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COMMUNITY INVOLVEMENT AND THE HOMETOWN EFFECT: A FACTOR IN FAMILY BUSINESS EXPANSION PATTERNS

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ABSTRACT

The purpose of this study was to examine community involvement among family businesses as related to their growth and expansion. One success factor may be their strong community relationships and reputation, since owners believe that the local hometown is part of their success and want to "give back." The family businesses interviewed were very active in their communities and had a strong sense of community values. These activities include donations, sponsorships, serving on boards of directors, and others. It is possible that family businesses involved in the local community will become dependent on the hometown and, therefore, not venture outside the local geographic area. These firms may perceive that their success is centered in a single geographical area and still remaining successful. We propose that family business involvement and close community ties could ultimately affect their growth and expansion efforts. This qualitative study is based upon interviews with seven small businesses.

INTRODUCTION

Family businesses tend to be involved in their local communities, which include memberships in civic groups, churches, schools, and other nonprofit organizations. Past studies have shown that family business success factors include having quality products and services, product differentiation strategies, and the founder's intent and vision. However, another success factor may be the strong ties to the hometown and the local reputation of the firm. Therefore, the purpose of this study is to examine community involvement among family businesses and its effect on growth patterns and expansion.

It is often said that many small businesses and family-owned firms tend to be close to their communities. These strong ties include involvement in nonprofit organizations and memberships in civic groups, such as Rotary International, Chambers of Commerce, and Better Business Bureaus. Other participation and support include religious, educational, civic, and other institutions.

The primary focus of this study was to examine the importance of the "hometown" effect as it relates to social responsibility and growth strategies. Although much research has been conducted regarding social responsibility and business strategies, this study examines community involvement as an important aspect of family business success. This research effort consists of personal interviews with firms that represent a variety of businesses. These firms were selected from the following industries: general retail, furniture, auto repair, restaurant, health foods, convenience, and auto parts.

Specifically, this research asked the following questions:

1. What types of community activities do family businesses support and participate?
2. How important is local community involvement to the family businesses and what types of community values exist.
3. Are these strong ties to the hometown and local area related to business expansion and growth?

SURVEY OF LITERATURE

The literature supports the idea that family businesses desire to be involved their communities. Also, much of the literature shows how family businesses are involved in the community in terms of "giving back," the importance of social responsibility, and motives for community support. However, no studies have related family firms that remain in the local area and choose not to expand due to their ties to the local community culture, values, and relationships.

Community Relationships

One study examined several factors involved in business and community involvement. The research was a qualitative study of 52 small- to medium-sized enterprises (SMEs) in Australia and examined motives, methods, and obstacles toward community participation (Madden, Schaife, & Crissman, 2006).

The SMEs preferred to avoid cash gifts but desired to support local causes. A major motive was a genuine belief that business organizations should support community causes. By the same token, the community expected that the enterprises would play an active part in the community. In addition, the firms indicated that this community participation would benefit their businesses. (Madden, Schaife, & Crissman, 2006).

A recent study examined small businesses and their interests in nonprofit collaboration (Zatepillina-Monacell, 2015). In utilizing interviews and focus groups, the researcher concluded that small businesses were interested in serving on nonprofit boards. Specifically, these small businesses wanted to support those nonprofit organizations that helped and provided assistance to the needs of the community. Moreover, the small businesses were interested in long-term partnerships with nonprofit organizations that focused on local community issues.

Family Business Growth

Factors affecting growth and strategic planning in the small business literature are widespread**.** Eddleston et al**.** (2013) analyzed factors in strategic planning and argued the importance of analyzing strategic planning efforts in light of different generations. They suggested that growth, strategic planning, and succession planning are affected by the management of first, second, or generations beyond (Eddleston, Kellermanns, Floyd, Crittenden, & Crittenden, 2013). However, research studies on success factors and growth strategies are limited when community involvement is involved.

Hamelin (2013) suggested that financing capacity might be explained in growth patterns between family and non-family businesses. Further, he indicated that family involvement could intentionally limit their growth. It is possible that this involvement could lead to atypical behavior, and thus these businesses may implement conservative growth patterns. In addition, he

pointed out that firm financing capacity, as well as and other factors, could limit growth (Hamlin, 2013).

Community Culture

Astrachan (1988) recognized early on the importance of the community related to small business success while examining a family firm case study. He reported that when small businesses are in harmony and/or compatible with the local culture, a higher level of morale and long-term productivity may follow. Ideally, family firms tend to be more congruent with the community culture. The family firms may have a strong sense of community and, therefore, encourage employees to be involved in local committees. The owner in the study believed that the company would be a substantial asset to the city and the community and pointed out that the community should even own and control the stock in the local institution (Astrachan, 1988).

After interviewing a successful four-generation family business, Karofsky (2001) suggested that public service involvement was important and deeply engrained in the family culture. In his interview, Grossman of Massachusetts further indicated that a challenge existed for individuals while balancing a family, career, and community participation.

Small Businesses and Support of Community

The enlightened self-interest model of business and social responsibility suggests that businesses can realize significant benefits through socially responsible behavior (Besser & Miller, 2004). They stated the roles of small businesses in the community have received limited attention in the business social responsibility literature. Yet, they found that supporting the community was an important strategy for business success. In other words, a good public image was perceived to be important for business success. This finding was true for both non-risky and risky support.

Community Influence on Family Business Involvement

Family businesses appear to have significant ties to the community which, therefore, could explain their lack of expansion (Fitzgerald, Haynes, Schrank, & Danes, 2010). In surveying family businesses, researchers found that social and economic factors affecting the community may contribute to business performance and responsible actions. The National Family Business Survey reported that family businesses with positive attitudes toward local communities were more likely to serve in leadership positions and contribute to the community. Further, they found that family businesses were willing to accept leadership positions and contribute in the form of technical expertise and financial assistance when the economy was at risk.

Success and Social Responsibility

Besser (1999) examined the relationship between the success of small businesses and social responsibility of firms in Iowa. He found that small businesses in small towns reported high levels of commitment and support for the community. He defined social responsibility as a commitment and support for the community. In using multiple regression analysis, he showed that helpful corporate citizenship was also good for the businesses. He concluded, "As a result of their positive net association with business success, commitment to the community and

providing support for the community may be considered strategies for business success" (Bessler, 1999, p. 27). In addition, his findings showed an interdependency between businesses and their local communities.

In addition, Bessler (2012) examined motivations of small business regarding their contribution to the community. In analyzing the consequences for their involvement in the community, he stated, "The town where they do business is their home. Their personal well-being, and, often, the success of their business are inextricably linked to the overall welfare of the community" (Bessler (2012, p. 131).

Another study gave credence to the fact that small businesses are motivated to be socially responsible. Udayaskankar (2008) reported that small- and medium-sized firms comprise 90% of the worldwide business population. Although it has been suggested that given their smaller scale, access to resources and lower visibility, smaller firms were less likely to participate in social responsible initiatives. While examining different motivations of firms, he found that both very small and very large firms were equally motivated. Moreover, medium-sized firms were the least motivated, which illustrates that a U-shaped relationship between firm size and social responsibility participation occurs. However, he pointed out that when broad categories of businesses are sampled, caution should be taken.

Reciprocated Community Support

In a study of 800 small businesses in small towns in Iowa, researchers reported findings regarding reciprocity between small businesses and the community. In particular, entrepreneurs who made contributions to their community perceived themselves to be successful. In addition, the study showed that the interaction effect of an entrepreneur's service to the community and reciprocated by community support of the business was the single most significant determinant of business success among many variables and respondent characteristics. Moreover, an important finding was the belief that individuals who felt successful expect to expand (Kilkenny, Nalbarte, & Besser, 1999).

Regional Influences on Startups

Bird (2014) investigated how regional factors impacted family and non-family startups. The study was based on longitudinal data and showed economic factors, such as population and regional growth, to be primarily associated with the number of non-family start-up businesses. However, factors related to regional embeddedness, such as pre-existing small family businesses and favorable community attitudes toward small businesses, were more strongly associated with the number of family start-ups. They suggested that this regional factor was an important area for family business and start-up research.

Survival of Family Firms

Santarelli and Lotti (2015) found problems of growth and succession to be a major cause in family firm closures. In addition, they reported small family firms that had reached 30 years in existence had a very high risk of sudden exit. Likewise, this potential risk increased with the age of the firm.

METHODS OF RESEARCH

This research effort consisted of personal interviews with seven family businesses to examine their perceptions on many factors. For this study, we focused, in particular, on the understanding of family businesses and their relationships and partnerships with local community activities. The questionnaire was carefully developed with input from other studies. The questionnaire was designed to obtain open-ended answers and organized into the following general categories: Firm history and description, challenges, family dynamics, expansion patterns, and succession plans. Initially, interviewing was conducted with one of the owner during the spring, 2015; however, interviews were repeated with different family members in order to obtain more in-depth experiences.

This research was designed to be cross sectional in nature and a representative sample of family businesses in the local area with different industry classifications. The participants came from a variety of industries, including general retail, furniture, auto repair, restaurant, health foods, convenience, and auto parts. Table 1 below shows demographic characteristics of the responding firms according to age of firm, number of employees, sales volume, and level of family generation.

Table 1
CHARACTERISTICS OF RESPONDING FAMILY BUSINESSES

Industry	Age of Firm (Years)	Number of Employees	Estimated Yearly Sales $ Million (2014)	Generation Level of Owners/ Managers
General retail	104	80	$12	2nd , 3rd
Furniture	119	30	$8	3rd ,4th
Auto repair	53	38	$6	3rd
Restaurant	17	83	$5	1st, 2nd, 3rd
Health foods	23	33	$6	1st and 2nd
Convenience	33	300	$250	2nd and 3rd
Auto parts	46	400	$60	2nd and 3rd

These family firms represented a variety of small businesses. The age of the firms ranged from 23 to 119 years with an average age of 58 years in existence. The number of employees in the family businesses ranged from 30 to 400 with an average of 94 employees. Also, estimated sales revenue varied from $5 million to $250 million with an average yearly sales volume of $47 million.

FINDINGS

The family businesses interviewed were very active in their communities and had a strong sense of community values. In addition, they were concerned with quality products and services and were actively involved in the community in numerous activities. Examples of community involvement included assisting charities, school systems, city services, and other ways of “giving back.” This section of the paper shows specific examples of community service

participation by family businesses in their hometown. These finding led to the following proposition:

> Family business involvement with their close community relationships and hometown could ultimately affect their growth and expansion efforts.

Community Involvement

One major community involvement activity was the association with religious institutions. One restaurant owner stated, "We are very involved in church activities. Many people come in after church, since the restaurant is next door. We have done a lot of business with them for years and know the pastors."

Also, these businesses have a close relationship with educational institutions, since many were raised in their local communities and went to area schools. Also, companies mentioned that their friends and relatives also went to the hometown schools. In fact, many owners started they started working in the family businesses after school.

Community Awareness

Another example of community involvement was having local community leaders serve on their boards of directors. One individual indicated that a hometown doctor was on the boards of directors of his organization. Another owner stated, "This community is our home, and our customers are our neighbors. We want to give quality service to our customers."

Customer Care

An auto repair shop owner wanted their hometown customers to feel comfortable and, therefore, created an atmosphere that does not resemble a "typical auto repair shop." For example, the shop is very clean and professional. The owners wanted the waiting room to have the feel of a doctor's office or car dealership. Therefore, in caring for the customers, the waiting room now has a television set and coffee bar. The owners believed that they are indeed a credit to the community. In particular, they perceived their success to be a prime example of diligence, hard work, and strong family values.

Giving Back

The importance of the hometown and community involvement is illustrated by one family business owner who believes in the "generosity to the community." For instance, this business has made major strides toward creating hometown values by sending underprivileged kids to camp and donating property to a church.

Community Values and Success

One firm indicated that hometown people expect more from their businesses. He indicated that people from the hometown believe their service is "great." The family business owners instilled in all family members community values and defined such values as "doing what is right for the community."

Another family business supported a volunteer fire department in the hometown and later raised money for a new fire truck. According to family members, the founder instilled family values and believed that the family has a responsibility to the community. Similarly, the next generation of family members also indicated they are instilling these same community values in their children. In fact, the second generation donated land near the local school to the fire department.

DISCUSSION

This research focuses on reasons why some family firms grow and add multiple outlets across a geographic area, while others remain in one location with little change or growth. It is often said that family firms have strong ties to their communities. The research found the family business involvement in a variety of community service activities, including participation in nonprofit organizations and memberships, civic groups, and others.

Factors that may affect family firm growth include the desire of founder(s) and the propensity to take a risk. In addition, quality products and service, differentiation strategies, and others are important. However, family firm leaders believe that the local community is part of their success and thus desire to give back to the local community with donations, sponsorships, and other activities. In conclusion, a success factor of the family businesses is the local reputation and involvement with the hometown.

This research suggests that family firms with strong ties to the community values may not venture outside the city. They may perceive that their success is geographically centered and thus remain successful in their hometown. The literature and personal interviews show that local owners believe that the local communities are part of their success and want to "give back."

This study contributes to the literature regarding entrepreneurial expansion. Many small business have grown across the U.S. while other operations never progressed beyond their hometowns. The hometown proposition is based on established literature regarding the nature of community involvement and is an important step in understanding growth strategies in family firms and small businesses. It is possible that these close relationships are an important factor in the decision to stay in the local community and, therefore, not to expand.

A decision to expand may depend on many factors, such as the type of business entity, community involvement, and the founder's mission and vision. Also, family dynamics may be a factor in this proposition which would include size of family and number of family members in the firm. Other factors affecting expansion include geographic location, including the neighboring states, economic factors, and population growth.

LIMITATIONS AND FUTURE RESEARCH

The study suggests that further analysis is warranted. In addition, several questions have emerged from this study. Since the research was designed to be exploratory in nature and based on a sample of seven small businesses, future research would do well to assess the nature of community involvement with other industrial classifications. Future research could examine other limiting factors affecting growth patterns, since this research focuses only one factor related to expansion.

These factors could include generation level, education of family leaders, and the nature of the industry. A more comprehensive survey of family businesses would give credence to the proposition that community involvement in the hometown may be a factor in lack of expansion.

As a final point, it would be interesting to connect growth patterns with family dynamics and level of generations.

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A JOURNEY FROM A SERVICE LEARNING PROJECT TO AN ACADEMIC-COMMUNITY COLLABORATION EFFORT

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ABSTRACT

The primary goal of this paper is to share our experience in coordinating a service learning project for our classes that later it turned into an academic-community collaboration effort. In this paper, we describe the background of the project and its progression from a student-centered design work to faculty-led development and implementation of a database application for a local food pantry. The project culminates in the delivery of a fully-functional multiuser database application that has been successfully deployed and used at the front-end operation of the local food pantry. In the conclusion, we offer our reflection in this journey and its meanings to all who involved in the project.

INTRODUCTION

As educators are moving into the 21st century, there is a push for extending classroom learning opportunity beyond the boundary of a college campus. One of the approaches is the effort to bridge concepts learned in a classroom setting to practices in a real-world context. The ultimate goal is perhaps to prepare our students as real-world ready as possible. Real-world ready (RWR) implies that students would understand and acquire the global skill set necessary to compete in the careers they will enter after graduation regardless of their discipline (Real-World Ready QEP, 2015). Recognizing this important goal, our university has chosen the Real-World Ready initiative as the topic for the Quality Enhancement Plan (QEP) in the next five years. QEP is a mandatory component of the Southern Association of Colleges and Schools (SACS) reaffirmation process. It describes a course of actions for enhancing student learning at our university. As a result, the RWR activities/practices have been encouraged across our campus. Under our QEP, some of the resources, supports, and incentives have been set aside exclusively for initiating, undertaking, monitoring, and assessing these RWR activities. Faculty, students, administrators, and the local community partners have worked together to build and sustain the culture of RWR at our university. One of the requirements for the launch of our QEP is that it has to be from the bottom up. The faculty members as well as students have to be vested in the whole process. Naturally, we as educators must practice what we preach. This is one of the motivations for us to write this paper and to share our experience in the journey from leading a service learning project to engaging in academic-community collaboration.

In the field of Information Systems (IS), educators are often frustrated in their attempts to demonstrate the power and relevance of their discipline in a classroom setting (Resier and Bruce, 2008). Increasingly, educators in particular those in business disciplines have tried in different ways to connect their academic courses to the real-world experiences (Andrews, 2007). Several in the field of IS (Chuang and Chen, 2013; Reiser and Bruce, 2008; Hoxmeier and Lenk, 2003; Petkova, 2012) have done this via service learning projects. All of these articles focused on the work done by students in their carefully designed service learning projects. Almost all of these

articles reported on the success of these projects. In this paper, we also intended to report our experience in coordinating a two semester service learning project for students in our IS classes, but along with the success were some of the challenges and limitations that we encountered. Eventually, we had to lead the project ourselves in an academic-community collaboration effort so that we could deliver a fully functional database application for a local non-profit organization.

In sum, this paper is aimed at sharing our journey going from a service learning project to an academic-community collaboration effort. In it, we describe two main phases. The 1st phase involved the student-focused service learning project and the 2nd phase centered on the faculty-led collaboration effort that ended with the solution to meet a specific need of a local non-profit organization. The first section introduces the context of the project. Next, we discuss the 1st phase of the project. The discussion includes the following parts: conducting the site visit and observation, identifying the bottlenecks and issues, documenting the manual processes, conceptualizing the need and proposing a solution. It is then followed with the description of the work done by students, the class activities, and the deliverables at the end of the 1st phase. The next section deals with the 2nd phase of the project. Here, we highlight the challenges as well as the limitations inherent in a service learning project that led us to engage in an academic-community collaboration effort. This section includes the discussion of our development work for the multiuser client-server database application. The final section concludes the paper with our reflection on the work that had been accomplished and its meaning to all who had involved in the project.

PROJECT BACKGROUND

The Project Site

The site of this project is the local food pantry that was established in 1987. The motto of this food pantry is to reach out to the hungry in the local community. Its mission is to alleviate hunger for the people and families that it serves throughout the local parish. The staff is passionate in providing their clients with the basic necessity of food and in giving them a helping hand in their time of crisis. This food pantry is a local, volunteer, non-profit organization that provides free groceries to over 40,000 members of the local community every year. The clients are those in desperate need of food assistance. Its warehouse and distribution site is located in a convenient business complex about two miles from our university. Its operation hours are from 1 pm - 4 pm on Tuesday and Thursday. The food pantry's focus is to distribute a nutritional balance of food as well as implement nutritional education through the food that it distributes. It does this by distributing groceries once a month to applicants who qualify based on the poverty guideline from the federal government. Each individual or family who qualifies receives a variety of food items such as canned goods, tomato sauce, pasta, macaroni and cheese, cereal, grits, and other items when available. In the recent years, the food pantry has been able to handout cookies, meat, soup, tuna, fruit and other nutritious items.

The Request for Help and the Launch of a Service Learning Project

One of the staff at the pantry was an alumnus from our College of Business. She worked as the office manager at the pantry. She came to us with a request for help to improve the pantry's operation. Specifically relevant to us was her request to help with the client application

process. She asked us whether we could do something to help improve the efficiency and accuracy of the clients' information. The clients are the food recipients who come to the pantry for food once a month. For years, the pantry had relied on the paper-based file system to handle its clients. Although the paper application had worked in the past, as the number of clients grew, it became a challenge to handle and process many applications given a limited number of staff.

After the initial meeting with the office manager, we saw that this request for assistance could be a good opportunity for coordinating a service learning project. We identified two IS courses that were particularly matched well with the nature of the request. One was the system analysis and design (SAD) course and the other the database management course. As a result, we decided to accept the request for help and turn it into a two semester long service learning project. As shown in the literature, we found that service-learning pedagogy extends traditional classroom learning into the field by integrating meaningful community service with in-classroom activities (Cauley, et al., 2001; Rhoads, 1998). By integrating the service learning component into the project, we allowed our students the opportunity to work with a local organization to provide services related to the academic content and at the same time to apply concepts and techniques learned in a real-world context. This has been an effective pedagogy as demonstrated in Tan and Phillips' (2005) work on incorporating service learning into computer science courses.

1ST PHASE: THE SERVICE LEARNING PROJECT

Conducting Site Visits, Interviews and Observations

Upon receiving the request to help, we mapped the needed work to two of the IS courses with the focus on the database development and management. In the first semester, we engaged our students in the SAD course and in the second semester our students in the database management course. We divided our students into teams. They took turn to visit the local food pantry and to observe the working process there in order to gain an in-depth understanding of what need to be done. We allowed them to talk to staff and obtain necessary artifacts in order to do the analysis. We asked them to take note on what they observed at the site. At the end of the site visit, we would sit down and debrief. Table 1 below was the summary of our plan for the major activities that we used as an overall guide for the entire project.

