on the capital gain from the sale of a home. However, after 1997, capital gains on the sale of a home that you lived in for 2 out of the past 5 years were tax exempt for up to $250,000 for an individual and $500,000 per couple, which encouraging people to buy a home for tax purposes. This tax change encouraged potential "flipping" the buying and immediate reselling of a house to make a profit. During this time, President Clinton also encouraged Fannie Mae and Freddie Mac to lend to lower income buyers.

During this time period, in 1998 the Commodity Futures Trading Commission called for regulation of the futures market, which included credit default swaps, however, Chairman Greenspan, along with the Secretary of the Treasury Rubin and the Economic Advisor to the president, Summers were all against such actions, and thus it remained unregulated. A year later, Phil Graham proposed to repeal the Glass Steagall Act in 1999, which was originally passed after the Great Depression to separate commercial and investment banks. It passed with overwhelming support.

2000s

While during the late 1990s, the stock market was growing tremendously, especially in what is known as the dot.com technology industry, however, in 2000 and 2001, the so called

[8] See Kahn (1989).

"Dot.com bubble" burst, so money that flowed into the stock market was looking for a perceived better and safer return, increasing the demand for real estate investment. Soon after this fall in the stock market and to the September 11th, 2001 attack, the U.S. economy went into a recession. In response, the Federal Reserve Bank under Chairman Greenspan reduced interest rates to 1% to easy credit to help increase aggregate demand. This action combined with the fall in the stock market and the preferential tax treatment of housing made mortgages and homes very attractive, thus greatly increasing the demand for homes.

The increase in the demand for housing was potentially exacerbated by President Bush's 2001 and 2003 tax cuts for middle and upper incomes, which again increased the demand for housing. The increase in demand pushed up home prices at unforeseen rates, with the ratio of house prices to rents becoming 78% and house prices to income of 190%.

In response to such high demand and the payment structure of mortgage brokers, mortgage companies and their brokers (who are paid on commission) actively sold subprime mortgages to people with bad credit and lower incomes. According to Credit Suisse, Subprime mortgages grew from $173 billion in 2001 to a record level of $665 billion in 2005, which represented an increase of nearly 300%. One reason for this tremendous growth was that commissions on subprime mortgages were much greater than the commissions for prime mortgages. Thus, mortgage brokers often became creative and sometimes even accepted "liar loans" and did not verify the information for that was used to obtain the loan. In fact, mortgage brokers often encouraged adjustable rate mortgages to people who could not afford homes.

In 2004, the Securities and Exchange Commission (SEC) very quietly deregulated Investment Banks and allowed their debt to capital ratio to increase from 12:1 to 30:1. This encouraged investment banks to greatly increase their leverage.

During the mid-2000s, in 2003, Bear Sterns fixed-income department set up a hedge fund called the High-Grade Structured Credit Fund and told investors the High-Grade Structured Credit Fund would invest in low-risk, high-grade debt securities, such as tranches of CDOs, which the ratings agencies had rated either AAA or AA. The fund would focus on using leverage to generate returns by borrowing money in the low-cost, short-term repo markets to buy higher yielding, long-term CDOs. In 2006, Bear Sterns opened a second fund, the High-Grade Structured Credit Enhanced Leveraged Fund with close to $600 million of investors' money, as well as $400 million borrowed from a credit facility from Barclays, the largest British Bank. This fund used substantially even more leverage and risk than the first fund. (Cohan, 2009).

Eventually, the expansionary monetary policy of low interest rates and expansionary fiscal policy of tax cuts and the war on Iraq started to put inflation pressures on the overall economy. Thus to reduce inflation, the Federal Reserve Bank increased interest rates very quickly from July 2004 to July 2006 from 1% to 5.25%. This made many of the adjustable rate mortgages (ARMs) which were reaching their common 3 and 5 year introductory fixed rates to increase the interest rates on many home owners, which made mortgage payments unaffordable. To help put things in perspective, for the average home loan a 2% increase in the interest rate can increase the cost of mortgage interest payments by close to 40%. Since many of the ARMs were given to low income and subprime mortgages, this quick and significant increase in the mortgage payments, caused many homeowners to default on their loans. As people began defaulting on their loans, others wanted to cash out and the supply of housing increased significantly.

As the supply of housing increased, it put downward pressure on the price of housing, causing a quick and significant reduction in home prices. This fall in housing prices was

exacerbated by the fact that building of new homes peaked in 2007. Homes were saturating the market with supply, just as demand was falling, causing housing prices to fall even faster.

The quick fall in housing prices made defaults for banks even more risky and costly. Since many of these subprime mortgages were packaged together and sold over and over again as credit default swaps, it caused banks to have to write-off bad assets, reducing their balance sheet and hurting their stock value. Since most of these credit default swaps were not traded on an exchange they were unregulated, and thus no one had any idea how many or how large the credit default swap market had become. Similarly, it was also not very clear what was in any of the packaged deals.

During this time, Lehman acquired five mortgage lenders, including subprime lender BNC Mortgage and Aurora Loan Services, which specialized in Alt-A loans (made to borrowers without full documentation). By 2007, Lehman underwrote more mortgage-backed securities than any other firm, accumulating an $85-billion portfolio, or four times its shareholders' equity. By the middle of 2007, the Credit Default market was estimated to be greater than 45 trillion dollars.

In August 2007, the credit crisis erupted with the failure of two of Bear Sterns hedge funds, the High-Grade Structured Credit Fund and the High-Grade Structured Credit Enhanced Leveraged Fund. By the end of 2007, Barclay's brought a lawsuit against Bear Sterns for not disclosing what was in the funds. Soon after Standard and Poor's downgraded the company's credit rating. By March 2008, Bear Sterns collapsed and was sold to J.P. Morgan.

By the summer of 2008, the stock market lost confidence in the mortgage finance giants Fannie Mae and Freddie Mac, with the stock prices plummeting by more than 90% after they reported accumulated losses of $14 billion for the year. By July 2008, the government gave Fannie $34.2 billion and Freddie $51.7 billion.

September 15, 2008, Lehman Brothers filed for bankruptcy. With $639 billion in assets and $619 billion in debt, Lehman's bankruptcy filing was the largest in history. Lehman was the fourth-largest U.S. investment bank at the time of its collapse, with 25,000 employees worldwide. Less than one week later, AIG's credit rating was downgraded, increasing their collateral obligations. In response, their stock price fell 95%. While they were on the brink of bankruptcy, the government stepped in on September 18th, 2008 and gave them a loan of $85 billion dollars.

Estimation technique and data

To examine the impacts of deregulation and financial innovations on the housing market, stock market and GDP, a chow test is employed. This test determines whether there is a significant structural change in RFI, DJIA, and GDP before and after the time periods before and after deregulation and financial innovations. To do this, I split the time period into two separate periods before and after each event and compare results to determine if there is a change in the behavior of RFI, DJIA, and GDP.

A Chow test is employed to examine whether there is a significant structural difference in the housing market after the earlier 1980s and then again after the late 1990s. This Chow test is similar to that of Pozdena (1990) and outlined in Hamilton (1994), and tests for a structural change between the two sample time-periods. A significant difference indicates a structural change in the housing market. To estimate this, an F test is constructed as:

F = [(RSS1 –RSS2 –RSS3)/k]/[(RSS2+RSS3)/(N1+N2-2K)]

where the residual sum of squares *(RSS)* information from regressions spanning the entire data sample is *(RSS1)*, the first sub-period *is (RSS2),* and the second sub-period is *(RSS3).* This F test has degrees of freedom of: *{k,N1+N2-2k}* where *N1* is the sample size of the first sub-period*, N2* is the sample size of the second sub-period, and *k* is the number of estimated parameters.

To examine the robustness of the Chow test results, Cusum-of-Squares tests (which stands for cumulative sum of the least squares recursive residuals) are estimated. Green (1997) argues that a cusum-of-squares test is appropriate if uncertainty exists regarding when a structural change might exist. According to Greene (2000), one advantage of this test is that is does not require a prior specification of when the structural change takes place as a Chow test does. However, the power of the cusum-of-squares test is limited compared with that of the Chow test.

In general, this test plots the variable over time and its 5 percent critical values. Any movement outside the critical lines suggests the parameter or its variance is no longer stable. This test, developed by Brown, Durbin, and Evans (1975), has a null hypothesis that the coefficient vector β is the same in every period, while the alternative is that β (or the disturbance variance) is not the same in every time period.

Specifically, the CUSUM Squares test is based on the test statistic:

$$S_t = \frac{\sum_{r=t}^{r=K+1} w_r^2}{\sum_{r=k+1}^{r=T} w_r^2},$$

where w_r is represented by

$$w_r = \frac{e_r}{\sqrt{1 + x_r^{/}(X_{r-1}^{/} X_{r-1})^{-1} x_r}},$$

which goes from zero at $t = k$ to unity at $t = T$. Assuming that T equals all observations and t equals the ex post prediction error for y_t, the regression is estimated using only the first t-1 observations such as where x_t is the vector of regressors associated with observation y_t and b_{t-1} is the least squares coefficients computed using the first t-1 observations. The forecast variance of the residual is:

$$\sigma_{ft}^2 = \sigma^2 \left[1 + s_t^{/}(X_{t-1}^{/} X_{t-1})^{-1} x_t\right]$$

where the expected value of S under the hypothesis of parameter constancy is:

$$E|S_t = \frac{(t-k)}{(T-k)}.$$

To determine the proper lag length, a likelihood ratio test is used. All log likelihood ratio test results suggest that four lags of RFI, DJIA, and GDP are the proper lag lengths, thus cusum square test results are based on four lags.

To obtain the necessary data, the Bureau of Economic Analysis reports real RFI and GDP in quarterly 1996 dollars from 1959.Q1-2009.Q4 at http://www.bea.doc.gov/. Data regarding the stock market is from the quarterly average of the closing of the DJIA.

Results

Chow test results for residential fixed investment suggest that there is a structural break in the housing market before and after each of the deregulations and financial innovations

mentioned. In fact, with the exception of the late 1980's, it appears that there is a continuous structural break in housing behavior. While this is a surprising result, it suggests that the housing market may never have returned to "normal". This may be driven by the tremendous and unprecedented rise and fall in RFI data over the past ten years creating a distortion in the data.

Similarly, Cusum Square results also show that there appears to be a structural break in housing market during the early 1980s. However, these results suggest that the housing market returns to normal soon after this break, which contradicts that found in the Chow Test Results. Again, this may be due to the extremes that we have seen in the housing market over the past decade driving the findings.

Chow test results for GDP also appear to have a continuous structural break since 1996. This is a very surprising result, considering that until 2007, GDP was growing at a three percent growth rate for close to twenty years. However, as previously mentioned this may be due to the tremendous and quick downturn from 2007 to 2009 driving the findings. Cusum square results for GDP also show that GDP was significantly different through the 1990s. During this time period we did see tremendous growth in the overall economy.

Chow test results for the DJIA show that there is a structural break in the stock market for every year after 1985. Similarly, Cusum square test results show very little stability in the stock market.

Conclusions

In conclusion, results suggest that financial innovations and deregulations have greatly altered the housing market, stock market and overall economy. In fact, it appears that all three are exhibiting a continuous structural break over the past few decades and have not returned to their "normal" behavior. While it is unclear what the catalyst is that caused this structural break, it is clear that it has been a strong and continued break, with an increase in the volatility of the housing market, stock market and the overall economy.

Appendix A: Tables

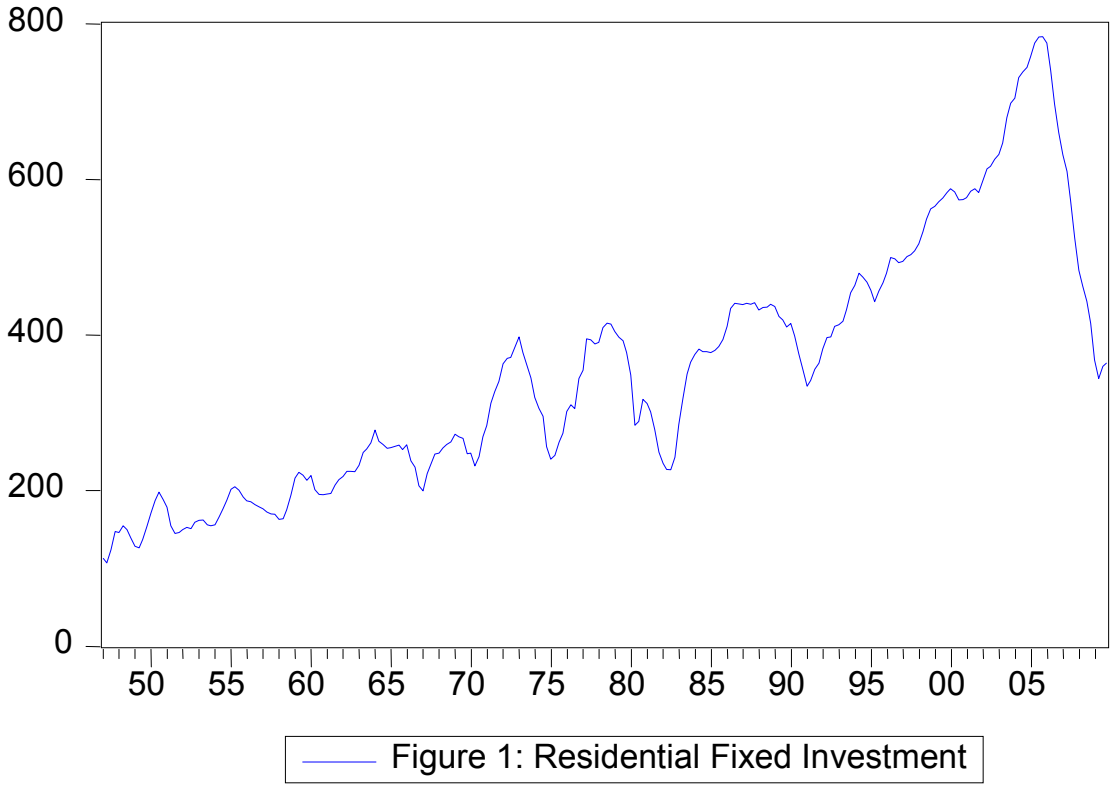
Table 1	Mean	Standard Deviation		Mean	Standard Deviation
Variable	1959-1979			1980-1989	
RFI	283.3881	66.186		365.0539	71.31433
GDP	4191.613	932.7594		6715.927	724.5147
DJIA	817.3667	112.9319		1513.849	599.1189
	1990-99			2000-2009	
RFI	459.8541	69.16426		605.9144	124.822
GDP	9117.556	926.6318		12340.17	777.4275
DJIA	5309.042	2599.579		10466.4	1437.649

Table 2: RFI Chow Breakpoint Test				
Date	F-stat	Prob.	LLR	Prob.
1980	3.177424	0.008831	16.0572	0.006683
1981	3.152122	0.009272	15.9342	0.007034
1982	3.488897	0.00483	17.5653	0.003544
1983	3.394887	0.005797	17.11129	0.004294
1984	2.630704	0.025081	13.38282	0.020044
1985	2.806402	0.017981	14.24611	0.014119
1986	2.557129	0.028806	13.02023	0.02319
1987	2.196776	0.056218	11.23494	0.046916
1988	2.117317	0.064985	10.83917	0.054664
1989	2.263012	0.049783	11.56427	0.041272
1990	2.531827	0.030207	12.89538	0.024379
1991	2.982531	0.012845	15.10786	0.009911
1992	2.89741	0.015117	14.69184	0.011763
1993	2.661805	0.023652	13.5359	0.018842
1994	2.455462	0.034846	12.51812	0.028338
1995	3.184255	0.008715	16.0904	0.006591
1996	3.460138	0.005107	17.42652	0.003758
1997	3.812077	0.002571	19.11837	0.001827
1998	3.713569	0.003117	18.64624	0.002237
1999	3.230505	0.00797	16.315	0.006
2000	3.398439	0.005758	17.12846	0.004263
2001	3.521602	0.004532	17.723	0.003314
2002	3.641066	0.003591	18.29803	0.002595
2003	3.307079	0.006873	16.68632	0.005135
2004	3.089913	0.010452	15.63147	0.007979
2005	4.285404	0.001016	21.37188	0.000689
2006	5.009234	0.000244	24.77059	0.000154
2007	3.345197	0.006384	16.87091	0.004751

Table 3: GDP Chow Breakpoint Test				
Date	F-stat	Prob.	LLR	Prob.
1980	0.744311	0.591181	3.876337	0.567354
1981	1.101168	0.361146	5.709023	0.33557
1982	1.895255	0.096849	9.729031	0.083287
1983	2.962008	0.01336	15.00764	0.01033
1984	1.724216	0.130757	8.869828	0.11437
1985	1.503356	0.190477	7.75497	0.170267
1986	1.450647	0.207901	7.488005	0.186802
1987	1.450743	0.207868	7.48849	0.18677
1988	1.327779	0.253962	6.864328	0.230928
1989	1.292785	0.268565	6.686346	0.245032
1990	1.39267	0.228653	7.193948	0.206611
1991	1.611549	0.158702	8.301869	0.140365
1992	2.110039	0.06585	10.80288	0.055431
1993	1.920815	0.092547	9.857117	0.079386
1994	2.047567	0.073736	10.49112	0.062457
1995	1.998089	0.080605	10.24387	0.068613
1996	2.642189	0.024544	13.43937	0.019592
1997	2.82082	0.017494	14.31679	0.013718
1998	2.844548	0.016721	14.43306	0.01308
1999	2.375378	0.040447	12.12174	0.033157
2000	2.695317	0.0222	13.70072	0.017627
2001	3.563578	0.004176	17.92524	0.003042
2002	3.684518	0.003299	18.50679	0.002374
2003	4.545451	0.000609	22.59944	0.000403
2004	4.465247	0.000713	22.22162	0.000475
2005	4.89338	0.000307	24.23039	0.000196
2006	6.026232	0.000033	29.45216	0.000019
2007	7.25674	0.000003	34.9766	0.000002

Table 4: DJIA Chow Breakpoint Test				
Date	F-stat	Prob.	LLR	Prob.
1980	0.533382	0.750834	2.785294	0.733045
1981	0.561153	0.729693	2.929275	0.710889
1982	0.674349	0.64337	3.515103	0.621104
1983	0.708457	0.617743	3.691294	0.59466
1984	0.746551	0.589536	3.887892	0.565667
1985	0.895993	0.484836	4.657333	0.459113
1986	0.93507	0.459359	4.858053	0.433448
1987	0.960256	0.443402	4.987317	0.41743
1988	1.37719	0.234487	7.115366	0.212201
1989	1.413385	0.221042	7.299062	0.199332
1990	1.438956	0.211949	7.42874	0.190656
1991	1.864069	0.102349	9.57264	0.08829
1992	2.06378	0.071608	10.57208	0.060556
1993	2.519502	0.030913	12.83454	0.02498
1994	3.022915	0.011888	15.30494	0.009136
1995	4.445225	0.000741	22.1272	0.000495
1996	5.175291	0.000176	25.54238	0.000109
1997	6.263187	0.000021	30.52768	0.000012
1998	7.642615	0.000001	36.67865	0.000001
1999	10.83862	0	50.25518	0
2000	10.28046	0	47.94833	0
2001	7.80616	0.000001	37.39576	0
2002	7.206169	0.000003	34.75248	0.000002
2003	0.000002	0.000001	38.38099	0
2004	7.697401	0.000001	36.91915	0.000001
2005	9.051082	0	42.7734	0
2006	10.58698	0	49.2184	0
2007	10.34074	0	48.19874	0

Appendix B: Figures



Fig

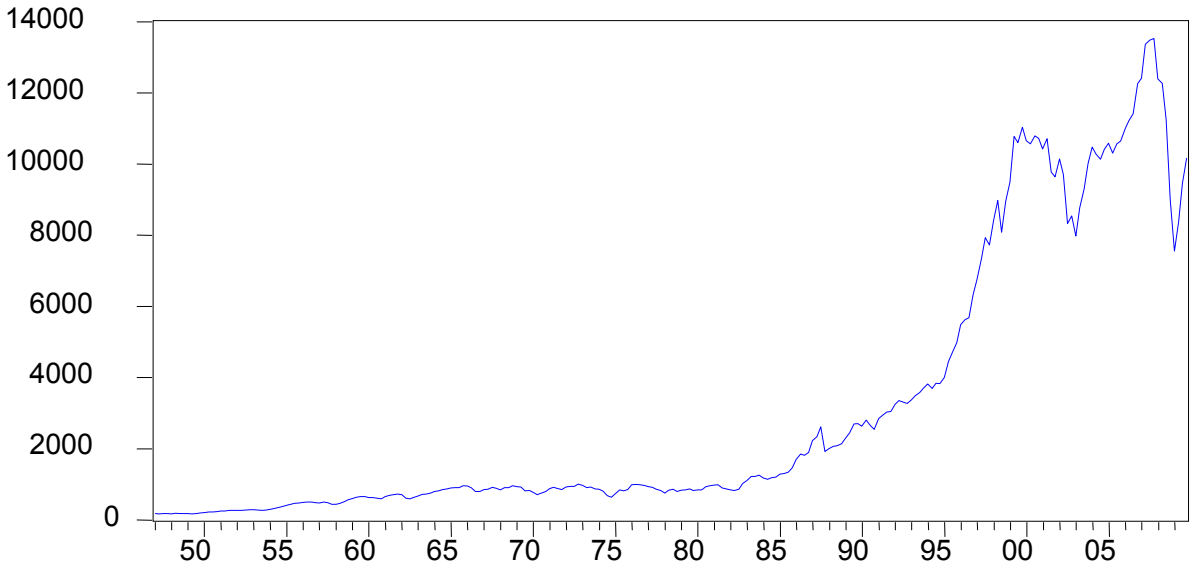


Figure 2: DJIA

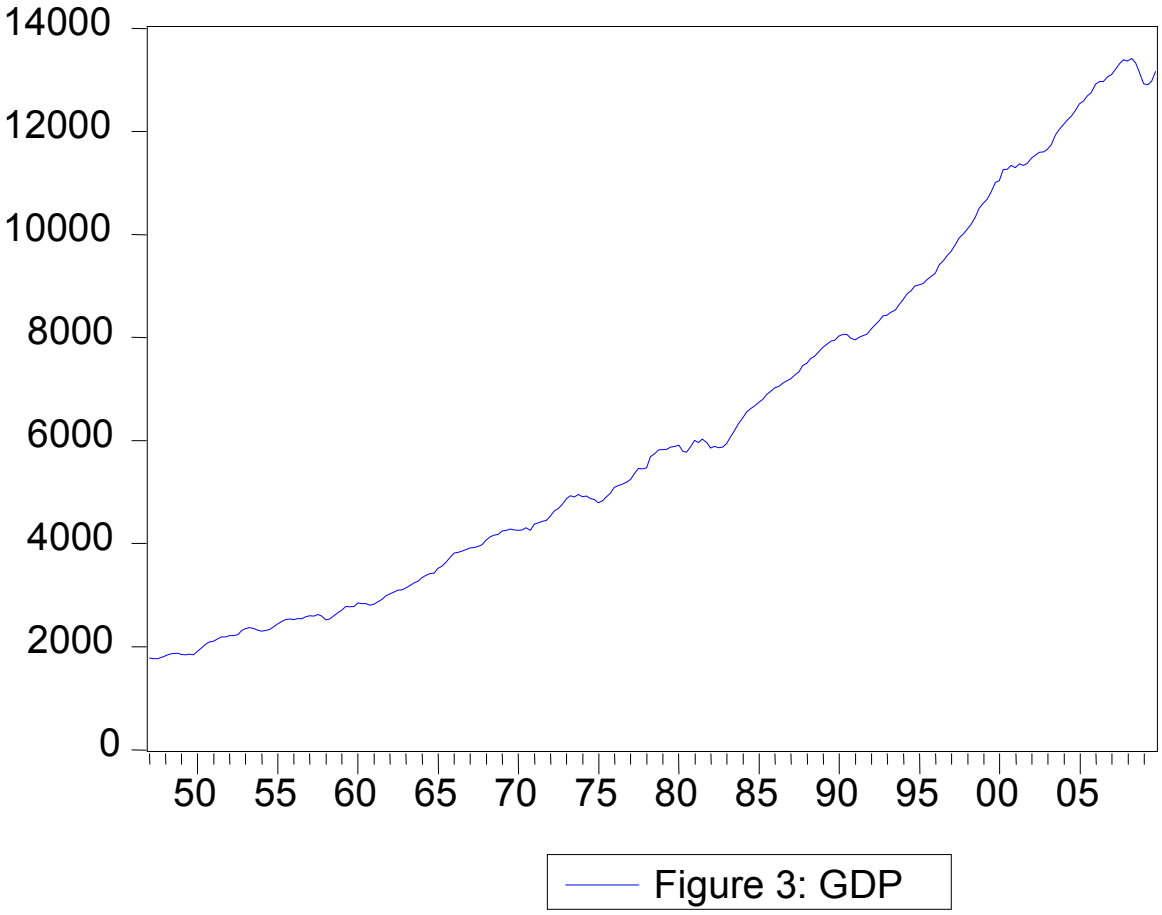

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Figure 3: GDP

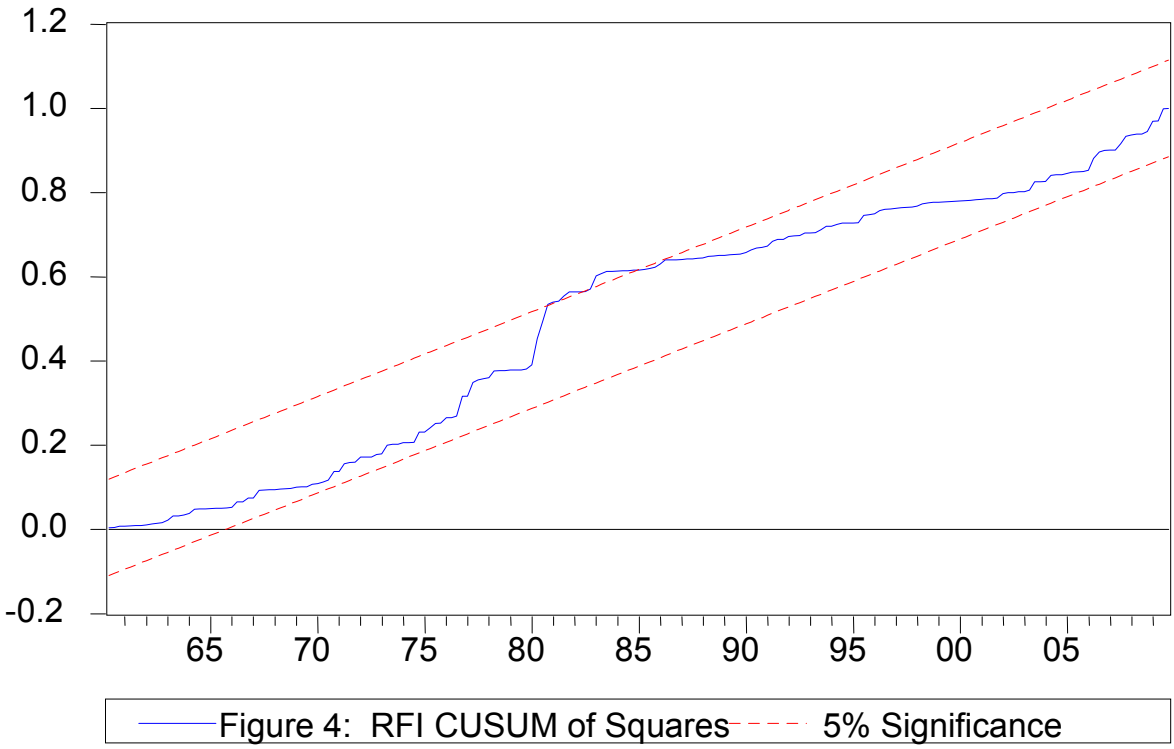
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Figure 4: RFI CUSUM of Squares
5% Significance

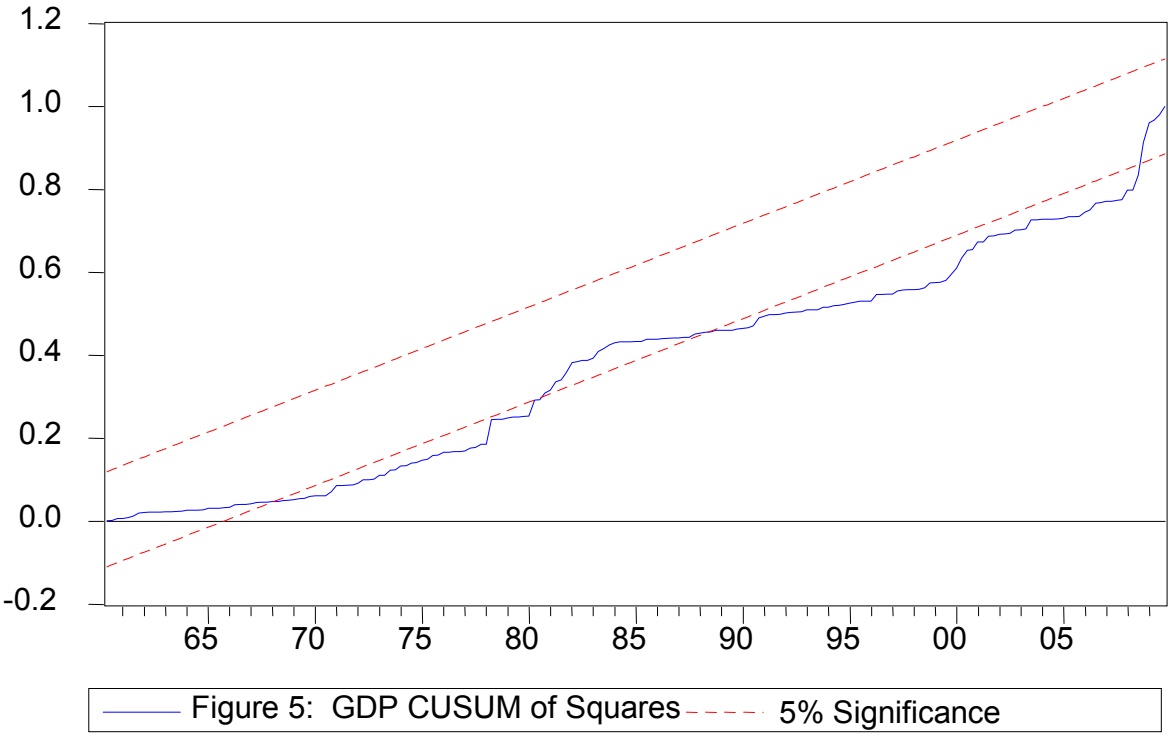
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Figure 5: GDP CUSUM of Squares
5% Significance

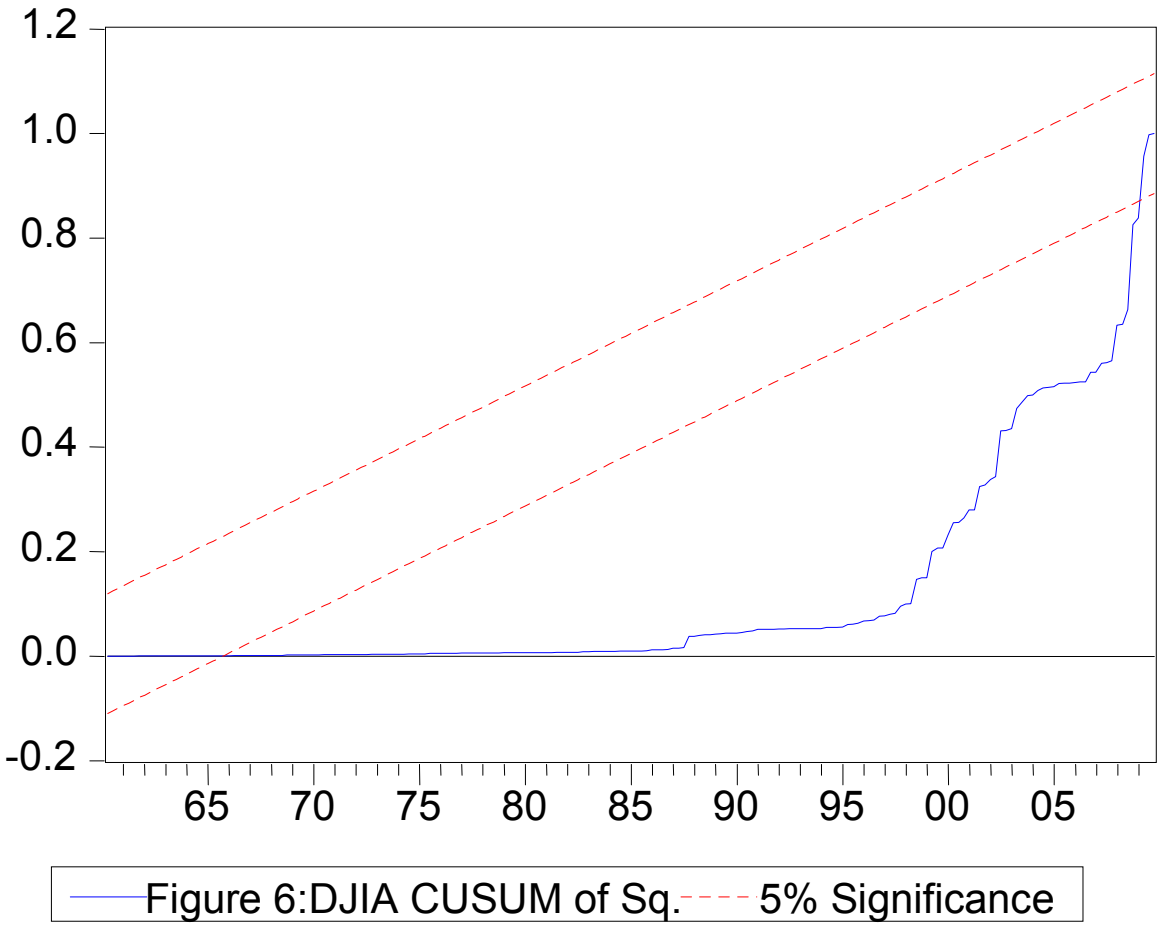
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Figure 6:DJIA CUSUM of Sq.
5% Significance

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Do Federal Budgets Cause Crowding Out?

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Abstract

The U.S. elections placed much emphasis on the size and role of government and tax policy. While congress passed the over $700 billion bailout plan to help stimulate the U.S. economy, many economists believe that this only increases our federal deficit and causes "crowding out". It is unclear whether expansionary fiscal policy helps stimulate the United States economy through the Keynesian multiplier effect or whether it causes crowding out of private investment? It's also unclear how much and how long it takes for investment, consumption, output, and interest rates to respond.

This paper examines the impacts of deficits on investment, consumption and output. Specifically, an error correction vectorautoregression (VECM) is employed to determine the predictive power of shocks to taxes, government spending, and deficits on investment, consumption, output and interest rates. Results show very little support for any crowding out affects. While interest rates appear to respond very little to deficits, reductions in taxes or increases in government spending, all appear to cause a relatively small increase in private investment, suggesting that the Keynesian multiplier effect outweighs or at least offsets any type of crowding out.

Introduction

The U.S. Presidential election placed much emphasis on the size and role of government as well as their competing tax policies. Similarly, congress recently debated and passed the over $700 billion bailout plan to help stimulate the U.S. economy. How and to what degree do changes in tax policy and government spending and their accompanying changes in the U.S. budget deficit alter investment, consumption and output in the aggregate U.S. economy?

According to the Wall Street Journal, the current U.S. Federal deficit is close to $1.4 trillion dollars. Considering that the Federal debt is just the accumulation of all of the deficits and surpluses overtime, this just keeps adding on to our overall debt, which is currently just over $12.7 trillion dollars. This debt doubled while President Bush was in office and reduced taxes. It continues to grow at an even faster pace today with the recent expansion if government fiscal policy. In fact, the debt grows by close to $4 billion dollars a day and the debt owed per person in the U.S. is now close to $40,000.

Since we have such a large deficit and debt that is due in large part to our recent cut in income taxes and increases in government spending, it is important to determine the impacts of fiscal policy on investment behavior and output for the U.S. economy. To do this, this paper does an empirical investigation into the predictive power of changes in taxes, government spending, deficits and the debt for investment, consumption and output.

The political contrast between parties regarding tax policies directly relates to the contrast and debate that market-clearing neoclassical and Keynesian macroeconomist have regarding the impacts of government spending and tax policies on the overall economy. According to Baxter and King (1993), both the neoclassical and Keynesian models imply that there is a positive effect

of government spending on GDP. However they suggest that the models differ in regards to how increases in government spending impact consumption and private investment. In general, neoclassical or market-clearing economists believe that increases in government spending and tax cuts "crowd out" private sector investment due to it causing higher interest rates. If government borrowing creates a greater demand for money and funds than is supplied, it leads to higher interest rates or a higher user cost of capital, creating higher prices for private firms to borrow money. As interest rates increase, firms face a lower rate of return and thus reduce investment. So as the public sector gets more, it "crowds out" private sector investment. As the private sector firms take on fewer investments, they also produce less and reduce output and thus GDP falls. Since the market-clearing model puts more emphasis on the long-run which assumes that we are at full employment or capacity, market-clearing economists suggest that increases in fiscal policy will also create long term inflationary effects. Thus, neoclassical economist would expect to find a negative relationship between government spending and consumption, private investment and GDP.

Building on the market-clearing model, Barro (1974) argued that tax cuts will not have an impact on the overall economy due to the Ricardian equivalence. Barro suggested that Ricardo believed that although taxpayers would have more money now, they would realize that they would have to pay higher tax in future and therefore save the tax cut in order to pay for the future tax increase. Thus, the extra saving by consumers would exactly offset the extra spending by government, so overall demand would remain unchanged. If this is the case, one might expect to not find any relationship between tax changes, and consumption, investment and output.

However, as Keynesian economist suggest any crowding-out effects are moderated by an increase in demand for goods in the private sector along with the multiplier or "accelerator effect". As the demand for goods increases, firms will want to produce more and will actually increase output causing a "crowding in" effect. In the traditional IS-LM analysis, the increase in demand for private goods caused by a cut in taxes or increase in government spending stimulates the IS curve, generating an increase in aggregate demand, eventually increasing output. Thus an increase in government spending or a decrease in taxes should find a corresponding increase in consumption, GDP and interest rates. The impact on GDP is likely to be bigger if the economy is not at full capacity, thus during a recession, we might expect a much bigger accelerator or "crowding in" effect causing a much larger increase in GDP. Thus, Baxter and King (1993) suggest that the Keynesian model would predict a positive relationship between tax cuts, increases in government spending, and investment and output, as long as the multiplier effect outweighs the impact of higher interest rates.

Similarly, the recent stimulus package and bailouts were aimed at trying to increase liquidity and lending by banks and thus under an IS-LM analysis should help increase the LM curve to the right, which should help increase aggregate demand and GDP. However, in contrast to the increase in the IS curve, this should help to reduce interest rates.

To determine whether the neo-classical market clearing model or the Keynesian non-market clearing model better predict and explain the U.S. economy, many empirical economist have tried to examine the impacts of deficits on investment, consumption and GDP. While Lusvigson (1996) found that deficit-financed tax cuts lead to higher investment if there is elasticity of labor and the debt shock is short, she also found that if the labor supply is inelastic or the debt shock appears permanent, there is crowding out. She suggests that if there is an elastic labor supply, a tax cut creates an incentive to work more and produce more (by

substituting labor for leisure), so even though current consumption increased, the increase in output is even greater.

Similarly, Blanchard and Perotti (2002) also found mixed results. Their findings suggest that increases in government spending increase consumption, supporting a Keynesian type multiplier effect. However, they also find that increases in both government spending and taxes have a negative impact on private investment supporting a neoclassical approach. Dotsey (1994), and Feldstein and Eckstein (1970) all find support that deficits do cause "crowding out" and reduce private investment and output. In contrast, Darrat (1989) found no evidence supporting crowding out effects.

Edelberg, Eichenbaum, and Fisher (1999) and Burnside, Eichenbaum, and Fisher (2000) suggest that different types of government spending may have different impacts. They all find that military spending in particular helps to increase GDP. Thus, there is no clear consensus by theoretically or applied macroeconomist regarding the size or even the directional impacts of changes in taxes, government and deficits on consumption, investment and GDP.

Estimation Procedure

This paper examines the direction and the size of an impact of taxes, government spending, deficits and debt on consumption, investment and GDP. Following Blanchard and Perotti (2002), an error correction vector autoregression is employed to determine the predictive power of tax changes, government spending, deficits, and debt on consumption, investment, output and interest rates. Data regarding aggregate demand and its components is available from the Bureau of Economic Analysis. Data regarding the average marginal tax rate and interest rates can be obtained the National Bureau of Economic Research (NBER) and the St. Louis Federal Reserve websites respectfully. After obtaining the data I estimate a VECM with interest rates, marginal tax rates, government spending (taxes, and deficits), investment and GDP.

While many researchers have used a single equation "St. Louis" type approach, which place structural causality assumptions onto the model. Following Chowdhury et al (1986) we employ a nonstructural ECM model instead to avoid imposing potentially spurious aprior constraints on the exogeneity of the variables in the system. While this approach cannot determine direct causality, it is a good way to test the explanatory power of deficits, interest rates, investment and GDP by allowing for direct and indirect effects between the variables in the system.

A nonstructural approach also allows for the incorporation of the proper lags of each series to avoid an omitted variable bias. To determine the proper lag length of each variable, this study uses the Log Likelihood Ratio, Akaike Information Criteria (AIC) and the Schwarz Information Criterion (SBC).[9]

In general the following VAR is estimated:

$$\Delta y_t = \Pi_0 + \Pi y_{t-j} + \Pi_1 \Delta y_{t-1} + \Pi_2 \Delta y_{t-2} + ...\Pi_p \Delta y_{t-p} + e_t \qquad (1)$$

where y_t is a vector of endogenous variables (Deficits, Interest rates, Investment and GDP) , Π is a matrix with elements Π_{jk} such that one or more of the $\Pi_{jk} \neq 0$, Π_i is a (nxn)

[9] Following Blanchard and Perotti (2002) I use a four-quarter distributed lag. Similar to Blanchard and Perotti (2002), augmented Dickey-Fuller and Phillips-Perron test results do not support cointegration between taxes and government spending. Results are available upon request.

coefficients matrices, t represents the time period, p represents the lag length, and e_t is a (nx1) vector of error terms.

A VAR is a useful method for analyzing the impact of a given variable on itself and on all other variables in the system by using forecast error variance decompositions (FEVD) and impulse response functions (IRF). By breaking down the variance of the forecast error for each variable into its components, FEVDs are a useful tool to analyze the impact of deficits on interest rates, investment and GDP. This allows one to examine which innovations better explain the error variance of consumption, investment and GDP. IRFs are also useful in tracing out the effects of a one-time shock to deficits and interest rates on the time paths of investment and output. These tools enable policy makers to empirically evaluate the magnitude and sign of the impacts of shocks to deficits in terms of its ability to predict changes in interest rates, consumption, investment and GDP.

Since all estimations use a Cholesky decomposition (to ensure that the covariance matrix of the innovations is diagonal), IRF results may be dramatically altered depending upon the order of equations in the system. I place deficits and interest rates first, followed by changes in the real variables (investment and GDP) last, which is consistent with Blanchard and Perotti (2002) and Taylor (1995) and the Keynesian interest rate transmission mechanism ordering, yet it also incorporates the relative price mechanism of a market-clearing model. While the chosen recursive model is not implied to represents the true structure of the economy, it does provide a basis to present evidence.

Results

Results suggest that budget deficits appear to cause crowding out. Results from impulse response functions (IRF) in Graphs 1 and 2 show the impacts of deficits on Investment behavior and GDP. Results in Graph 1 show that positive Federal budgets have a strong and positive impact on investment behavior through the first 5 quarters. This impact falls around quarter 6, but then picks up again at the end of the first year.

Results from FEVD tables 1 and 2 also suggest that budget deficits have a strong influence on investment behavior and GDP. Tables 1 and 2 show that budget shocks explain close to two thirds of the innovations in private investment and GDP. Combined, this suggests that budget deficits do cause crowding out of private investment and a reduction in future GDP.

Investment also appears to explain some of its own innovations, supporting Keynes' idea of investment responding to "Animal Spirits". Thus, changes in investment appear to be driving future changes in investment behavior. This may be due to investor confidence or fear and can be seen in FEVD Table 1 showing that investment explains close to 20% of its own innovations.

While investment explains much of its own innovations it also helps to explain some of the fluctuations in GDP as well. Investment explains close to fifty percent of GDP in the second quarter. Collectively this suggests that while deficits have a strong impact on investment behavior, investment behavior has an impact on GDP.

In contrast, interest rates and inflation never explain more than 4% of the shocks to real investment or GDP. Results are similar when we estimate taxes and government spending separately and when reordering deficits last.

While interest rates and inflation don't appear to impact investment and GDP, budgets appear to have an influence on interest rates and consumer prices. Impulse response functions in graph 4 show that deficits increase long-term interest rates over the first year by close to .1

percent, this impact dies away and is not statistically different that zero after the 5th quarter. FEVD results in Table 4 also show that budgets explain close to twenty percent of the innovations in long-term interest rates.

Results showing that deficits cause increases in long-term interest rates contradicts the findings of Darrat (1989) and Romer (1988), who suggested that deficits have no long term impacts on increasing long-term interest rates. Darrat, actually shows that increases in long-term interest rates actually increases the deficit, since they increase the borrowing cost for the U.S. government.

Results in Graph and Table 4 also show that higher consumer prices relate to an increase in nominal long-term interest rates. While this result is not surprising, it does suggest that higher prices create higher inflation expectations, increasing long-term interest rates. Interest rates also appear to respond to increases in investment behavior as well.

Results with taxes and government spending

To better understand how budget deficits impact investment and output it is important to know how the components of the deficit, taxes and government spending influence investment and output. Thus, in all regressions are re-estimated with taxes and government spending in place of budgets. Results re-estimated using both taxes and government spending in place of the budget continue have are very mixed.

It is interesting to note that taxes have a much larger impact on investment and GDP then government spending. Table 5 shows that taxes explain close to a third of the innovations in Investment behavior, while shocks to government spending explain five percent or less. However, impulse response function results in Graph 5 show that the directional impact of taxes changes from a positive to a negative impact after the first year back to a positive impact by the end of the second year. This change in sign from positive to negative is a very different result than that found by Blanchard and Perotti (2002), who find that an increase in taxes reduces investment by about a third through the first 5 quarters.

It also appears that taxes change their directional impact on GDP around the second year, going from positive to negative. This contradicts results found by Blanchard and Perotti (2002), suggesting that an increase in taxes has a negative effect on GDP reaching its peak around the 5th quarter. Thus, it appears as if taxes have a strong impact on investment and GDP, but it is unclear whether it is a positive or negative impact.

Results in graph 6 show that increases in government spending increase investment and GDP, supporting Keynes's multiplier effect. However, this positive impact falls significantly after the first year and is similar to that found in Blanchard and Perotti (2002). FEVD results in Tables 5 and 6 show that government spending has a relatively small impact on investment behavior, but it has a relatively strong and growing impact on GDP, further supporting Keynes' multiplier affects. These tables also show that shocks to government spending also cause reductions in consumer prices. However, this may be an indirect affect caused by a strong correlation during recessions causing prices to fall, while government spending increases.

Results using Debt

While budget deficits, and more specifically increases in taxes, appear to cause crowding out, the over debt level appears to have very little to no impact on investment or GDP. Tables 7 and 8 show that the national debt explains 8 percent or less of the innovations in investment and output. Similarly, graphs 9 and 10 show that the impact of the debt also changes from negative to positive after the first year.

Conclusions

Results suggest that deficits do create some crowding out of private investment. More specifically, it appears that taxes crowd out investment and output, but only for the first year. However, while deficits and taxes cause crowding out, the national debt has little impact on investment and output, and government spending appears to create a "crowding in" affect, supporting the Keynesian multiplier effect.

Of course, there are also other concerns regarding such a large deficit and national debt. What is the opportunity cost of paying so much in interest out of our national budget? How much and to whom do we have to pay back this large national debt? Will we have the resources if needed to combat future downturns in the economy?