Table 1
PLAN FOR MAJOR ACTIVITIES

1. Conduct site visit: Observe the process Interview with staff at the local food pantry Collect data and maintain field notes
2. Conduct the system analysis: Understand the current process Identify the operational issues Come up with requirement specification
3. Provide the system specification
4. Perform conceptual design: Formulate database design requirement Develop preliminary database design. Draw entity-relationship diagram, normalize database
5. Document the design and development process
6. Develop the prototype
7. Present to the staff at the local food pantry

Identifying the Bottlenecks and Issues

During the site visit, students observed the working process and interviewed with staff, they quickly learned of several bottlenecks and issues with this paper-based system. One, staff had to fill out the application for the client again and again every year even though most of the time the information remained the same. Two, the process of filling out the application by hand was time-consuming. Hence, it caused a long line of people waiting in the queue. Often, there was not enough space for everyone to be inside so the clients had to wait outside. This was not desirable especially during the heat of the mid-summer. Three, some of the writing was scripted quickly and consequently they were often incomprehensible. In such a case, it was difficult to read what was on these applications. Therefore, staff had to guess the information and sometime their guess was not accurate. Four, it was very tedious to create any reports when all the information was stored on the paper. The pantry staff had a hard time to tabulate the data to provide the required reports to the government agencies, its funding agencies, and its food suppliers. Five, the paper applications might get misplaced or lost. All the information had to be recaptured. Finally, it was very difficult to prevent and detect abusers/fraud. For instance, the husband and wife could fill out two different applications or same person might be claimed in multiple households. Those were among the major inefficiencies and bottlenecks that students were able to identify.

Documenting the Manual Processes

There were two core processes that were the focus of our study. The first one was the annual re-certification process that takes places once a year in July and the other was the process of handling clients who come to the site to pick up food once a month. For many years, the pantry had relied on the paper-based process to capture and manage its client information. The bottleneck was especially keen during the month of July when clients need to be re-qualified. The reason is because clients have to bring in their documents and proof of income to be recertified for eligibility to receive food. This re-certification occurred once a year. During this time, the line was particularly long and the staff was often under stress to do multiple tasks at once. As the clients bring in their proof of income and identification for recertification, staff at the front desk would fill out the application by hand for them. Then, they would verify the information with the documents provided by the clients. Next, they would issue the food and have the client sign the sheet. The whole manual sequence was a time-consuming and arduous process for both the staff and the clients.

After the re-certification in July, the application was filed in a cabinet. In the following months, when the clients came back to pick up food, staff would search and retrieve the application from the file cabinet and would have the clients check the information, sign and date it to affirm that they had picked up the food for the month. The application was then put back in the cabinet according to the alphabetical order. When next month came, the same process started all over again. Occasionally, the applications were misplaced; therefore, staff had to rewrite another application for clients. This created duplicate applications.

Conceptualizing the Need and Proposing a Possible Solution

From the data collected from the site visit and the interview with staff, students were able to apply the first step in system analysis. That was to understand the existing process, identify the bottlenecks, and engaged in the process of requirement analysis. As observed by students, one of the urgent needs was to deal with the manual process in which staff had to fill out the client's application, then store it in a cabinet, and retrieve it when clients come pick up their food. The identified need was essentially to build a database application to handle and process the client applications with the hope of overcoming some of the bottlenecks and issues that the staff encountered in the manual process.

They further understood that this system would be used by volunteers who come only once a month. One of the challenges was that most of the volunteers were retired individual and were not computer savvy. This means the system would have to be user-friendly, easy to learn, fairly simple to use, and relatively stable.

Students' Work on the Specification, Conceptual Design, Documentation, and Prototype

Students from the SAD class brought back with them samples of actual applications and some other related documents for study. They started using the artifacts collected and drawing on their field notes and observation from the site visit to put together the basic system specification. In the first semester, students were able to deliver the conceptual design of the database and the documentation of the process. In the second semester, students in the Database Management class began to develop the database prototype based on the conceptual design from the previous semester. Students applied their knowledge in Entity-Relationship diagram (ERD) to turn the

conceptual design into a prototype. Students chose Microsoft Access as their platform to develop a functional prototype. The prototype as being developed could perform basic tasks such as capturing the information using forms and displaying the information in forms and generating few simple reports. This first database prototype however was not ready to be used by the food pantry because it still lacked the functionalities and did not have the real data to work with.

Deliverables

After two semesters of work, students were able to develop the prototype and provide technical documentations for the database application design and development. This service learning project was no doubt a good learning opportunity for students. The work was definitely rooted in the context of the real world. Being able to apply what they learned in class and applied the knowledge to help a local non-profit organization was one of the major benefits in doing a service learning project. In this particular project, students in both classes were exposed to the real world setting. From such a setting, they identified a problem and proposed a solution. More impressive was that they were able to develop and deliver a functional prototype.

It was not an easy process because of the complex and messy nature in the real-world setting as well as the constraints in time, resources, and knowledge. Students did learn a great deal not only about the system analysis and the database design aspects but also about servicing a real need and giving back to the community. In this sense, our service learning provided what Furco (1996) described as a "balanced pedagogy". That is service learning helps students develop a sense of personal responsibility while serving the needs of a local community. In this respect, the benefits from our service learning project were in alignment with the literature. More importantly, the real world setting helps to expose students to the uncertainty and complexity of managing daily business operations that were difficult to experience from reading the textbook and listening to a lecture (Govekar and Meenakshi, 2007; Weis, 2000). Again, the observed benefits of service learning in our project appeared to connect to those identified in the literature. They include personal gains such as greater civic engagement, confidence, and student satisfaction, and increased academic performance as reflected by increased grade-point average, retention and degree completion rates, and the development of professional skills such as leadership, communications, critical thinking, and conflict resolution (Astin and Sax, 1998; Berson and Younkin, 1998; and Toncar et al., 2006).

Challenges Encountered

Although the prototype worked and it proved the concepts, it did not have all the features needed in order to be deployed in the actual operation at the local food pantry. To turn the prototype into a fully functional database, further work was needed. However, the complexity of such work was beyond the course level. Furthermore, the work required in the testing, implementation, and maintenance phases would be much more extensive than one semester database class could handle. Finally, the process of getting the real data into the database was a real challenge. It only took time but also had to deal with the legibility issue as well as privacy issues. Therefore, the constraints in time, knowledge, and resources make it difficult for students in a normal IS class to actually turn the prototype database application into an actual system to be used at the food pantry. As a result, we decided to end the service learning project after two semesters and initiated the 2nd phase of the project. Despite all the challenges, we recognized that this work opened up a unique opportunity for faculty to get involved and to make contribution.

Therefore, we decided to transition the project up from the service learning to an academic-community collaboration effort. That was the beginning of the 2nd phase of our journey.

2ND PHASE: THE ACADEMIC-COMMUNITY COLLABORATION EFFORT

Limitations in a Service Learning Project

As described earlier, the service learning project work laid the foundation for the development of the database at the local food pantry, but it needed substantial work in order for the database application to be deployed in the actual operation. To turn the prototype into a fully functional application would require much more intensive and advanced work. More specifically, knowledge of programming in Visual Basics was necessary to provide capabilities to the user interface. The incorporation of advanced features in forms and reports were needed so that they could deliver more functionality. More sophisticated queries had to be constructed in order to obtain needed information for the required reports. The actual database should also support multiuser. This would require the knowledge of server, SQL, as well as the understanding of client-server architecture. All of these knowledge and expertise were beyond the scope of our students in the IS classes. As a result, it was our turn to lead the effort and actually practice what we teach.

The Academic–Community Collaboration Effort

This idea of an academic-community collaboration project is inspired by the philosophical underpinning of community-engaged research that entails a collaborative partnership between academic researchers and the community (Ross, et al., 2010). Collaborations between academic researchers and community groups are not new. A wide range of research projects has been carried out based on such collaborations (Huynh, et al., 2012). Academic-community collaborations are becoming popular as evidenced in a number of publications in academic journals (e.g. Lennett and Colton, 1999; Viswanathan et al., 2004; Hillier and Koppisch, 2005; Peterson et al., 2006). All of the work was voluntary-based. Like students in a service learning project, the faculty members also wanted to give back to the community and to provide technical expertise to help a local community in need. We followed the strategy for academic-community collaboration as proposed in the paper entitled "Strategy for academic-community collaboration: Enabled and Supported by the Development of an Open-source web service" by Huynh, et al. (2012). This strategy was drawn from the two conceptual frameworks: the asset-based community development (Kretzmann and McKnight, 1997) and the value chain analysis (Porter and Millar, 1985). In the following section, we are going to share our experience in this academic-community collaboration project that involved a team consisted of faculty and selected students as well as staff at the local food pantry.

Motivated and guided by these conceptual frameworks, one of the faculty members took the leading role. He organized a small team of people who were willing to help and to learn. A few capable students were recruited to work closely with him. He became the main person to work with the local food pantry staff. At this point, the service learning project had essentially transitioned into an academic-community collaboration project. The project at this point was driven by the need of a local organization and was taken on and led by a faculty member to achieve the goal of bringing the database application into reality. Therefore, the main focus in

this 2nd phase was to redesign the prototype and develop it into a fully functional database application so that the database application could actually be used at the local food pantry.

Developing a Fully Functional Standalone Database Application

Based on the service learning project, we analyzed more in-depth on the requirements to make the database application deployable at the local food pantry. Here were what we came up with the requirements.

We needed to have an Add form that was structured similar to the paper form. This would be familiar to the staff so they could enter the data correctly.
We needed the ability to print the form so that staff does not need to use the pre-printed form. Our printed form had to include everything on the pre-printed form and should look closely similar to the pre-printed form.
We needed to provide a View form where the staff could retrieve an application and the display should have all the information required for verification.
We needed to allow the staff to update the client's information.
We needed to handle record duplication by building in the integrity rule and condition.
We needed ways to pull the data and create the reports for the local food pantry.

All of these required more advanced knowledge and skill in Microsoft Access. Furthermore, we needed to use more advanced features in form and report and learned about Visual Basic programming in order to do those requirements above. As a result, we were able to embed the Visual Basic codes inside our forms to handle the needed operations. We also created more complicated queries to pull data, aggregate them, and organize them into needed reports and extract information that the local food pantry need. At the end, we were able to deliver a fully functional database application.

More technical details on this development of the fully functional database application were presented in the appendix A and B of this paper. In the Appendix A, we displayed the following:

The ERD for the database that we used to create our tables in the database;
The Add form that we designed to add new client to our database;
The printed form that we generated based on the information in the database;
A sample of the distribution report that we used to allow clients to sign when they come to pick up their food;
A sample of the Visual Basic code that we embedded in the form to support the pantry's operation;
The advance queries that we designed to pull data and generate reports as required.

Transitioning from a standalone application to a multiuser client-server database application

In the previous section, we described the work involved in taking the prototype and turning it into a fully functional database application. Although it worked, the application was still limited because it was standalone. This meant the database could not be shared. Each of the PC would house its own database and application. Therefore, it was difficult to operate when there was more than one person to input data or process the clients' applications. This was a problem especially in July of each year when the pantry went through the process of re-certifying

its clients. With the standalone database application, each of the computers had its own database. Whatever was added and updated was stored in that specific database on a respective computer. At the end, we would have to merge all these different databases into one master database. This merging process was not simple to do. Therefore, we realized that we needed to have a multiuser database. It had to be in sync so that multiple users could use the database application concurrently. This need led us into the next step of turning the standalone database application into a multiuser client-server database application. This was much more challenging to do because we would have to bring in a server and set up a local area network.

Therefore, our project team set out to redesign/enhance/develop the standalone database application and turned it a multiuser application based on client-server architecture. In this process, we chose to set up our own network. Within this local network were a server, a wireless router, printers, and other laptops as shown in Figure 1. Since we were familiar with Ubuntu, we installed Ubuntu server operating system on a server laptop. Along with Ubuntu, we also installed mySQL, which is the database engine on the server. We also used phpmyadmin to manage the database and the tables. In the set up, we had to modify our tables on Microsoft Access accordingly so that they were compatible when we imported them into mySQL on the server. Figure 1 depicts the setup of the multiuser environment at the local food pantry.

Figure 1
THE SET UP OF THE CLIENT SERVER DATABASE SYSTEM AT THE FOOD PANTRY

Setting up the Open Database Connectivity on the Client PCs

Once, we had all the tables in the database on the server. The next thing we did was to modify the Access database on the client laptops. We downloaded the ODBC (Open Database Connectivity) driver on each of the laptops and set up the ODBC to connect to the database on the server. Once, the ODBC connection was established, we ran the Microsoft database application and linked to the tables on the server. All the tables were no longer local but actually were linked to those tables on the server. Since the tables were on the server, they were supported in a multiuser environment. This meant multiple users could access the tables, manipulate, update, and operate at the same time. This greatly enhanced the operation of the database application. Highlights on the multiuser set up were presented in the Appendix B. There, we displayed the basic set up of a multiuser client-server database application. Appendix B includes the screen captures of the following:

Set up ODBC (Open Database Connectivity) on a client PC;
Add system DSN and configure it;
Connect from MS Access to database on a server via ODBC;
Set Machine Data Source and select a database.

Current Implementation and Usage of the Database Application

At the presence, we are still using the system. In particular, during July, when the local food pantry is set up to recertify its clients, we would come in and set up four laptop stations to handle four clients separately but concurrently. If the client is an existing client, then all we need to do is to pull their record up from the database, update the information, and print out the application. If the client is the first-time applicant, then we would enter his/her information into the database and print out the application. Over the years, most of the clients were already in the database; hence, the recertification process has gone very smoothly with the use of the multiuser database application. It has been a big relief because gone are the line that extended outside of the distribution site, the long wait that the clients had to go through, and the stress that the staff had to face in the manual re-qualifying process.

For months other than July, we set up two laptops with the database applications. One is used for entering new client information and the other is for viewing and printing existing clients. At the end of the month, we would come on site and gather these databases and merge them for use in the next month. We also run reports for the local food pantry and generate the list of households for sign in. Prior to the computer database, each client had to write his/her household information including name, gender, number of people in the household, and sign. Now, we provide the list and the client just looks for his/her name in alphabetical order and then sign at the designated space next to their name. The process is much more efficient. At the end of the month, the office manager also uses the information on the list to tabulate how many people had been served breaking down by gender, race, age, etc.

DISCUSSION

Although teaching the technical skills required of Information Systems (IS) graduates is a straightforward process, it is far more difficult to prepare students in a normal classroom environment for the challenges after they graduate and start working in a real world context (Hall and Johnson, 2012). This is the reason for us to launch the multi-semester project for our students to work on. As described, the project was based on a real need of the local food pantry. Students had worked closely with the pantry. They also had to learn the techniques and methodologies needed to do the project. The emphasis was placed on the application of these concepts learned in meeting the need of the local food pantry. As a result, students had to follow systematically the steps involved from doing the analysis to design and development of a prototype. When the service needed and the course content could be matched, service learning is appropriate because service performed was a direct application of content and skills learned in the classroom as shown in this case.

At the end of the two semesters, students were able to finish their required work. However, while their finished work satisfied the course requirements, it could not fully function to support the actual operation at the food pantry. The project could have been stopped at this point, but it did not in this case. A faculty saw this as an opportunity to make contribution and give back to the community. The faculty led the initiative and had turned the service learning

project into an academic-community collaboration effort. The goal was to further develop the prototype into a fully functional database application for a local food pantry to use. In the paper, we have recounted the details of the journey from our first response to the need of a local community organization to the initiating and launching of a service learning project and eventually to the undertaking of the development and implementation of a fully functional database for use. From our account, we hope to encourage more educators to take on the opportunities such as service learning projects and academic-community collaboration work. Although they require time, effort, and extra work, they are meaningful to everyone who involve. We have learned much from this journey and would like to offer our reflection on what all these mean to us.

CONCLUSION

Technology constantly advances at an amazing rate. As new technology emerges, it also brings upon new capabilities. This is particularly evident in the area of information technology (IT). As we all have seen, the landscape of computer has moved from PC to laptop, to netbook, then tablets, smartphone, and now wearable gadgets in a relatively short span of time. The good news is that despite all these changes, technology nowadays is becoming smaller, faster, more prevalent and powerful, but most importantly it is much more affordable to everyday users. As we look around, it is hard not to notice that advance in IT has been the key driver for so many changes in our life and at work. This is why in a typical IS class; we tend to focus much attention on the newest and latest technology and its impacts. We would spend time to study and analyze cases where trends such as cloud computing, mobile platform, virtualization, artificial intelligence, and social media technology help shape our businesses. We try to demonstrate the power of IT by showing our students how systems like transaction processing systems (TPS), management information systems (MIS), decision support systems (DSS), and even executive information systems (ESS) have been used by successful businesses such as Walmart, Bank of America, GM, etc. Ironically, we tend to neglect those who are not at the bleeding edge. The question that we should ask ourselves is "What about those small local non-profit organizations?" These organizations are often underfunded and neglected in terms of using technology. In the context of the digital divide, these organizations represent the ones being left behind the technology trend.

Looking at the technology from the digital divide perspective helps us to become more balanced and sensitive to needs of those have-nots. Indeed, there are many of such have-not organizations like the local food pantry in this paper who are in desperate need of assistance. They provide real services to the needy in the community, but at the same time they also need a lot of help. There are many ways to map and match the resources in the community to the local needs. Service learning projects and academic-community collaboration effort are two of the examples where the local resources can be mapped and matched with the needs in a local community. More importantly, these works are now counted and valued as indicated in the guideline and expectation set forward by the accreditation bodies such as AACSB and SACS .

In recent years, both AACSB and SACS have emphasized on relevance and impact in higher education. A journey from a service learning project to an academic community collaboration effort such as the one described here is based on real world setting. It involves experiential learning in which students as well as faculties have opportunities to learn, apply, and practice in a setting authentic to their discipline. Such an initiative could offer a practical approach to address and meet the requirements for relevance and impact as recommended by the

higher education accreditation bodies. Moreover, it could serve as an effective pedagogical approach that connects academic course work with real-world experiences. Series of extensive activities could be designed and integrated so that students could see the relevance in their learning and apply their knowledge appropriately in an authentic setting, and at the same time make a positive impact on a community.

REFLECTION

It is such a refreshing experience and a great opportunity for students, faculty, as well as a local organization to engage in a carefully match up service learning projects and academic-community collaboration work. As described in this paper, this is one of the most rewarding and meaningful ways for those participants to demonstrate the power and relevance of IT in a classroom setting and at the same time to meet a real need of a local community. First of all, for students, they learned about the system analysis and design. They understood the concepts in database design and development. The service learning project provided a real world context in which they had the opportunity to apply their knowledge and skills. This connection is crucial in bringing the real world relevance to the classroom learning. Secondly, the faculty members were able to teach their subject in a meaningful way. They not only taught just IT related concepts but also exposed their students to the real world needs and gave them the opportunity to give back to the community. Going beyond the service learning project, the faculty member himself engaged in a more advanced level through the academic-community collaboration. He took on the role of a practitioner as he played the leading role in the collaboration effort. The work made real contribution and created positive impacts in the community. Such academic-community collaboration was equivalent to a professional development where he could learn new skills, apply his expertise, share his knowledge with students, and contribute his work to the needs of a community. The experience helped enriching classroom teaching and stimulate student learning. At the same time, the faculty was also practicing what he teaches. He was in their field where he could actually help solving a problem or meeting a need of a local community. Essentially, it was a unique opportunity for him to serve and to give back to the community. Although this required time and commitment, at the end, the reward was a feeling of accomplishment for doing something valuable, meaningful, and making a positive impact on a local community. Finally, for the local community such as the food pantry in this case, they had their needs met. As a result of the collaboration with students and faculty member, they received a fully functional database application. Their work could be done much more efficient and accurate with the computer-based system. At the end, they could focus more on fulfilling their mission -- That is "to alleviate hunger for the people and families that it serves throughout the local Parish". Indeed, this initiative created a win-win situation for all who had involved in the work.

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APPENDIX A

The following figures provide the core elements in the database application including: the Entity-Relationship Diagram, the interface of the input form, samples of the application and report, examples of codes and queries.

Figure A1

ENTITY-RELATIONSHIP DIAGRAM FOR THE LOCAL FOOD PANTRY DATABASE

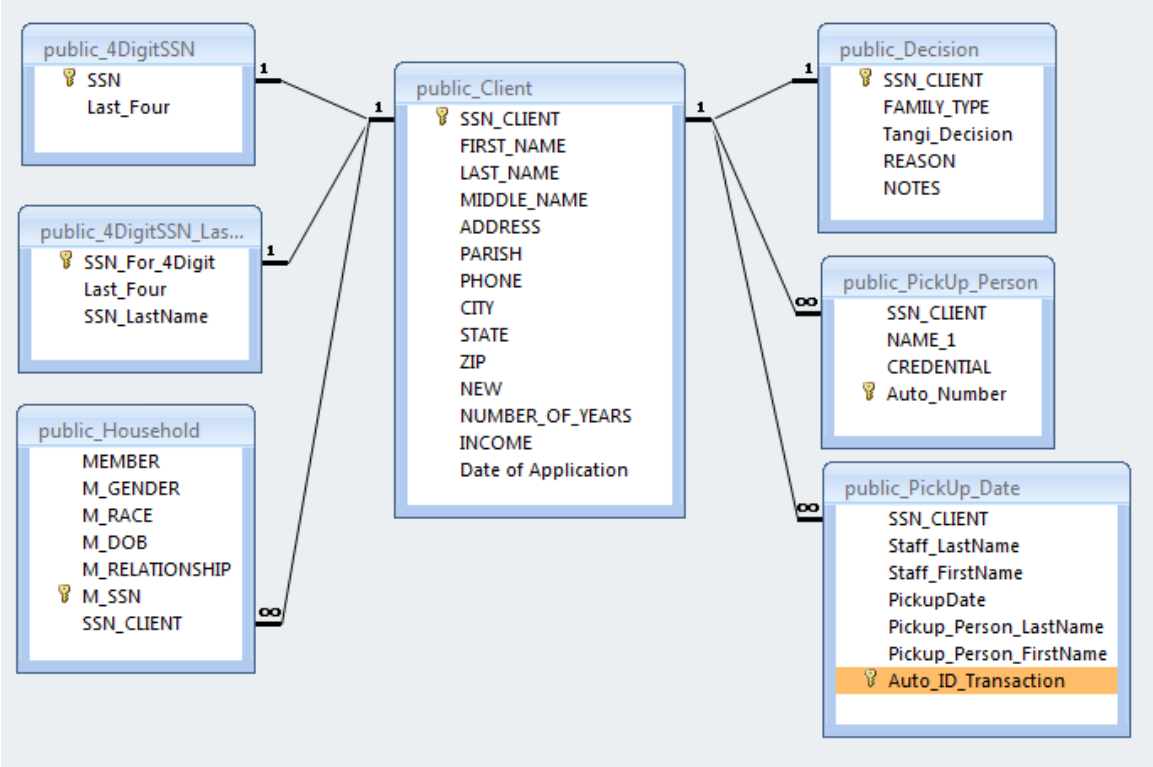


Figure A2

THE INTERFACE OF THE INPUT FORM

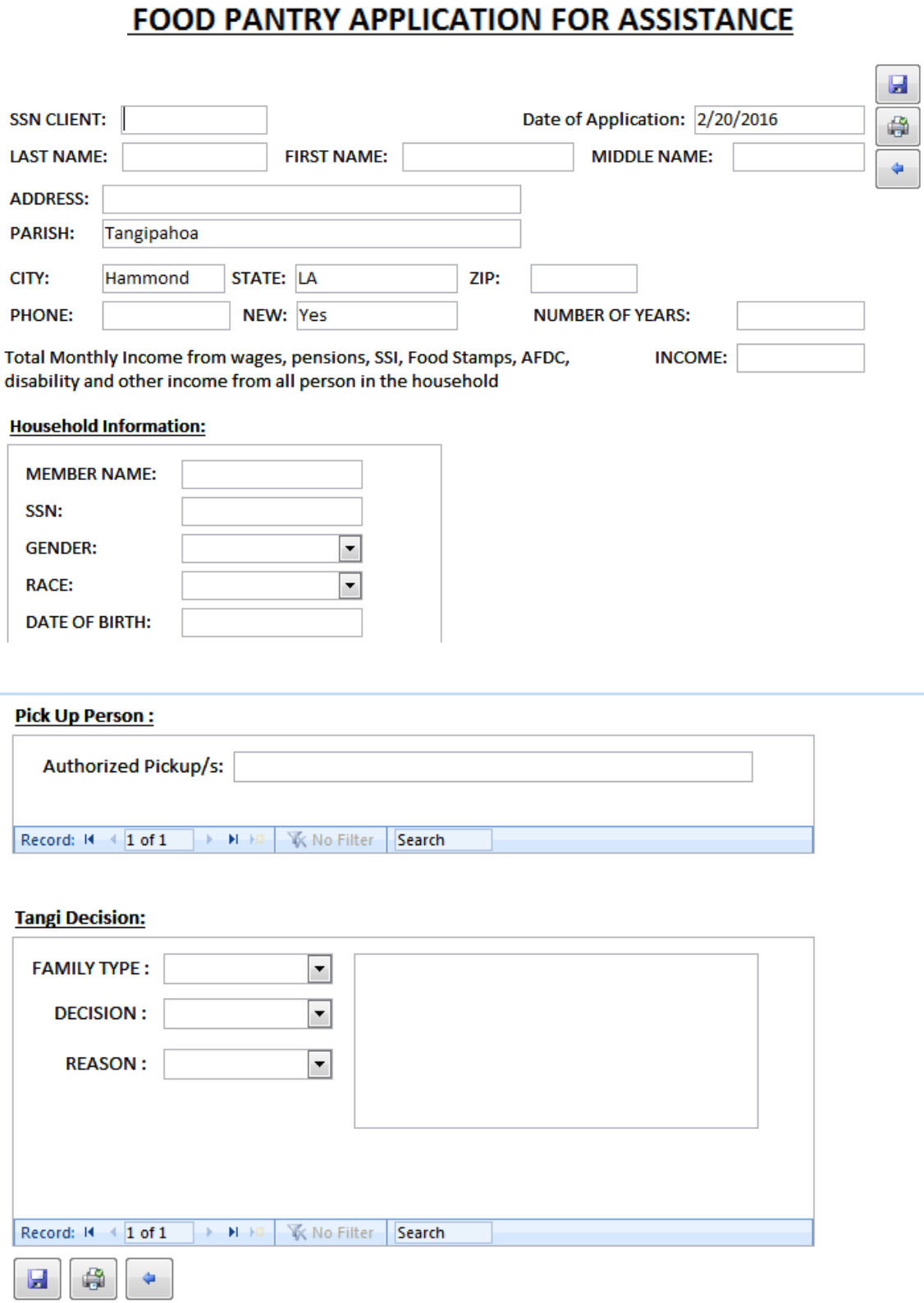


Figure A3

A PRINT-OUT SAMPLE OF THE APPLICATION

FOOD PANTRY APPLICATION FOR ASSISTANCE

LAST NAME McDonald FIRST NAME Mike NEW Yes # YRS 0

ADDRESS 79 Old McDonald Rd ADDRESS VERIFIED BY TFP

CITY Springfield STATE LA ZIP 70466 _____Date:____

PARISH Tangipahoa PHONE 222-555-5555

SSN 000-00-1111

Total Monthly Income from wages, pensions, SSI, Food Stamps, AFDC, disability and other income from all persons in the household $

Household Information

NAME	RELATIONSHIP	M/F	RACE*	DOB	SSN
Mike McDonald	Self	M	C	01/01/1981	000-00-1111

Figure A4

A SAMPLE OF A REPORT

Food Pantry
LA

Department of Agricuture and Forestry
Food Distribution List
Second Havest Food Bank

Feb 2016

LAST_NAME	FIRST_NAME	ADDRESS	PARISH	NEW	TotalHH	F	M	M_RACE	Adult	Children	Senior	Signature Of Application	Today's Date
[redacted]	[redacted]		Tangipahoa	Yes	1		1	C	1				
[redacted]	Sharron	13(Quick Blvd apt 1C	Tangipahoa	Yes	1	1		C			1		
[redacted]	Earice	15! W. Club Deluxe	Tangipahoa	No	1			AA	1				

Figure A5

EXAMPLE OF VISUAL BASIC CODES

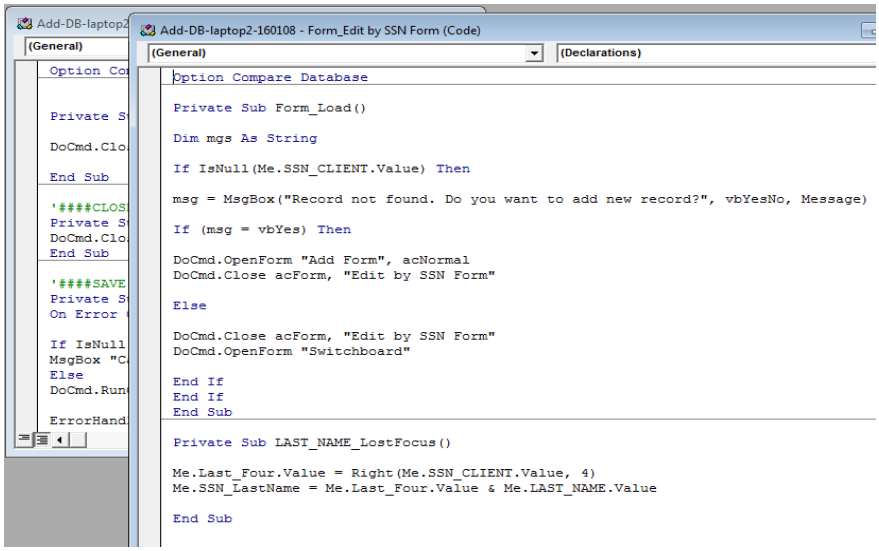
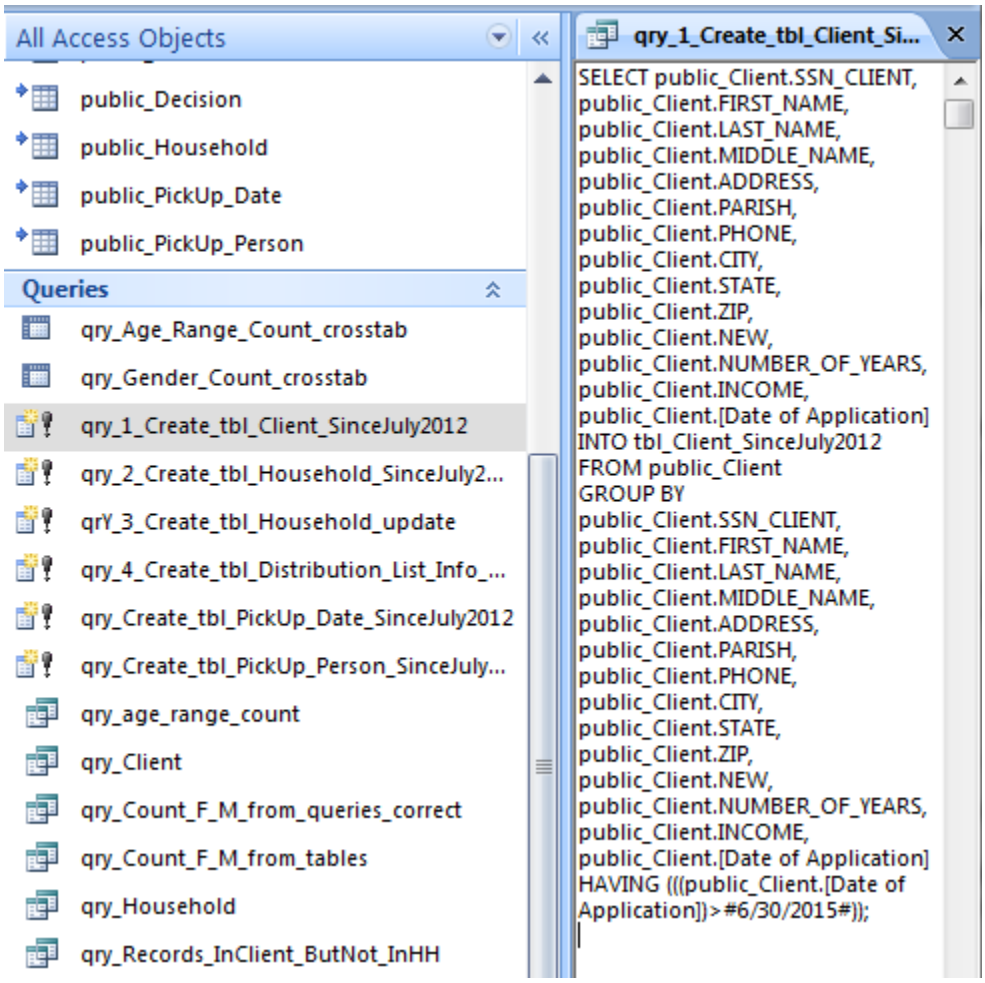


Figure A6

EXAMPLE OF QUERIES

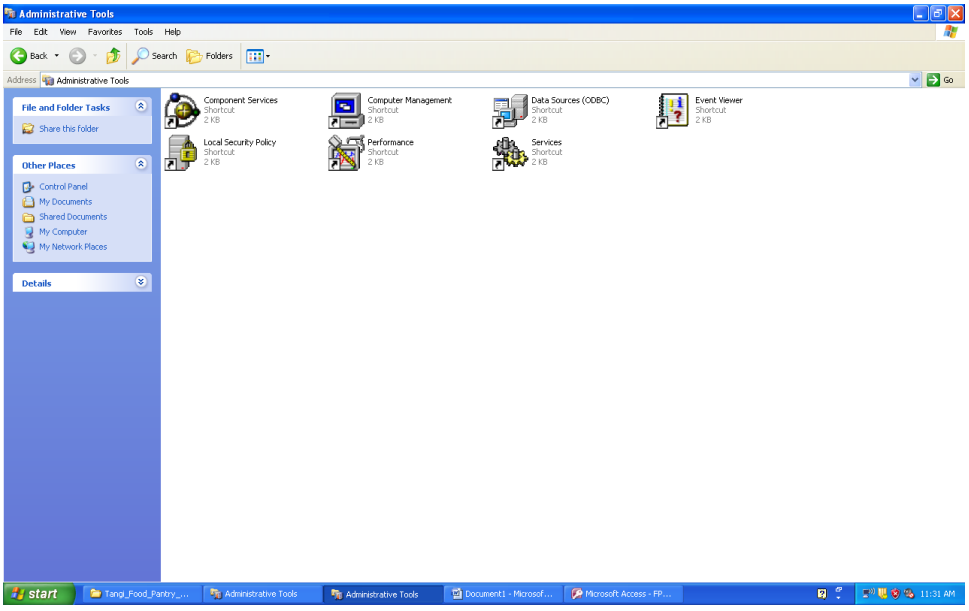


APPENDIX B

The following figures illustrate how to set up the ODBC to allow connection from Microsoft Access to the database on the server.

Figure B1

SET UP ODBC ON THE CLIENT PC



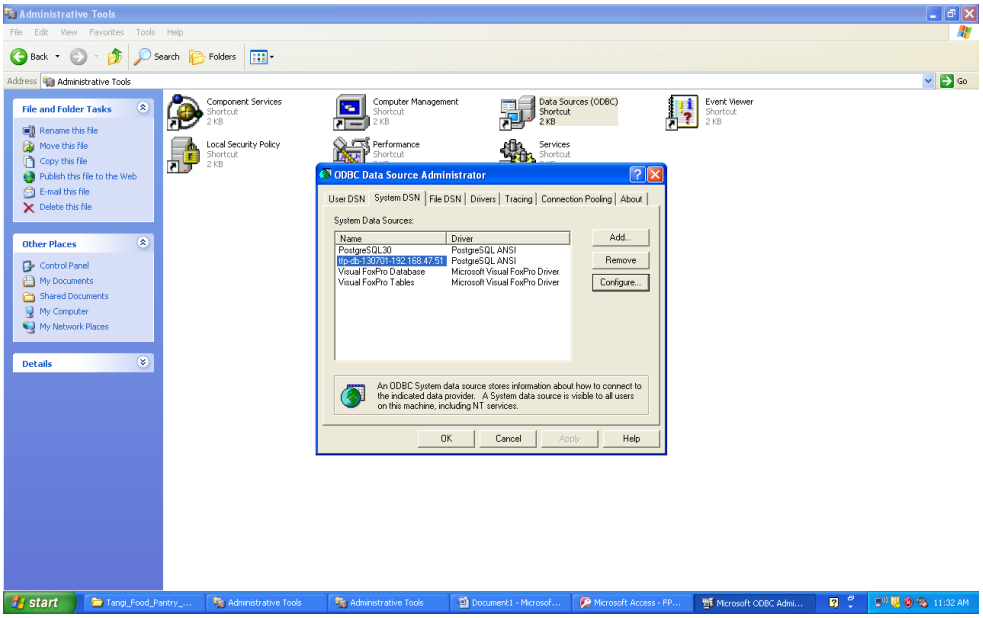


Figure B2
ADD SYSTEM DSN AND CONFIGURE IT

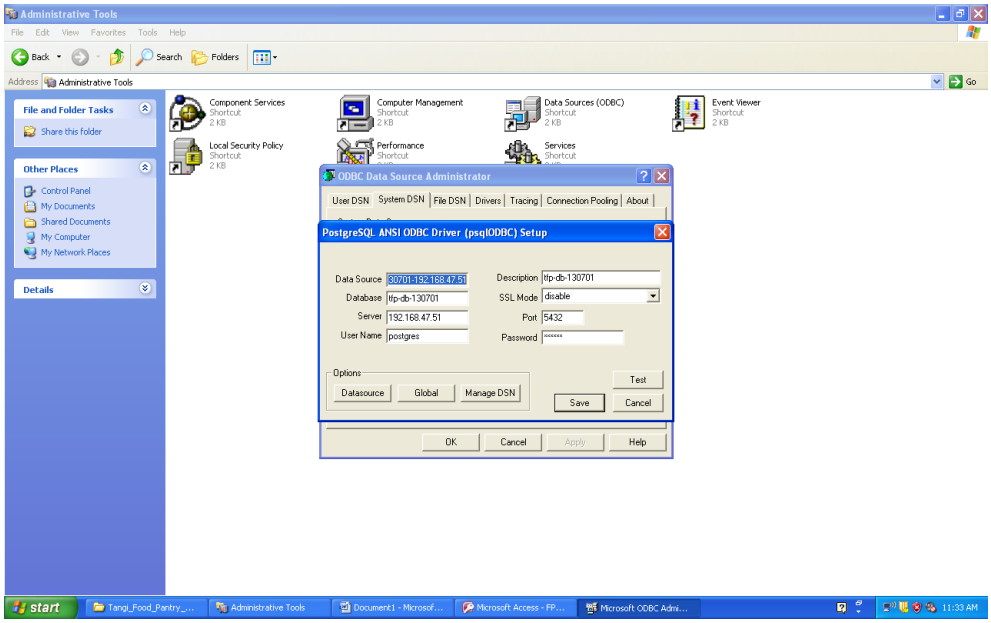
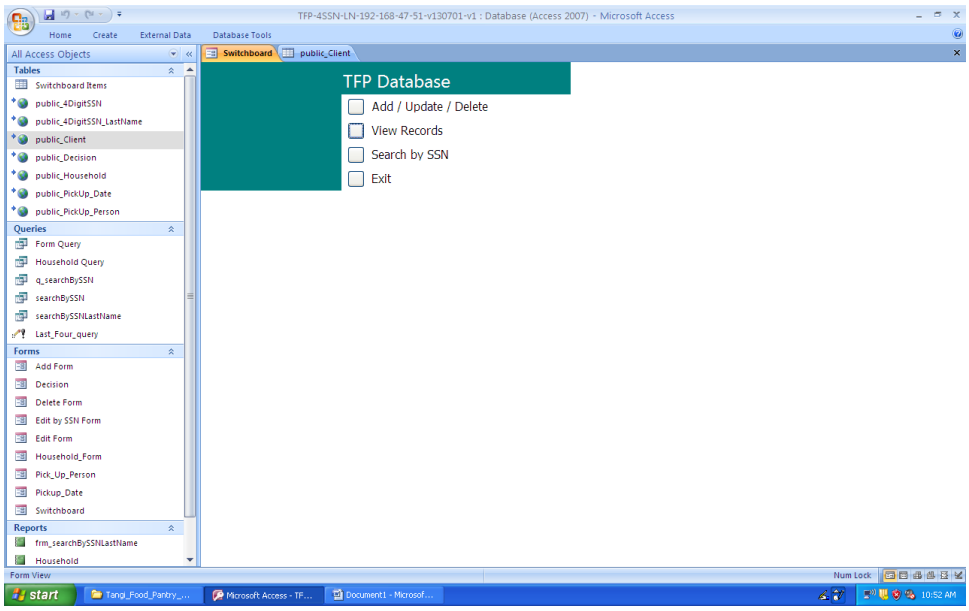
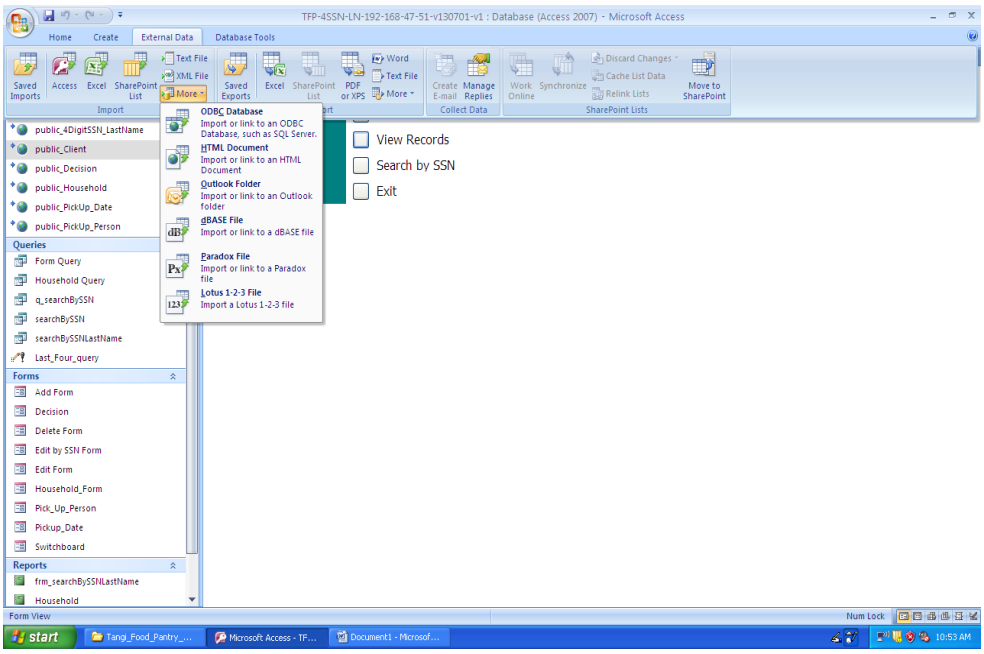