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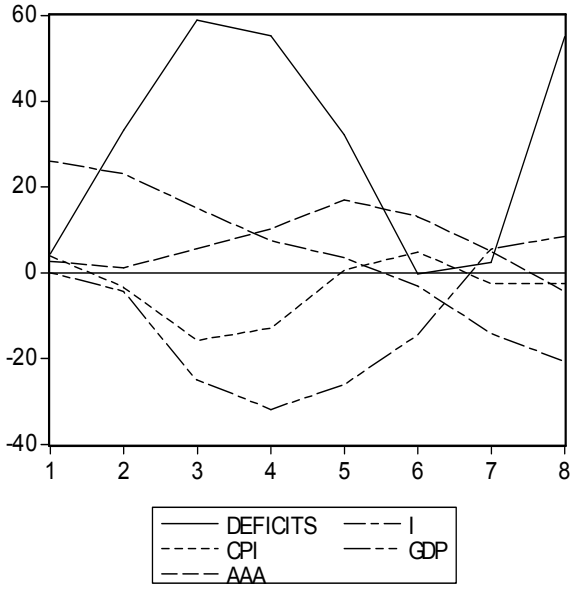
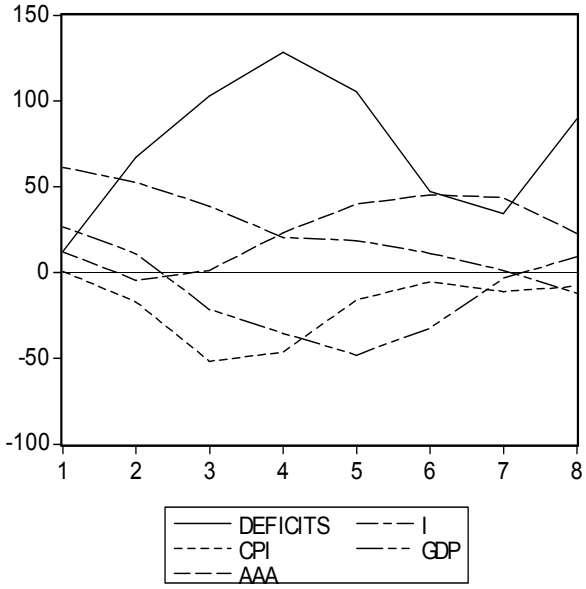
Appendix A: Impulse Response Function (IRF) Graphs

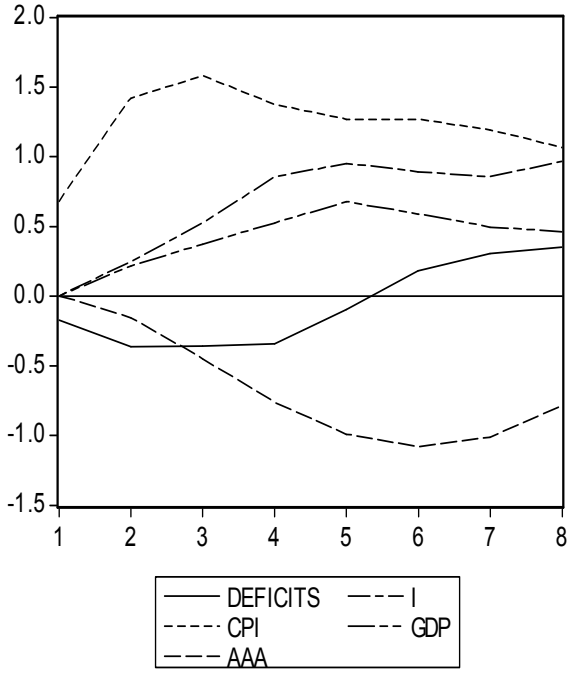
Graph 1: IRF of Investment to a One S.D. Innovations



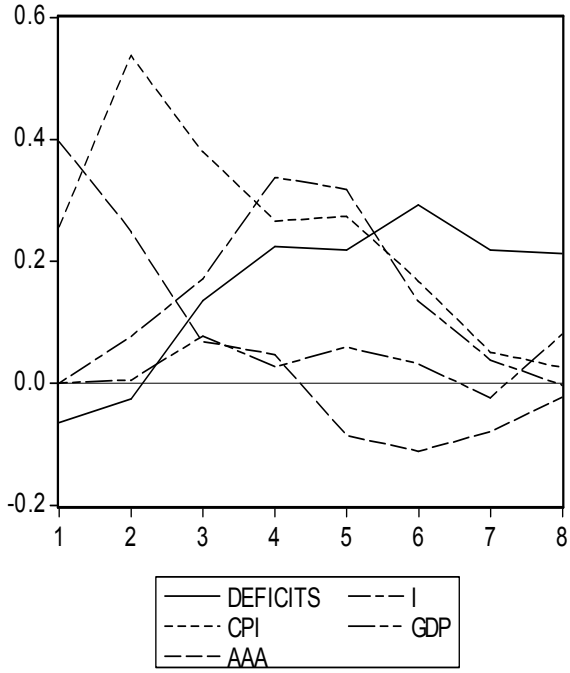
Graph 2: IRF of GDP to a One S. D. Innovations



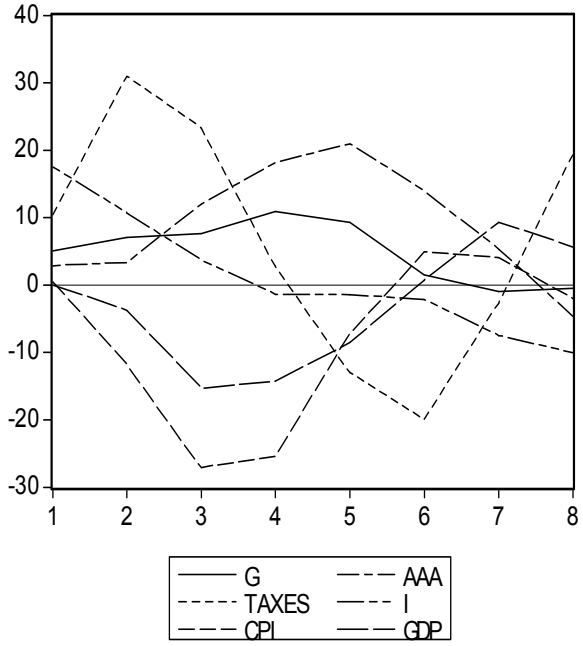
Graph 3: IRF of CPI to a One S.D. Innovations



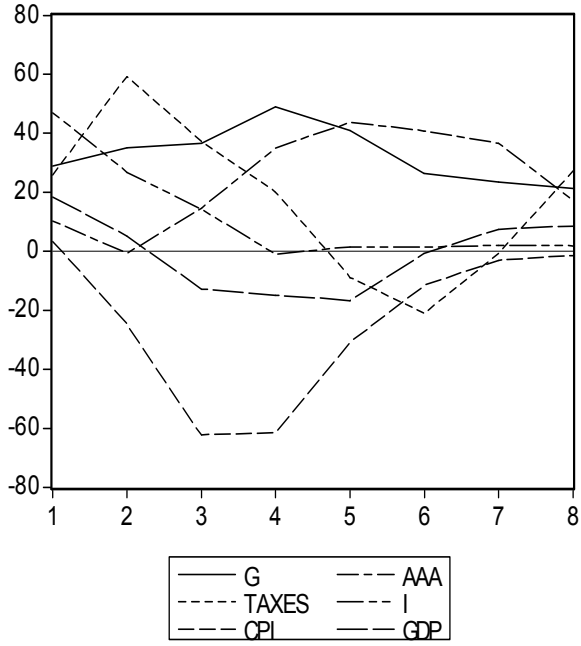
Graph 4: IRF of AAA to a One S.D. Innovations



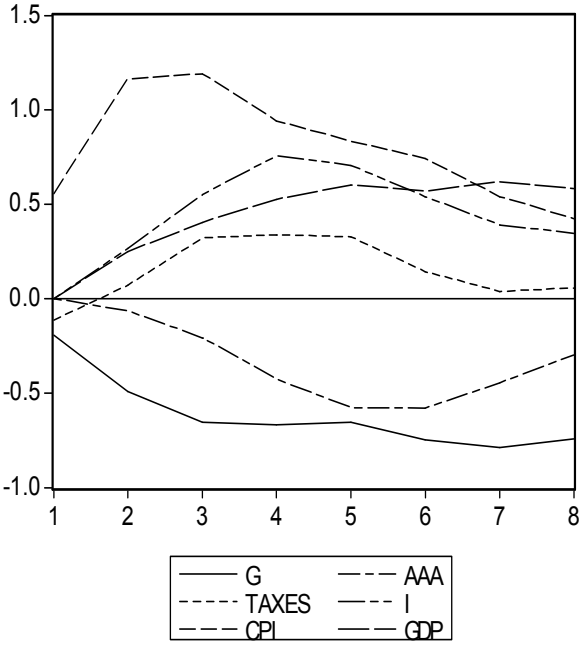
Graph 5: IRF of Investment to a One S.D. Innovations



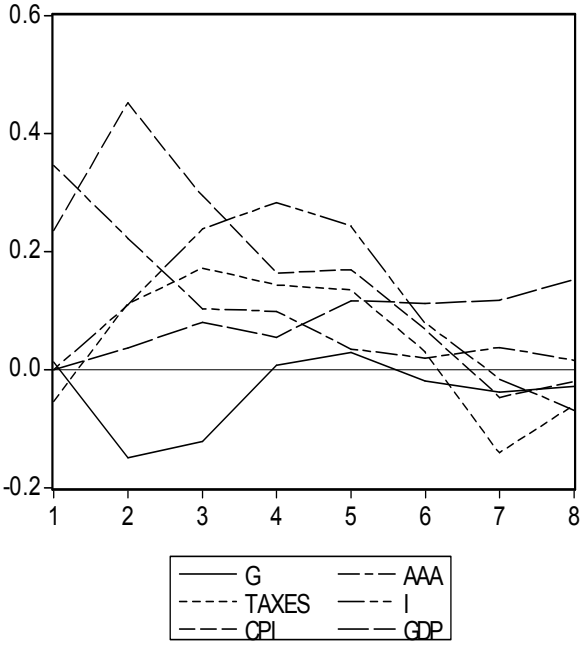
Graph 6: IRF of GDP to a One S.D. Innovations



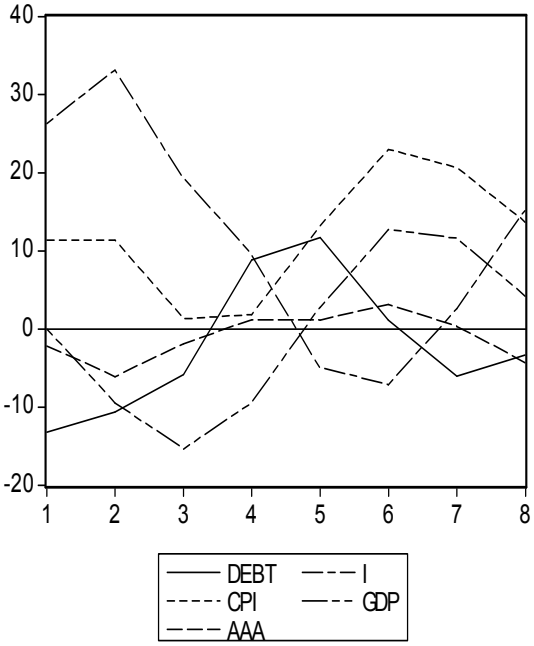
Graph 7: IRF of CPI to a One S.D. Innovations



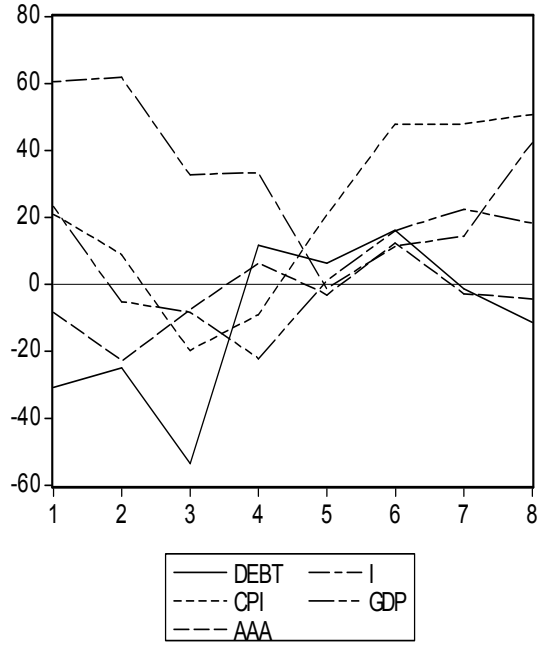
Graph 8: IRF of AAA to a One S.D. Innovations



Graph 9: IRF of Investment to a One S.D. Innovations



Graph 10: IRF of GDP to a One S.D. Innovations



Appendix B – Forcast Error Variance Decomposition Tables

Table 1: FEVD of Investment					
Period	Deficits	CPI	AAA	Investment	GDP
2	47	1	0	51	1
4	67	4	1	13	15
6	63	3	4	11	19
8	66	3	4	12	15

Table 2: FEVD of GDP					
Period	Deficits	CPI	AAA	Investment	GDP
2	37	2	1	52	7
4	65	11	1	17	5
6	65	8	6	13	9
8	66	7	8	11	7

Table 3: FEVD of CPI					
Period	Deficits	CPI	AAA	Investment	GDP
2	6	89	1	2	2
4	4	71	8	11	5
6	3	57	17	16	7
8	3	52	19	19	7

Table 4: FEVD of 30-Year AAA Interest Rates					
Period	Deficits	CPI	AAA	Investment	GDP
2	1	61	37	1	0
4	7	57	22	15	1
6	15	48	17	19	1
8	20	45	17	18	1

Table 5: FEVD of Investment						
Period	Taxes	G	CPI	AAA	I	GDP
2	34	2	8	24	54	1
4	35	4	32	9	10	10
6	36	5	26	7	8	9
8	38	5	23	8	8	9

Table 6: FEVD of GDP						
Period	Taxes	G	CPI	AAA	I	GDP
2	45	16	6	1	29	4
4	26	20	33	6	13	3
6	21	23	28	15	10	3
8	22	23	25	18	9	3

Table 7: FEVD of Investment 1					
Period	Debt	CPI	AAA	I	GDP
2	8	0	2	90	0
4	4	3	1	94	0
6	2	7	1	90	1
8	1	12	1	84	2

Table 8: FEVD of GDP					
Period	Debt	CPI	AAA	Investment	GDP
2	5	1	3	49	43
4	3	4	1	65	28
6	2	11	1	67	19
8	2	17	2	66	13

Table 9: Data								
	Debt	**Deficits**	**Taxes**	**G**	**CPI**	**AAA**	**I**	**GDP**
1947		11796	41560.00	409.5280	22.33167	2.610833	201.3107	1776.141
1948		580	39415.00	439.4315	24.04500	2.816667	221.9570	1854.247
1949		-3119	39443.00	491.8805	23.80917	2.660000	202.8623	1844.708
1950		6102	51616.00	492.4268	24.06250	2.622500	241.9680	2005.951
1951		-1519	66167.00	672.7152	25.97333	2.860000	232.1540	2161.142
1952		-6493	69608.00	809.9760	26.56667	2.955833	227.7167	2243.869
1953		-1154	69701.00	868.0155	26.76833	3.199167	243.6163	2347.240
1954		-2993	65451.00	808.8960	26.86500	2.900833	247.4050	2332.360
1955		3947	74587.00	779.3387	26.79583	3.052500	279.5595	2500.302
1956		3412	79990.00	779.9713	27.19083	3.364167	280.7060	2549.746
1957		-2769	79636.00	814.7465	28.11333	3.885000	277.6818	2601.059
1958		-12849	79249.00	840.9278	28.88083	3.787500	257.7890	2577.628
1959		301	92492.00	869.4590	29.15000	4.381667	293.8233	2762.460
1960		-3335	94388.00	870.9543	29.58500	4.410000	296.3548	2830.932
1961		-7146	99676.00	914.7800	29.90167	4.350000	295.4447	2896.880
1962		-4756	106560.0	971.1073	30.25333	4.325000	322.1352	3072.390
1963		-5915	112613.0	996.1173	30.63333	4.259167	347.1320	3206.708
1964		-1411	116817.0	1018.046	31.03833	4.405833	380.6170	3392.315
1965		-3698	130835.0	1048.667	31.52833	4.493333	419.4620	3610.127
1966	322790.8	-8643	148822.0	1141.065	32.47083	5.130000	443.6307	3845.342
1967	333599.8	-25161	152973.0	1228.650	33.37500	5.506667	435.2953	3942.523
1968	351903.5	3242	186882.0	1267.212	34.79167	6.175000	465.6745	4133.393
1969	360338.0	-2842	192807.0	1264.260	36.68333	7.029167	494.7502	4261.800
1970	377484.2	-23033	187139.0	1233.733	38.84167	8.040000	484.3857	4269.940
1971	406343.0	-23373	207309.0	1206.882	40.48333	7.386667	520.8180	4413.263
1972	434049.5	-14908	230799.0	1198.124	41.80833	7.213333	583.4960	4647.730
1973	461402.5	-6135	263224.0	1193.927	44.42500	7.440833	637.0317	4917.010
1974	480510.0	-53242	279090.0	1223.997	49.31667	8.565833	597.9870	4889.916
1975	543285.8	-73732	298060.0	1251.582	53.82500	8.825833	532.9585	4879.519
1976	627291.5	-53659	355559.0	1257.203	56.93333	8.434167	585.3428	5141.295
1977	690353.8	-59185	399561.0	1270.978	60.61667	8.024167	669.3243	5377.652
1978	761931.5	-40726	463302.0	1308.415	65.24167	8.725000	750.1558	5677.624
1979	818335.0	-73830	517112.0	1332.841	72.58333	9.629167	793.1862	5855.049
1980	894744.0	-78968	599272.0	1358.820	82.38333	11.93833	741.9617	5838.979
1981	990572.2	-127977	617766.0	1371.209	90.93333	14.17083	758.2755	5987.190
1982	1120010.	-207802	600562.0	1395.284	96.53333	13.78750	705.2663	5870.944
1983	1337997.	-185367	666438.0	1446.259	99.58333	12.04167	756.6085	6136.170
1984	1552918.	-212308	734037.0	1494.866	103.9333	12.70917	884.2180	6577.116
1985	1813604.	-221227	769155.0	1598.978	107.6000	11.37333	930.8090	6849.265
1986	2096576.	-149730	854288.0	1696.189	109.6917	9.020833	941.6730	7086.509
1987	2334503.	-155178	909238.0	1737.113	113.6167	9.375833	946.7790	7313.277
1988	2580446.	-152639	991105.0	1758.917	118.2750	9.710000	977.9690	7613.889

1989	2837812.	-221036	1031972.	1806.787	123.9417	9.257500	1007.437	7885.927
1990	3198461.	-269238	1054996.	1864.040	130.6583	9.321667	986.5470	8033.908
1991	3617544.	-290321	1091223.	1884.398	136.1667	8.769167	922.4562	8015.142
1992	4026894.	-255051	1154341.	1893.178	140.3083	8.140000	977.0910	8287.072
1993	4382426.	-203186	1258579.	1878.202	144.4750	7.219167	1061.574	8523.449
1994	4678643.	-163952	1351801.	1878.024	148.2250	7.962500	1160.854	8870.673
1995	4944534.	-107431	1453055.	1888.904	152.3833	7.590000	1235.715	9093.724
1996	5206711.	-21884	1579240.	1907.927	156.8583	7.370000	1346.547	9433.894
1997	5418144.	69270	1721733.	1943.773	160.5250	7.261667	1470.775	9854.333
1998	5557693.	125610	1827459.	1984.990	163.0083	6.531667	1630.377	10283.52
1999	5680689.	236241	2025198.	2056.124	166.5833	7.041667	1782.057	10779.85
2000	5698931.	128236	1991142.	2097.794	172.1917	7.622500	1913.822	11225.98
2001	5812864.	-157758	1853149.	2178.316	177.0417	7.082500	1877.578	11347.16
2002	6191611.	-377585	1782321.	2279.633	179.8667	6.491667	1798.123	11552.97
2003	6728045.	-412727	1880126.	2330.451	184.0000	5.666667	1856.231	11840.70
2004	7345150.	-318346	2153625.	2362.009	188.9083	5.628333	1992.481	12263.81
2005	7929140.	-248181	2406876.	2369.882	195.2667	5.235000	2122.274	12638.38
2006	8494599.	-160701	2568001.	2402.085	201.5500	5.587500	2171.281	12976.25
2007	8988542.	-458555	2523999.	2443.118	207.3354	5.555833	2126.279	13254.06
2008	9913532.	-1412686	2104995.	2518.052	215.2470	5.631667	2018.406	13312.16
2009	11527348			2564.813	214.5490	5.313333	1649.322	12990.26
2010					217.5870	5.305000		

Innovative Analysis: An Empirical Study of College Students Savings Habits with Findings and Proposed Solutions

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Abstract

The following is a discussion of the implications of college students' basic financial knowledge and long-term financial goals on their savings habits. The following paper contains a thorough literature review, identifies theory, and presents propositions, methodology, as well as posit propositions and offers recommendations. The literature review is interdisciplinary in nature.

This study is important as it proposes understudied influencers on savings habits of college students such as long-term financial goals and finance courses. The study builds on Ian Ayres propositions presented in his book *Super Crunchers: Why Thinking-by-Numbers is the New Way to be Smart* (Ayes, 2008).

A simple survey was conducted to gather quantitative data to demonstrate differences in savings habits based on academic level.

Introduction

In *Super Crunchers* by Ian Ayres, he details how, "Orley has used statistics to find out what characteristics of vintage are associated with higher or lower auction prices" (Ayres 2008, p. 2). Similarly, statistical analysis can be used to reveal longitudinal patterns of college students' savings habits as well as the influence of intrinsic and extrinsic factors on savings (Ayers 2008). Understanding what factors influence individuals to be "savers" and identifying when they first start savings as well as patterns of savings throughout college may be an indicator of future savings intentions.

Savings are important as they can provide emergency funds, provide for retirement, put a down payment on a house, provide a vacation or other luxury item, help purchase a vehicle, or provide for needed repairs on vehicles homes, etc., that otherwise would require indebtedness and interest payments (Caldwell 2010). Savings and spending habits of today's college students are particularly relevant as the United States economy faces one of its toughest economic downturns short of the Great Depression. It is particularly important to understand the influences on savings and spending habits of college students who will, in the not so distant future, be the movers and shakers with the discretionary income and who will be making strategic decision as to how to save or spend monies not only personally, but for corporations, small businesses and not-for-profits.

This study examines the saving habits from the college students through secondary research and by surveying the population (i.e., graduate and undergraduate) of a small Liberal Arts university in the southeastern United States in 2009. A simple online survey was conducted as a starting point to identify the saving habits of college students as to academic level. Research has shown that saving for the future is not typically the foremost on the minds of many college

students. However, United States' college students overall spend approximately $5.5 billion dollars annually on alcohol (New York State 2010).

Based on a US Federal News (2010) report, learned financial strategies lead to savings. Therefore, influencers of college student saving habits (i.e., undergraduate college students in particular) are proposed in this study.

Literature Review

The current college student population is deeply entrenched in consumerism that began to blossom in the 1960s (Rodriguez 2006) and in a society where credit has been accessible to them. According to Creditcards.com (2010), as of the end of 2009 United States' issued credit cards in circulation in the US were $576.4 million and debit cards equaled $507 million. At the end of 2008, on average the number of credit cards held by credit cardholders was 3.5 each and of those 80% also own debit cards. The average age for which credit cardholders apply for his or her first credit card is well under the age of 35 (i.e., 20.8 years of age) (Creditcards.com 2010). This is clearly falls in the age range for college students. However, today's and tomorrow's college students are living in a time when an economic recession that is projected to last for some time to come is stifling the buying habits of myriads of consumers in the United States (US). Spending is becoming more and more constrained by the flow of monies, credit card usage for college students is restricted (e.g., President Obama's 2010 Credit Card Reform - credit card issuers are banned from issuing credit cards to anyone under 21, unless they have adult co-signers on the accounts), thus savings may become depleted or non-existent (Creditcards.com 2010). Therefore, a clear understanding of the role of financial knowledge as to savings habits of college students is an important focus of the current study.

Students' spending habits have been previously examined from various perspectives. The relationship between high interest credit card debt and one's ability to save are intertwined. Therefore, studies as to college student credit card usage are relevant to the foundation of this study. For example, Joo, Grable, and Bagwell (2003), examined attitudes and behaviors toward credit card usage of college students. The study was conducted using a survey methodology in courses in the College of Human Science. Findings from this convenience sample of 242 college students revealed that students are not exhibiting knowledge of credit card usage or practices. Although, this study did not examine college students' savings habits, the lack of knowledge and poor financial practices are good indicators that financial responsibility among college students is problematic and might also be an indicator of problems with saving money.