Figure B3
CONNECT FROM MS ACCESS TO DATABASE ON THE SERVER VIA ODBC




TFP-4SSN-LN-192-168-47-51-v130701-v1 : Database (Access 2007) - Microsoft Access
Home
Create
External Data
Database Tools
ODBC Database
Import or link to an ODBC Database, such as SQL Server.
HTML Document
Import or link to an HTML Document
Outlook Folder
Import or link to an Outlook folder
dBASE File
Import or link to a dBASE file
Paradox File
Import or link to a Paradox file
Lotus 1-2-3 File
Import a Lotus 1-2-3 file
View Records
Search by SSN
Exit
Form View
Num Lock
start
10:53 AM

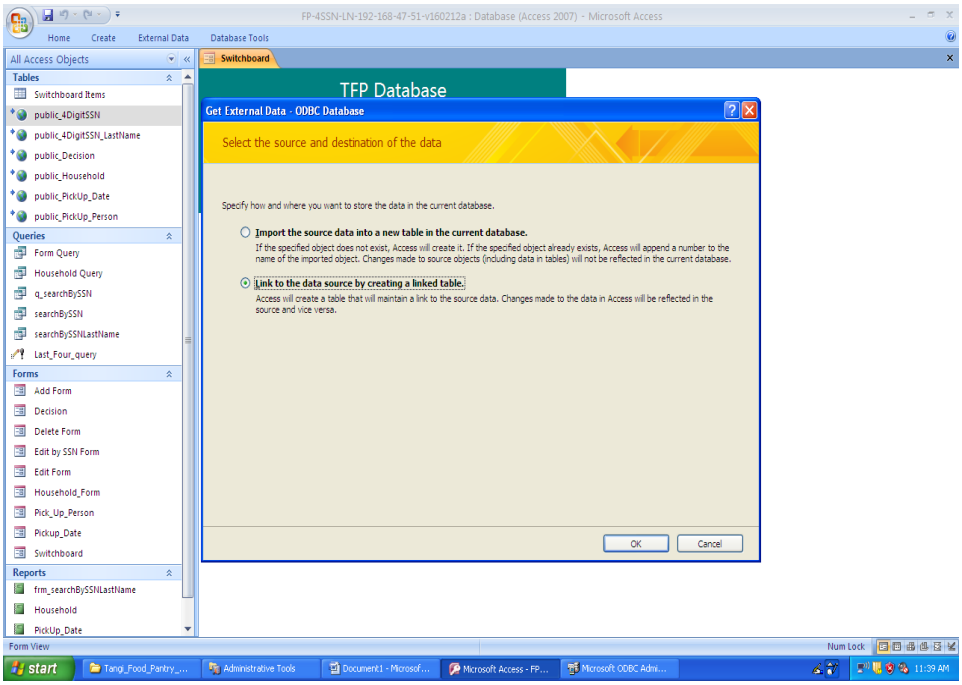

FP-4SSN-LN-192-168-47-51-v160212a : Database (Access 2007) - Microsoft Access
Home
Create
External Data
Database Tools
All Access Objects
Switchboard
TFP Database
Get External Data - ODBC Database
Select the source and destination of the data
Specify how and where you want to store the data in the current database.
Import the source data into a new table in the current database.
If the specified object does not exist, Access will create it. If the specified object already exists, Access will append a number to the name of the imported object. Changes made to source objects (including data in tables) will not be reflected in the current database.
Link to the data source by creating a linked table.
Access will create a table that will maintain a link to the source data. Changes made to the data in Access will be reflected in the source and vice versa.
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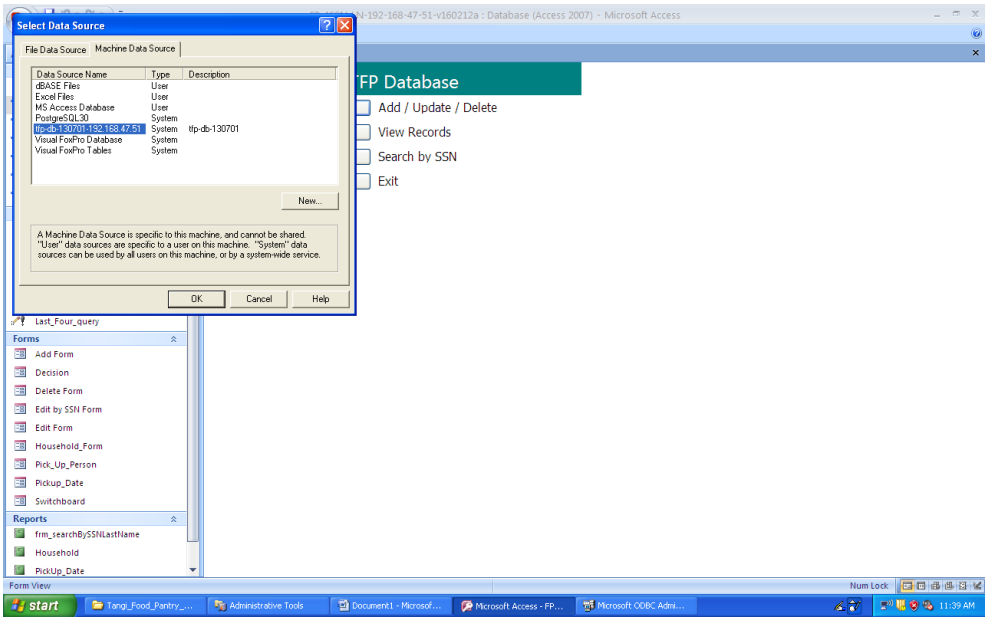
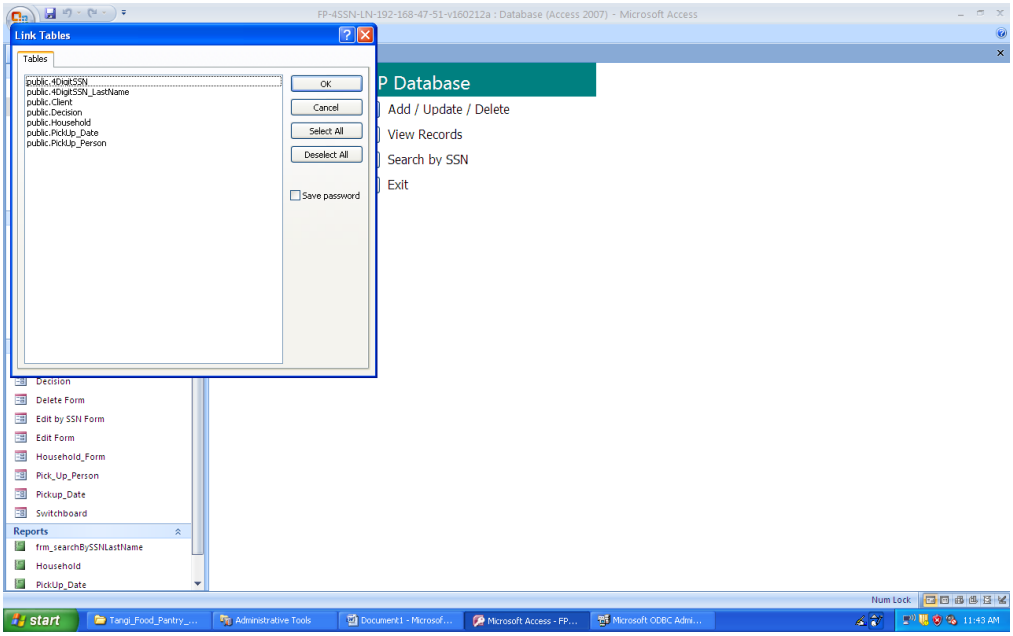
Figure B4
TAB MACHINE DATA SOURCE AND SELECT THE DATABASE





DOES TRANSFORMATION LEADERSHIP PROMOTE INNOVATION PRACTICES IN E-COMMERCE?

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ABSTRACT

Organizations face many challenges in today's dynamic business environment (Gumusluoglu & Ilsev, 2009). Rapid technological changes, shortened product life cycles and globalization have made it necessary for organizations to be more creative and innovative to survive, compete, grow and lead (Gumusluoglu & Ilsev, 2009). Therefore, innovation is a key factor in organizations' ability to create a sustainable competitive advantage as well as for the success of strong economies in the 21st century (Eisenbeiss, Boerner & Knippenberg, 2008). Evidently, it has been suggested that leadership is among the most important factors affecting innovation (Gumusluoglu & Ilsev, 2009). A number of studies have shown that transformational leadership positively influences organizational innovation (Gumusluoglu & Ilsev, 2009). However, limited studies have discussed how other leadership styles such as transactional and laissez-faire leadership may be utilized and may be more beneficial for organizations to adapt for innovative practices. Without such initiatives, companies could fall into product dormancy and loss of market share.

INTRODUCTION

This paper will critically assess the three leadership styles and determine if transformational leadership does indeed promote innovation practices or if other leadership styles such as transactional leaders or laissez faire leaders would be more beneficial for organizations to implement, for future success in innovation. In the following sections, a critical assessment of both transformational and transactional leadership, as well as laissez faire leadership will be conducted. The last section will determine which style would be more appropriate for organizations to adapt and whether transformational leadership is a better fit for innovation.

CRITICAL REVIEW: TRANSFORMATIONAL LEADERSHIP ON ORGANIZATIONAL INNOVATION

Transformational leadership defined by Gumusluoglu & Ilsev (2009) are leaders who "transform followers" personal values and self-concepts, move them to higher levels of needs and aspirations and raise the performance expectations of their followers." This leadership style has four main components: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass, Jung, Avolio & Berson, 2003). Tichy & Devanna (1990) highlight the transforming effect these leaders can have on organizations as well as on individuals. By defining the need for change, creating new visions and mobilizing commitment to these visions, leaders can ultimately transform the organization (Ticky & Devanna, 1990). Gumusluoglu & Ilsev (2009) further state that transformational leadership is an important determinant of organizational innovation and should be implemented by managers to promote

strong innovation practices in organizations. Those in favor of transformational leadership in organizations argue that these types of leaders effectively increase commitment from employees and elevate higher level needs such as self-actualization and self-esteem (Bass, 1990). As a result, employees are highly motivated, which can be an important driver of both employee creativity and firm innovation (Gumusluoglu & Ilsev, 2009). Essentially, transformational leaders encourage their employees to identify new approaches to problem solving as well as looking at old problems in new ways (Gumusluoglu & Ilsev, 2009). Under these positive environments, employees are more likely to be engaged in innovative ideas (Oke, Munshi, & Walumbwa, 2009). Overall, researchers tend to agree on the role of transformational leadership of top management in enhancing quality management (Berson & Linton, 2005). However, there is little agreement regarding the role of transformational leadership at lower levels of the organization (Berson & Linton, 2005). For example, Dean and Bowen (1994) suggest that quality management practices could be seen as substitutes to leadership. In other words, instituting effective quality management practices diminishes the need for transformational leadership at lower levels of a firm (Sousa and Voss, 2002).

TRANSACTIONAL LEADERSHIP ON ORGANIZATION INNOVATION

Transactional leadership is the style of leadership that is most often seen in businesses and organizations today (Humphreys, 2001). Transactional leadership is usually characterized by the factors of "contingent reward and management-by-exception" (Bass, 1990). The key to transactional leadership is the exchange between the leader and the follower (Humphreys, 2001). They influence each other in ways that both receive something of value. They are said to be mutually dependent upon one another (Humphreys, 2001). Transactional leadership theories are all founded on the idea that leader-follower relations are based on a series of exchanges or implicit bargains between leaders and followers (Hartog, Muijen & Koopman, 1997).

Oke et al. 2009 suggest that "transactional leaders are likely to contribute to innovative processes and activities by clarifying what performance standards are required and how needs would be satisfied." Essentially, transactional leaders contribute to the innovation process by encouraging people to perform in a desired way by motivating them through rewards and punishment (Gumusluoglu & Ilsev, 2009). The transactional leader has clear performance expectations, goals, and paths that link achievement of the goals to rewards (Hartog et al, 1997).

However, Bass et. al (2003) & Humphreys (2001) also discuss how a transactional leader can have a negative impact on organizational innovation if they are constant reprimanding or disapproving of actions taken by employees. Contingent reprimand has a negative impact on employee performance, meaning they are less likely to want to achieve the desired result by its leaders. (Bass et. Al, 2003, Humphreys, 2001.)

LAISSEZ-FAIRE LEADERSHIP ON ORGANIZATIONAL INNOVATION

Both transformational and transactional leaders are active leaders. They actively intervene and try to prevent problems. When researching these two active forms of leadership, they are often contrasted with extremely passive laissez-faire leadership (Hartog et al, 1997). Laissez faire leadership describes passive leaders who are reluctant to influence subordinates or give direction (Deluga, 1990). They generally refrain from participating in-group or individual decision-making and to a large extent, abdicate their leadership role (Deluga, 1990). Subordinates are given considerable freedom of action and, therefore, seem likely to maximize

their power and influence (Gumusluoglu & Ilsev, 2009). This is a leader who is "relatively inattentive, indifferent, frequently absent, and un-influential" (Gumusluoglu & Ilsev, 2009). As stated by Hartog et al, (1997) laissez-faire leadership is an inappropriate way to lead. However, Hartog et al, (1997) also states, "one could probably define situations in which highly active leadership is not necessary and may not even be desirable." For instance, in their substitutes for leadership theory Kerr & Jermier (1978) propose several subordinate, task, and, organization characteristics that could reduce the importance of leadership (Hartog et al, 1997). A less active role of leaders could also lead to 'empowerment' of followers (Hartog et al, 2007). However, in the long run this type of leadership would not be beneficial. Thus, this leadership style is ineffective in organizations that are wanting to be innovative in their ideas and approaches. In addition, laissez-faire leadership has shown strong negative relationships with various leadership criteria (Hinkin & Schriesheim, 2008).

TRANSFORMATIONAL, TRANSACTIONAL, LAISSEZ-FAIRE LEADERSHIP: WHAT LEADERSHIP STYLE WORKS?

Although transformational and transactional leadership are distinct leadership styles, contrasting transactional and transformational leadership does not imply that the models are unrelated (Hartog et al, 1997). Burns (1978) thought of the two types of leadership as being at opposite ends of a continuum (Hartog et al, 1997). Bass (1985) however viewed them as separate dimensions, this means a leader can be both transactional and transformational (Hartog et al, 1997). In fact, both are necessary for organizational performance, and the best leaders are both transformational and transactional (Oke et. al 2009). However as both work in different ways to motivate employees, and neither are substitutable, Bass et al (2003) suggest that transformational leadership is more likely to reflect social values and to emerge in times of distress and change while transactional leadership are more likely to be observed in a well-ordered society.

Hartog et al. (1997) states that while transactional leadership motivates subordinates to perform as expected, the transformational leader typically inspires followers to do more than originally expected (Hartog et al, 1997). Bass (1990) further argues that the leadership continuum ranges from complete non-leadership, which he believes to be laissez-faire at one extreme end to the very active leader, which he views as transformational leadership. Other transformational leadership theorists (e.g., Burns, 1978; Bass, 1985; Bass and Avolio, 1994) have argued the same, stating that leadership styles can be placed on a continuum in terms of leader pro-activity and effectiveness (Berson & Linton, 2005). At the bottom end of this continuum or range is laissez-faire leadership (Berson & Linton, 2005). In the middle range is transactional leadership behavior and at the top is transformational (Berson & Linton, 2005). This range implies that transformational leadership is more proactive and ultimately more effective than transactional and laissez faire leadership in terms of motivating followers to achieve higher performance (Berson & Linton, 2005).

Organizational innovation in Gumusluoglu & Ilsev (2009) study is defined as the "tendency of the organization to develop new or improved products and services and its success in bringing those products and services to the market." Therefore, leaders must display attributes that promote innovation and innovation practices in order to be both successful in product development and marketing. Overall, transactional leaders tend to get results by thinking more about specific goals, work skills, work assignments and various reward relationships and offering reward relationships to employees (Oke et. al 2009). Alternatively, transformational leaders

place greater emphasis upon intellectual capability and creativity by providing the emotional support that encourages employees to excel (Oke et. al 2009).

Furthermore, Oke et al. (2009) suggest that the "transactional form of leadership, through its focus on management, clear structures, formal systems, reward and discipline is likely to be more effective in the implementation stage of innovation than transformational leadership." Transformational leadership style is more appropriate to foster the creative innovation process than the transactional leadership style, since the creative endeavor requires risk-taking, experimentation, change and challenges to the status quo (Oke et al, 2009).

In regards to laissez-faire leadership, subordinates compete for the power and influence abdicated by the laissez faire leader, meaning there is a lack of leadership, resentment, intense competition and manipulation between employees and management, which in turn does not foster innovation practices or growth, especially for organizations in today's technology driven work environment (Deluga, 1990). Therefore, organizations that want to be successful in innovation implementation must consider alternate leadership styles such as transformational leadership to have a positive influence and strong impact on organizational innovation (Gumusluoglu & Ilsev, 2009).

IS TRANSFORMATIONLAL LEADERSHIP A BETTER FIT FOR INNOVATION?

Humphreys (2001), states that there is little question that advancing technologies will impact the traditional view of leadership and that emerging technologies will have greater implications on effective leadership behaviors and leadership paradigms. Therefore, it makes sense that organizations should implement transformational leaders, as they promote innovation practices and utilize the most appropriate leadership qualities for this day and age; where continual change is driven by escalating technological advancement (Humphreys, 2001). Furthermore, Bass (1990) indicates that transformational leadership can lead to substantial organizational rewards. Transformational leadership has also been positively correlated to leader effectiveness ratings, leader and follower satisfaction, follower efforts, and overall organizational performance (Humphreys, 2008).

Transformational leadership is evidently the better leadership style that enhances innovation within an organization. Using charisma, transformational leaders instill admiration, respect, and loyalty and emphasize a sense of mission (Gumusluoglu & Ilsev, 2009). They also build a one-to-one relationship with his or her followers and understand their individual needs, skills and aspirations (Gumusluoglu & Ilsev, 2009). Thus, transformational leaders meet the emotional needs of each employee (Bass, 1990). By inspirational motivation, the leader articulates an exciting vision of the future, shows the followers the ways to achieve the goals, and expresses his or her belief that they can do it (Gumusluoglu & Ilsev, 2009). In addition to its effect on the tendency of organizations to innovate, transformational leadership also has a positive impact on the market success of the innovations (Gumusluoglu & Ilsev, 2009). By articulating a strong vision of innovation and displaying a sense of power and confidence, this leader will strive to ensure the market success of the innovation (Gumusluoglu & Ilsev, 2009) Furthermore, in addition to the internal roles, transformational leadership has been suggested to be effective in playing external roles such as boundary spanning, entrepreneuring and championing, which might be important both for understanding the needs of the market and marketing the innovation successfully (Gumusluoglu & Ilsev, 2009).

CONCLUSION

To remain competitive in today's rapidly changing work environment, organizations must continually develop leaders who will support innovation and emerging technology (Humphreys, 2001). Transformational leaders promote higher performance in organizational units that are open to change and are flexible, in other words, in an innovative climate (Gumusluoglu & Ilsev, 2009). Therefore, transformational leadership is ideal in organizations that want to innovate successfully. Transformational leaders do not settle for current states but articulate an appealing and challenging future vision (Eisenbeiss et al, 2008). Transformational leaders also display unconventional and creative behavior and serve as role models for innovation (Eisenbeiss et al, 2008). Overall, transactional and laissez-faire leadership do not articulate the qualities needed for a good leader in innovative organizations. Although a transactional leader may be useful in the implementation stage of innovation, it is apparent that the transformational leader's style is more catered to that of innovation. Additionally, for organizations to be successful in their innovation practices, strong and dedicated leadership is key, therefore laissez faire leadership would not be acceptable in innovative organizations. Transformational leaders promote innovative practices and are essential in organizational innovation (Gumusluoglu & Ilsev, 2009). Therefore, the presence of transformational leaders will strongly assist in an organizations ability to successfully innovate in today's changing business environment.

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IMPLIED VERSUS REALIZED VOLATILITY OF S&P 500: EFFECTS OF STOCK MARKET FACTORS

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ABSTRACT

This study analyzes the ability of the implied volatility index (VIX) to incorporate available contemporary stock market information, which is relevant for the volatility forecasts. Employing a number of market factors positively correlated with actual future market volatility, namely, historical (past) market volatility, general stock market trading volume and significant stock market returns, it documents that VIX is positively correlated with them, but on the other hand, does not manage to account for them fully and immediately, or in other words, under-reacts to relevant market information. One of the possible explanations for this finding may be that investors' tend to be "anchored" towards (or over-affected by) the recent implied volatility measures, causing VIX to be relatively sticky and relatively less affected by relevant market factors, compared to the realized future volatility.

Keywords*: Anchoring; Historical Volatility; Implied Volatility; Under-Reaction; Volatility Forecasts; VIX.*

JEL Classification Codes: D80, D84, G12, G14, G17.

INTRODUCTION

Volatility is a fundamental characteristic of financial markets. Although a derived number, describing the propensity of prices to fluctuate, it plays an important role in options pricing and in any simple characterization of market dynamics. Therefore, much effort has been invested in forecasting stock market volatility. The two sources of information most widely employed in future volatility forecasts are the historical (realized) volatility measures and implied volatility measures.

The most commonly used measure of implied volatility is the Volatility Index (VIX) introduced by Whaley (1993) and launched by the Chicago Board Options Exchange (CBOE) in 1993. VIX is based on the prices of S&P 500 index options, providing thereby a benchmark for the expected future market volatility over the next month. The index is calculated in real-time and is continuously disseminated throughout each trading day. VIX is widely followed and has been cited in hundreds of news articles in leading financial publications. Since VIX represents an implied measure of expected future volatility, it has been labeled the investors' 'fear gauge' (see Whaley, 2000; 2008). According to this interpretation, though there are other factors affecting this index, in most cases, high VIX reflects increased investors' fear and low VIX suggests complacency. Whaley (2008) documents negative correlation between daily S&P 500 index returns and VIX changes, and interprets it as indicating that changes in the VIX are partially driven by investors demanding portfolio insurance in times of high current market volatility.

The previous financial literature tends to conclude that implied volatility measures tend to outperform realized volatility measures in forecasting future volatility. Latane and Rendleman (1976), Chiras and Manaster (1978), and Beckers (1981) provide early assessments of implied volatility forecast quality. They find that implied volatilities offer better estimates of future

return volatility than ex-post standard deviations calculated from historical returns data. More recently, Jorion (1995) finds that implied volatilities from currency options outperform volatility forecasts from historical price data. Christensen and Prabhala (1998), Christensen and Strunk-Hansen (2002), and Fleming (1998) find that implied volatility forecasts dominate historical volatility in terms of ex-ante forecasting power. Blair, Poon and Taylor (2001) show that historical prices (even intraday prices) do not provide much incremental information compared to the information given by VIX; moreover, VIX provides the best out-of-sample forecasts of realized volatility. Jiang and Tian (2005) deem the information content of the VIX volatility forecast superior to alternative implied volatility measures as well as forecasts based on historical volatility.

Another related issue discussed in the previous literature is the "absolute" accuracy of implied volatility measures in predicting future stock market volatility. Chernov (2001) notes that implied volatilities are generally higher than realized ones. Christensen and Prabhala (1998), Christensen and Strunk-Hansen (2002) and Fleming (1998) document that implied volatility forecasts are upwardly biased. Carr and Wu (2009) and Bollerslev, Tauchen and Zhou (2009) conclude that typically the spot VIX computed from option prices embeds volatility risk premium and exceeds realized volatility.

Yet, a question that has not been raised in the previous literature is whether implied volatility measures, and VIX, in particular, fully and immediately incorporate current stock market information that is relevant for volatility forecasts. The present study makes an attempt to fill this gap by examining effect of historical market volatility, market trading volume and significant stock market returns on the *ratio* of VIX and the subsequently realized market volatility. In this context, it documents that VIX, though correctly reacts to these relevant factors, does not manage to fully forecast their effects on future market volatility. This kind of under-reaction demonstrated by VIX may be possibly attributed to investors' general tendency to be "anchored"[1] towards current variable or index values, which may cause the expectations with respect to a given variable or index to be relatively sticky and not to account completely for all relevant information.

The rest of the paper is structured as follows: Section 2 describes the data sample and the volatility estimation procedure. Section 3 comprises the research hypothesis and the results. Section 4 concludes.

DATA DESCRIPTION AND VOLATILITY ESTIMATES

The present research employs the daily quotes of VIX and S&P 500 (the underlying index) for the period from January 1990 to December 2012 (overall, 5,797 trading days) extracted from www.finance.yahoo.com. For the sampling period, the daily log close-to-close returns on S&P 500 are calculated.

For every 22 consecutive trading days, roughly representing one trading month, the volatility of S&P 500 returns is calculated as a standard deviation of daily returns. In order to make the resulting figures commensurable with the VIX quotes, denoting the one-month-ahead implied volatility of S&P 500 expressed in percent and in yearly terms, they are multiplied by 100 and then by 20^2. To summarize, for every 22 consecutive trading days, the realized monthly market volatility is calculated as:

$$V_{1,22} = \frac{\sum_{t=1}^{22}(r_t - \bar{r}_{1,22})^2}{22} * 100 * 20 \quad (1)$$

where: r_t is the S&P 500 log return on day *t*; and $\bar{r}_{1,22}$ is the average S&P 500 daily return over days 1 to 22.[3]

In this way, for each trading day *t*, it is possible to define the last month's (past or historical) volatility (PV_t) and the next month's (future) volatility (FV_t) as:

$$PV_t = V_{t-22,t-1} \text{ and } FV_t = V_{t+1,t+22} \quad (2)$$

Table 1 reports the basic descriptive statistics over the sampling period of VIX quotes, of the subsequently realized actual market volatility, calculated according to formula (2), and of the ratio of the two, calculated for each trading day *t* as:

$$VR_t = \frac{VIX_t}{FV_t} \quad (3)$$

where: VR_t represents the implied-to-realized Volatility Ratio.

Table 1
DESCRIPTIVE STATISTICS OF THE IMPLIED AND THE REALIZED MARKET VOLATILITY MEASURES AND THEIR RATIO

Statistics	Implied and realized volatility measures		
	VIX	Realized Volatility (FV)	Volatility Ratio (VR)
Mean	20.45	20.23	1.12
Median	18.88	17.32	1.08
Standard Deviation	8.13	12.09	0.32
Maximum	80.86	110.95	2.76
Minimum	9.31	5.97	0.26

The Table shows that, though the mean VIX and FV measures are quite close to each other (20.45 and 20.23, respectively), VIX, ranging from 9.31 to 80.86 with a standard deviation of 8.13, is less volatile than the subsequently realized market volatility, ranging from 5.97 to 110.95 with a standard deviation of 12.09. The volatility ratio has a relatively low standard deviation of 0.32, indicating that contemporaneous VIX and FV measures tend not to deviate too much from each other, or in other words, that VIX represents a reasonable forecast of one-month-ahead market volatility.

In order to verify the latter inference, Table 2 presents the results of a simple regression model predicting the next month's market volatility based on the current value of VIX, namely:

$$FV_t = \delta_0 + \delta_1 VIX_t + \varepsilon_t \quad (4)$$

where: VIX_t represents the day-*t* closing value of VIX.

Table 2 THE PREDICTIVE ABILITY OF VIX WITH RESPECT TO THE SUBSEQUENTLY REALIZED ACTUAL MARKET VOLATILITY (DEPENDENT VARIABLE – FV)	
Explanatory variables	Regression coefficients (t-statistics)
Intercept	***-3.227 (-11.79)
VIX	*****1.147 (92.21)**
Adjusted R-Squared	0.595

Asterisks denote 2-tailed p-values: ***p<0.01

As it might be expected, the coefficient estimate for VIX_t is positive (1.147) and highly significant. The adjusted R-squared of this simple regression model is also impressively high (0.595), demonstrating that, consistently with the previous literature, VIX represents a high-quality forecast of the future market volatility.

RESEARCH HYPOTHESIS AND RESULTS

The previous Section's results confirm that VIX represents a good forecast of the future stock market volatility. But is VIX able to fully and immediately incorporate current stock market information that is relevant for the volatility forecasts? The major goal of this study is to answer this question. In this respect, I hypothesize that investors, when forming their estimates of the "correct" contemporaneous implied volatility, should be probably over-affected by recent implied volatility measures, causing VIX to be relatively sticky and under-react to relevant information.

In this context, first of all (in Subsection 3.1) three contemporaneous market factors that are highly correlated with the realized future market volatility are established, and furthermore (in Subsection 3.2) a test for their effects on VIX and on the *ratio* of VIX and the subsequently realized market volatility is carried.

Market factors correlated with future market volatility

Stock market volatility may be affected by a very wide range of market factors. The present study concentrates on three of them, with the final goal of testing if VIX is able to fully and immediately reflect them, or in other words, if these factors systematically affect the ratio of VIX and the subsequently realized market volatility. These factors include:

Past (Historical) Market Volatility

The previous literature dealing with stock volatility clearly indicates that market volatility over different periods of time is positively autocorrelated and that past volatility may serve a good (though slightly worse than implied volatility) forecast of future volatility (e.g., Fleming, 1998; Blair et al., 2001; Jiang & Tian, 2005). Therefore, the realized future market volatility (FV_t) may be expected to be positively correlated with the respective past market volatility (PV_t).

Market Trading Volume

Trading volume activity, in general, is recognized to be a reflection of heterogeneous investors' expectations (e.g., Copeland, 1976; Pfleiderer, 1984; Varian, 1985). Karpoff (1986)

demonstrates that trading volume has essentially two causes – dispersion in prior expectations and idiosyncratic interpretations of information events. He also shows that the increase in trading volume is positively correlated with the information "surprise". On the other hand, the new incoming information is also one of the major causes of stock price volatility. Thus, an increased trading volume in a stock market is usually a result of an increased flow of information and may serve a hint for increased subsequent market volatility. For each trading day *t* in the sampling period, the abnormal market trading volume ($AVol_t$), with respect to the previous trading month, is calculated as:

$$AVol_t = \frac{Vol_t - Average(Vol_{t-22} : Vol_{t-1})}{StDev(Vol_{t-22} : Vol_{t-1})} \quad (5)$$

where: Vol_t represents the total day-*t* trading volume in S&P 500 stocks.[4]

In the light of the aforesaid, FV_t may be expected to be positively correlated with $AVol_t$.

Substantial Stock Market Returns

Similarly to the abnormally high daily trading volumes, substantial daily changes (both rises and falls) in the stock market index may be a result of important information arriving at the market, and may serve an indication for the increased future market volatility. Similarly to Fabozzi and Francis (1977) and Kliger and Kudryavtsev (2010), this study defines the days of substantial changes in S&P 500 as the days when the absolute value of S&P 500 return was larger than half standard deviation of S&P 500 returns measured over the total sampling period. The "substantial" dummy variable ($SDum_t$) is defined to be equal to 1 for the days with substantial S&P 500 returns (overall, 2,717 trading days), and 0 for the rest of the sampling period days (overall, 3,080 trading days). In the light of the aforesaid, FV_t may be expected to be positively correlated with $SDum_t$.

First of all, the effects of the three aforementioned variables' contemporaneous values on the subsequent month's market volatility are verified. For this purpose, three linear regressions of the following format are performed:

$$FV_t = \varphi_0 + \varphi_1 Factor_t + \varepsilon_t \quad (6)$$

where: $Factor_t$ refers to PV_t, $AVol_t$ and $SDum_t$, respectively, for each of the three regressions.

Table 3 presents the regressions' results, and most notably the highly significant coefficient estimates of 0.731, 0.593 and 6.160 for the past market volatility, the abnormal market trading volume, and the "substantial" dummy, respectively. Thus, as expected, the three factors are positively correlated with the subsequently realized stock market volatility, and represent its significant predictors. One more thing to note is that, in line with the previous literature, the predictive power of VIX with respect to the future volatility, as expressed by the adjusted R-squared of regression (4) (0.595 – see Table 2) is higher than that of the past volatility (0.535).

Table 3 THE EFFECTS OF THREE MARKET FACTORS ON SUBSEQUENT MARKET VOLATILITY (DEPENDENT VARIABLE – FV)					
Explanatory variables	Regression coefficients (t-statistics)	Explanatory variables	Regression coefficients (t-statistics)	Explanatory variables	Regression coefficients (t-statistics)
Intercept	***5.459 (25.69)	Intercept	***20.206 (127.39)	Intercept	***17.342 (82.29)
PV	*****0.731 (81.61)**	**AVol**	*****0.593 (4.66)**	**SDum**	*****6.160 (20.01)**
Adjusted R-Squared	0.535	Adjusted R-Squared	0.004	Adjusted R-Squared	0.064

Asterisks denote 2-tailed p-values: ***p<0.01

Reaction of VIX to Market Factors and its Ability to Reflect Them

After establishing positive and significant correlation of the three aforementioned market factors with the future market volatility, the next step is to verify if VIX, that, according to the previous literature and the results in Section 2, represents a high-quality forecast of the future volatility, properly reacts to these factors. Three linear regressions are run, which are similar to regressions (6), but with VIX instead of FV as a dependent variable, that is:

$$VIX_t = \phi_0 + \phi_1 Factor_t + \varepsilon_t \quad (7)$$

Table 4 reports the regressions' results. The coefficient estimates of 0.596, 0.176 and 5.177 for the past market volatility, the abnormal market trading volume, and the "substantial" dummy, respectively are lower than the respective based on regression (6), but are still highly significant. So it appears that though VIX is affected by the market factors more weakly than the future volatility is, it is still positively and significantly correlated with the factors, suggesting that investors correctly take them into account. Another finding interesting in itself is the extremely high goodness-of-fit (0.786) of the regression of VIX on PV, indicating that the realized historical volatility is by far the most important factor affecting implied volatility.

Table 4 THE EFFECTS OF THREE MARKET FACTORS ON VIX (DEPENDENT VARIABLE – VIX)					
Explanatory variables	Regression coefficients (t-statistics)	Explanatory variables	Regression coefficients (t-statistics)	Explanatory variables	Regression coefficients (t-statistics)
Intercept	***8.386 (87.03)	Intercept	***20.443 (191.41)	Intercept	***18.023 (129.75)
PV	*****0.596 (145.83)**	**AVol**	****0.176 (2.05)**	**SDum**	*****5.177 (25.51)**
Adjusted R-Squared	0.786	Adjusted R-Squared	0.001	Adjusted R-Squared	0.101

Asterisks denote 2-tailed p-values: **p<0.05; ***p<0.01

So, by now, the (quite not surprising) results confirm that VIX represents a strong predictor of the one-month-ahead market volatility and correctly reacts to relevant market factors. At this stage, however, the study arrives at its main question, namely: "Is VIX able to *fully and immediately* incorporate current stock market information that is relevant for the volatility forecasts?"

In this respect, it may be expected that VIX, though positively correlated with the relevant market factors, should not be able to account for them fully and immediately, or in other words, should under-react to relevant information. This expectation is based on the well-documented people's tendency to form their estimates for different categories, starting from a particular available, and often irrelevant, value and insufficiently adjusting their final judgments from this starting value. This tendency represents a simplifying decision-making rule, known as *anchoring* (or *anchoring bias*), and may cause the expectations with respect to a given variable or index to be relatively sticky and not to account completely for all relevant information. In other words, it may cause people to be "anchored" towards the current value of the variable or index.

The term "anchoring" was introduced in one of the most cited ever studies by Tversky and Kahneman (1974). They argue that in many situations people make estimates by considering an initial value that they adjust upwards or downwards to yield a final estimate. Such adjustments are often insufficient, leaving judgments biased in the direction of the initial "anchor" value. In what is probably the best-known demonstration of this effect, Tversky and Kahneman (1974) first ask their research participants whether the percentage of African nations in the United Nations (*target* number) is higher or lower than an *arbitrary* number (the anchor) which is randomly determined by spinning a wheel of fortune (e.g., 65% or 10%). The participants are then asked to give their best estimate of this percentage. The absolute judgments are assimilated to the provided anchor value so that the mean estimate of participants who have received the high anchor is 45%, compared to 25% for participants who have received the low anchor.

The anchoring effects have proved to be a truly ubiquitous phenomenon that has been observed in general knowledge questions (e.g., Jacowitz & Kahneman, 1995; Strack & Mussweiler, 1997; English, 2008), probability assessments (e.g., Plous, 1989; Chapman & Johnson, 1994), legal judgment (e.g., Markovsky, 1988; Chapman & Bornstein, 1996), and a number of other fields. There is also a continuously growing body of literature documenting the effects of anchoring on different aspects of economics and finance, including, for example, real-estate pricing (Northcraft & Neale, 1987), buyers' and sellers' behavior (Galinsky & Mussweiler, 2001), auctions (Beggs & Graddy, 2009), advertising (Biswas & Burton, 1993), technical analysis (Zielonka, 2004), and general stock market analysis (Fischer & Statman, 2000; Kudryavtsev & Cohen, 2010a, 2010b). Gruen and Gizycki (1993) use anchoring to explain the widely-observed anomaly that forward discounts do not properly explain subsequent exchange rate movements. They argue that anchoring phenomenon may be relevant to the "sticky prices" that are so talked about by macroeconomists. So long as past prices are taken as suggestions of new prices, the new prices will tend to be close to the past prices. The more ambiguous the value of a commodity, the more important a suggestion is likely to be, and the more important anchoring is likely to be for price determination.

Adopting the idea by Gruen and Gizycki (1993), this study suggests that investors, when forming their estimates of the "correct" contemporaneous implied volatility, may be "anchored" towards the recent implied volatility measures, causing VIX to be relatively sticky and under-

react to relevant information, or in other words, causing VIX to be relatively less affected by the market factors, than the future realized volatility is (or than the VIX itself should be). Therefore, it may be expected that the *ratio* of VIX and the subsequently realized market volatility (VR) is negatively correlated with the market factors.

That is, this study's major hypothesis is as follows:

H1 VR_t is negatively correlated with market factors having positive effects on FV_t

In order to test this hypothesis, for each of the market factors, a regression analysis similar to regressions (6) and (7), but with VR_t as dependent variable, is performed, that is:

$$VR_t = \phi_0 + \phi_1 Factor_t + \varepsilon_t \quad (8)$$

Table 5 concentrates the regressions' results that clearly support the study's research hypothesis. The past market volatility, the abnormal trading volume and the substantial daily market returns are all negatively (with coefficient estimates of -0.004, -0.012 and -0.041, respectively) and highly significantly correlated with VR. That is, on the one hand, as demonstrated earlier in this Subsection, the three market factors cause the levels of VIX to increase, but on the other hand, they lead to relative decrease in the levels of VIX with respect to the subsequently realized (and predicted by VIX) levels of market volatility, suggesting that VIX generally tends to under-react to relevant information.

Table 5
THE EFFECTS OF THREE MARKET FACTORS ON THE RATIO OF VIX AND FV (DEPENDENT VARIABLE – VR)

Explanatory variables	Regression coefficients (t-statistics)	Explanatory variables	Regression coefficients (t-statistics)	Explanatory variables	Regression coefficients (t-statistics)
Intercept	***1.199 (148.17)	Intercept	***1.121 (267.49)	Intercept	***1.140 (198.50)
PV	*****-0.004 (-11.24)**	**AVol**	*****-0.012 (-3.51)**	**SDum**	*****-0.041 (-4.86)**
Adjusted R-Squared	0.021	Adjusted R-Squared	0.002	Adjusted R-Squared	0.004

Asterisks denote 2-tailed p-values: ***p<0.01

CONCLUDING REMARKS

The present paper explores the ability of the implied volatility index (VIX) to incorporate current stock market information that is relevant for the volatility forecasts. Employing daily stock market data, it documents that VIX, though being positively correlated with the relevant market factors, does not manage to account for them fully and immediately, or in other words, under-reacts to relevant market information. This finding may be potentially explained by investors' tendency to be "anchored" towards (or over-affected by) the recent implied volatility measures, causing VIX to be relatively sticky and relatively less affected by the market factors, than the future realized volatility is.

This study's results may prove to have important practical implications. Since the implied volatility plays a crucial role in option pricing, the fact that it systematically under-reacts to

relevant contemporaneous information suggests that the options may be systematically mispriced. Awareness of this fact may, therefore, open new profit opportunities for stock market investors, and in the end, help to eliminate this mispricing and make stock markets more efficient.

Potential directions for further research may include analyzing other factors that may affect both the implied and the subsequently realized volatility, and also performing similar studies with intraday data.

ENDNOTES

1 Anchoring (anchoring bias) (Tversky & Kahneman, 1974) refers to people's tendency to form their estimates for different categories, starting from a particular available, and often irrelevant, value and insufficiently adjusting their final judgments from this starting value.

2 The factor of 20 is intended to make the mean realized volatility roughly equal to the mean value of VIX (this represents, in fact, a conversion of the volatility figures from daily to yearly terms, taking into account the VIX calculation formulae, as well). It should be noted that this multiplication is made only for the sake of conveniently presenting the comparison between the expected and the realized volatility, and does not qualitatively affect the empirical results of this study.

3 Alternatively, in line with a number of previous studies of market volatility (e.g., Schwert, 1989, Schwert & Seguin, 1990), the monthly volatility of S&P 500 is calculated as a sum of squared daily returns over the month. The results with respect to this study's hypothesis (available upon request from the author) are qualitatively similar to those reported in the paper.

4 For this study's sample, abnormal market trading volume of S&P 500 stocks ranges from -8.836 to 8.281, with the mean of 0.040 and the standard deviation of 1.247.

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WHAT IS WRONG WITH INDIAN CORPORATE GOVERNANCE? : A CASE STUDY OF FAILURE OF KINGFISHER AIRLINES

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ABSTRACT

Corporate Governance failures and corporate frauds have become a recurring phenomenon in India. While greed and dishonesty of individuals are at the heart of the corporate frauds, major part of the blame must also go to the inadequate policy implementation and corruption. India has emerged as the fourth largest economy in the world in terms of Purchase Power Parity in the world and Indian corporate sector is growing at a faster rate. Foreign Direct Investment inflows into India are on the raise during last two years. However the weakest link in India's efforts to become an 'Economic superpower' appears to be the poor corporate governance practices in India. On paper, India has one of the best legal frameworks for corporate governance in the world. But on ground the reality is somewhat different. The latest to join the already long list of corporate governance failures and frauds is Kingfisher Airlines (KFA). This paper analyses the failure of Kingfisher airlines and subsequent events from the corporate governance perspective.