Closely related to savings is frugality. An article in *The Florida Nurse* (2008) by the Bank of America suggests frugality as a means for college students to increase savings. Thus, planning (budgeting) was posited to be an important path to savings (BofA 2008). However, effective budgeting requires an understanding of financial planning and long-term financial objectives.

In October 2009, in the Journal of *University Business*, insights into the economic situations of many families were provided. "It's a given, the current economy and coinciding state cuts are adding financial pressures on higher education institutions and the shoulders of the students attending them" (p. 13). This clearly suggests that external economic factors are increasing pressure on college students' and their families' personal finances and negatively influencing savings.

The following section provides the framework for developing propositions as to relationships between economic constraints, long-term financial planning, finance courses, academic levels, and college student saving. Each proposition is supported by relevant to research.

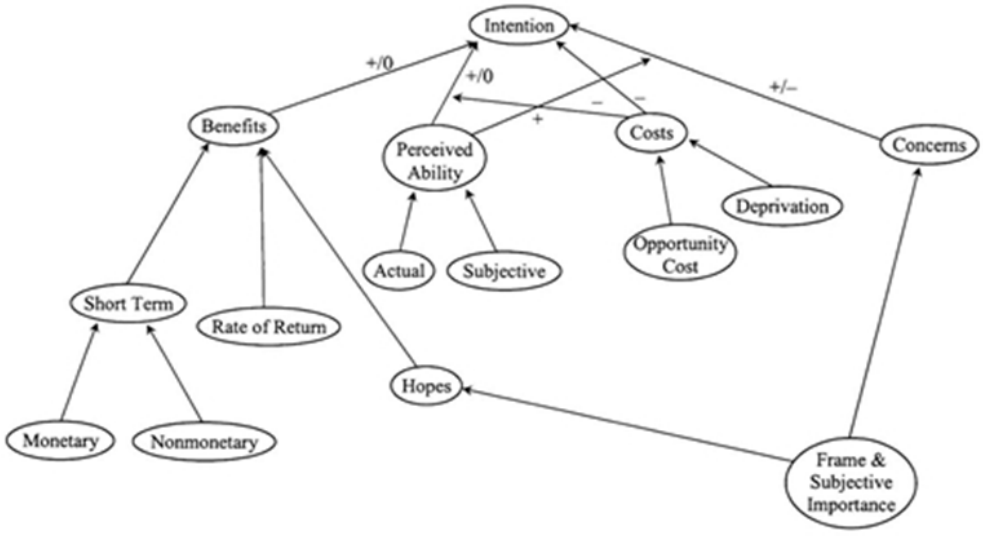
Proposition Development

Theory provides great insight into previous trends and gives an indicator of expected trends that have been tested through time. Two important theories relevant to this study are: 1) *structural approaches* (e.g., Pension Protection Act 2006) that are expected to increase automatically contributions to savings plans, and 2) communication approaches such as finance courses that are expected to change both individuals' knowledge and their perceptions of the benefits of saving monies (Weiner and Doescher 2008).

Proposition #1

Figure 1 below is a path analysis of constructs that Weiner and Doescher (2008) empirically tested as to propensity to save. One construct in this network is "perceived ability." Simply defined is both actual and subjective ability to save. This directly relates to proposition #1.

FIGURE 1
A Policy Framework Depicting the Decision to Save for Retirement



P_1: Reasons for not saving while in college are perceived to be due to economic constraints outside of the control of the students.

Propositions #2, #3, and #4

National agencies have implemented *structural approaches* designed to increase overall savings in the United States through the signing of the "Pension Protection Act of 2006" (Weiner and Doescher 2008). This incentive was created and signed into law in order to give a greater reason for younger citizens to invest early. However, low savings rates in United States (US) still dominate the landscape (Helman, VanDerhei and Copeland 2007). According to the 2007 Retirement Confidence survey, only 66% of US workers report that they and/or their spouse had

saved money for retirement and only 60% report that they are currently saving (Weiner and Doescher 2008). These statistics may be startling to well disciplined, financially frugal, and goal oriented savers; yet, these numbers come from data of US citizens in the 21st century. Therefore, the following propose that intentions to save by college students are constrained in spite of structural approaches and communication approaches indicating a need to identify constrains and implement strategies to entice college student to save.

P_2: Identifying long-term financial goals early in life do not necessarily lead to a greater tendency to save at an earlier age.

P_3: Reasons for not saving while in college are due to a lack of long-term financial planning.

Research into behaviors and intentions has been conducted by Bandura and Cervone (1986) from a social cognitive learning approach in that they tested hypotheses that self-reactive influences (i.e., perceived self-efficacy, self-evaluation, and self-set goals) are contributing factors that motive the attainment of one's standards and attainment goals. From this perspective turning intentions into actions could have many influencers. Further, Bagozzi, Baumgartner, and Youjae (1992) offer reasoned action/planned behavior as to trying and goal directed behavior in that subjective norms (i.e., what one's important others expect of them) and the combination of attitudes and action orientation interact to influence intentions in a preconscious and automatic sense. Thus, student saving intentions may be influenced by their reference groups as well as attitudes formulated from financial knowledge. Tanner, Hunt, and Eppright (1991) examined protection motivation and health belief. Although the current study focuses on saving, the fear derived from the lingering economic recession may play a role as to the strength of the intentions revealed in the current study. The findings of each of these studies demonstrate that the likelihood a person will engage in a particular behavior can be explained as an increasing function of the strength of his or her intention to act as influenced by many possible externalities.

P_4: There is no one specific reason for not saving while in college that is more significant than any other reason.

Proposition #5

Savings is an important focal point that economists and researchers target. Graduate and undergraduate students, other than undergraduate finance majors, would have less exposure to finance courses. US Federal News Service (2010) states that college programs "that prepare students with an understanding of appropriate credit card use, student banking options, knowledge as to how to develop and follow a budget, and the importance of saving" are needed (U.S. Federal News 2010, p. 1).

Therefore, the influence of finance courses is expected to have a more significant impact on graduate students and finance majors than on other undergraduates.

P_5: Taking finance courses at college increase the tendency to save.

Proposition #6

As a group, "college students today are generally underprepared to face the financial challenges of life after college, and it is unlikely that many of them will receive formal financial education before they graduate" (Masuo, Kutara, Wall, and Cheang 2007, p. 21). However, most graduate programs in the college of business require at least one undergraduate finance course and one graduate level finance course. Therefore, the following is proposed.

P_6: Graduate students save more money per academic year than do undergraduate students.

Methodology

Measuring Propositions

Relevant variables that should be studied in order to measure the above propositions include attitude toward savings, intention to save, awareness of savings processes, savings behaviors, reason for not saving, short-term savings goals, long-term financial goals, education level, college major, finance courses taken (i.e., high school/college), age range, parents annual household income, student's average annual income, and approximate saving per academic year. For the purpose of this study, one proposition was examined empirically (Proposition #6).

Sample

A simple survey was conducted in the spring semester of 2009 at a small Liberal Arts university in the southeastern United States across College of Business students. The survey involved a convenience sample using an intercept survey methodology that involved 500 respondents. Currently enrolled college students (i.e., freshmen, sophomores, juniors, seniors and graduate students) answered two questions related to saving habits. This is a self-report survey that may reflect response bias and thus further research should be conducted before attempting to generalize the findings. However, the respondents were aware that the results of the study could in no way identify them. Through this assurance, response bias would be expected to be minimal.

Analysis Proposition #6

As a first step in examining the propositions, Proposition #6 was measured using a ratio scale ($0 to infinity) to indicate annual savings. This was compared to the students' self-reported academic level. This proposition holds that graduate students save more money per academic year than do undergraduate students. A frequency analysis of the percentage of respondents' reporting a saving account demonstrates that overall the difference in those reporting a saving account is much larger of a percentage starting at the junior year through graduate studies. (See Table 1 and Figure 1 below for details.) However, this does not indicate the amount of savings. Therefore, a cross tabulation between academic level and self-report saving per academic year is also examined.

Table 1: Frequency Analysis Savings

Academic Level	Percent of Respondents Reporting Saving Accounts
Freshmen	26%
Sophomores	42%
Juniors	61%
Seniors	75%
Graduate Students	84%

N = 500 (i.e., 100 respondents per level)

The following trend line is a depiction of the above findings.

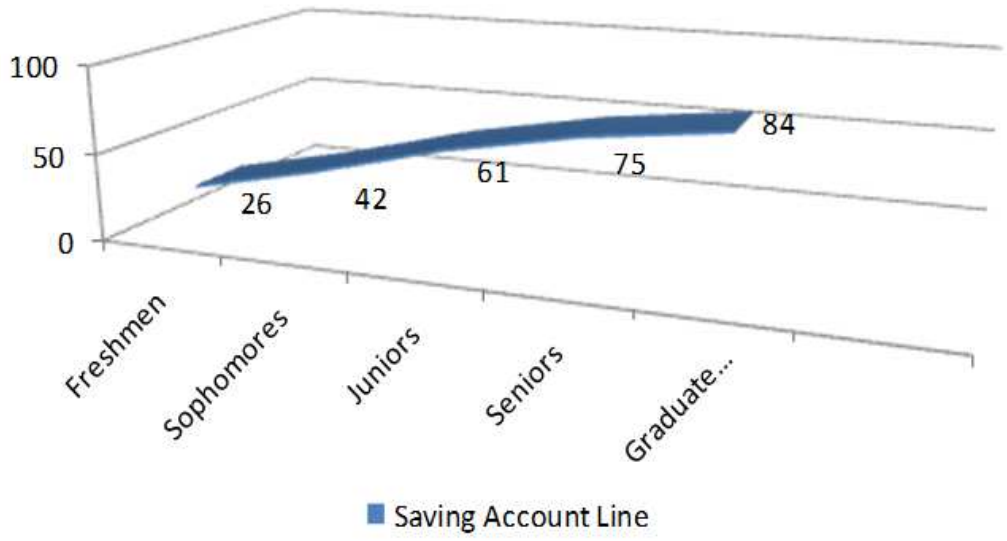


Figure 1: Savings Trend Line

Conclusions and Recommendations

The finding as to the disparity when comparing the percentage of freshmen saving accounts to that of upper classmen warrants attention. It is recommended that initiatives to better educate students about life skills such as budgeting and savings should come early in life and be reinforced early in their college career. Investigating what occurs in K-12 as to knowledge of handling financial matters or in the college students' lives as they grow up should be examined in order to gain knowledge of where in the process learning best occurs as to savings intentions. This would also require examining family savings habits and income levels.

At the present, no one clear place has been identified where college students go to find help in developing saving habits outside of sporadically offered courses in high schools, from family members, or where finance is a required subject (in which savings may or may not be a topic) that are clearly directed toward the needs and wants of college age students. Also, it is the researchers' belief, based on this study, that teaching the appropriate strategies can be very beneficial when saving to reach long-term financial objectives. If it is found that college students have been adequately exposed to savings knowledge, then an investigation into other factors and incentives to save should be examined.

Limitations of the Study

As with any research study, there are limitations. The survey instrument itself limits this study. The instrument did not use proven scales. Reliability of the instrument was not verifiable. Therefore, the findings should be considered exploratory and further research should be conducted. Another limitation of the study comes from lack of generalizability. Because the study come from a convenience sample and involves self-report, the information should be used with caution. It is recommended that the study be conducted on a random sample. Further, the study is limited to a small liberal arts university with students from relative wealthy families in

the southeastern United States and thus may not be representative of other college students at other universities.

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Evaluating Intangible Assets for Making Investment Decisions

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Abstract

This paper is devoted to the intangible asset valuation for investors' purposes. The literature review provides the reasons why the evaluation of intangibles is very important for a particular investor. The estimation part of the paper is presented by regression analyzes that measures the relationship between R&D investments (type of intangible assets) and the company's performance (the net income). The obtained results are applied for the forecasted purposes, and investors can implement these in their analysis.

Introduction

Actuality

"A study of non-financial companies over 20-year period from 1978 to 1998 indicated a significant shift in composition of corporate value (Blair & Wallman, 2001). In 1978, nearly 80% of the market value of a corporation was due to tangible assets and only 20% was due to intangible assets. By 1998, the intangible asset portion of corporate value had increased to 80%, and the tangible asset portion had fallen to 20% (Bair & Wallman, 2001; Sullivan & Sullivan, 2000)".[10]

It is known from accounting and financial practice that considerable part of intangible assets is not recorded in financial statements clearly. Furthermore, other types of intangible assets are either under or overestimated. At the same time, intangible assets in particular industries (pharmaceutical, IT and etc.) are very important elements of assets (high percentage in the assets' structure); therefore, it is essential to record and evaluate the intangible assets in accordance with fair value principle, and it is apparent that for this basic purpose different estimation methods should be developed and tested. Finally, since the "fair" value of intangibles influences on companies' performance, nowadays the investors are more careful to intangible's assessment in making their investing decisions.

Purpose

Purpose of this term paper is to determine basic methods for intangible assets valuation and develop the particular assessment of intangible assets.

This purpose determines the following structure of the research:

1. Determine the common reasons to value intangible assets, the main attention will be paid to the investor's interest.
2. Indicating in a glance the developed classifications in intangible assets for the investor's evaluation purposes.
3. Exploring the existing methods of intangible asset evaluation and developing the detailed model for the intangible asset valuation.

The agenda of this study is the following: introduction, literature review, stated hypothesis, data and methodology, obtained results and conclusion.

[10] Randal R. Thom and Toni Buchsbaum (2008).

Literature review

In accordance with Clifton's (2008) study, nowadays the intangible element of market capitalization for the companies listed in S&P 500 increased up to 80% compared with the past data (20 years ago this indicator reached only 30% level). Moreover, a recent research by Harvard and South Carolina Universities which compared the financial performance of the 100 world wide brands and the Morgan Stanly Capital Index found the results to be significantly different: brands' performance was better. Therefore, it is obvious, that this sphere – evaluation of intangible assets - should obtain higher attention in the business society.

This research aims to identify the particular sphere in the intangible assets valuation – the investor's sight and approach. Moreover, the agenda for the literature review is the following: determine the exact investors' interests in the intangible assets valuation, define the classification of intangibles for the investors' purposes, investigate the particular evaluation methods of intangibles and some other scientific issues.

It is essential to begin with identifying reasons - why it is important for investors to evaluate the intangible assets. Several examined studies - Lin and Tang (2009), Clifton (2009) and Reilly (2009) - determine a wide range of reasons for the intangible assets valuation. Analyzing these reasons and its evidence it is possible to identify the most appropriate of them and combine them in the manner that facilitates investors' goals:

1) *The fair value of intangible assets will extend the company's equity.* From our point of view, it is one of the main reasons why investors seek to evaluate the intangible assets in a fair value. It is obvious, that the current financial accounting systems are appropriate to the industrial economy but are inadequate in the information economy. In the information stage, intangible assets are far more important compared to the tangible assets that the traditional accounting systems were designed to measure. Therefore, the company's equity in reality does not reflect the fair value of all assets, which damages the investors' interest.

2) *The fair value of intangible assets will contribute to transaction pricing and structuring.* If the investors are interested in investing in a particular intangible assets or a bundle of two or more intangible assets it is vital for them to determine the fair price of these assets. Moreover, the equity allocation in new business enterprise or the asset allocations in the liquidation process among different investors are the important reasons for the intangible asset evaluation.

3) *The intangible assets valuation for the merger and acquisition purposes*. It is essential for the investors to assess the company's assets accurately, so not to lose the potential value of the company. Since nowadays the intangible assets become more valuable its value should be counted and put as a basic feature in the merger and acquisition process.

4) *The fair intangible asset valuation is a fundamental key in providing investment advisory*. Nowadays scientific studies have proved that the stocks of companies with a significant part in effective intangible assets tend to perform better on the stock market. Therefore, the proper intangible asset valuation is a one of the basic keys for compiling the stocks portfolio with the strongest financial performance. The intangible assets valuation provides a tool which can be applied by any particular investor for the companies' valuation.

5) *The investors' interests in the companies' management*. It is evident that the investors of the company are interested in managerial approach for the company. Therefore, from this standpoint it is vital to underline the following reasons for the intangible assets valuation:

- Determine the performance metrics for the management purposes;

- Defining the royalty rates when establishing the licensing program;
- Obtaining evidence of debt financing for future capital projects;
- Supporting risk management and etc.

On one hand, the mentioned managerial applications are not direct intentions for investors to establish the intangible assets valuation. On the other hand, these managerial guidelines can influence the company's performance directly and also investors' interests.

The second step in the literature review investigation is determining the types of intangible assets that should be assessed by investors for the above stated reasons.

It is vital to begin with existing common accounting approach. For instance, in accordance with Statement of Financial Accounting Standards (SFAS) No. 141R (FASB 2007) it is possible to underline the following classification of intangible assets:

- marketing-related (e.g., trademarks, internet domain names);
- customer-related (e.g., customer lists, customer contracts and related customer relationships);
- artistic-related (e.g., plays, operas, ballets; books, magazines, newspapers);
- contract-related (e.g., licensing, royalty, standstill agreements);
- technology-based (e.g., patented technology; computer software and mask works; databases).

However, it is possible to mention unofficial approach to the intangible assets classification. In accordance with the Lin and Tang (2009) research the various types of the intangible assets can be divided in the following manner: Innovation and Technology, Management Capability, Employee Capability, Customer relationship and Alliance, Goodwill. This is the 1st level of appraising dimensions; however, the 2nd level of the appraising criteria is developed too, which is more detailed and more applicable for the valuation methods (see appendix A).

Moreover, other classification is presented by Reilly (2009) research. This author identifies the intangible real property assets (contracts, permissions and etc.) and intangible personal property assets (financial assets, general intangible assets and intellectual property).

The main advantage of these classifications is providing the investor with a range of existing types of intangible assets for particular valuation. The investor obtains possibility to choose the most essential assets for his or her valuation and be accurate in this valuation. Moreover, the variety of the above mentioned intangible assets indicate the future potential and value growth of these types of assets for the investors' goal.

The third step in the literature review is determining the basic valuation methods for the intangible assets.

Obviously, very often it is impossible to estimate the money value of the intangible assets, since many of them are social phenomena and there are no accurate valuation methods for them. Therefore, in Lin and Tang (2009) study the Analytic Hierarchy Process (AHP) for the intangible assets appraisal is constructed. The AHP method can mainly sort the non-financial value drivers in order, according to their weighed contribution. This contribution is assessed by the managers of their particular companies by assigning the level of preference to each intangible asset. The authors developed a tentative model for the evaluation of intangible assets, which helps business to correctly appraise corporate value ratios and avoid bias due to mainly relying on financial statement when measuring the entity value (applicable to investor's point of view).

Furthermore, the several accurate valuation methods of the particular intangible assets are discovered.

Chan (2001) examined whether stock prices fully value firms' intangible assets, specifically research and development (R&D). The basic method in this study is sorting portfolio in accordance with R&D intensity level to sales. The results of this study revealed

that the companies with high R&D to equity market value earn large excess returns. A similar relation exists between advertising and stock returns. R&D intensity is positively associated with return volatility.

Dubin (2007) in his study developed an econometric method for valuing intangible assets using nested logit market share assumptions. This method is developed to measure the value to a license holder of owning a branded consumer product. In this study the demand for branded goods is assessed and compared with the same unbranded products.

Johnson W.H.A. (1999) develops an integrative taxonomy of intellectual capital that contributes the entire valuation of intangible assets.

Johnson L.D. (2002) reviews the various attempts by practitioners and academics to evaluate the human capital and investment in innovation.

In the other study by Reilly (2009) three basic methods are offered for the intangible asset valuation:

1) Market approach valuation methods – value intangible assets by reference to transactions that occur recently in similar markets, or benchmarks of comparable assets;
2) Cost approach valuation methods – value intangible assets by assessing the development or replacement cost of the asset.
3) Income approach valuation methods – value intangible asset on the basis of the future economic benefits obtained from the owned asset.

One of the most extensive studies about the intangible assets valuation is Sveiby K.E. (2002) research. This study mentions a wide range of valuation methods, but finally, it is possible to divide all of them into four groups:

1. Direct Intellectual Capital methods (DIC). The main approach of this method is evaluating the particular components of the intangible assets and then summarizing the obtained results.
2. Market Capitalization Methods (MCM). The basic technique is defining the difference between the market capitalization of the company and its book value.
3. Return on Assets methods (ROA). These methods are connected with ROA determination for the similar forms.
4. Scorecard Methods (SC). Each component of the intangible assets has its score and the composite index should be combined.

Therefore, it is possible to conclude that nowadays there is a wide range of researches that investigate the issues of intangible assets valuation. The investors do have possibility to utilize these results in their own estimations and decision making.

Hypotheses

It is evidential fact that a company's performance determines investors' behaviors. Moreover, in recent years the technology sector developed rapidly, and it's companies' performance has improved greatly. One reason for this trend is increasing investments in the intangible assets such as R&D. Therefore, it is possible to assume that the intangible assets such as Research & Development influence the company's performance and have an indirect influence on the investors' decisions.

In this research we intend to extend the recent study by Lin and Tang (2009) by investigating 7 industries:

1) Application Software;
2) Diversified Computer Systems and Personal Computers;
3) Internet Information Providers;
4) Semiconductors (Integrated Circuits and Broad Line);
5) Networking and Communication Devices;

6) Computer Peripherals;

7) Biotechnology.

These industries are chosen since plenty of market researches and academic papers indicate that R&D plays a significant role in the above mentioned industries. Therefore, this study proposes and tests two hypotheses:

Hypothesis 1: the investing level in the Research & Development assets in particular year (2008) has a positive influence on the Net Income of the company in the same year (2008) (influence on the company's performance).

Hypothesis 2: the investing level in the Research & Development assets in previous year (2007) has a higher positive influence on the company's Net Income in the next year (2008). This hypothesis implies that the R&D investments will cause higher Net Income only a year later since this R&D should be completed and implemented into the market.

Nevertheless, it is essential to underline three main limitations for this study:

1) The R&D is only one type of intangible assets, and nowadays for the investor's purpose it is important to evaluate the influence of other intangible assets for the company's performance. However, the lack of financial and internal data does not give us opportunity to investigate other types of intangible assets and its relations with the company's performance and investor's decisions. At the same time, this issue is for our future scientific investigations.

2) We have limited our research only with several technological industries and biotechnology industries. The reason for this limitation is to be consistent with initial study conducted by Lin and Tang (2009) – we aim to develop the quantitative evaluation of intangible assets in these particular industries. Moreover, we suppose that the above mentioned industries should indicate interesting relation between intangible assets and the companies' performance.

3) As it is already mentioned for this study we have selected the recent two years - 2007 and 2008. On one hand, it gives us opportunity to obtain regression that possibly will describe the future relation more accurately. One the other hand, the 2008 year is a year of recession and this fact can influence on the final results.

Data and Methodology

Data for this study has been obtained from Yahoo Finance Historical Databases (finance.yahoo.com) and from official companies' sites.

For each of the mentioned industries the top 10 companies have been chosen in accordance with its market capitalization. Further, for each company we indicate the R&D investments in 2007 and 2008 years and Net Income in 2008 year. Finally, the regression has been developed for each industry in the following manner:

$$Y_j = k*X_j + b,$$

Where: Y – Net Income of the company (j) in the particular industry in 2008 year;

X – R&D investments of the company (j) in the particular industry in 2007 or 2008 year (depending on hypotheses).

k and b – parameters of the regression.

Moreover, the obtained regression gives us opportunity to make a forecast for the next 1-5 years for each industry (in the sight of net income – R&D relations).

Results

Regression analysis conducted the following results:

Table 1. Regression analysis for the explored industries (hypothesis 1).

Industry	Net Income (2008) vs. R&D (2008)				
	Coefficient	Intercept	R2 adj	F	F sign
Application Software	2.16	-498079	98.06%	456.23	0.0000
Personal Computer and Diversified Computer Systems	2.02	413577	93.49%	130.18	0.0000
Internet Information Providers	1.35	-52545	87.23%	62.51	0.0000
Networking and Communication Devices	1.58	-151048	99.41%	1358.12	0.0000

Table 2. Regression analysis for the explored industries (hypothesis 2).