Keywords: *Corporate Governance, Economic Super Power, Kingfisher Airlines, Frauds, Legal framework*

INTRODUCTION

Corporate Governance failures are not new to India. No month passes without a minor or major corporate scandal. In fact poor corporate governance has become the hallmark of many Indian corporations. The list of corporate governance failures in the recent past is too long, Satyam Computers, Sahara, Reebok India, Vodafone, Diageo, Axis bank, Saradha Chit funds, Ranbaxy (NUJS, 2015; Bhattacharya, 2013) to name a few and now Kingfisher airlines. The irony of the matter is India on paper has a legal frame work that can be compared with Sarbanes – Oxley act of US. In fact Indian law on Corporate Governance has drawn very heavily from Sarbanes – Oxley act and has been continuously improved by committees chaired by eminent people from industry, Rahul Bajaj (1997), Kumar Mangalam Birla (2000), Naresh Chandra Committee (2002), Narayan Murthy Committee (2003) and Naresh Chandra Committee (2009). The question that arises then is, why corporate governance failures occur in India with an unending regularity? This paper is an attempt to answer this question by analyzing the latest failure of corporate governance at the Kingfisher Airlines.

The rest of the paper is structured as follows. The second section explains the methodology, the third section discusses what corporate governance is?, the fourth section describes the brief history if Indian corporate governance, fifth section discusses the case of Kingfisher Airlines, the sixth section is discussion and findings as to why the corporate governance mechanisms failed in case of KFA, the sixth section concludes the paper.

METHODOLOGY

This study is based on the case study approach. Corporate governance failures have many factors that are mostly qualitative in Nature. Kingfisher airlines failure is a complicated case that cannot be analysed by a few quantitative factors. Case study approach allows researchers to deal multiple factors and stakeholders in a comprehensive manner (Lee, 1989), in areas like Corporate Governance. Case study research can be used in theory testing (Darke and Shanks, 1997). The present study analyzed the failure of Kingfisher Airlines from the lens of Corporate Governance.

CORPORATE GOVERNANCE

Corporations have come into existence as a novel way of pooling financial resources to undertake capital intensive endeavors and enterprises, which were beyond the reach of an individual or few individuals. In the present-day context, corporations world over have become the engines of economic growth. According to Hansmann et al. (2004) all corporations have five common characteristics, they are ownership by shareholders (investors), limited liability, transferrable shares, separate legal personality of the corporation and delegated management by board of directors. The distinguishing characteristic of corporations is separation of ownership and control. In a modern corporation, large number of owners known as shareholders contribute the capital but do not manage the business. Owners (shareholders), employ professional managers (CEO and top management), who are experts in different functional areas of business, to manage the business activities on their behalf. Thus a relationship of principal and agent comes into existence between the shareholders (Principals) and Managers (agents). The managers are compensated for their skills with salaries, bonuses and stock options etc. The agents have a fiduciary responsibility to the principals and are expected to work in their best interests and create wealth for the owners. However this does not always happen. As managers take all the decisions, they are in apposition to take decisions in their own interest and not for the benefit of the owners, which often is referred to as 'Managerial opportunism'. To prevent managerial opportunism, corporations establish mechanisms, which are collectively called as 'corporate governance mechanisms'. According to Mayer, corporate governance has been traditionally associated with principal- agent relationship problem, caused by separation of ownership and management. Corporate governance brings in line the interests of the investors and mangers and ensures that the companies are run for the benefit of investors (Mayer, 1997). Three internal corporate governance mechanisms, namely concentration of shareholders, board of directors, and managerial compensation, and one external corporate governance mechanism mechanisms namely market for corporate control have evolved over time, to control the opportunistic behavior of mangers (Hitt et al.).

According to Schapiro (2009), chairperson, Securities and Exchange Commission (SEC), USA "Corporate governance is about maintaining an appropriate balance of accountability between three key players: the corporation's owners, the directors whom the owners elect, and the managers whom the directors select". According to Sir Adrian Cadbury, corporate governance is "the system by which business corporations are directed and controlled'. According to OECD "The corporate governance structure specifies the distribution of rights and responsibilities among different participants in the corporation, such as the board, managers, shareholders and other stakeholders, and spells out the rules and procedures for making decisions on corporate affairs. By doing this, it also provides the structure through which the company

objectives are set, and the means of attaining those objectives and monitoring performance (OECD, 2004)". Securities and Exchange Board of India (SEBI) defines corporate governance as the "acceptance by management of the inalienable rights of shareholders as the true owners of the corporation and of their own role as trustees on behalf of the shareholders. It is about commitment to values, about ethical business conduct and about making a distinction between personal & corporate funds in the management of a company". According to Thompson (2009), corporate governance refers to all the policies, procedures, systems and controls used for setting and controlling the direction of corporations and managing the relationships between all the stakeholders of a corporation. Stakeholders include shareholders, managers, board of directors, employees, customers, and also the society.

The importance of corporate governance can be gauged from the findings of a Harvard Business School study, that 'The Economist' did not publish any editorials on Corporate governance till 1998, but published more than 20 each year starting from the year 2002 and 2003, and this number is increasing with each passing year (Coglianese, 2004).

INDIAN CORPORATE GOVERNANCE

Corporate governance in India has evolved in three different phases. The first phase is during the British colonial rule, the second one is after independence till the start of economic reforms in 1990, and the last phase is after 1990s. During the colonial days, the corporate governance was not really heard off. In the second phase, 1947-1990, the shareholders other than promoters of the company, had no say in management of the company. Government's control over corporations is complete and for companies with government protection, there were virtually no threats of takeover. Public financial institutions that normally held a large chunk of shares in majority of the corporations and nominated their officers to the boards, but did not show any interest in management or corporate governance. All this resulted in a very week form of corporate governance and political influence on corporations.

The third phase of the corporate governance in India coincides with the economic reforms initiated by Indian Government in 1990s. The capital market and corporate governance reforms started with the revision of age old Indian Company Act, followed by establishing Securities and Exchange Board of India (SEBI), modeled on SEC of US, in 1992 and dismantling many government controls known as license – permit raj. The most important reform was facilitating the foreign direct investment, by replacing the draconian Foreign Exchange Regulation Act (FERA) with Foreign Exchange Mechanism Act (FEMA). The Indian rupee was made convertible on the current account resulting in the exchange rate being determined by the market, subject to intervention by the apex bank, if needed. These reforms have brought the Indian corporate governance model close to Anglo American Model (Reed, 2002).

CORPORATE GOVERNANCE FAILURE - CASE OF KING FISHER AIRLINES (KFA)

Notwithstanding the improvements made in corporate governance law and framework in India as result of the recommendations of all these committees, corporate governance failures have become pretty common in India. The latest and one of the largest corporate frauds is Kingfisher Airlines

Vijay Mallya, became the Chairman of United Breweries Limited (UB Ltd), a successful company producing alcoholic beverages started by his father, at a very young age of 28 years in

1983. Over years Mallya was very successful and acquired a number of companies in diverse industries that included Berger paints, Best and Crompton, Mangalore Chemicals and Fertilizers and Asian Age, a newspaper group apart from many companies in liquor industry. The group under the leadership of Mallya has grown into a multinational conglomerate of 60 companies, with an annual turnover of US $ 11 Billion during 1998-1999. United Spirits, most profitable company of the group that produces alcoholic beverages, has made history with 18 of their brands selling more than one million cases each year and four of their brands selling more than 10 million cases. It has become the largest alcoholic beverage company in India and the second largest company in the world (United Spirits, 2016). King Fisher beer, undoubtedly the most popular beer, has 50% market share of the Indian beer market. Mallya has also been chairman of a number of other companies including multinational companies like Sanofi India (Formerly Hoechst AG) and Bayer CropScience. Apart from his companies, Mallya co-owns Sahara Force India, a Formula One team, owns Indian Premier League Cricket Team Royal Challengers, I-League soccer teams Mohun Bagan AC and East Bengal FC (The Guardian, 2009). He is also an independent politician, elected as Member of Parliament to Rajya Sabha, the Indian upper house of Parliament, since 2002. He is well known for his successful bids at some prominent auctions worldwide, in which he acquired the sword of Tippu Sultan the famous ruler of Mysore, from his home province of Karnataka, who died fighting British forces for £ 175, 000 and also another 30 items belonging to him. He also acquired wire rimmed spectacles, pocket watch and other items of Mahatma Gandhi, Father of Indian Nation, for $ 1.8 million, from an auction in US. (Mallyainparliment, 2011). Mallya was known as 'King of Good Times' for his flamboyant lifestyle.

Kingfisher Airlines (KFA), an Indian airline company was promoted by Mallya in 2003 and made its maiden flight on May 09, 2005 from Mumbai to Delhi. As part of the economic liberalization initiated in 1991, Government of India liberalized the government controlled aviation sector and opened it to private sector with its 'open skies policy'. This attracted many companies like Damania Airways, East-West (1991-1996), Jet Airways, Air Deccan and Modiluft, a joint venture between Modis and Lufthansa of Germany. Most of these airlines were operating in the domestic routes, due to restrictions placed by Government of India. KFA's headquarters was located at Andheri, Mumbai, India. UB Ltd, the holding company, is an Indian conglomerate with operations in alcoholic beverages, real estate, chemicals and fertilizers among others. KFA's strategy was to offer premium, high quality service to Indian passengers and was not intended to compete with low cost airliners that have come up. Their philosophy was reflected by the statement made by Mallya, "This is a world class experience, all at an affordable price. We are not a low-cost carrier and we do not be intended to be one". KFA started its operations with four Airbus A- 320-200 aircrafts in 2005 that were wet leased. Wet lease implies that the lessor provides aircraft, complete crew, maintenance and Insurance (CMAI) to the lessee.

Mallya was the Chairman and Managing Director, since its incorporation. The board members included Ravindra Nath Nedungadi, Diwan Arun Nanda, GN Bajpai, Naresh Trehan, Piyush Mankad, Subhash Gupte (Vice Chairman)),Arun Ganguly, MS Kapur (since 2012), and Srinivasulu Reddy. Gopinath of Air Deccan and Tennis player Vijaya AritRaj joined the borad after 2007. V Bharat has served as the secretary of the company since 2102. However Vijay Amritraj and Ganguly resigned from the board in 2012. The capital structure of the airliner from 2002 to 2013 was as follows. Subhash Gupte was a former Chairman and managing director of

AIR India, MS Kapur was the former chairman of Vijya Bank. They came on to KFA board in 2012 and resigned from the board in 2014.

Table 1
CAPITAL STRUCTURE OF KING FISHER AIRLINES 2002 -2013

Period		Instrument	Authorized Capital	Issued Capital	- P A I D U P -		
From	To		₹ (Rs. cr)	₹ (Rs. cr)	Shares (nos)	Face Value	Capital in ₹ (Rs) crores
2012	2013	Equity Share	1650	808.72	808722990	10	808.72
2011	2012	Equity Share	1650	577.65	577647274	10	577.65
2010	2011	Equity Share	1650	497.78	497779223	10	497.78
2009	2010	Equity Share	900	265.91	265908883	10	265.91
2008	2009	Equity Share	400	265.91	265908883	10	265.91
2007	2008	Equity Share	400	135.8	135798503	10	135.8
2006	2007	Equity Share	150	135.47	135470118	10	135.47
2005	2006	Equity Share	125	98.18	98182007	10	98.18
2004	2005	Equity Share	60	31.06	1501298	1	0.15
2003	2004	Equity Share	32	30.39	1537160	100	15.37
2002	2003	Equity Share	10	10	200000	100	2

Source: Dian Global Solutions Limited, 2016, www.moneycontro.com,2016; Economic Times, 2016; and Bombay Stock Exchange, 2016.

KFA, by offering premium services, eye catching promotions using Bollywood movie actresses, was able to attract a number of air passengers and by 2006 has become the second largest carrier in India, in terms of numbers. The quality of service satisfied many customers who were unhappy with airlines operated by government and also the other low cost airliners. As a full service airliner, KFA served quality food and beverages on all routes and was the only airliner in India at that time that offered first class service on domestic routes. Trained and helpful ground and air crew helped in developing a good reputation. KFA could create a distinct identity of its own with their differentiation strategy in Indian market. KFA soon became synonymous with 'five star' air travel, in India and also has become the first airliner to provide live in-flight entertainment on domestic routes. By 2007, KFA was flying to 255 destinations with 41 aircrafts and carried 17.5 million passengers.

Mallya considered Jet Airways as his major competitor. Jet Airways has been promoted by Mr. Goyal, who had a lot of industry experience having worked with many major airlines in Europe. Jet airways has been operating profitably for few years and then it made a bid and

acquired the ailing Air Sahara in 2006 and later renamed it as JetLite. Mallya too made an unsuccessful bid for Air Sahara. In order to take away the market share from Jet, KFA offered many upgrades vouchers to corporate clients and others if they switched to KFA and for some time it appeared that this strategy is working (Livemint.com, 2016). Jet airways has international operations too. That is one area KFA could not get into due to the government policy.

As on September 2007, KFA was serving 34 destinations with 37 aircrafts that included four A-319, twelve A-320, six A-321 and 12 ATR 72. KFA needed additional aircrafts as they wanted to increase the number of routes. The company had ambitious expansion plans and placed orders for 35 ATR aircraft for delivery by 2010, 51 A-320 aircrafts to be delivered by 2014 and 50 wide bodied aircraft for delivery between 2008 and 2018. The carrier also wanted to fly international. But to go international, as per Government of India policy, Indian airline companies needed to be operating for a minimum period of 5 years and also required to own more than 20 aircrafts. Towards the end of 2007, KFA in order to meet this requirement decided to acquire 46% of 'Air Deccan' another low cost airliner, to compete with other low cost carriers and most importantly to be able to open international operations.

Air Deccan was in existence for more than five years and this acquisition would allow KFA to fly on international routes. To facilitate this, a reverse merger was engineered, first Air Deccan acquiring KFA and few months later the merged airline becoming KFA again. KFA also hoped that the acquisition would save ₹ 300 crore ($60 million) annually and also increase the fleet strength to 71. This acquisition was financed with ₹ 550 crore ($110 million) from the group's holding company UB Ltd. This move surprised many industry watchers as both these airlines are operating at different ends of the spectrum, KFA with differentiation strategy and Air Deccan with cost leadership strategy. However, this acquisition helped KFA become a large airliner with 77 aircrafts, operating 412 domestic flights daily and carrying 10.9 million passengers annually. Captain Gopinath, the founder of Air Deccan and Vijay Amritraj, a well-known international tennis player joined the Board of Directors of the new KFA. In 2008 KFA got permission to fly international and their first international flight was from Bangalore to London in September 2008.

Unfortunately, increasing passenger numbers however did not translate into profits for KFA. In fact, KFA's troubles started right from the start of its operations in 2005. It is also a well-known fact that the fixed costs for airlines are very high. Fuel expenditure accounted for 50% of aviation firm's operating costs. In 2005, the oil prices were soaring at nearly $75 per barrel. In 2006 KFA approached IDBI Bank with a proposal for a loan of ₹ 900 crore (US $180 million) for purchasing new aircrafts for the carrier. However the credit committee of the IDBI bank, decided not to approve the loan considering the fact that the airline industry is capital intensive, highly competitive and that KFA is a new company. For 2005, KFA had a revenue of ₹ 305.55 crore ($ 61 million), Interest on borrowed funds was ₹ 10.21 crores ($ 2 million) and the net loss was ₹ 19.53 crores ($ 4 million). In 2006 the revenue increased three fold to ₹ 989.12 crores ($197.8 million), but interest payment grew to ₹ 25.57 ($ 5.11 Million) crores and net loss has grown to an alarming ₹ 272.44 crores ($54.4 million). Though the acquisition of Air Deccan helped the fledging airliner starting its international operations, it has created an operational problem in domestic market, that of managing two different entities in the same corporation, one with a premium service and the second one an economy service.

In the years that followed, the interest and debt of the KFA have skyrocketed. By March 2008, the debt stood at ₹ 934 crore ($186.8 million). By 2008, the crude oil prices world over rose to nearly $140 a barrel and according to the estimate of International Air Transport

Association, the world airline industry collectively suffered a loss of $ 5.2 billion. The industry was going through one of the most difficult period and it was not different for India or KFA. The main competitor of KFA, Jet Airways also suffered a loss during these years, but could overcome the crisis as it had been operating profitably in the previous few years.

KFA published its combined financial statements in 2009, which reflected a phenomenal growth in sales to the tune of $1.1 billion, but unfortunately the losses too followed in same proportion, to the tune of $0.8 billion. In 2009 KFA board of directors approved a resolution to raise ₹ 500 crore (US $ 100 Million) by using Global Deposit Receipts (GDRs) and also other means. Further they approved raising another ₹ 500 Crore ($100 Million) by issuing rights shares to existing shareholders. But, by end of 2009 the net-worth of the company has become negative. KFA has started a restructuring program and laid off 100 pilots. They also increased the fuel surcharge. However these measures could not stop the downward slide of the KFA.

Surprisingly, in 2009, IDBI approved a loan of ₹ 950 crore ($190 million) in spite of turning down the same request in 2006. During the ensuing period the airliner has managed to get massive loans from different banks for its operations as follows. IDBI loan is particularly interesting, as it comes to light that the huge loan was sanctioned at lightning speed, within one month, after Mallya had a meeting with IDBI Chief Yogesh Aggarwal. One of the conditions of the loan requires Kingfisher Airlines to deposit the tax deducted from employees to the tune of Rs 100 crore with authorities. KFA did not comply with this requirement but still managed to get the loan (NDTV, 2016). Mallya approached a number of other banks between 2008 and 2010 and managed to get huge amount of loans from a number of banks. Surprisingly these banks provided the loans to KFA by taking the company's 'brand value' into consideration and seven trademarks as collateral. They included Fly Kingfisher (Label Mark and Word), Flying Models of Kingfisher, Fly the Good Times, Funliner and Kingfisher, which were valued by global consultancy firm Grant & Thronton. In 2012, Director General Civil Aviation (DCGA) of India valued these trademarks at ₹ 3,008 crores ($601 million). Many market watchers speculated that this reversal of decision has more to do with political and other influences, read as corruption, rather than sound business case. The brand value is dependent on the firm performance and growth and by 2014, the value of these assets have come down and currently the value is estimated at paltry Rs 6 crore ($1.2 million).

According information provided by Government of India, Minister of Finance (in 2011), KFA pledged its brand to the banks for ₹ 4100 crore ($820 million). Apart from this Mallya was supposed to have given personal guarantee of ₹ 248.07 crores ($ 49.5 million) and the holding company UB Ltd provided a corporate guarantee for ₹ 1601.43 crores ($320 million). According to the minister's statement made in Indian parliament, Mallya had also provided collateral security to the tune of ₹ 5,238.59 crore ($1.4 billion) in the form of real estate, Kingfisher House in Mumbai and Kingfisher villa in Goa, ground support equipment, computers, office furniture and aircrafts of the company and all assets owned by Mallya, valued at nearly ₹ Rs 277 crores ($55.4 million).

Table 2
BANK LOANS TO KFA 2008 TO 2010

Ser#	Bank	Amount in Indian Rupees (₹) Crores	Amount in US $	Year	Collateral Security
1	State Bank of India	1,600	$212 million	2010	Trademarks and Goodwill
2	IDBI Bank	800	$106 million	2009	Trademarks
3	Punjab National Bank	800	$106 million	2010	Trademarks
4	Bank of India	650	$130 million	2010	Trademarks
5	Bank of Baroda	550	$110 million	2010	Trademarks
6	United bank of India	430	$86 million	2010	Trade marks
7	Central Bank	410	$82 million	2010	Sales proceeds and lease rents to be deposited an escrow account
8	UCO Bank	320	$64 million	2010	Trade marks
9	Corporation Bank	310	$62 million		Trade marks
10	State Bank of Mysore	150	$30 million		Trade marks
11	Indian Overseas Bank	140	$28 million	2008	Two Helicopters
12	Federal Bank	90	$18 million		Trade marks
13	Punjab and Sindh Bank	60	$12 million	2010	Kingfisher House, Mumbai
14	Axis Bank	60	$12 million	2010	Trade marks
15	Three other banks (Vijaya Bank and others)	603	$120 million	2010	Trade marks

Source: Compiled from different sources

By the end of year 2010 KFA had an accumulated debt of ₹ 7000 crores ($1.4 billion) and suffered a loss of ₹ 1608 crores ($320 million). For the lending banks the loans to KFA have become nonperforming assets. Notwithstanding this KFA announced new flights to Europe. In September, 2010, Mallya appointed Sanjay Aggarwal as new CEO of the beleaguered airline. According to the audit report for 2010-11 the accumulated losses of the company were more than 50% of the net worth of the company. The airliner approached the lending banks to restructure the debt. In spite of KFA piling up losses wiping out all its assets, Mallya drew salaries of ₹ s 33.46 crore ($6.5 million) for years 2010 and 2011. The share prices of the company from 2006 to 2015 are as follows:

Table 3
SHARE PRICES OF KFA

Ser #	Year	High	Low
1	2006	140.70 (28 Dec 2006)	68.00 (19 July 2006)
2	2007	316.60 (18 Dec 2007)	91.30 (05 April 2007)
3	2008	284.50 (01 Jan 2008)	29.10 (17 Dec 2008)
4	2009	68.75 (02 Jun 2009)	49.60 (06 Nov 2009)
5	2010	86.80 (10 Nov 2010)	41.55(20 May 2010)
6	2011	66.85 (03 Jan 2010)	19.65 (11 Nov 2010)
7	2012	29.15 (07 Feb 2012)	7.40 (10 Aug 2012)
8	2013	15.16 (02 Jan 2013)	3.88 (16 Dec2013)
9	2014	3.46 (02 Jun 2012)	1.28 (27 Nov 2014)
10		1.34 (01 Dec 2014)	No transactions after 1 Dec 2014.

Source: Compiled from Yahoo Finance

In November 2010 consortium of banks led by State Bank of India, the largest lender restructured the KFA debt for the first time. According to the agreement reached the banks converted ₹ 1355 crores ($271 million) into equity at a premium of 61% to the market price of around ₹ 80 ($14). Further they extended the period of repayment to nine years and also offered a moratorium of two years on loans, cut interest rates and also sanctioned fresh loans. Prior to this the market regulator SEBI had two restrictions on such conversions. First, only 10% or less of debt could be converted into equity by banks. The second is that the price of conversion must be an average market price of previous 30 days or six months. During 2010 SEBI relaxed these provisions and the banks were able to convert a large part of their loans to KFA into equity at a premium. On November 25, the KFA board approved the recast package.

Finally on September 28, 2011 KFA decided to exit the low-cost part of their business in India. But by this time, the troubles for KFA started mounting. By December 2011, KFA had outstanding dues of ₹ 93 Crore ($18.5 million) to Mumbai International Airport Pvt. Ltd. Meanwhile Service Tax department froze 11 bank accounts of KFA for nonpayment of ₹ 70 Crore ($14 million), which was partially lifted after KFA made partial payments. Income Tax department froze some of KFA's accounts resulting in cancellation of many flights, for want of working capital. The airliner started operating on a truncated schedule, losing a number of profitable routes. KFA could not settle it dues with private operators and suffered another blow when IATA asked its members not to book KFA tickets from March 08, 2012.

Finally, in 2012 King Fisher airlines was grounded. The Income Tax department attached KFA's (International Air Transport association) IATA collection bank account in March and after that KFA could not and did not make any payments to employees including salaries. KFA employees protested delays in salary payment. Vijay Amritraj, respected tennis player and independent director on the board resigned, followed by Anil Kumar Ganguly another independent director leaving KFA with only three board members. On March 20, 2012, KFA suspended all its international operations. On March 27, the airline suspended operations from Hyderabad, Kolkata, Bhubaneshwar, patina and Lucknow, bringing the number of flights to 120 from 400. Employees including pilots, were not paid salaries for many months and after many protests, they received partial salary dues for few months in April 2012. In May and June the same year again, pilots went on strike for non-receipt of salaries, resulting cancellation of further flights. Mallya tried hard to get some form of intervention by Government but the minister for civil aviation ruled out any bailout by Government. Again in October 2012, employees went on go on strike for non-payment of salaries and KFA declares partial lockout. In October, 2012, Director General Civil Aviation (DGCA) issued show-cause notice to KFA asking why its license should not be cancelled and finally on October 20, 2012 the license of KFA was suspended. In December 2012 the company's license got cancelled. In 2013 the KFA's flying permits were withdrawn. The company suffered a loss of ₹ 4000 crore ($ 800 million) in 2012-13 taking accumulated losses to ₹ 16, 023 crore ($3.2 billion) and by 2013 the net worth of the company has fallen to negative (– ₹ 12, 919 crore (2.54 billion)).

Resignation of independent directors Amritraj and Ganguly in 2012, have left the board without independent director, which is in violation of the government norms for listed companies. In order to meet the requirements of listing norms, the company appointed MS Kapur, a banker, Lalit Bashin, reputed corporate lawyer and Shrikant Ruparel, former MD of Kolhapur Sugar Mills, as independent directors on March 28, 2012. Mr. Subhah Gupte was the vice chairman of KFA and earlier he was the former Chairman and Managing Director of Air India, MS Kapur was the former Chairman and managing Director of Vijaya Bank, one of the

lenders. Ravi had a long association with UB Ltd from 1990. Three directors Ravi Nedungadi, Subhas Gupte and MS Kapur Resigned from the board on 01 April 2014.

The consortium of banks have approached UB Ltd, the holding company and guarantor to banks, to repay the loans of ₹ 6.493 crore ($1.2 billion). Mallya promised to repay the loans, once he completed the sale of 35% of his stake in United Spirits limited, one of the UB Ltd companies to Diageo Plc, for nearly ₹ 5000 crore ($1 billion). At the same time Mallya continued his efforts to revive the airline by meeting banks and civil aviation authorities, without success. State Bank chairman felt that KFA needed ₹ 2000 crores ($400 million) to revive but no bank or international investor was willing to invest. Director General Civil Aviation asked the company to clear all dues including salaries of employees, before making any application for revival of the license. Three senior executives resigned from KFA in June 2013.

Finally, convinced that all their efforts are going in vain, in 2014, United Bank of India declared Mallya as 'willful defaulter', followed by State Bank of India and Punjab National Bank. Mallya has challenged these declarations in various courts. Banks also started acting on his collateral securities. In 2015, the consortium of banks have taken over the prestigious Kingfisher House in Mumbai valued at Rs 100 crores. CEO Sanjay Aggarwal resigned his position on February 2014.

Mallya has been accused of Money laundering. He is reported to have acquired a large number of properties in all continents of the world. However Mallya reportedly did not have any major properties in India, according his declaration to Rajya Sabha, the upper house of the parliament. As of November 2015, the principle amount due was ₹ 5000 crores ($1 billion) and the interest on loans amounted to ₹ 4,091 crores ($800 million). Mallya lobbied with the banks for waiver of interest or lowering interest rate without success. The banks asked Mallya to pay all principal and put the interest in an escrow account. Banks were not willing to take any chances with Mallya and also as Mallya has assets in excess of this amount all over the world. Bank officials are also wary of the onetime settlement due to the irregularities noticed in the books of accounts of other Mallya companies. At the end of 2015 Mallya is fighting 27 cases in courts and 22 of them pertain to KFA. According the union finance minister, Government of India, the loan amount owned by KFA stood at ₹ 9,091.40 crore ($ 1.85 billion) at the end of November 2015. Meanwhile Diageo Plc, alleged that Mallya diverted his funds from United Spirits Ltd to other businesses and he was made to resign his position as Chairman of United Spirits Limited. Mallya was reported to have got a golden parachute of $ 75 million, to be paid over next 5 years by Diageo Plc, for a non-competing agreement he signed with them. Market observers felt that Mallya got out of United Spirits limited on very good terms, but more than two million shareholders of the company are not so lucky and are still stuck in KFA. In December 2015, CBI, the premier investigating agency of government of India questioned Mallya about his role in the suspected conspiracy between him and some of IDBI bank officials. The consortium of banks have taken over possession of more than nine trademarks of KFA in 2016 including " Kingfisher" Label, "Flying Models" and "Fly the Good Times". However experts feel that there will be no takers for these trademarks, of a defunct company.

KFA could not pay its suppliers and airport authorities. Mumbai International Airport auctioned Mallya's private jet for ₹ 22 lakhs ($42000), to recover some of the dues. DGCA after KFA default asked all airlines to disclose the dues they owe to suppliers like oil companies and also to the government. These details are not available publicly. KFA as on March 07, 2012 has outstanding dues over ₹ 425 crore ($85million) To Hindustan petroleum Corporation (HPCL). Yogesh Agarwal, the then Chairman and four members BK Batra, OV Bundelu, R Bansal and

SKV Srinivasan of credit committee are being investigated by CBI for their role in sanctioning loan to KFA. The CEO Sanjay Aggarwal has submitted his resignation on February 14, 2014 but it was finally approved by the board on 12 Feb 2015.

As it stands today KFA has a total debt of $1.3 Billion. State Bank of India managed to get Rs 155 crore ($31 million) out of the loaned amount ₹ 1,623 Crore ($324 million). The value of KFA assets pledged to various banks for ₹ 4000 crore ($800 million) is only ₹ 6 crore ($1.2 million) as of now. There are no takers for the 'Kingfisher' trademarks, the SBI accepted as security for the loans. This is only a tiny fraction of the amount Mallya owned to the banks. CBI asked the banks to lodge a FIR about the fraud, but no bank has come forward so far to file the complaint with the investigation agency. The investigation agency says, it cannot proceed if banks do not file a complaint of fraud with them.

In March 2016, banks apprehending that Mallya might fly out of the country, were preparing to approach Supreme Court to attach his passport. But Mallya flew out of country to UK on March 02, 2016. Surprisingly the Central Bureau of Investigation (CBI), Government of India which had earlier issued an arrest warrant if he tried to leave country on October 16, 2015, changed it on November 24, 2015 asking immigration authorities merely to report, if Mallya is travelling abroad. This facilitated his leaving the country, fueling allegations that some powerful persons in corridors of power facilitated his leaving the country. CBI tried to justify the change by saying that the first order was issued 'erroneously'. The head office of the organization said that their Mumbai office made a mistake by ticking a wrong box in the form initially, a mistake which they said was corrected in the second notice. CBI further clarified that Mallya went abroad at least 6 times between November 2015 and February 2016 and always returned and according them Mallya also made himself available to questioning by CBI on December 9, 10 and 12, 2015, hence they did not find it necessary to arrest him (Indian Express, 2016).

Industry watchers and legal experts feel that Banks may never be able to recover the loans (Manish, 2015). Further according to CBI and banks, Mallya has laundered a large portion of the loans he received from banks by transferring them to the other firms owned by him and recording the transactions as 'repayments of inter corporate deposits', which Mallya vehemently denied.

Could KFA have been saved? Undoubtedly Kingfisher Airlines was dream child of Flamboyant Mallya. In fact the inauguration of the airliner coincided with birth day of Mallya's son Siddarth. Many industry analysts feel that Mallya had great dreams for this airliner, which he thought would catapult him into world's richest list. However that did not happen for many reasons. To begin with like everything he did, Mallya wanted a business that is highly visible, but did not understand the intricacies of running a complicated business like airlines. The next important issue is lack of a clear vision and a supporting business strategy. KFA's business strategy was clouded. Mallya wanted to emulate successful airlines like South West of US but did not follow their strategy. He always wanted to offer differentiated service and succeeded to a great extent initially though at great cost, but his acquisition of Air Deccan defies all the logic in the context of his strategy to make KFA different. Offering first class and inflight entertainment on domestic routes was not a wise business move. The longest routes in India are less than three hours duration and many industry experts are skeptical about the benefits of inflight entertainment to the fledging airline.

Mallya also wanted to vanquish KFA's main competitor, Jet airways at any cost. This single point obsession according to industry experts resulted in many questionable decisions. Mallya could have tried to save the company by taking in an experienced partner. But he did not

want to lose the control of KFA, it is believed. At one point another Industrial power house of India the TATAs were supposed to have made an offer to buy majority stake at ₹ 30 during 2011, which was not accepted. Mallya it is believed has approached Mukesh Ambani of Reliance group, but had not been able to evoke any interest. Subrato Roy of Sahara group also was supposed to have expressed interest. But none of these materialized and according to reports and analysts, Mallya's ego, unwillingness to lose control or being a minority stakeholder were the main reasons (Bazmi & Nayyar, 2011).

DISCUSSION AND FINDINGS ON CORPORATE GOVERNANCE ISSUES

Board of Directors

Indian Company act and legal framework requires that at least half the directors must be outside directors. The board of directors KFA comprised of insiders and outside independent directors on paper, as stipulated by SEBI guidelines. However the board was dominated by the Chairman and Managing director Mallya all along. It is clear that the board did not have any say in the control of the airliner and Mallya was controlling all activities. It is clear that the composition of board was to meet the requirements of SEBI and related legal framework in letter but not in spirit. Indian corporate governance law has many stringent requirements like Sarbanes – Oxley Act. Clause 49, was introduced into the Indian corporate law in order to provide transparency in financial reporting. Surprisingly for a company of this size there are only four directors at many times and one associate director including Mallya. Obviously the board has clearly failed to exercise their oversight on the actions of executives and in their fiduciary duty to the shareholders. This clearly shows in matters of corporate governance, implementation of the law in spirit is more important than having a robust legal framework. Surprisingly the Board members may or may not hold any shares in KFA as per the company policy on shareholding policy.

Effect on Employees

All employees including pilots lost their jobs. They were not paid salaries for months in spite of going on strike many times. As of 2012, KFA owed ₹ 300 Crores ($60 million) in salaries to 3000 employees (Chowdhury, 2016). Employee's provident fund was deducted but not deposited with the Provident fund organization, as legally required. Employee Income Tax deducted at source has not been deposited with Income Tax authorities and adding insult to injury. Employees of KFA started getting notices from Income Tax department to pay taxes. Employees are protesting and have appealed to the government and Supreme Court of India to help them in getting their dues. Employees are now demanding that Diageo Plc. which acquired 53.4% stake in United Spirits pay their dues before they settle their $ 75 million deal with Mallya. On 07 March 2016, Debt recovery tribunal barred Mallya from accessing $75 million due from Diageo, until loan default cases are settled. But legal experts doubt the enforceability of this order (NDTV, 2016). Employees Provident Fund Organization (EPFO), formed an investigation team to look into the related issues on March 15, 2016, again a knee jerk reaction, and a case of too late and too little. EPFO's argument that none of the employee unions have filed a complaint is seen as an attempt to cover-up their failure, since employees are agitating on salaries and PF from 2012 onwards. Except for salaries, all other issues were avoidable, if the

authorities in Provident Fund and Income Tax acted in right time, which again leads to the problem of implementation of laws of land by government officials.

Executive Compensation

Executives, CEO and top Management team are paid huge salaries and perks to motivate them to create wealth through firm performance and in the best interest of shareholders, who are the owners. As Managing Director Mallya, has rewarded himself with salaries of ₹ 25 crore ($ 5million) per year from 2008 to 2011. By Indian standards it a princely pay, as many well performing company CEOs do not make one tenth of this amount. This executive compensation is all the more difficult to explain, considering the fact that the employees of KFA have not been paid their salaries and other dues for a number of months starting from 2012. Independent director responsible for audit should have disclosed such irregularities but there is no evidence that it was done.

Effect on Shareholders

In all such failures the most affected group of stakeholders are shareholders. Shareholders of KFA lost everything. The share price of KFA has come from a high of ₹ 307 ($60.5) during 2007 to a low of ₹ 1.5 in 2012. The trading of the shares of this company on the Bombay stock Exchange has ceased from 2012 and there is no liquidity for KFA's share anymore. Small shareholders are the worst affected. Under the present circumstances there is no light seen at the end of the tunnel or even the end of the tunnel. Even the shareholders of parent company UB Ltd lost 75% of their share value. In 2011 the share price of UB Ltd moved from a high of ₹ 315($63) to a low of ₹ 82 ($14). Apart from this banks converted a substantial part of debt into equity at a substantially higher premium then the market price. As large block shareholders after this conversion, instead of being in control, they are at a disadvantage and loss. As it stands the whole equity holding of banks has to be written off as loss (Bamzai & Nayyar, 2011)

Role of Banks

The role of the banks in granting the loans to KFA seems questionable in many cases. For example banks provided loans, accepting trademarks (Kingfisher airlines) as security, in spite of the opposition from some of their own (bank's) board members. The estimated values of these trademarks now are ₹ 6 Crores ($1.2 million). Accepting trademarks as security may be an accepted practice for banks in developed countries, but not common in India. None of the banks reflect capitalized brand value in their balance sheets. Indian Banks are normally considered very conservative. Bank of India, another bank provided ₹ 308 crores ($61 million) loan, by accepting air conditioners in the offices, tractors, boarding pass printers and even folding chairs. The way the loans have been provided clearly indicates that the banks did not carry out a thorough 'due diligence' check and calling to question their risk assessment practices, lending credence that corruption and political influence could have played a major role. As usual the Indian government reacted to the situation now on March 15, 2016, giving directions to banks that in future, promoters taking loans will be personally responsible for the corporate loans. It is doubtful, if such a measure will stand the legal tests.

The Brand Issue

Kingfisher airlines brand that has been provided as a security to the banks was registered as a separate trade mark, though derived from mother brand Kingfisher beer. Kingfisher brand is owned by UB Ltd, registered as a brand pertaining to alcoholic beverages. UB Ltd maintains that this brand has not been hypothecated to any one of the lenders. Kingfisher airlines brand is a separate entity. It is unlikely that this issue will be settled any time soon. However under the present circumstances it is unlikely that anyone will be interested in buying Kingfisher airline bank. SBICAP Trustee Co. Ltd, a subsidiary of SBI sought an 'expression of interest' from parties interested in acquiring these assets failed to get any response. Experts in brand management are of the opinion that banks may never be able to monetize Kingfisher airline brand, as the mother brand represents a totally different product. Many experts also feel that a brands value is dependent on the performance of the company and going by that yardstick, Kingfisher airlines brand is unlikely to attract any buyers (Indian Express, 2016)

Property as Bank Guarantee

Mallya according to reports provided 'personal' guarantee to SBI and Punjab National Bank by mortgaging Kingfisher Villa in Goa, his family home and Kingfisher House in Mumbai, which houses his corporate offices of UB Ltd. But the value of the properties is so merger that one wonders how commercial banks have extended such huge loans on such properties. Kingfisher house has become an irrecoverable property, as it is owned by UB Ltd and not by Mallya. The bank has now approached the court. Indian Overseas bank was given two helicopters as guarantee for ₹ 108 crores (21 million). It is believed that these two helicopters are not in flying condition. Central Bank of India provided ₹ 410 crores ($81 million) with a guarantee by KFA that the sales proceeds will be deposited with them in an escrow account, but soon after KFA ceased operations.

Conversion of Debt into Equity

This is another debatable issue. In the case of KFA banks paid 61% premium on the share price of November 2010. The share price was dropping and the banks were aware of that. Though this allows the banks to convert their nonperforming assets into a performing asset, it is fraught with danger as in the case of KFA. Banks may get the shareholding, but there is no guarantee that it will lead to a turnaround in a badly managed firm. Banks in most cases may not have the required expertise to be active on the management side of the business. The more important challenge that comes up is if the banks decide to sell away their shares. This may destabilize the management of the company and if the present management is not willing to play by rules, they may approach courts. Indian courts are clogged with cases and the matters may drag on for a long time. Meanwhile if the company performance goes down, the banks will be badly hit. SEBI has since modified their policy and formula about conversion of debt into equity after the KFA experience, asking banks to negotiate the price with management. This again is a knee jerk reaction many market watchers suspect that this may not work either in the Indian context. Certainly SEBI cannot make policies on such important issues on trial and error basis (Business Standard., 2015).

Effect on Suppliers

KFA owed a lot of amount to Mumbai Airport towards service charges. Mumbai International Airport auctioned Mallya's private jet to recover their dues, but could get only ₹ 22 lakhs ($44, 000), a meager amount compared to the dues. KFA as on March 07, 2012 has outstanding dues over ₹ 425 crore ($85 million) to Hindustan petroleum Corporation (HPCL). DGCA after KFA default asked all airlines to disclose the dues they owe to suppliers like oil companies and also to the government. These details are not available publicly. Again this action by the regulator is too late and of no consequence at this stage.

Market for Corporate Control

India does not have a great market for corporate control. No other company has shown interest in acquiring or reviving the failed airliner. Aviation sector is high risk sector and not many takers will be there to venture into an airline which has net worth in negative and brand value in taters and is also facing a number of court cases. The airline has taken most of its aircrafts on wet lease. Without fixed assets (aircrafts) of their own airlines will not be able attract buyers. In a country like India, where bureaucratic processes, nexus between business houses and politicians rule the roost, in the best of times, it is difficult to takeover other companies. In a case like KFA, it is safe to imagine that no other company will come forward and if anyone would come forward, expect government to provide a bailout. Under the present circumstances, that is not a possibility.

Ethics in Business

In spite of all this Mallya is reported to have spent a fortune on his birthday party on December 18, 2015. He was also reportedly spent ₹ 76.39 crore ($15.5 million) on acquiring players for his IPL team Royal Challengers from 2013 to 2016, while the KFA employees were not paid salaries for months amounting to ₹ 350 crore ($t0 million). His excesses also include purchase of a race horse called 'Air support', for ₹ 4 crore ($0.8 million), for his stable. The other acquisitions by Mallya include, Indian Empress, a yacht with a helipad for $98 million from a Qatari Shaik in 2006, Spycar F1 team for € 90 million in 2007. He also owns another vintage yacht built in 1906, three planes, a Boeing 727, Gulfstream and a Halker 700. He is also reported to have acquired one island in Lakshdweep and an Island in Europe of coast of Monte Carlo for 750 crores ($150 million) in 2009. These extravagances call for ethical and moral questions apart from legal questions.

CONCLUSION

KFA is a case of collective failure of the system in India. Such recurring failures can have a serious effect on the efforts of Indian Economy and may seriously dent the aspirations of India to become an economic super power. India on paper has corporate legal framework that is as good as US Sarbanes – Oxley Act. They have created organizations like SEBI modelled on SEC of US. But unlike in US, the problem is with implementation. This case brings into question the Banking practices of India. Collectively the nonproductive assets of Indian public banks have been estimated at $120 billion in 2016. This is not possible in developed countries and many developing countries. Host of factors like political nepotism, outright corruption

facilitate the many questionable practices of Indian Banking sector. In all recent corporate governance failures in India, the only end result and common theme is blame game. In KFA case also the blame game has begun between ruling party and opposition parties. Banks blame political influence and politicians blame the banks for lack of due diligence. The issue is complicated by the fact that many CEO appointments in banks are normally political appointments. Market watch dogs keep changing the policies, for example SEBI's change of policy of conversion of debt to equity by banks at premium resulted in lending banks paying 61% premium to KFA. The investigating agencies like CBI are hampered by politicians and loopholes in the legal system. For example CBI says its investigations in KFA case are hampered by the fact that none of the banks have registered official complaints, which they say is prerequisite for continuing with investigation. All the players knew that there is a good chance that Mallya may leave the country, but nobody took the initial step of approaching the court. By the time they decided to move the court, Mallya already left the country. Not many people are convinced by the explanation given by CBI as to why the arrest warrant at airports to arrest Mallya has been withdrawn and changed to only providing immigration, in case he left. The Indian judiciary is independent, effective and respected but they are drowned in the number of pending cases which runs into millions. Even presuming that the banks indeed file cases I courts, it may take years or even decades before the cases are decided. The case KFA is so complicated and considering the fact that on paper Mallya does not own any property of his own India, as per the records available with Rajya Sabha of Indian Parliament, it may be impossible that the banks will be able to achieve anything.