Industry	Net Income (2008) vs. R&D (2007)				
	Coefficient	Intersection	R2 adj	F	F sign
Application Software	2.50	-579541	97.32%	327.24	0.0000
Personal Computer and Diversified Computer Systems	2.03	522950	91.52%	98.16	0.0000
Internet Information Providers	1.70	-65018	82.07%	42.18	0.0002
Networking and Communication Devices	1.81	-147461	99.45%	1450.87	0.0000

The presented data reveals the positive regression results for the following industries: Application Software, Personal Computer and Diversified Computer Systems, Internet Information Providers and Networking and Communication Devices. The regression equations for these industries have significant R2 (87,23 % - 99,45%), and F parameter. Furthermore, since these regressions are reliable it is possible to analyze the relation between variables. In accordance with Hypothesis#1 and Hypothesis#2 all coefficients have a positive sign which means that if the company increases the R&D investments its Net Income will grow up to 2.16 times (Application Software), 2.02 (Personal Computers and Diversified Computer systems), 1.35 (Internet Information Providers) and 1.58 (Networking) and Communication Devices). Moreover, it is possible to conclude that Application Software and Personal Computer (and Diversified Computer Systems) industries are more sensitive to changes in R&D investments than the other two industries. Therefore, for investing decisions this information is valuable, since it is possible to assess the changes in the company's (industries') performance relating to changes in R&D (part of intangible assets). Further, concerning to Hypothesis #2 our assumption obtained some evidence since the coefficients for this case are higher (2.50, 2.03, 1.70 and 1.81 respectively). Thus, the investor has a possibility to predict that today's investments in the intangible assets have a higher influence on future (after a year or more) company's performance than on today's performance. This trend is predictable since the R&D should be completed and implemented into the market (it takes usually more than one year). Moreover, concerning to the "b" parameter for Application Software, Internet information Providers and Networking and Communication Devices industries it is negative that means that if the company cancels R&D investments its performance (Net Income) will be harmed greatly. On the other hand, for the Personal Computer and Diversified Computer Systems industry the reducing R&D investments level is not so destructive, since the "b" parameter is positive. Thus, this revealed feature is valuable for investing decisions.

Finally, the particular investor has the possibility to use these equations to evaluate how the changes in R&D investments (investments into the intangible assets) influence the

changes in the company's performance (net income); basing on this information he or she can make investing decisions.

Concerning to the rest of the selected industries: Semiconductor (Integrated and Broad line), Computer peripherals and Biotechnology the final regression analysis indicate insignificant results (the F parameter and its significance are unreliable); moreover, the R^2 is too low. Thus, the Hypothesis #1 does not obtain any empirical evidence for these industries. Only Hypothesis #2 acquires some positive results for the Biotechnology industry: the regression equation is significant; the R^2 reflects that changes in the industry' performance in 2008 year for 70% is described by changes in R&D investments in this sphere; the positive coefficient's sign indicates that growth in R&D investments causes 1.37 growth in the company's performance (the company's Net Income). Finally, if the company in biotechnology industry cancels its R&D completely, the Net Income of this company will be harmed greatly (the sign of interception "b" is negative).

Relating to the industries with negative regression results we conducted the regression for the 2007 year (in accordance with mentioned above limitation #3). As a result, for the Semiconductor (Broad line) and Biotechnology industries some positive regression results are obtained:

Table 3. Insufficient regression results for the rest of the industries.

Industry	Net Income (2008) vs. R&D (2008)						Net Income (2008) vs. R&D (2007)			
	Coefficient	Intercept	R2 adj	F	F sign	Coefficient	Intersection	R2 adj	F	F sign
Semiconductor_Integrated	0,75	157287	12,33%	2,27	0,1706	1,25	-73026	30,09%	4,87	0,0583
	Net Income (2007) vs. R&D (2007)									
	Coefficient	Intercept	R2 adj	F	F sign					
	1,23	7583	34,05%	5,65	0,0448					

Industry	Net Income (2008) vs. R&D (2008)						Net Income (2008) vs. R&D (2007)			
	Coefficient	Intercept	R2 adj	F	F sign	Coefficient	Intersection	R2 adj	F	F sign
Semiconductor_broad line	0,81	-710594	34,96%	5,84	0,0421	0,84	-726343	39,23%	6,81	0,0311
	Net Income (2007) vs. R&D (2007)									
	Coefficient	Intercept	R2 adj	F	F sign					
	1,24	**-297986**	**82,65%**	**43,88**	**0,0002**					

Industry	Net Income (2008) vs. R&D (2008)						Net Income (2008) vs. R&D (2007)			
	Coefficient	Intercept	R2 adj	F	F sign	Coefficient	Intersection	R2 adj	F	F sign
Computer_peripheries	0,70	15603	22,69%	3,64	0,0928	0,78	10242	30,90%	5,02	0,0553

Industry	Net Income (2008) vs. R&D (2008)						Net Income (2008) vs. R&D (2007)			
	Coefficient	Intercept	R2 adj	F	F sign	Coefficient	Intersection	R2 adj	F	F sign
Biotechnology	1,27	-405084	51,58%	10,59	0,0116	**1,37**	**-314432**	**69,70%**	**21,70**	**0,0016**
	Net Income (2007) vs. R&D (2007)									
	Coefficient	Intercept	R2 adj	F	F sign					
	1,01	**-91041**	**82,67%**	**43,92**	**0,0002**					

1) For the Semiconductor Broad line Industry: the regression equation is significant; the R^2 indicates that changes in the industry' performance in 2007 year for 44% is described by changes in R&D investments in 2007 year; the growth in R&D investments causes 1.24 growth in the company's performance (the company's Net Income). In conclusion, the R&D is really vital for this sphere since the "b" indicator is negative (the absence of R&D investments has negative influence on Net Income).

2) For biotechnology the regression analysis for 2007 year indicates that regression is more reliable (F significance), the R^2 is 82%. The coefficient indicates that increase in R&D investments is a reason for the Net Income growth at 1.01 times. Moreover, the Net Income is really sensitive to absence of such kind of intangible assets as R&D.

To summarize all above mentioned it is possible to state that for 4 industries - Application Software, Personal Computer and Diversified Computer Systems, Internet Information Providers and Net Working and Communication Devices – this study indicates the positive results: reliable linear regression, high coefficient of determination (R^2), positive coefficient signs (the growth in R&D investment causes the growth in the company's performance) and negative intercept (the company's performance is sensitive to absence of R&D). Finally, for investors this study can be valuable since it reveals the relation between the company's performance in the particular technology industries and the level of R&D investments (and how this relation is sensitive compared to other industries). However, for the rest three industries other results are obtained:

- For Semiconductor (Broad Line) only regression for year 2007 is reliable and can be utilized by investors;
- For biotechnology industry the regression for the year 2007 and for year 2008 vs. 2007 are significant;
- For Semiconductor (Integrated Systems) and Computer Peripheral industries the equations are not liable for year 2008 either for the year 2008, so these results are not appropriate for investors.

The next step for this research is to make 5 year financial forecast (net income forecasts) for leaders in each industry basing on its' average R&D investments growth (in 2008 year) and the obtained results (regression equations) in this study. The estimated results are given in the table below (table 4), and these results can be valuable for investors' decisions since they indicate the Net Income growth (the company's performance) in relation with the level of R&D investments. Moreover, for the particular forecast (for the exact year) it is better to obtain the accurate level of R&D investments, so investor can adjust this assessment every year.

Table 4. Forecasts for the industries' leaders based on the obtained regression results.

Industry	Industry's Leader	R&D, 2008 year (thous.$)	Growth rate in R&D in 2008	Forecast, R&D, thousands, $				
				2009	**2010**	**2011**	**2012**	**2013**
Application Software	[MSFT]	$8 164 000	14,65%	$9 359 766	$10 730 674	$12 302 377	$14 104 284	$16 170 113
Personal Computer and Diversified Computer Systems	[AAPL]	$1 109 000	41,82%	$1 572 738	$2 230 392	$3 163 049	$4 485 705	$6 361 441
Internet Information Providers	[GOOG]	$2 793 192	31,76%	$3 680 178	$4 848 828	$6 388 587	$8 417 300	$11 090 236
Net Working and Communication Devices	Inc. [CSCO]	$5 153 000	14,54%	$5 902 069	$6 760 027	$7 742 703	$8 868 226	$10 157 361
Semiconductor Broad Line	[INTC]	$5 722 000	-0,57%	$5 689 189	$5 656 567	$5 624 131	$5 591 881	$5 559 817
Biotechnology	[AMGN]	$3 030 000	-7,23%	$2 811 053	$2 607 928	$2 419 480	$2 244 649	$2 082 451

Industry's Leader	Regression equation		Forecast, Net Income, thousands, $				
	Coefficient	**Intercept**	**2009**	**2010**	**2011**	**2012**	**2013**
Microsoft Corporation [MSFT]	2,16	-498079	$19 764 754	$22 732 615	$26 135 172	$30 036 097	$34 508 382
Apple Inc. [AAPL]	2,02	413577	$3 588 233	$4 915 743	$6 798 363	$9 468 216	$13 254 491
Google Inc. [GOOG]	1,35	-52545	$4 921 417	$6 500 913	$8 581 981	$11 323 898	$14 936 519
Cisco Systems, Inc. [CSCO]	1,58	-151048	$9 171 369	$10 526 528	$12 078 680	$13 856 462	$15 892 673
Intel Corporation [INTC]	1,24	-297986	$6 779 814	$6 739 229	$6 698 876	$6 658 755	$6 618 864
Amgen Inc. [AMGN]	1,01	-91041	$2 760 822	$2 554 748	$2 363 564	$2 186 195	$2 021 643

Conclusion

This paper is devoted to the intangible asset valuation for t investors' purposes.

First of all, the essential reasons were stated from the investors' standpoint:

a) The fair value of intangible assets will extend the company's equity.

b) The fair value of intangible assets will contribute to the transaction pricing and structuring.

c) The intangible assets valuation matches the merger and acquisition purposes.

d) The fair intangible asset valuation is a fundamental key in providing investment advisory.

e) The investors' interests in the companies' management.

Then the different classifications of intangible assets were presented. Moreover, this variety of classifications gives to the investor an opportunity to choose which of these assets are more valuable for any particular situation. Finally, the basic valuation methods of the intangible assets were mentioned.

Concerning the estimation part we decided to extend the Lin and Tang (2009) research by developing and assessing the model of intangible assets for the technology and the biotechnology sectors.

The main methodology of this study was regression analyzes that measures the relationship between R&D investments (type of intangible assets) and the company's performance (the net income). The obtained results were applied for the forecasted purposes, and investors can implement these in their analysis.

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Appendix A

The AHP model for the intangible asset valuation

	The 1st Level:Appraising Dimentions	**The 2nd Level:Appraising Criteria**
The Evaluation of Intangible Assets	Innovation and Technology	Key Technology
		R&D Capability
		Manufacturing Process
		Service Process
		Patenting
	Management Capability	Asset Management Capability
		Internal Control Capability
		Operation Quality Capability
		Technology Update Capability
	Employee Capability	Employee's R&D
		Employee's Innovation
		Employee's Knowledge
		Employee's Training
	Customer Relationship and Alliance	Contract with Customers
		Contract with Suppliers
		Distribution Right
		Cooperation Contract Agreement with Shareholders
	Goodwill	Company's Reputation
		Customer's Loyalty
		Business Culture
		Trademark

Market Evaluation of IT Sector: Net Income - R&D Relation (the Apple, Inc. and the Dell, Inc. examples)

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Abstract

Investments in R&D create intangible capital assets, which are expected to have a positive influence on firms' efficiency and performance. The purpose of this paper is to investigate the relation between the R&D investments and the company's performance (net income) and prove that this approach is valuable for particular investors. For this research we have chosen technology sector – Personal Computers – Apple, Inc. and Dell, Inc. – to be an appropriate choice as in the recent years the R&D investments increased rapidly for these two companies and proved a significance influence on the companies' performance.

Introduction

Actuality. Nowadays the business society is concerned about creation of a superior value for the company. Moreover, this superior value can be created not only through manufacturing process or service, it requires advanced implementation of the NPD (New Product Development) process. In the recent years NPD contributes the companies to create a superior value for the product or service, and the base of this NPD process is R&D investments. In this paper we aim to investigate the influence of the R&D development investment on the companies' performance and to prove importance of this approach for the investors' purposes. For the research we have chosen only the technology sector industry for personal computers, since the recent years in these industries the R&D level increased rapidly and has a significance influence on the companies' performance. However, to narrow our investigation we decided to focus our research more closely on Apple, Inc. and Dell, Inc.

Purpose. The purpose of this paper is to investigate the degree of relation between the R&D investments and the company's performance (net income) and to prove that this approach is valuable for particular investors.

Literature review. The basic studies that discover the importance of R&D investments and its influence on the companies' performance are investigated. This sphere is developing and the new research has evolved. The following authors are mentioned in this study: Desyllas and Hughes (2008) Sundaram, A. John and John (1999) Chia-Hui Lu (2004), Sadao Nagaoka Madsen (2005), Greenhalgh, C. and Rogers (2006), Tsang, E., P. Yip and M.H. Toh, (2007) and others.

Hypothesis. As we notice above, it is important for the investors to have the possibility to estimate the Research & Development influence on the company's performance, because it has direct effect on the stockholders' wealth. So, to make a clear and detailed conclusion about the influence of the Research & Development Investments on the company's performance, we will analyze relation between the amount of the Research & Development and the amount of Net Income for a particular company. Moreover, to extend the framework of our research, in this paper we will state three hypotheses. The first hypothesis tells that the investing in the Research

& Development brings a positive influence on the Net Income of the company in the future. The second - the investments in the Research & Development of this year may have positive or negative influence on the company's Net Income in this year. Finally, third hypothesis maintains that the companies in one industry have different correlation between the investments in the Research & Development and Net Income changes.

Methodology. To prove the above mentioned hypotheses, the following methodology is presented. This methodology may help to determine degree of dependence between the companies' Net Income and the Research & Development Investments. Firstly, we will choose test industry – Personal Computers – and companies – the Apple, Inc. and the Dell, Inc. Secondly, we will find the official data about Research & Development investments and Net Income of these companies from the official companies' web-sites[11]. Then, we will do the regression analysis to estimate dependence between the Research & Development investments and company's Net Income. Finally, based on the results of the regression analysis and the Research & Development Investments tendency, we will forecast growth of the chosen companies' Net Income for the next 5 years (from 2010 to 2015 years) in three scenarios: bad (5 % of growth), base (10 % of growth) and good (20% of growth).

Literature review

It is clearly evident that nowadays business society is interested in the creation of a superior value for a given company. Moreover, this superior value can be created not only through manufacturing process or service; it requires advanced implementation of the NPD (New Product Development) process. In recent years NPD contributes the company to create a superior value of the product or service, and the base of this NPD process is R&D investments. Therefore, in this literature review we would like to investigate the existing scientific studies that discover the degree of influence of R&D to the company value creation (the company performance).

Desyllas and Hughes (2008) assess the innovation company's performance in accordance with the level of the R&D-intensity (R&D expenditure over assets), patent-intensity (patents per US $ million of assets). Moreover, the research results are presented from the point of merger and acquisition standpoint, i.e. are the targets really successful in their innovation and financial performance due to the R&D. The obtained results underline that the targets are really advanced in the R&D sphere in the recent years. Finally, the same authors (Desyllas and Hughes (2008)) investigate the influence of the technological knowledge (this knowledge is a part of the NPD process) on the company performance and acquisition decisions. The following results were obtained: (1) A firm's commitment to internal R&D is negatively affected by the decision to acquire; (2) Low R&D productivity increases the likelihood of acquisition; (3) A large knowledge stock predisposes firms to acquire because they perceive they are capable of selecting and absorbing targets.

Furthermore, Sundaram, A. John and John (1999) indicate a firm's competitive strategy through a new framework. Using this framework, they study announcement effects of R&D spending. The announcing firm's stock prices are positively influenced by a change in spending, and negatively by competitive strategy measure (CSM). This is obvious, since on one hand, the investors expects that investments in R&D will have a positive influence on the company's

[11] Dell, Inc: http://content.dell.com/us/en/corp/about-dell-investor-info.aspx?c=us&l=en&s=corp
Apple, Inc: http://www.apple.com/investor/

performance (the stock prices go up), on the other hand, the competitors stock prices go down since these company do not make investments in this field.

Chia-Hui Lu (2004) introduces industrial diversification in R&D productivity into the quality-ladder model of the North–South trade to study how firms' choices made between R&D and foreign direct investment (FDI) vary across industries, and how such choices consequently determine the evolution of comparative advantage and trade.

Hsu and Schwartz (2008) develop a real options model of R&D valuation that takes into account the uncertainty in the quality (or efficiency) of the research output, the time and cost to completion, and the market demand for the R&D output. This model is really helpful for identifying the R&D and to evaluate them.

Sadao Nagaoka, professor of the Japanese Institute of Innovation Research in the article "R&D and market value of Japanese firms in the 1990s" (1996) finds the influence of the Research & Development Investments on the companies' market value. And approve this supposition with the example of the Japanese companies' market value declining after significant reduction of the Research & Development Investments in the 1990s.

The importance of the Research & Development Investments' observation presented in the article of Madsen, J.B. "Are there diminishing returns to R&D?" (2005). Author gives a hypothesis that the returns on the companies' Research & Development Investment are constantly diminishing. And CEO should be very carefully with this indicator.

Greenhalgh, C. and Rogers, M. in the paper "The value of innovation: The interaction of competition, R&D and IP" (2006) research the most competitive sectors and estimate that the firms with larger market shares and amount of the market capitalization (an inverse indicator of competitive pressure) also have higher R&D valuations. This evidence approves the importance of the Research & Development Investments on the company's performance.

In the paper "Efficiency, R&D and ownership – some empirical evidence" (2001), Dilling-Hansen, M., E. S. Madsen and V. Smith maintain that the Investments in Research & Development create an immaterial capital asset, which is expected to have a positive influence on firms' efficiency and consequently on their profit. Using a sample of 2370 Danish firms, their analysis suggests that Research & Development - active firms are significantly more efficient than other firms. Moreover, this article presented the evidence that the short-term effects of current investments in R&D are difficult to prove.

The study of the Tsang, E., P. Yip and M.H. Toh, presented in the article "The impact of R&D on value added for domestic and foreign firms in a newly industrialized economy" (2007) compare the impact of R&D on value added between domestic and foreign firms in Singapore. This study found that R&D investments of foreign firms generated higher value added than those of domestic firms, and that the difference in value added contributed by R&D was moderated by the type of R&D, its' amount and the technological level of industry. However, in any case, the Investments in the Research & Development have a positive influence of the companies' performance.

In the next article of the Zantout, Z. and Tsetsekos, G. "The Wealth Effects of Announcements of R&D Expenditure Increases" was presented the fact that – "it is always strategically beneficial for the firm to disclose its future R&D plan". In the base of this fact lay the analysis of 114 announcements of increases in R&D. The analysis shows that the news of Research & Development increasing has direct influence on the market expectation. The shareholders assume that increasing Research & Development Investments will have positive effect on the company's performance and as a result on the stockholders wealth.

Finally, these are the base studies that discover the importance of the R&D investments and its influence on the companies' performance. Nowadays this sphere is developing and the new approaches appear. It is obvious, that the mentioned investigations are valuable for the investor's evaluation purpose.

Hypothesis

This paper proposes and tests next three hypotheses. When the company increase its' investments in the Research & Development, it is hypothesized that its' Net Income will increase.

In some cases the Net Income may increase only after some years after Investments, so the second hypothesis states that if research program takes few years, the Net income may increase after this program is completed and introduced to the market.

Based on the recent study by Shao-Chi Chang, Sheng-Syan Chen and Wen-Chun Lin[12], we assume, that company's performance mainly affected by individual internal governance. In this case the third hypothesis states that the same Research & Development investment policies may brings different effect on the company's performance. Specifically:

Hypothesis 1 – Investing in the Research & Development brings a positive influence on the Net Income of the company in the future;

Hypothesis 2 – Investments in the Research & Development of this year may have positive or negative influence on the company's Net Income in this year;

Hypothesis 3 – Companies in one industry have different correlation between the investments in the Research & Development and Net Income changes.

Data and Methodology

Firstly, the companies choosen for this study– Apple, Inc. and Dell, Inc. These companies were taken according to the list of the companies in the Personal Computers industry from the Yahoo Finance (finance.yahoo.com).

Secondly, the official data about Research & Development investments and Net Income of these companies was taken from the official companies' web sites[13]. The main sources of the data were the Income Statements of the Annual Reports from 1987 to 2009 for Dell, INC and of the Quarterly Reports from 1995 to 2009 for the Apple, INC.

Then, to estimate dependence between the Research & Development investments and company's Net Income the regression analysis was done. The regression analysis helps us understand how the typical value of the Net Income (dependent variable) changes when the Research & Development investments is varied (independent variable), while the other independent variables are held fixed. Using the regression analysis we estimated α (Alpha) and β (Beta).

$$Y = \alpha X + \beta,$$

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[12] Internal Governance and the Wealth Effect of R&D Expenditure Increases Shao-Chi Chang[a,*] Sheng-Syan Chen[b] Wen-Chun Lin[a]

[13] Dell, Inc: http://content.dell.com/us/en/corp/about-dell-investor-info.aspx?c=us&l=en&s=corp
Apple, Inc: http://www.apple.com/investor/

Where: Y – Net Income of the company in the particular year;
X – R&D investments of the company in the particular year;
α – the coefficient of the regression;
β – the parameter of the regression.

Finally, based on the results of the regression analysis and the Research & Development Investments tendency, we can forecast growth of the Net Incomes for the next 5 years (from 2010 to 2015 years). In the case of recession and different percentage of growth of the Research & Development investments in each company, we predict Net Incomes' growth with three scenarios: bad (5 % of growth), base (10 % of growth) and good (20% of growth).

Results

In the database we obtain official information about the Research & Development Investments and Net Income for 21 years for the Dell, Inc (1987 – 2009 years) and 15 years for the Apple, Inc. (1995 – 2009 years). To present more clear regression analysis and obtain exact result (coefficient - α and parameter –β) we should use representative amount of the years. In our case we decided to use data at list for 13 years. So, in the regression analysis we use data from 1987 to 1999 year for the Dell, Inc. and from 1995 to 2007 years for the Apple, Inc.

Table 1. – Results of the regression analysis for 13 years: the Apple, Inc (1995 – 2007 years) and The Dell, Inc. (1987 – 1999 years).

Indicator	Dell, Inc.	Apple, Inc.
Coefficient, α	3.757753849	5.737391
Intercept, β	- 52.32707146	- 2118.54
R^2	82.80%	48.22%
F	43.32594	10.24697835
F sign	0.0001	0.00843

Based on the obtained R^2 results, we can estimate, that both regression equations present high dependence between changes in the Research & Development Investments (independent variable X) on the companies' Net Income (dependence variable). The Dell, Inc. has R^2 equals 82.80% and Apple, Inc. 48.22%. Also, we can see that the Net Income of the Dell, Inc. has twice as higher subject of Research & Development Investments. This approve, if companies in one Industry, it does not mean they should have same collaboration between Research & Development Investments and Net Income. This demonstrates that the company's Net Income depends on many internal and external factors, which specific for each company.

Based on the α coefficient from regression analysis we can estimate, that increasing in the Research & Development Investments affect increasing in the companies' Net Income. We can conclude this because both companies have positive α coefficient (the Dell, Inc. 3.76 and the Apple, Inc. 5.74).

Estimating F sign indicator for both companies, we see that both are less than 0.05, so our regressions data is correct and it can be used to make forecast in the Net Income increasing in the future. However, to approve regression results and convince the forecast correctness, we should compare the original Net Income of the 2008, 2009 years and calculate the equation based on the

regression data shown in the table above.

For the Dell, Inc this equation is:

Net Income = 3.757753849 * R&D Investments + (- 52.32707146) (1);

For the Apple, Inc this equation is:

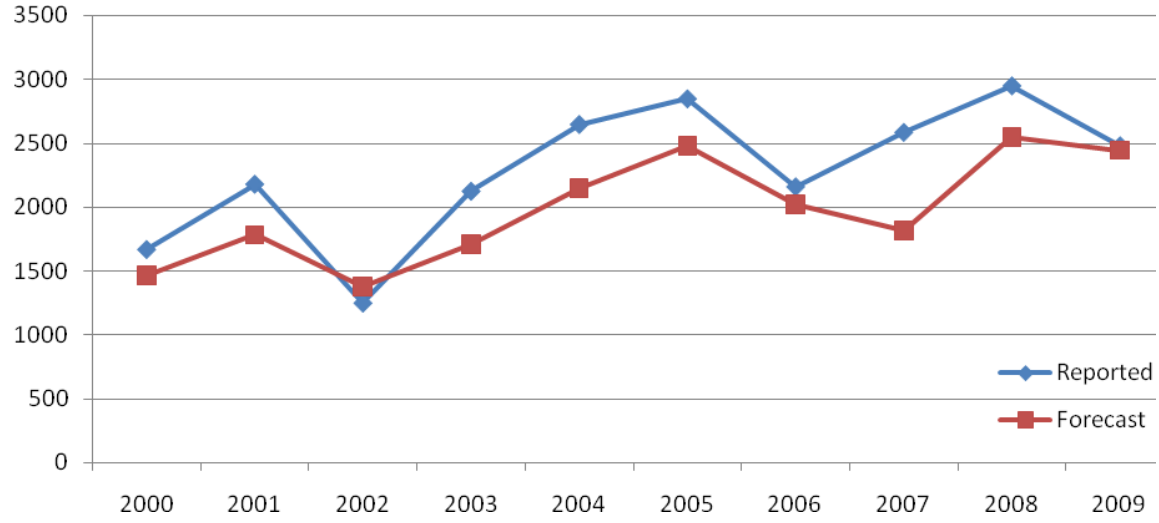
Net Income = 5.737391* R&D Investments + (- 2118.54) (2);

As we mentioned above we have official information about The Dell, Inc for 21 years (1987 – 2009 years) and for The Apple, Inc for 15 years (1995-2009). For regression analysis we use 13 years for each company. In this case, we can check received equations comparing official reported information in the period 2000 – 2009 for the Dell, Inc and in the period 2000-2009 for the Apple, Inc. However, we should notice, that the regression function for the Apple, Inc.

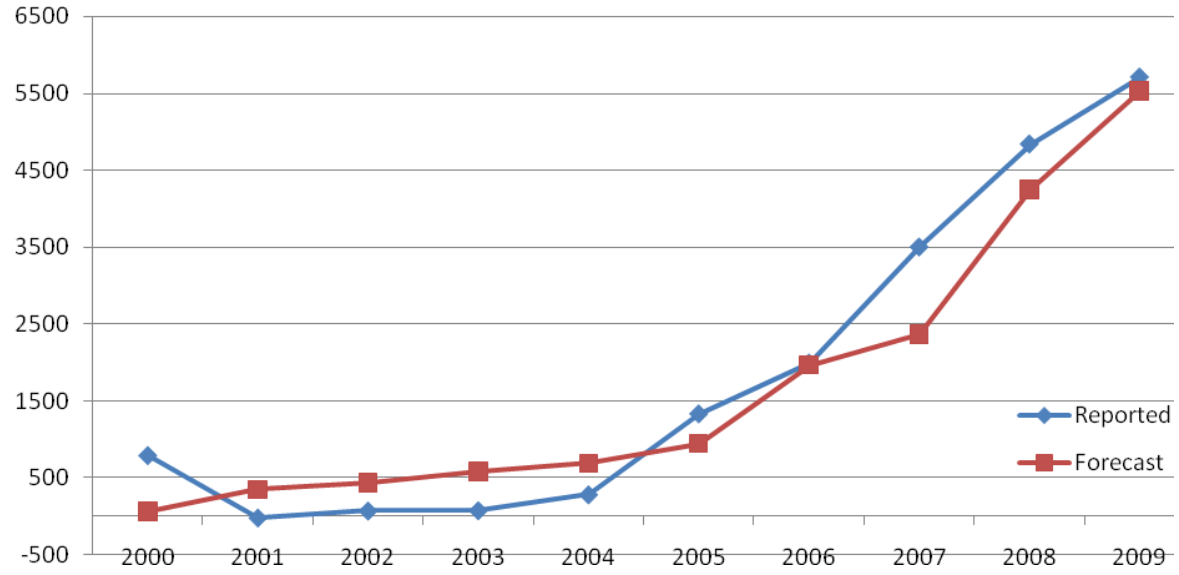
Table 2. – Comparing of the forecasted and reported amounts of the Net Income.

Year	**Dell. Inc.**			**Apple. Inc.**		
	R&D. millions $	**Reported. millions $**	**Our Forecast. millions $**	**R&D. millions $**	**Reported. millions $**	**Our Forecast. millions $**
2000	406	1666	1468.321	380	786	61.66
2001	490	2177	1783.972	430	-25	348.53
2002	382	1246	1378.135	446	65	440.33
2003	471	2122	1712.575	471	69	583.77
2004	587	2645	2148.474	489	276	687.04
2005	674	2845	2475.399	534	1328	945.22
2006	553	2157	2020.711	712	1989	1966.48
2007	498	2583	1814.034	782	3496	2368.09
2008	693	2947	2546.796	1109	4834	4244.22
2009	665	2478	2441.579	1333	5704	5529.40

On the graphs presented below show deviation between official Reported Net Income of the each company and Forecasted with received regression equations 1 and 2.



Graph 1 – The deviation between Reported and Forecasted Net Income of the Dell, Inc.



Graph 2 – The deviation between Reported and Forecasted Net Income of the Apple, Inc.

As we see from the graphs above, our Forecast shows the total tendency of the Net Income increasing and, moreover forecasted figures close to the Reported. This fact approve, that received regression equations 1 and 2 are correct and may be used for forecast of the Net Income growth in the future for both companies.

Based on the historical data from the results presented on the graphs above, we can see, direct relation between increasing Research & Development Investments and increasing Net Income. This fact confirms Hypothesis 1 – The investing in the Research & Development brings a positive influence on the Net Income of the company in the future received.

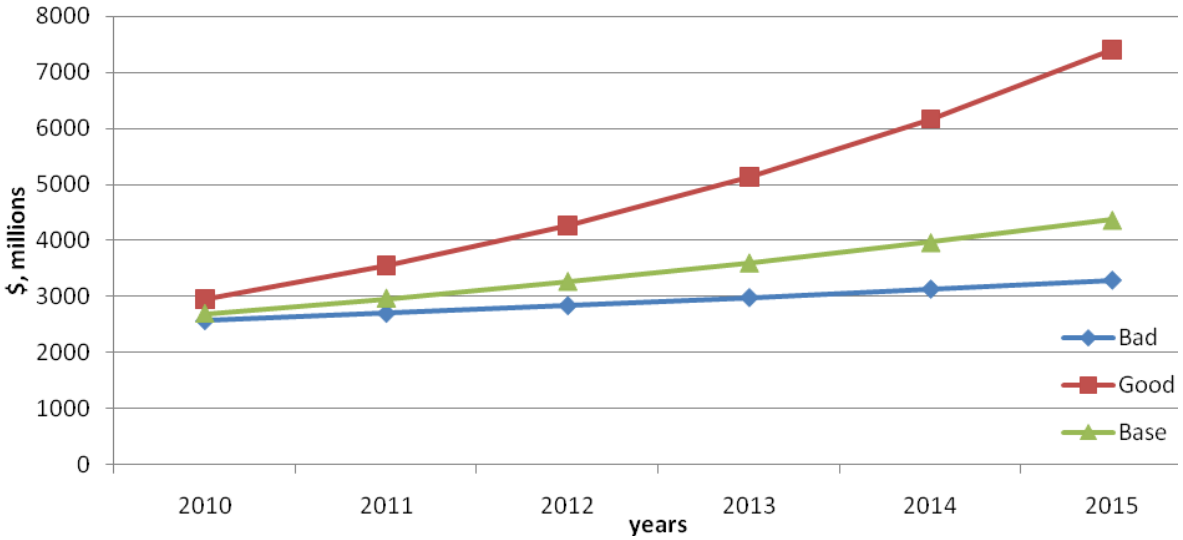
However, in the historical data of the Apple, Inc. we can see the unpredictable relation between the Research & Development Investments and Net Income. In 2001 year R&D Investments was $430 million (in the 2000 year – $ 380 million), but Net Income of the company decline from $786 million in 2000 year to – $25 million in the 2001 year. Moreover in the 2004 year the R&D investments shows increase on 3.4% with previous year ($ 471 million in the 2003 year and $ 489 million in the 2004 year), however company's Net Income increases on more than 300% ($ 276 million in the 2004 year and $ 69 million in the 2003 year). The same situation we can see in the 2005, 2007 years. Based on this data we can conclude that the investments in the Research & Development of this year may have positive or negative influence on the company's Net Income in this year. It depends on the Research & Development program. Some program continuous during few years, in this case the company should transfer investments every year, but financial results will be seen after the program finished and final product launched. This fact approve the second hypothesis – the investments in the Research & Development of this year may have positive or negative influence on the company's Net Income in this year.

The main idea of the regression equation is to predict future Net Income of the companies, what brings direct influence on the shareholders wealth and stockholders earnings. So, based on received and proved equations 1 for the Dell, Inc. and 2 for the Apple, Inc. we can forecast future Net Income of both companies. Firstly, based on the historical tendency we create

three scenarios of the Research & Development Investments for each company: bad – increasing on 5%, base – 10% and good – 20%.

Table 3. – Net Income forecast for Dell, Inc. 2010-2015.

Dell, Inc ($, million)	2010	2011	2012	2013	2014	2015
Bad (5%)						
R&D Investments	698	733	770	808	849	891
Net Income	2 567	2 698	2 835	2 980	3 132	3 291
Base (10%)						
R&D Investments	732	805	885	974	1 071	1 178
Net Income	2 691	2 966	3 269	3 601	3 967	4 370
Good (20%)						
R&D Investments	798	958	1 149	1 379	1 655	1 986
Net Income	2 941	3 541	4 261	5 124	6 161	7 404

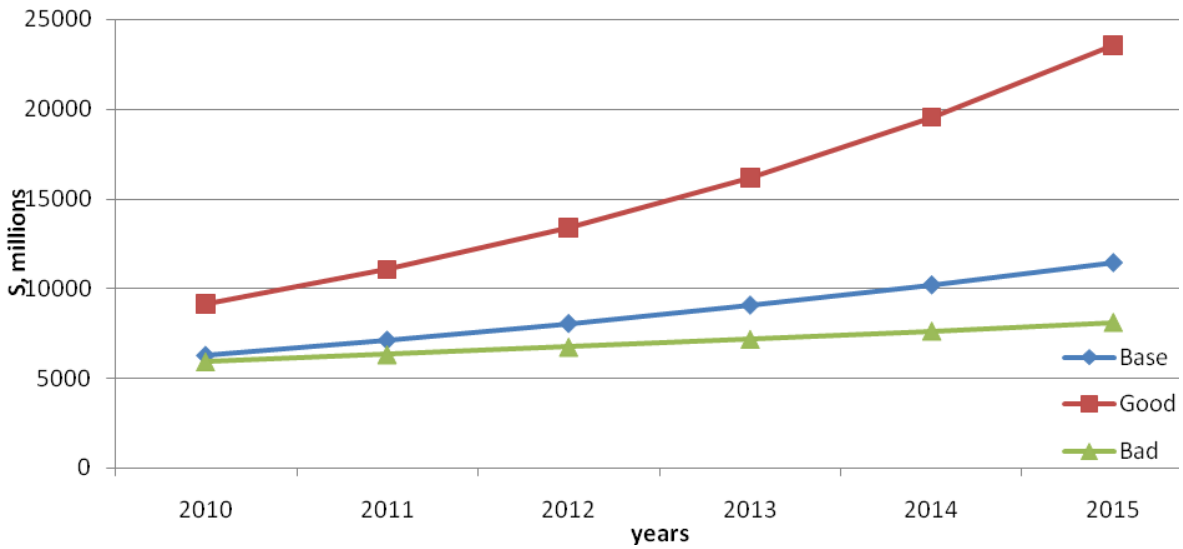


Graph 3. - Forecasted Net Income for Bad, Base and Good scenarios.

Table 4. – Net Income forecast for Apple, Inc. 2010-2015.

Apple, Inc ($,million)	2010	2011	2012	2013	2014	2015
Bad (5%)						
R&D Investments	1 400	1 470	1 543	1 620	1 701	1 786
Net Income	5 912	6 313	6 735	7 178	7 642	8 130
Base (10%)						

R&D Investments	1 466	1 613	1 774	1 952	2 147	2 361
Net Income	6 294	7 135	8 061	9 079	10 199	11 430
Good (20%)						
R&D Investments	1 600	1 920	2 303	2 764	3 317	3 980
Net Income	9 127	11 065	13 391	16 181	19 530	23 549



Graph 4. – Forecasted Net Income for Bad, Base and Good scenarios.

From the tables and graphs above we can see the forecasted Net Income in each scenario for both companies. Moreover, if we look carefully, in the same scenario companies have rather different Net Income. Even if the Research & Development Investments are the same for each company, the Net Income would be different. The reason is different coefficients α in the regression equations 1 (for the Dell, Inc.) and 2 (for the Apple, Inc.). The Apple, Inc. has coefficient 5.737391, while the coefficient of the Dell, Inc. is only 3.757753849. So, that means that the Net Income of the Apple, Inc is more sensitive to any changes in the Research & Development Investments. This fact, that every company has specific relation between its' Net Income and Research & Development Investments approves the last hypothesis – "Companies in one industry have different level of dependence between the investments in the Research & Development and Net Income changes".

Conclusion

The purpose of this paper is to determine relation between Net Income of the company and its' Investments in the Research & Development.

In the paper was presented the methodology, which can help to determine degree of dependence between the companies' Net Income and the Research & Development Investments. Based on the received data we estimate that investing in Research & Development brings a positive influence on the Net Income of the company in the future; however the investment in the

Research & Development of this year may have positive or negative influence on the company's Net Income in this year. Moreover we conclude that the companies in one industry may have different level of dependence between the investments in the Research & Development and Net Income changes. Based on these conclusions we can affirm that all three hypotheses are proved.

This study may be useful for the investors, who utilize the EPS indicator for the company's evaluation. Because EPS depends on the Net Income, investors should analyze all indicators and factors which may affect the Net Income (ex., the Research & Development Investments). Moreover, presented methodology can help investors to make the forecast about future Net Income of the company and make a right decision.

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Returns Dynamics and Global Integration of The Stock Markets of "Plus Five" Nations

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Abstract

Outreach five or "Plus Five" nations (Brazil, China, India, Mexico and South Africa) are currently among the most rapidly growing emerging markets. However, the issue of stock market returns dynamics and global integration of these markets remains largely unexplored. Filling this gap, we empirically analyze the issue of Plus 5 equity market returns interdependence to leading global markets (U.S., U.K., Germany, Canada, France, Italy and Japan). Evidence from our study suggests that though not complete; the equity markets of the Plus 5 nations are on path for a global integration. We conclude that there still is possibility of diversification benefits from investing in Plus 5 markets depending on the origin of investment portfolio.

Introduction

As the regional and global convergence of business cycle progress, correlation among the economic fundamentals of developed nations has increased reducing benefits from domestic investing in equity markets of these nations. Therefore, investors are now focusing on the concept of diversifying across emerging markets. Several of these markets have been categorized as "investable" for some years. Besides the potential for diversification, interest in equity markets of Emerging countries (EMEC) is from the potential returns from investing in these markets. For e.g. in the year 1996, Venezuela, Hungary, and Turkey registered 23 per cent, 120.4 per cent and 47 per cent respectively compared to 19.1 per cent of NYSE. With rapid emergence of EMEC coupled with increasing investor appetite for foreign investing, an understanding of the diversification benefit from these rapidly growing economies is becoming important.

Is it likely that the liberalization process in emerging markets will lead to full integration of the equity markets of these nations into the global market?***** We answer this question by examining the integration of the Plus 5 nations (Brazil, China, India, Mexico and South Africa) with major global markets (U.K., U.S.A., Canada, France, Germany, Italy and Japan). Convergence of these markets is possible with abolition of trade and entry barriers, FDI (Foreign

***** According to Bekaert and Harvey (2003), markets are considered integrated when assets with similar risk command the same expected return irrespective of their location of sale. In principal, process of liberalization should bring about emerging market's equity market integration with the global equity markets. Foreign investors will demand domestic stocks in the emerging markets with diversification potential.

Argument for increased integration of the Plus 5 nations is the liberalization and deregulation of their capital markets, with relaxed investment restrictions, free cross-border capital flows, and significantly lower transaction costs. Integration process affects expected risk premiums through three main channels: the profitability of firms, the structure of the market portfolio, and the pricing of global risk. Whether equity markets of the Plus 5 nations are integrated or (at least partially) segmented has important implications for the design of asset allocation strategies.

Direct Investment) friendly orientation of legal and regulatory infrastructure in the Plus 5 nations. These factors and lower transaction costs associated with portfolio investing the equity markets of the Plus 5 nations are likely the reason to suspect the convergence. However, if the equity markets of Plus 5 nations reflect local factors rather than global, then the global integration of these markets is not complete.

According to Raj and Dhal (2009) EMEC have emerged as major channel of capital flow in emerging economies signaling financial integration following liberalization process. Other factors contributing to cross border capital inflows directed towards EMEC is foreign investors seeking portfolio diversification and better yields. Also, there has been a growing trend of firms of emerging market relying on the savings of other nations, and a shift in the leverage preference of these firms from debt to equity financing[†††††]. There are also domestic benefits of global integration for the EMEC. It accelerates the process of development of local markets and institutions and in turn the process of asset price discovery which leads to higher savings and investments and economic growth.

Purpose of this paper is to investigate the extent to which the equity market returns of major global markets i.e. US, UK, Germany, Canada, France, Italy and Japan affect returns of EMEC of the Plus 5 nations, i.e. China, Brazil, Mexico, India and South Africa. And, if the EMEC do respond to the global market returns, are the responses homogenous for all the countries? For example do changes in the equity market returns in US identically affect the equity market returns of China, Brazil, Mexico, India and South Africa alike? Answers to these questions are important since integration of financial markets implies the convergence of risk premiums across global markets and Plus 5 markets, which might play an important role in forecasting the stock markets of the Plus 5 markets. Results from this paper will also have important implications for policymakers that seek to reduce country spillover effects and international investors who aim to improve their portfolio performance.

The rest of the paper is organized as follows. Section 2 reports literature review. Section 3 describes the data and descriptive statistics. Section 4 details the econometric methodology used, whereas section 5 reports the empirical findings and the results. Finally, section 6 concludes.

Literature Review

1.1 Investing in Equity Markets of Emerging Countries

Equity markets of emerging countries (EMEC) with their characteristics of higher sample average returns, often low correlation, and higher volatility (Bekaert and Harvey, 1997) provide a challenge to existing finance models. Returns from investments in emerging markets remain uncertain, following discontinuous short-run and more 'bi-modal' paths (Dania, 2005). Studies in understanding returns distribution of EMEC have reported high long-horizon returns, high volatility, time-varying skewness and kurtosis, high autocorrelation and low correlation with both developed and other emerging markets, distinguishing these markets from other developed markets (Bekaert and Harvey, 1995, 1997, 1998).

Despite challenges to forecast of returns of the EMEC, interest in these markets have steadily increased as these markets have widely been viewed as an exciting and promising investment alternative, especially because of possibility of high returns and their diversification

[†††††] Emerging market debt trading volumes exceeded $1.3 trillion for the third quarter of 2005, approaching the peak of $1.62 trillion that was seen in 1997. Source: Emerging Markets Traders Association.

benefits (Arouri et al., 2009). The significance of the EMEC also stems from the fact that these have become a pertinent driver of the global economic growth in the recent years (Nikkinen et al., 2008). Not for the growth in India and China, IMF (2009) estimates the overall global growth would have been negative, following the international financial crises of 2008. Another imposing evidence and advantage of international diversification in EMEC is provided by Bodie, et al. (2009), who state that the risk of an internationally diversified portfolio can be reduced to less than half the level compared to that of a diversified U.S. only portfolio[‡‡‡‡‡]. This marked reduction in risk for a portfolio that includes foreign as well as U.S. stocks further enhances the value of portfolio diversification. Therefore, it is in the benefit of the investors to understand relevant drivers influencing the interdependence of EMEC and global markets to realize the potential risk and rewards of global diversification (Pretorius, 2002).

Results from studies to understand the nature of interdependence among the EMEC and global markets have largely been inconclusive with respect to results. For e.g. Wong et al. (2004), observed some co-movement between developed market returns and returns of EMEC; however some emerging markets did differ from the developed markets with which they share a long run equilibrium relationship. The authors also observed that there has been increasing interdependence between most of the developed and emerging markets since the stock market crash of 1987. According to Gklezakou et al. (2009), the correlation among the developing markets of South Eastern Europe in on average low and vague. The observed relationships among them might be due to the influence of the leading stock exchanges. However, their links are strengthened during the current economic crisis.

1.2 Plus 5 nations[§§§§§]

India

India has been on an accelerated path into developing as an open market economy. Economic liberalization, including reduced controls on FDI which began in the early 1990's, strong educated workforce have been the drivers of India's GDP growth, which has averaged more than 7% each year since 1997. India's has a diverse and billion plus strong internal economy supporting the economic growth. Services remain as major source of economic growth for India. Even as the global economy loomed in economic recession, Indian economy still reported a 6.1% GDP growth in 2009, which was the second highest in the world.

China

China's economy during the past 3 decades has transformed from a socialist, centrally planned system that was largely closed to FDI and trade to a managed market oriented economy. Since the early 1970s this process and the rapidly growing private sector has transformed China in a major player in the global economy. After having pegged its currency to the US dollar for years, China in July 2005 conceded to a managed float system, revaluing its currency by 2.1% against the US dollar. Cumulative appreciation of the Renminbi (or the Chinese Yuan) against the US dollar since the end of the dollar peg remains more than 20% by the late 2008. However, the exchange rate has remained virtually pegged since the onset of the global financial crisis. The restructuring of the Chinese economy and resulting competence gains have attributed to a more

[‡‡‡‡‡] The GDP of emerging market countries as a group has been growing at roughly double the rate of advanced economies in recent years. Aggregate GDP of the developing countries grew 6.6 percent in 2004, while the GDP of high-income nations grew at 3.1 percent. Source: World Bank's Global Development Finance 2005, pp. 33-34.
[§§§§§] Source: The World Factbook (Central Intelligence Agency), sourced on April 8, 2010. Location: https://www.cia.gov/library/publications/the-world-factbook/

than a tenfold increase in GDP of China since 1978. In 2009, China was reported as the second-largest economy in the world after the US.

South Africa

South Africa, a leading economy on the African continent is a middle-income, emerging market rich in natural resources comprised with well-developed financial, legal, communications, energy, and transport sectors. The Johannesburg stock exchange (JSE) is 18th largest in the world. South Africa can claim modern infrastructure supporting an efficient distribution of goods and services to major urban centers throughout the region. Growth in South African economy has remained robust from 2004 to 2008 due to macroeconomic stability and a global commodities boom. However, the economy suffered a slow in the second half of 2008 due to the global financial crisis' and the impact on commodity prices and demand. South African GDP fell nearly 2% in 2009.

Brazil

Brazil, a leading Latin American economy, has been characterized by large and well-developed agricultural, mining, manufacturing, and service sectors. In 2008, Brazil became a net creditor. With increase in global exports, Brazil's external debt totaled less than its foreign reserve holdings. This resulted in Brazil's debt being awarded an investment grade status by rating agencies. After record growth in the Brazilian economy in the year 2007 and 2008, the onset of the global financial crisis hit Brazil in September 2008. Brazilian currency and its stock market, the Bovespa, experienced a drop as foreign investors pulled investments out of Brazil. However, Brazil is one of the first emerging markets to begin a recovery post global financial crises of 2008. Investor confidence revived in Brazil, and GDP growth has returned to positive in the second quarter, 2009.

Mexico

As a NAFTA member and in close proximity to the largest economy –US— Mexico has enjoyed special economic status. FDI from most major US corporations in the 1980s in the Mexican economy has helped in creation of a technologically advanced manufacturing and service industry. However; China, India and Brazil have since stepped in as competition for the outsourced manufacturing and service demand. Mexico's GDP plunged 6.5% in 2009 as world demand for exports dropped and asset prices tumbled. However, the Mexican GDP is expected to turn positive growth late in 2010.

Data and Descriptive Statistics

For our study we obtain monthly data between January 1993 and February 2010. As a proxy for check of interdependence on foreign markets we include the market returns from US, UK, Germany, Canada, France, Italy and Japan. To assess the global integration of the Plus 5 markets, we include corresponding monthly data for Plus 5 markets. These are the markets of China, Brazil, Mexico, India and South Africa. Source of our data is the MSCI Barra database. To eliminate local currency effect, we use all performance indices in US dollar terms. We compute the continuously compounded returns for all indices.

Table 1 reports the descriptive statistics for variables. From the table we can observe that the mean returns for all the markets in sample have positive returns. The positive average returns may be attributed to the overall growth in the markets. Further, all samples of Plus 5 market returns have a higher mean figure than the developed market returns indicating the pace of growth of the EMEC which is higher than the developed markets. We also observe a higher

Standard Deviation figure for the Plus 5 markets compares to the developed markets. This is consistent with the contention that investors are being compensated for taking higher risk. Only China, India, Italy and Japan report a positive skewness. Largely the presence of positive (negative) Skewness indicates a distribution with an asymmetric tail extending towards more positive (negative) values. A large Kurtosis figure (>3) is also observed, indicating a relatively peaked distribution. Presence of theses observed Skewness and Kurtosis characteristics further motivate the use of time-series methodology for any result inference.

[Table 1 about here]

Table 2 reports the coefficient of correlation among the variables of interest. The level of correlations between sample Plus 5 market returns and global market returns is moderately low to low. These figures seem consistent with our earlier discussion that there exist inherent comparative differences between the EMEC and developed markets economic environment. In summary, moderate to low correlations among these variables suggest that each variable represents unique expectations of their individual market participants. However, we still need to investigate the nature of interdependence between Plus 5 market returns and developed market returns.

[Table 2 about here]

Econometric Methodology

Since the sample of Plus 5 market returns and global market returns may act as a system, we choose the VAR model developed by Sims (1980) as an appropriate econometric approach to investigate the postulated relationships, i.e. to understand the nature of relation between returns of global markets (UK, US, Canada, France, Germany, Italy and Japan) and the returns of Plus 5 nations (Brazil, China, India, Mexico and South Africa). We specify four separate system(s) comprised of individual developed market with all Plus 5 markets.

The VAR model can be expressed as:

$$Z(t) = C + \sum_{s=1}^{m} A(s)Z(t-m) + \varepsilon(t) \qquad (1)$$

where, $Z(t)$ is a column vector of variables of interest, C is the deterministic component comprised of a constant, $A(s)$ is a matrix of coefficients, m is the lag length and $\varepsilon(t)$ is a vector of random error terms.

The VAR specification allows the researchers to do procedural simulations and integrate Monte Carlo methods to obtain confidence bands around the point estimates (Doan, 1988). The likely response of one variable to a one time unitary shock in another variable can be captured by impulse response functions. As such they represent the behavior of the series in response to pure shocks while keeping the effect of other variables constant. Since, impulse responses are highly non-linear functions of the estimated parameters, confidence bands are constructed around the mean response. Responses are considered statistically significant at the 95% confidence level when the upper and lower bands carry the same sign.

It is well known theoretically that traditional orthogonalized forecast error variance decomposition results based on the widely used Choleski factorization of VAR innovations may

be sensitive to variable ordering (Pesaran and Shin, 1996; Koop, Pesaran and Potter, 1996; Pesaran and Shin, 1998). To alleviate such potential problems of misspecifications, we employ the recently developed *generalized impulses* technique as described by Pesaran and Shin (1998) in which an orthogonal set of innovations which does not depend on the VAR ordering.

Estimation Results

Before proceeding with the main results, we first check the time series properties of each variable by performing unit root tests using Augmented Dickey Fuller (ADF) test (Dickey and Fuller, 1979, 1981) and Phillips-Perron test (Phillips and Perron, 1998). Based on the consistent and asymptotically efficient *AIC* and *SIC* criteria (Diebold, 2003) and considering the loss in degrees of freedom, the appropriate number of lags is determined to be two. In the case of the ADF test and Phillips-Perron test, the null hypothesis of non-stationarity is rejected. The inclusion of drift/trend terms in the ADF test equations does not change these results.

[Table 3 about here]

We construct the generalized impulse responses from the VAR model to trace the response of one variable to a one-standard-deviation shock to another variable in the system. We employ Monte Carlo methods to construct confidence bands around the mean response. When the upper and lower bounds carry the same sign, the responses become statistically significant at the 95% confidence level[******].

To analyze the effects of developed market returns on Plus 5 markets returns we categorize the response results based on each individual market, i.e. UK, US, Canada, France, Germany, Italy and Japan. We first estimate the responses of the Plus 5 market returns to the UK. Based on AIC and SIC, we analyze the VAR models with two lags.

Figure 1 plot the impulse responses of the Plus 5 market returns to one time standard deviation increase in UK market. The effects of UK returns are positive and significant on all Plus 5 markets. The response of China and South Africa is positive and significant for first period and then become insignificant. Response of Brazil, India and Mexico is positive and significant for first two periods and then becomes insignificant.

[Figure 1 about here]

Figure 2 plot the impulse responses of the Plus 5 market variable returns to one time standard deviation increase in US market. The effects of US returns are positive and significant on all Plus 5 markets except South Africa. The returns of the Brazil, China, India and Mexico markets demonstrate positive and significant for first period and then becomes insignificant. Response of South Africa is insignificant.

[******]Sims (1980) suggests that autoregressive systems like these are difficult to describe succinctly. Especially, it is difficult to make sense of them by examining the coefficients in the regression equations themselves. Likewise, Sims (1980) and Enders (2003) show that the *t*-tests on individual coefficients are not very reliable guides and therefore do not uncover the important interrelationships among the variables. Sims (1980) recommends focusing on the system's response to typical random shocks i.e., IRFs. Given these theories, we analyze the relevant IRFs and do not place much emphasis on the estimated coefficients of the VAR models.

[Figure 2 about here]

Figure 3 plot the impulse responses of the Plus 5 market returns to one time standard deviation increase in the Canadian market. The effects of Canadian market returns are positive and significant on all Plus 5 markets. The response of Brazil, China, India, Mexico and South Africa is positive and significant for the first period and then becomes insignificant.

[Figure 3 about here]

Figure 4 plot the impulse responses of the Plus 5 market returns to one time standard deviation increase in the French market. The effects of French returns are positive and significant on only the Indian market returns (positive and significant in period one and then become insignificant). Response of Brazil, China, Mexico and South Africa are insignificant.

[Figure 4 about here]

Figure 5 plot the impulse responses of the Plus 5 market returns to one time standard deviation increase in the German market. The effects of German returns are insignificant. None of the Plus 5 markets (i.e. Brazil, China, India, Mexico or South Africa) report a significant response.

[Figure 5 about here]

Figure 6 plot the impulse responses of the Plus 5 market returns to one time standard deviation increase in the Japanese market. The effects of Japanese returns are insignificant on all Plus 5 markets except South Africa. Brazil, China, India, Mexico market returns report an insignificant response to the Japanese market. South African market returns are positive and significant for period one and then becomes insignificant.

[Figure 6 about here]

Figure 7 plot the impulse responses of the Plus 5 market returns to one time standard deviation increase in the market returns of Italy. The effects of the Italian market returns are insignificant on all Plus 5 markets except China. Brazil, India, Mexico and South Africa market returns report an insignificant response to the market returns of Italy. Market returns of China report a negative and significant response to the Italian market returns for period one and then becomes insignificant.

[Figure 7 about here]

Conclusion

The last decade has witnessed changes in the global "investable" alternatives. Relatively new to this horizon are the Plus 5 nations. Ideological shift in several of EMEC nations has lead to immense privatization and creation of new firms necessitating funding, often through private

source, leading to issuance of securities to raise funds. Regional authorities realize that the abolishment of political and economic barriers, barriers to enter or to exit exchange markets, tax barriers, and allowing inflow of foreign investment is to their economies.

The argument for investing in emerging markets of the Plus 5 markets is essentially the potential for growth and diversification. However we have little understanding of these issues from existing studies. Specifically, we answer how well are the markets of these nations integrated with the markets of the developed economies, and whether the Plus 5 markets move largely following global factors or local factors. The diversification argument will revolves around the correlation between the returns earned in the developed nation(s) equity markets and the returns on the Plus 5 markets.

We analyze this by means of using vector auto regression methodology on returns of UK, US, Canada, France, Germany, Japan and Italy (proxy for developed markets) and returns of the five Plus 5 markets (Brazil, China, India, Mexico and South Africa). The results of the generalized impulses generated from vector auto regression (VAR) models suggest that returns of almost all Plus 5 nations in our sample are interdependent with the returns of the UK, US and Canada. However, there seems to be little evidence to suggest that the Plus 5 markets are influenced by markets of France, Germany, Japan and Italy.

These results from this paper have important implications for both investors and policymakers. Time series evidence from this paper suggests that the market returns of Plus 5 nations are on path for global convergence. However, the global integration is yet not complete. Though, the independence condition might reduce the possibility of diversification benefit, it necessarily does not eliminate the possibility of returns from growth in the region. Information regarding interdependence among different markets is a critical factor. An investor can maintain a desired rate of return from investment portfolio while reducing the risk level by combining assets which are structurally different. Investors should be concerned about the potential of constructing a portfolio which provides equal or higher rate of return with lower risk. In this case, a direct implication of the results from this paper is that the inclusion of Plus 5 nations in portfolio is likely to offer benefits of diversification depending on where the portfolio originates. Nevertheless, the development of securities markets in these nations coupled with industrial and economic growth does provide groundwork for returns potential for all investors.

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Table 1: Descriptive statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
Brazil	0.0195	0.0253	0.3650	-0.3900	0.1162	-0.2542	4.3528
China	0.0034	0.0030	0.4650	-0.2767	0.1092	0.5667	5.1202
India	0.0114	0.0136	0.3663	-0.2856	0.0910	0.0618	3.6821
Mexico	0.0107	0.0199	0.1903	-0.3426	0.0896	-0.9070	4.9232
SA	0.0106	0.0122	0.2126	-0.3084	0.0808	-0.5812	4.3122
UK	0.0041	0.0049	0.1324	-0.1913	0.0445	-0.5250	4.7871
USA	0.0056	0.0109	0.0988	-0.1725	0.0438	-0.7463	4.2659
Canada	0.0096	0.0156	0.2101	-0.2716	0.0607	-0.7493	5.6466
France	0.0064	0.0092	0.1530	-0.2243	0.0567	-0.5117	4.2894
Germany	0.0072	0.0124	0.2239	-0.2435	0.0652	-0.6200	5.0139
Italy	0.0062	0.0025	0.2141	-0.2362	0.0683	0.0459	3.6485
Japan	0.0018	-0.0022	0.1771	-0.1665	0.0584	0.2126	3.2911

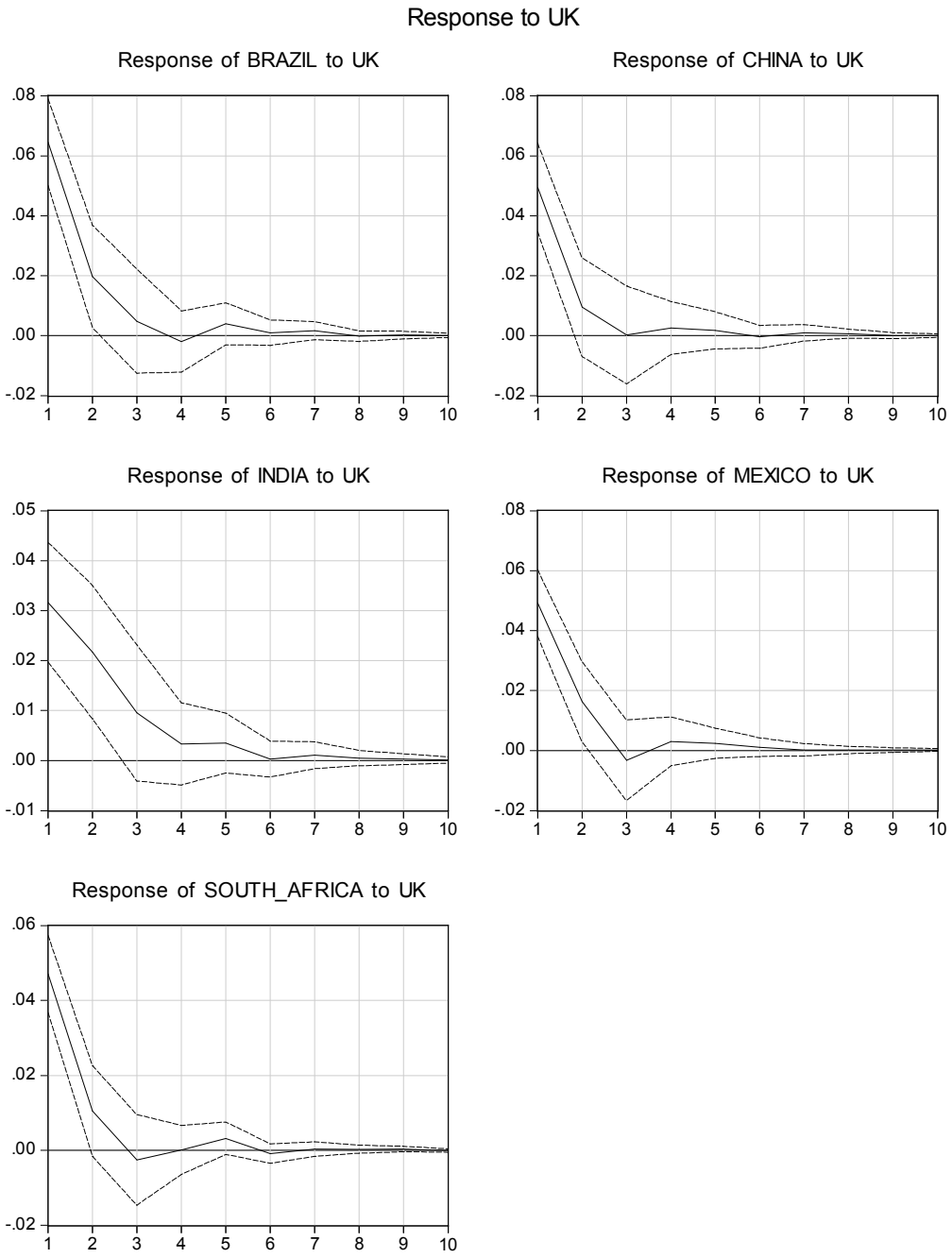
Table 2: Coefficient of correlations among variables of interest

	Brazil	China	India	Mexico	SA	UK	USA	Canada	France	Germany	Italy	Japan
Brazil	1											
China	0.4377	1										
India	0.4762	0.3999	1									
Mexico	0.6231	0.4486	0.4218	1								
SA	0.5060	0.5616	0.4363	0.5448	1							
UK	0.5677	0.4337	0.4137	0.5590	0.5652	1						
USA	0.5624	0.4687	0.4121	0.6244	0.5312	0.7672	1					
Canada	0.6238	0.5227	0.5078	0.6158	0.6517	0.7241	0.7822	1				
France	0.5426	0.3725	0.4559	0.5486	0.5735	0.8177	0.7544	0.7076	1			
Germany	0.5496	0.3955	0.4292	0.5235	0.5629	0.7592	0.7618	0.6684	0.8834	1		
Italy	0.4726	0.1977	0.4196	0.4379	0.4300	0.6167	0.5712	0.5472	0.7321	0.6936	1	
Japan	0.3799	0.2389	0.3338	0.3910	0.5181	0.5055	0.4670	0.5173	0.4699	0.3856	0.4085	1

Table 3: Unit root results

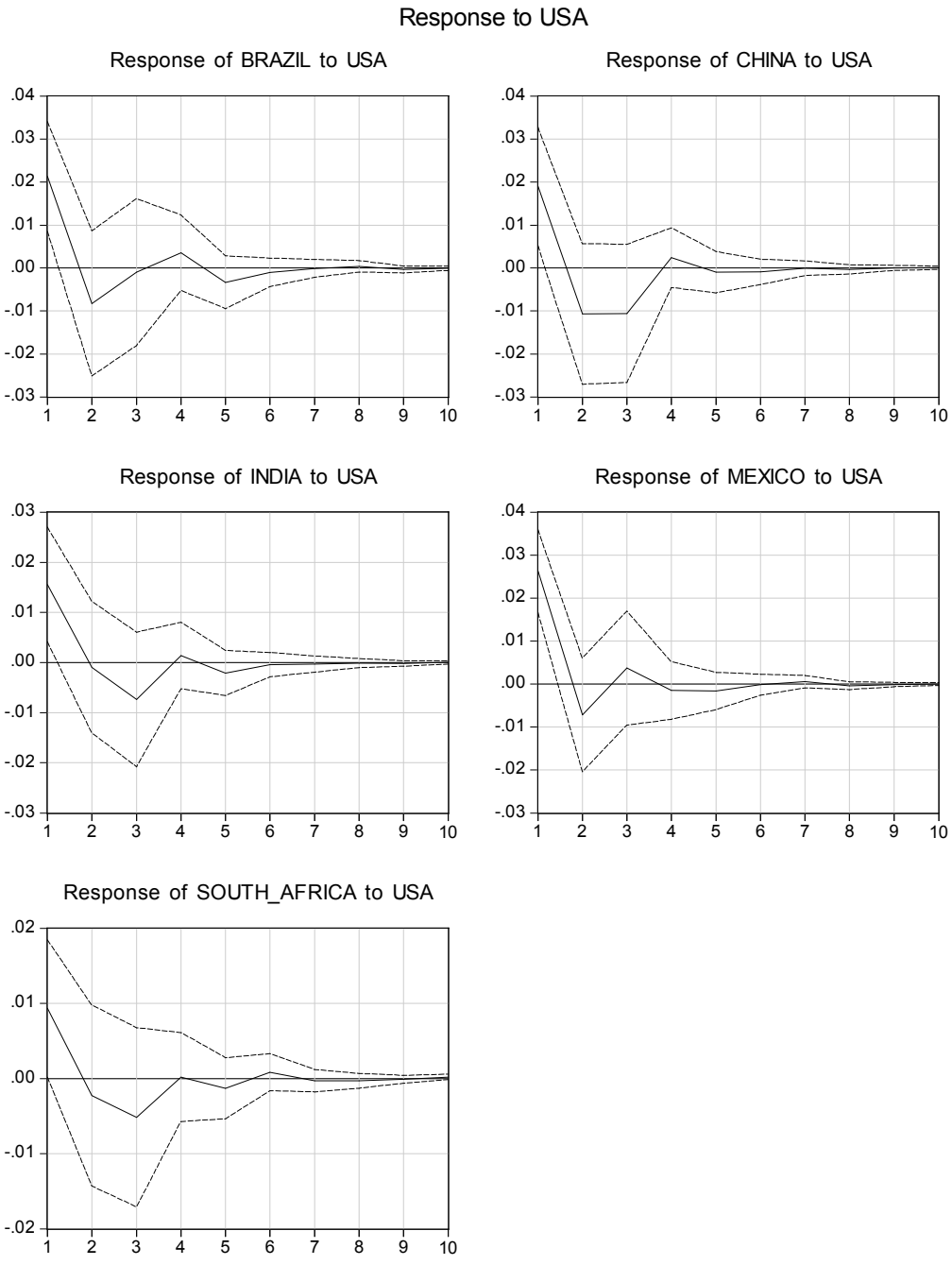
	ADF		PP	
	level	1st Diff	level	1st Diff
Brazil	-13.3868	-11.8381	-13.4001	-164.2045
China	-13.1557	-12.3801	-13.1084	-112.1253
India	-12.5795	-11.4739	-12.6790	-180.5873
Mexico	-12.9531	-9.1586	-12.9531	-66.8024
SA	-13.8479	-11.1781	-13.8573	-104.2649
UK	-11.3099	-14.7202	-11.5535	-38.7860
USA	-12.7071	-12.0060	-12.8236	-64.1816
Canada	-12.3083	-13.4419	-12.3774	-58.1208
France	-12.6537	-15.0076	-12.6631	-55.2936
Germany	-13.3905	-12.0975	-13.4148	-107.0225
Italy	-13.5841	-16.3015	-13.6040	-33.3829
Japan	-11.8568	-12.1076	-11.8706	-62.0157
1% Critical Value		-3.4627		-3.4624
5% Critical Value		-2.8757		-2.8755
10% Critical Value		-2.5744		-2.5743

Figure 1: Impulse response of Plus 5 market returns to UK market returns



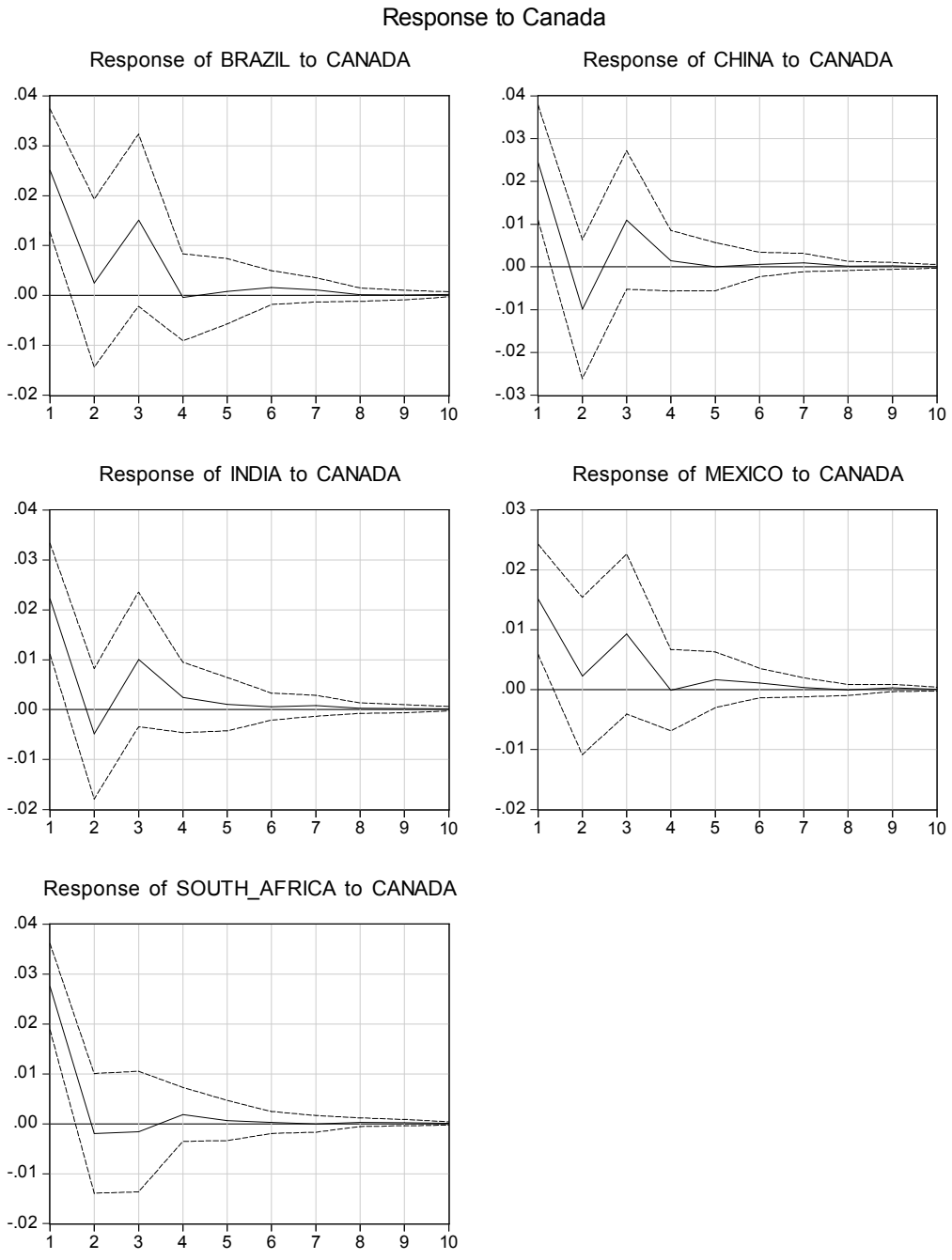
Note: The dashed lines on each graph represent the upper and lower 95% confidence bands. When the upper and lower bounds carry the same sign the response becomes statistically significant.

Figure 2: Impulse response of Plus 5 market returns to USA market returns



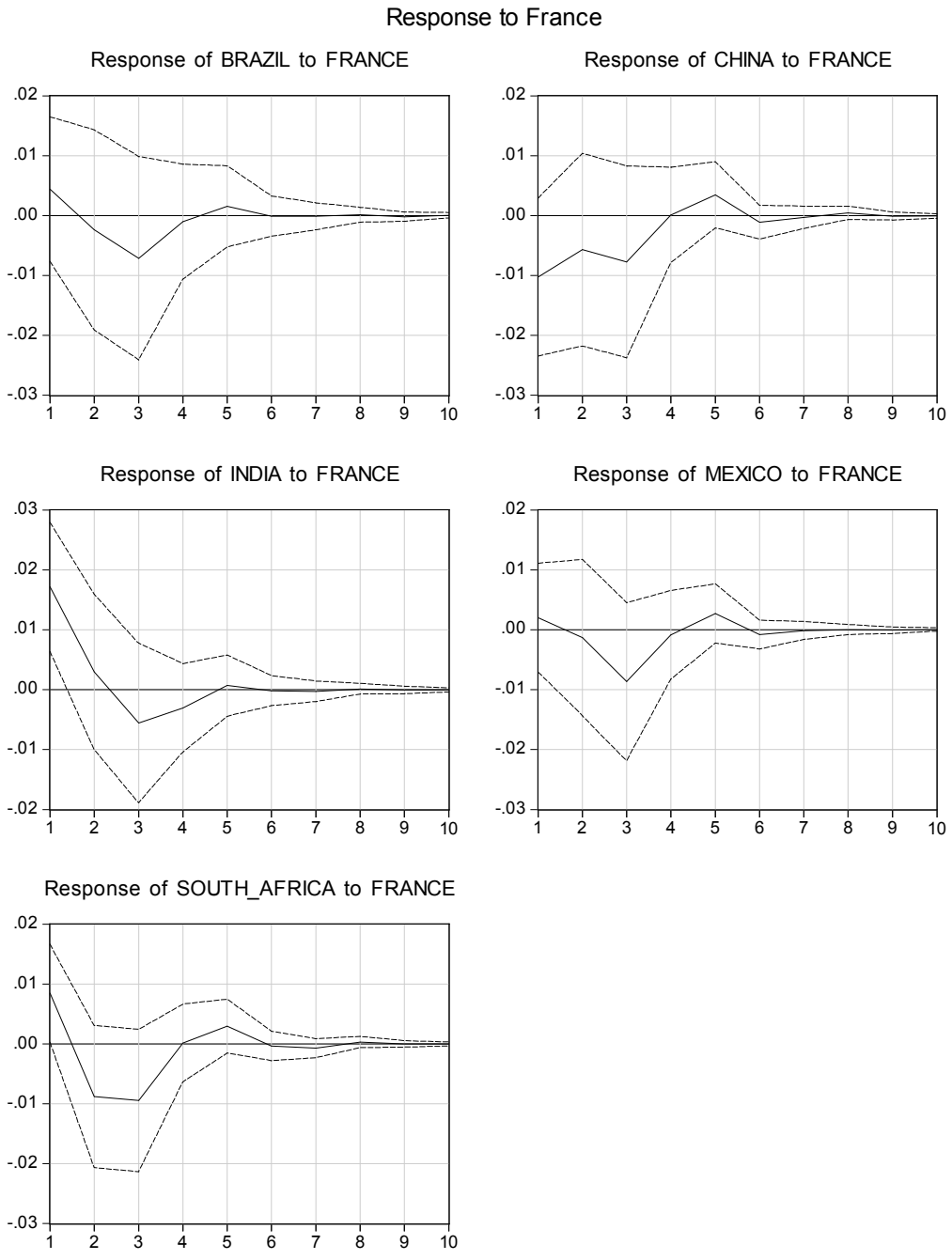
Note: The dashed lines on each graph represent the upper and lower 95% confidence bands. When the upper and lower bounds carry the same sign the response becomes statistically significant.

Figure 3: Impulse response of Plus 5 market returns to Canada market returns



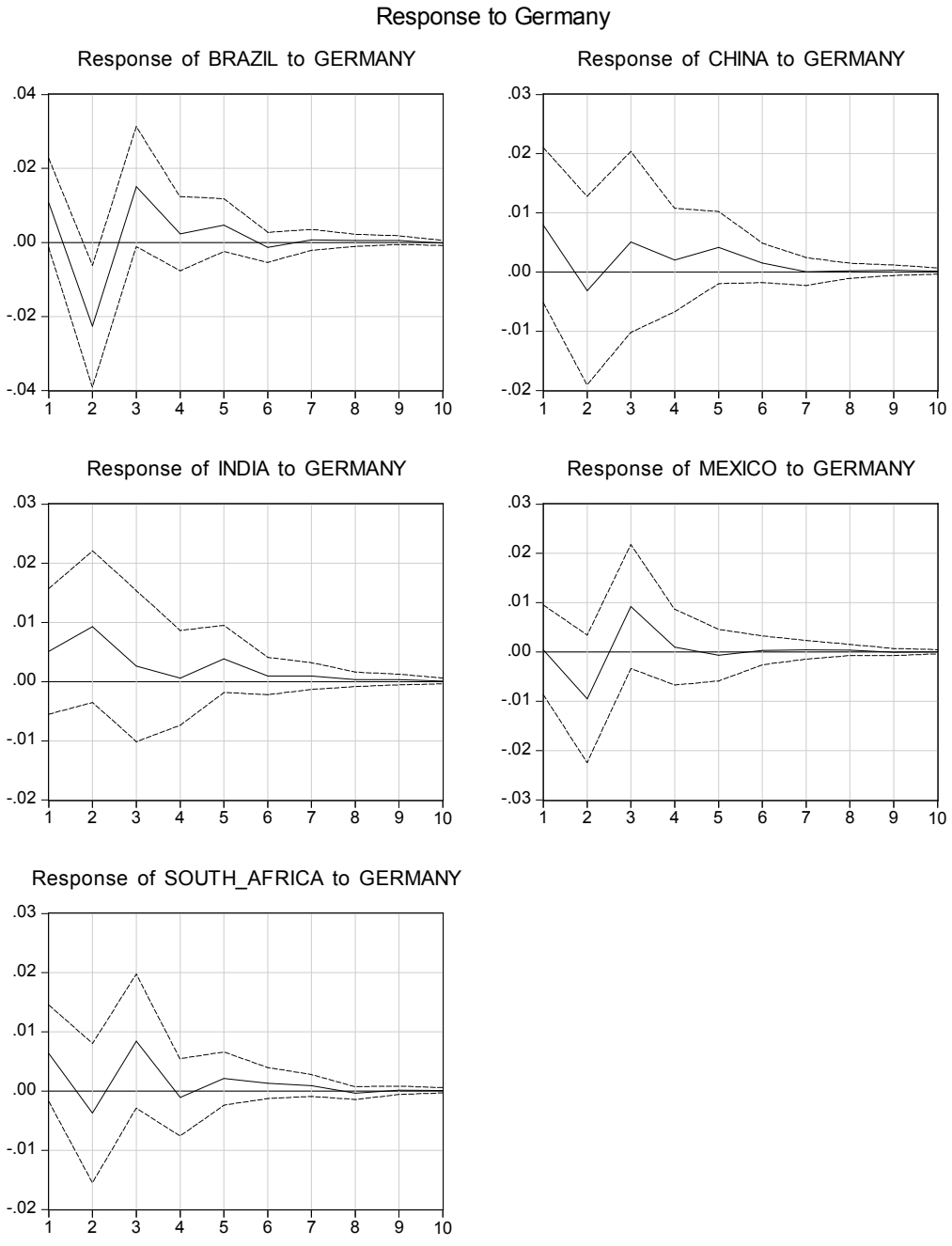
Note: The dashed lines on each graph represent the upper and lower 95% confidence bands. When the upper and lower bounds carry the same sign the response becomes statistically significant.

Figure 4: Impulse response of Plus 5 market returns to France market returns



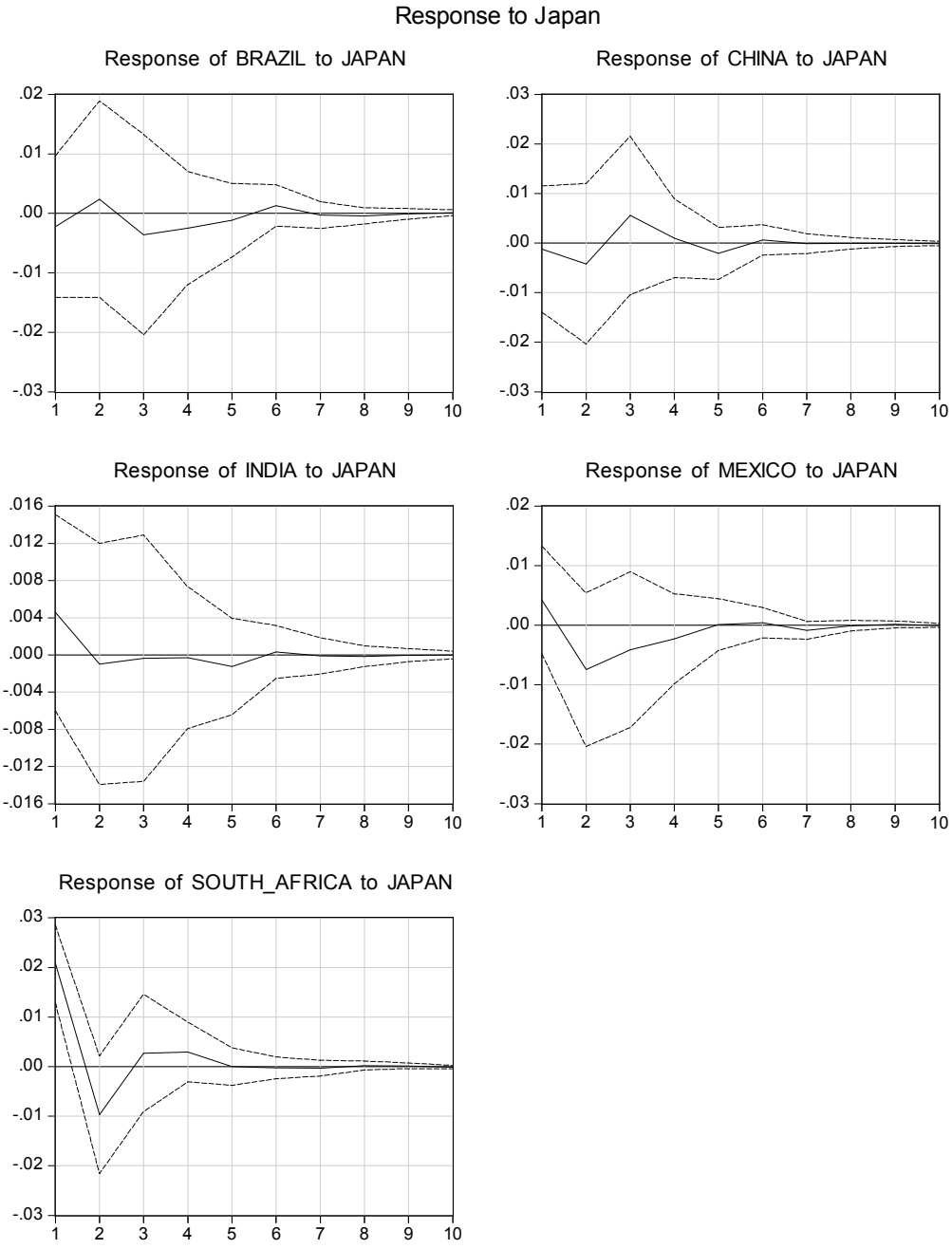
Note: The dashed lines on each graph represent the upper and lower 95% confidence bands. When the upper and lower bounds carry the same sign the response becomes statistically significant.

Figure 5: Impulse response of Plus 5 market returns to Germany market returns



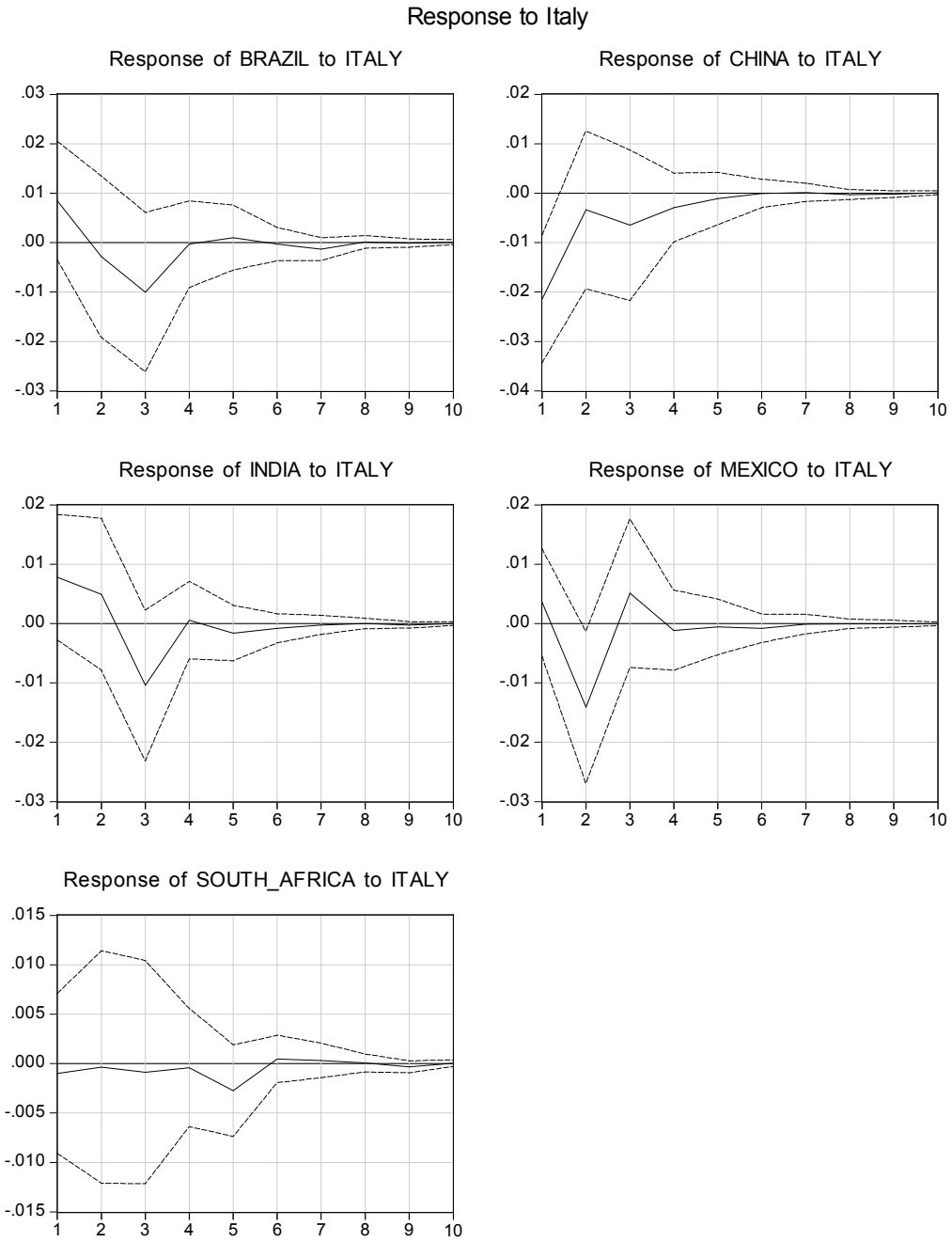
Note: The dashed lines on each graph represent the upper and lower 95% confidence bands. When the upper and lower bounds carry the same sign the response becomes statistically significant.

Figure 6: Impulse response of Plus 5 market returns to Japan market returns



Note: The dashed lines on each graph represent the upper and lower 95% confidence bands. When the upper and lower bounds carry the same sign the response becomes statistically significant.

Figure 7: Impulse response of Plus 5 market returns to Italy market returns



Note: The dashed lines on each graph represent the upper and lower 95% confidence bands. When the upper and lower bounds carry the same sign the response becomes statistically significant.

Supply Chain Management for Higher Education: Trends and Challenges

Angela Tidwell Lewis, Florida A & M University
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Abstract

Over the past decade, the number of for-profit higher education institutions that offer four-year degrees has grown significantly, in comparison to the growth of traditional (public and private not-for-profit) four-year institutions. This growth represents a changing industry and signals a need to understand the trends and challenges of more institutions offering four-year degrees, expanding the higher education supply chain. Increased competition among suppliers of a product or service in a supply chain provides customers with more options, yet it often requires existing suppliers to reposition in the marketplace. This pattern of shifting supply chains is noted in various industry examples, where new market entrants that were once viewed as non-threats eventually thrive to become dominant players in the market. Such industry examples serve as potential models for higher education stakeholders. This research will identify trends and challenges in the dynamic supply chain of four-year degree-granting institutions.

Using Systems Approach to Create and Sustain a Culture of Assessment: a Case Study

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Shawnta Friday-Stroud, Florida A & M University
Jennifer M. Collins, Florida A & M University

Abstract

The movement towards a culture of assessment of student learning is indeed a paradigm shift for teaching-oriented faculty members, who in the past were not required to prove student learning beyond grades. Regional and specialized accrediting agencies alike are requiring colleges and universities to demonstrate through an ongoing and systematic cycle of continuous improvement that students have in fact learned the skills espoused in degree programs. Thus, student learning, rather than teaching, is at the heart of the assessment process. This paper discusses a case study where a business school in a mid-sized southern university used a systems approach to move towards a culture of assessment.

An Examination of the Relationship Between Student Procrastination and Academic Performance

Amos Bradford, Florida A & M University
Jennifer M. Collins, Florida A & M University

Abstract

This paper seeks to understand the relationship between student procrastination and academic performance. Students enrolled in Principles of Management and Organizational Behavior course at a mid-sized southern university completed a battery of personality self assessments, including a Procrastination scale. The literature reports mixed results on the relationship between procrastination and academic performance. This paper proposes a model of an indirect relationship between procrastination and academic performance where procrastination influences one's level of Conscientiousness and Need for Achievement which in turn influence academic performance. The preliminary results of this study indicate that while a relationship exists among procrastination, Need for Achievement and Conscientiousness, the proposed mediating relationship among the variables and academic performance is not significant.

Visitor Evaluation of a Major U.S. Theme Park

Gary L. Geissler, University of Arkansas at Little Rock
Conway T. Rucks, University of Arkansas at Little Rock

Abstract

The U.S. theme park industry has experienced steady growth for decades. Since the 1980s, the theme park industry has developed into a global phenomenon. Monitoring visitor satisfaction is critical to help ensure a satisfying overall experience, customer value, and repeat visits. Here, we examine ten years of customer satisfaction tracking data collected at a major U S theme park. The study focuses on identifying significant factors influencing customer evaluation of and satisfaction with the overall theme park experience. The key findings reveal that visitors evaluate the theme park primarily on three factors: 1) overall park experience and value; 2) park food quality, value, and variety; 3) park cleanliness and atmosphere. Satisfaction with the total cost of the park visit is primarily predicted by perceptions of the admission price/value, general enjoyment, and customer expectations of the experience. Also, the more visitors experience the park, the more satisfied they are with its value. Additional findings concerning the important role of expectations and prior park experiences in visitor satisfaction, as well as managerial implications, are detailed in this paper.

Using *Wolfram Alpha* in Economics Courses

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Abstract

The purpose of this presentation is to demonstrate how *Wolfram Alpha* can be used in economics classes to enhance the students' learning experience. *Wolfram Alpha* is a relatively new product from Wolfram Research, the developer of the powerful symbolic computation system known as *Mathematica*. Wolfram began its *Alpha* project in the fall of 2009 with an ambitious long term goal of making "all systematic knowledge immediately computable and accessible to everyone." While *Alpha* is still in its infancy, it currently includes data and information from many branches of knowledge, including a significant amount from economics, finance, and demography. *Alpha* uses data collected from the Web and other sources, then organizes the data in a form that can be manipulated with *Mathematica*'*s* advanced built-in algorithms. *Alpha* combines the capabilities of a sophisticated calculator with those of a search engine. This combination provides students with the capability to easily access and manipulate a large amount of computable information that is available through Wolfram. The presentation will include illustrations from economics, finance, and demography.

Bringing Relevance to the Classroom through Experiential Learning: A Case Study of Student Consulting Projects in Information Resource Management

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Abstract

Experiential learning in management education has received considerable interest in response to increasing concerns about relevancy and the lack of practical applications in the traditional business school curriculum. The experiential learning process has been suggested as an effective approach to integrating classroom learning with the real-world business environment. This article presents a case study of experiential learning using field-based student consulting projects in an undergraduate Information Resource Management course. Using knowledge and skills learned in the classroom, student consulting teams worked with small business clients to identify, evaluate, and implement IT-based solutions to business problems. The qualitative results suggested that both students and clients valued the learning experience and were satisfied with the projects. A comparison of student course evaluations between the course with the experiential learning component and one with a simulated business for the project, however, showed little difference between the two courses in student perceptions of learning. Challenges and constraints related to implementing experiential learning methods in the classroom environment are reviewed and feedback from students and clients is presented.

Comparing Experiential Learning Techniques: The Business Student's Perspective

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Abstract

There is little question that active, experiential pedagogies are on the rise in business education. In fact, with the advent of new technologies, millennial students' experiences inside and outside the classroom are likely to be dramatically different from their predecessors'. This shift comes at a time when student learning has supplanted content-based methods ("old school" lecture formats) as the goal of assessment; the role of the educator clearly has changed. (Duke 2002). Business educators are responding to this shift by utilizing a more diverse set of techniques with increased emphasis on active and experiential learning (Frontczak 2000). While these are valued by educators and administrators and marketers of programs, we do not yet fully understand how students perceive these various learning techniques. Those in business education would benefit from understanding how well these techniques foster students' engagement in learning the knowledge and skills needed to succeed in business.

Past research has studied students' perceptions of experiential techniques from different angles. Karns examined marketing students' perceptions of learning activities in several different studies (1993, 2005, 2006). In general, his findings suggest that internships, class discussion, and case analyses are perceived by students as techniques that contributed the most to their learning. He also found that investing intensively in catering to learning style individual differences did not produce a very high payoff, compared to employing active learning pedagogies.

Building on Karn's work, our study examines students' perceptions of various experiential learning pedagogies. One key difference, however, is that we ask students to make direct comparisons between each learning technique on several global factors rather than rate each technique individually on a set of adjectives. This technique allows the student to see a specific technique within a universe of options. In addition, we measured several variables (i.e., gender, major) in order to assess if any differences exist between groups.

Specifically, a sample of 87 business students in an AACSB-accredited business program were asked to rank nine different experiential learning techniques on four separate dimensions – most valuable learning experience, highest realism, most intellectually stimulating, and grade being a direct result of personal effort. The sample was drawn from a capstone business course at a small private university. Subjects also reported classification variables such as gender, academic status, and major.

The results of this study identify students' ranking of the top learning techniques based on value, realism, personal effort, and intellectual stimulation. The findings suggest that students perceive differences exist between the various experiential techniques based upon these dimensions. Conclusions from these findings, both within separate disciplines and collectively, are discussed with emphasis on implications for creating an effective learning environment.

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A Summary of: Clickers—Are They Effective as a Teaching Tool in Intermediate Accounting 2?

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Abstract

This paper compares two classes of Intermediate Accounting 2 that were taught Spring 2009 at a regional state university in the Southeastern United States—Class One in which clickers were used every class meeting and Class Two where clickers were not used at all. Overall student performance in Class One was compared with Class Two, and each class was analyzed independently to determine relevant predictors for success, or lack of success, within the class. Predictors included are: Grade Point Average (GPA); English Comp I (ECI); Male/Female (M/F); Cumulative Participation (CP); and Age. It was determined that the use of clickers did not enhance nor diminish the performance of the students in Class One. Also, only GPA was significant in predicting student success in the class. Although two thirds of the students in Class One said that they liked using clickers, their Course evaluations were less positive for Class One than for Class Two.

These findings are similar to those of Carnaghan and Webb (2007) whose study group included four sections of introductory management accounting courses with approximately 200 students as the treatment groups. They used student surveys to evaluate student satisfaction with the CRS (classroom response system) as well as performance measures on the midterm exam and oral participation by the students over the course of the term. The results indicated while students receive satisfaction with the usage of technology in the classroom as well as on their learning, the examination results were only positive when like questions were used in the classroom and covered on the examination. One of their study constraints is the results were based on one or two questions per topic, per exam, thus Carnaghan and Webb state that further research is needed to examine whether the level of material difficulty has a negative or positive correlation on the relationship between exam performance and CRS usage in the classroom. As intermediate accounting is considered to be one of the more difficult and demanding junior-level accounting courses, this study will serve to further the research started by Carnaghan and Webb. This study will be useful to accounting pedagogy literature as well as possibly being considered by other challenging course subjects on whether CRS is beneficial to the classroom environment.

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