The only solution to this recurring problem in India is to provide teeth to the watch dog organizations like SEBI, grant more powers to investigating agencies like CBI, ensuring more accountability from public banks, strengthen the other supervisor institutions, and decongest courts and bringing culprits to swift justice. The corporations must be made to follow the corporate governance practices both in letter and spirit.

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THE KEY INDICATORS OF GOODWILL IMPAIRMENT WRITE-OFFS

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ABSTRACT

When a firm acquires another firm it generally pays more than the fair value of the target firm. This is due to the expectation of synergies being obtained from the acquisition. Simply put, the combination of firm A and firm B is expected to be greater than the value of firm A plus the value of firm B.

From an accounting perspective this amount paid above the fair value is called goodwill and is considered an asset on the balance sheet. Since 2001, goodwill is considered a perpetual asset meaning that, theoretically it can continue to have value for perpetuity. However, the goodwill is required to be assessed on an annual basis to determine if the asset still has value, in other words if the synergies of the acquisition are being realized.

If it is deemed to have lost value a goodwill impairment write-off must be taken. This impacts the firm's earnings from an accounting position. It is not a change in cash flows. However, investors view a goodwill impairment write-off as a short term negative event, thus if an investor could determine which firms that have goodwill will be taking an impairment in the near future, they can short the stock and generate a positive return.

This paper examines which factors contribute to the probability that a firm will be required to take an impaired goodwill write-off. The paper uses a Probit regression model to estimate the marginal effect of nineteen variables thought to be key determinants of the likelihood for the need of a goodwill impairment write-off. These variables are comprised of firm performance factors, firm specific characteristics, and an indicator of the general business cycle.

This analysis finds that momentum, book-to-market equity, goodwill age, and a lengthy prior economic state of contraction are the key predictors of an impending goodwill impairment write-off.

INTRODUCTION

Goodwill impairment write-offs have been shown to have a significant negative impact on stock prices in the short term (Hirschey and Richardson, 2003; Bens and Heltzer, 2005; Li and Meeks, 2006) however, in the long term there is a positive impact on stock prices after goodwill impairments (Cheng, Peterson, and Sherrill, 2015). Thus it would be helpful to understand the likelihood of a company taking a goodwill impairment write-off in order to develop trading strategies based on this likelihood and subsequent expected stock price decline. This paper examines firm performance factors, firm characteristic variables, and general economic data to determine the impact different factors have on the probability that a goodwill impairment write-off is forthcoming.

This impairment write-off impact can be substantial, as in the case of e-Bay in 2007. E-Bay acquired Skype in 2005 for $2.6B. In 2007 a goodwill impairment write-off of $1.39B was taken. Due to this, the total operating expenses increased considerably. Consequently, the net income was only $348M vs. the previous year's net income of $1.1B. E-Bay's earnings per share were 25 cents compared with 79 cents the previous year. Without the impairment charge of

$1.39B, the earnings per share would have been close to $1.25. In early December of 2007, e-Bay's stock price was $33.19. In January of 2008, after the goodwill impairment write-off was announced in the results, the stock price dropped to $26.89. This was a 19% decline in the stock price in one month.

Goodwill is an intangible asset that represents the difference between what an acquiring firm pays for a target company during an acquisition and the book value of the target firm. Simply put, this is the premium a company pays for a firm during an acquisition. This goodwill can be a substantial portion of the acquisition price. The mean goodwill to purchase price ratio is 55 percent (Shalev, 2009; Lys, Vincent, and Yehuda, 2011). With the adoption of rule SFAS 141 in 2001, a firm that acquires another firm, regardless of whether the target firm is public or private, is required to list this goodwill as an intangible asset on the balance sheet. Thus, almost all acquisitions result in goodwill being brought onto the balance sheet. Consequently, in 2011 67% of U.S. based public firms listed on a major exchange, excluding financial firms and utilities, carried a positive goodwill balance.

Since the accounting rule changes implemented in 2001, goodwill is no longer considered a wasting asset. Theoretically goodwill could remain on a balance sheet forever. Accordingly it is no longer depreciated or amortized over time. Instead, companies are required to assess their balance sheet goodwill on an annual basis and determine if the goodwill is still adding value or if it has become an impaired asset. If it is deemed impaired it must be written-off immediately. Since the decision is now binary, impaired or not impaired, I am using a limited dependent variable model, specifically a Probit regression model, to assess the probability that a company will be taking a goodwill impairment write-off. This model uses the marginal effects of each variable to analyze the amount that each factor contributes to the overall probability of a goodwill impairment write-off.

This model examines eight factors that can impact a firm's decision of whether an impairment write-off is required. Variables are constructed to proxy for these eight factors. One of the factors is examined categorically, thus separating it into 12 separate variables and expanding the number of variables to 19. Only firms with a positive goodwill amount on the balance sheet are included in this analysis.

DISCUSSION OF MODEL

The Model

Given the new accounting guidelines a firm is required to examine any balance sheet goodwill once a year and assess whether the goodwill is impaired, if so the amount of goodwill deemed impaired must be written off. If it is not deemed impaired then no action need be taken. The goodwill that is not impaired remains on the balance sheet. Accordingly, I use a binary variable, IMPAIR to indicate if an impairment write-off occurred in year y. It takes a value of one if a write-off occurred and a value of zero if a write-off was not required.

The purpose of the model is to determine which factors contribute to the likelihood of an impairment being required and the level of impact of each of the factors. Thus a Probit binary choice model is employed with IMPAIR being the dependent variable. The independent variables are the factors that are being analyzed to determine if they have statistically significant and economically relevant impact on the likelihood of the firm taking a goodwill impairment write-off.

Specifically the following regression model is estimated:

$$P(IMPAIR=1) = \Phi\ (\alpha + \beta_1 GA + \beta_2 Cont_1 + \beta_3 Cont_2 + \beta_4 Cont_3 + \beta_5 Cont_4 + \beta_6 ont_5 + \beta_7 Cont_6 + \beta_8 Cont_{7+} \beta_9 Cont_8 + \beta_{10} Cont_9 + \beta_{11} Cont_{10} + \beta_{12} Cont_{11} + \beta_{13} Cont_{12} + \beta_{14} mom + \beta_{15} chrev + \beta_{16} chebit + \beta_{17} lnsize + \beta_{18} lbtm + \beta_{19} age + \varepsilon) \quad (1)$$

The Data

The data for goodwill, assets, book equity, impairment write-offs, income, and revenue are from Compustat via WRDS. The data for individual firms' stock returns and the data for computing market equity are from the Center for Research in Security Prices, (CRSP) again via WRDS. The National Bureau of Economic Research data is used to determine whether the economy is in a state of contraction or expansion.

All data is for U.S. based firms only. Only public firms listed on the New York Stock exchange, the American Stock exchange, or the NASDAQ are included. Utilities and financial institutions are excluded from this model. Utilities are highly regulated and therefore acquisitions follow different rules. Financial firms manage their balance sheets differently so they are excluded as well. I exclude these firms based on their Standard Industrial Classification, (SIC) codes. SIC codes 6000-6999 (financials) and SIC codes 4900-4999 (utilities) are excluded.

The timeframe of data is from the beginning of fiscal year 2002 to the end of fiscal year 2011 and all years are measured by the firm's fiscal year start and end dates. The new accounting rules regarding the recording and handling of goodwill were implemented with a start date of fiscal year 2002, so this ensures that all data used in this model is reflective of the new accounting standards. Firms must have a positive amount of goodwill on their balance sheet to be included in this study. If a firm's goodwill balance changes, only the firm years where there is a positive goodwill balance is included in the study. This provides 15,590 firm year observations.

The Regressors

Regressors are one of three types; firm performance indicators, firm characteristic variables, and general economic indicators. The firm characteristic variables are size, book-to-market equity, level of goodwill, and age of goodwill. The firm performance indicators are change in revenue, change in earnings, and momentum. The general economic indicator is the number of months of contraction.

Size is included in this model to determine if the smaller firms are more likely to have impairment write-offs than larger firms. The size, or market capitalization is measured as the number of shares outstanding of common stock at the end of fiscal year y times the price per share on the last day of the month of the last month in the fiscal year of year y. Closing price is used if available, if it is not available an average of the bid and ask prices is used. The size is scaled by taking the natural log of size.

Similarly book-to-market equity is used to determine if growth firms are more likely to have impairment write-offs than value firms, or vice versa. Book equity is calculated as the total

assets minus the total liabilities plus the balance sheet deferred taxes and income tax credit minus the preferred stock liquidating value. This is consistent with previous literature, (Fama and French, 2008). The book equity is divided by the size variable to obtain the book-to-market equity ratio. All values are obtained at the end of the fiscal year. Again the book-to-market value is scaled by taking the natural log of the ratio.

The goodwill characteristics used are the age and amount of the balance sheet goodwill. Goodwill is not a wasting asset, in other words it stays on the balance sheet until it is deemed impaired and then it is expensed. Theoretically goodwill could remain on the balance sheet forever if the expected synergies of the acquisition are recognized. Thus the goodwill balance generally remains constant over time unless it is deemed impaired and is written off, or if further acquisitions are undertaken. This model attempts to determine if the risk of impairment increases as the goodwill ages. To determine the age of the goodwill, the difference between goodwill at the end of fiscal year y is compared to the goodwill at the end of fiscal year y-1, if at least 95% of the goodwill is still on the balance sheet it is given an age of one year. This is done for subsequent years. As long as at least 95% of the previous year's goodwill remains on the balance sheet the age is incremented. When an impairment write-off occurs, the age in the year of the write-off is set to the last calculated age and then the age counter is reset to zero. Therefore the age variable will be an integer between zero and ten years. No impairments can occur in year zero.

This study only includes firms that carry some positive amount of goodwill on the balance sheet as there cannot be goodwill impairment if there is no goodwill. Another goal of the model is to determine if a greater amount of goodwill results in a greater likelihood that it will be deemed impaired. The amount of goodwill is scaled by the firm's assets to create a relative measure for comparison. Both the goodwill level and the level of assets are measured at the end of the fiscal year.

The firm performance variables are change in revenue, change in earnings, and momentum, which is the previous twelve month's stock price performance. With an acquisition a firm generally expects to increase their revenue by the additional revenue of the acquired firm and by any revenue synergies from the new combined entity. Thus intuitively, an increase in revenue indicates a successful merger and would make an impairment write-off less likely. Revenue is measured at the end of the fiscal year and the change in revenue is determined by subtracting revenue of year y-1 from year y. Therefore an increase in revenue will be seen as a positive number.

Likewise earnings are measured at the end of the fiscal year and changes in earnings are calculated as earnings in year y minus earnings in year y-1 so that an increase in earnings shows as a positive number. Earnings are measured before income taxes, (EBIT). And again, earnings are expected to increase post-merger as cost synergies are realized, therefore intuitively an increase in year over year EBIT would be expected to have a negative impact on the probability of impairment.

The third performance indicator is the momentum or the overall stock return for the firm in the prior twelve months. The cumulative compound return is calculated for the twelve months prior to the end of fiscal year y.

The final factor is a variable used to indicate the general economic condition or business cycle. The economy is either expanding or contracting. Intuitively, in a contracting economy it would be expected that more firms would find they needed to take an impairment write-off. To test this, the variable CONT is created. This takes a value of zero to twelve. Each month of the

twelve months prior to the end of fiscal year y gets a value of one or zero, one if the economy is in a state of contraction and zero if it is expanding. These values are summed at the end of the twelve month period. For example, if each of the twelve months prior to end of fiscal year y were in a state of contraction, the value for the variable CONT would be 12. The higher the value of CONT, the longer the economy has been in a contraction. Consequently the higher the number for CONT, the greater the likelihood of the need for an impairment. This variable is treated as a categorical variable, making 12 separate values for CONT. This allows for examination of each economic state individually.

The variables total return, total market return, goodwill/assets, change in revenue, change in earnings, size, and book-to-market equity are all Winsorized at the 1% level on both the upper and lower ends. The observations are not truncated, but any values greater than the 99th percentile or less than the 1st percentile are set to the closet value within the accepted range. This removes the most extreme outliers. The mean and standard deviation of each of the regressors is included in Table 1. These are shown separately for the two cases of IMPAIR; IMPAIR = 1 and IMPAIR =0.

Table 1
KEY VARIABLE SAMPLE MOMENTS

	No Goodwill Impairment		Goodwill Impairment Write-off	
	(n = 13,888)		(n =1,702)	
Variable	Mean	SD	Mean	SD
Firm Characteristics				
Log of Size	13.26	1.91	13.23	1.93
Log of Book-to-market ratio	-7.84	.87	-7.72	.88
Goodwill scaled by assets	.57	.78	.69	.85
Age of goodwill	3.07	2.25	4.82	2.36
Performance Characteristics				
Year on year revenue change	238.17	830.78	107.65	737.85
Year on year earnings change	36.83	172.85	2.04	171.36
Momentum	.19	.55	-.10	.54
Business Cycle				
Contraction	1.66	3.55	3.69	4.82

ECONOMETRIC RESULTS

After running the Probit regression model, equation (1), I first test the joint significance of the regressors using the log-likelihood ratio test to ensure that the model does provide some explanatory power for the probability of IMPAIR being one. The hypothesis is as follows:

H_O: $\beta_1 GA = \beta_2 Cont_1 = \ldots = \beta_{19} age = 0$

H_A: at least one $\beta_i \neq 0$

The log likelihood value of the complete model is -4619.725. The log likelihood value of the constrained model, where the regressors are set to zero, is -5375.1489. The equation for the log-likelihood ratio test is as follows:

$$-2\left[ln\, L\left(\tilde{\delta}\right) - \ln L\left(\hat{\delta}\right)\right] \underset{\sim}{A} x^2_{k-1} \quad (2)$$

where $\left(\tilde{\delta}\right)$ is the value of the constrained likelihood function, and $\left(\hat{\delta}\right)$ is the value of the unconstrained likelihood function. In this case, the likelihood ratio value is 1510.85. The critical value for chi-squared with k =19 is 36.19. Clearly, 1510.85 is greater than 36.19, so the null hypothesis is rejected. Thus, the regressors are jointly significant at the 99% confidence level.

The coefficient estimates from the regression are listed in Table 2, along with the standard errors, the t-statistics and the p-values. Eight of the regressors are individually significant at the 99% confidence level. The categorical variable CONT is only individually significant for three levels of contraction, 7 months, 11months, and 12 months. A Probit regression was estimated with the same variables as equation (1) with the exception that CONT was not a categorical variable, but was treated as a continuous variable. In this case, CONT offered virtually no explanatory power for the likelihood of impairment. By treating it as a categorical variable, certain levels of contraction do indeed show a high statistical and economic significance for predicting an impairment write-off. Thus the variable is kept as a categorical variable in this study even though many of the categories provide no statistically significant results.

Table 2
MODEL ESTIMATION

	Regressor	Coefficient Probability >|t	Std. Error	t-stat
Intercept	-.079	.151	-0.52	.601
GA	.098	.018	5.50	.000
Cont -1	-.185	.175	-1.05	.292
Cont-2	-.281	.177	-1.59	.112
Cont-3	.121	.210	.58	.565
Cont-4	-.203	.185	-1.10	.273
Cont-5	-.153	.156	-0.98	.327
Cont-6	-.067	.202	-0.33	.742
Cont-7	.232	.054	4.26	.000
Cont-8	-.063	.147	-0.43	.670
Cont-9	.234	.165	1.41	.158
Cont-10	.011	.134	0.08	.937
Cont-11	.301	.050	6.02	.000
Cont-12	.237	.082	2.89	.004
mom	-.613	.036	-16.98	.000
chrev	-.000	.000	-3.57	.000
chebit	-.000	.000	-1.95	.051
lnsize	.010	.009	1.13	.258
lbtm	.245	.020	12.16	.000
age	.149	.006	23.99	.000

In a Probit model a marginal effects analysis is used to standardize the coefficients in order to more easily interpret the impact of each individual regressor. The marginal effects results as well as the standard errors, t-statistics, and p-value for the marginal effects are listed in Table 3. The marginal effect column is interpreted as a one unit change in the variable has an impact on the probability of impairment by the value listed. For example, a one unit change in the goodwill scaled by assets, GA impacts the probability that impairment will be taken by 1.6%. Seven of the variables have a statistically significant impact on the probability of impairment at the 99% confidence level and an economically relevant impact on the probability of impairment. Change in revenue, CHREV, has a statistically significant coefficient estimate and marginal effect, but it has an economically insignificant change, .02%, in the probability of impairment.

Table 3
MARGINAL EFFECTS

Regressor	Marginal Effect	Std. Error	t-stat	Probability >|t|
GA	.016	.003	5.50	.000
Cont -1	-.026	.022	-1.18	.238
Cont-2	.037	.019	-1.90	.057
Cont-3	.020	.037	0.54	.589
Cont-4	-.028	.023	-1.24	.214
Cont-5	-.022	.020	-1.07	.283
Cont-6	-.010	.029	-0.34	.732
Cont-7	.041	.011	3.87	.000
Cont-8	-.009	.021	-0.44	.658
Cont-9	.041	.033	1.26	.208
Cont-10	.002	.021	0.08	.938
Cont-11	.055	.010	5.35	.000
Cont-12	.042	.016	2.59	.009
mom	-.100	.006	-16.87	.000
chrev	-.000	.000	-3.57	.000
chebit	-.000	.000	-1.95	.051
lnsize	.002	.001	1.13	.258
lbtm	.040	.003	12.16	.000
age	.024	.001	24.25	.000

CONCLUSION

The intent of this model is to determine which factors have the greatest impact on the likelihood that a firm will take an impairment write-off of their goodwill. The results are quite interesting and not completely intuitive. For example, neither changes in revenue nor changes in earnings have a relevant impact. Theoretically goodwill is deemed impaired when it is no longer contributing to the firm's success in the amount that it was intended. Having year on year increases in revenue or earnings, (or both) would be an intuitive indication that the acquisition was successful and that the premium paid, i.e. the goodwill, continues to be a productive asset. This model shows no evidence that changes in revenue or earnings, (neither positive nor negative changes), impact the probability of the need for an impairment. The only performance indicator examined that has an impact is the firm's stock price momentum. Momentum has a marginal effect of -10%. This is interpreted as, for every one unit increase in momentum, the likelihood of an impairment write-off drops by 10%. This is both statistically significant and economically

relevant. Of all the regressors analyzed, momentum is the factor with the biggest impact on the likelihood of impairment.

The variables with the next largest impact on the need for impairment are the CONT11 and CONT12 variables. These represent a period of 11 months and 12 months of contraction for the prior twelve month period. They impact the likelihood of impairment by 5.5% and 4.2% respectively. Again these are both statistically significant and economically relevant results. This implies that some of the key components of the need for an impairment write-off are outside the control of the firm. A contraction of 7 months is also relevant and significant, with a 4.1% impact. Since this variable was categorized into 12 unique variables it can be seen that the contraction period length is not statistically significant until the longer periods. This is an intuitive result as the goodwill impairment assessment requires that the fair value of the reporting unit be used in the assessment along with the book value of the goodwill. Thus, the assessment includes a relative measure for the reporting unit value and an absolute measure for the goodwill value. Consequently, a lengthy contraction period would be expected to negatively impact the fair value of the reporting unit, yet it would have no impact on the absolute value of the goodwill, making impairment more likely.

Of the firm characteristic variables the most impactful is the book-to-market equity value, lBTM. A one unit increase in lBTM drives a 4% increase in the probability of impairment. This suggests that value firms, (firms with high book-to-market equity) are more likely to take impairment than growth firms. Yet the size of the firm has no statistically significant impact on the probability of impairment.

For the firm characteristics related to the goodwill itself, the age of the goodwill is more impactful to the likelihood of it being written down than the amount. The age of the goodwill, AGE, has a 2.4% impact on the probability while the amount of goodwill, GA, has only a 1.6% impact.

This model suggests that firms with the highest potential of an impending goodwill impairment write-off are value firms that have negative momentum in their stock price and have goodwill that has been on the balance sheet for the largest number of years. The model also suggests that the likelihood of impairment increases as the length of the economic contraction increases. Thus investors may want to consider short strategies for value firms with aged goodwill when making investment choices in a contracting economic state.

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FOUR PROOFS IN OPTION PRICING

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ABSTRACT

Many very good finance students will get to graduate school unprepared to read a logical proof, and yet logical proof is the essential tool that is required to produce finance theory. This paper is designed to help these students to learn how to read and understand logical proofs. To this end, four original proofs in option pricing theory are presented. Much attention is given to the logic of the material conditional: what it means to say, if A is true then B must be true. Four different proof techniques are studied: direct proof, contrapositive proof, proof by contradiction (reductio ad absurdum), and proof by cases. An appendix is also provided that sketches out the historical development of attitudes toward theorem and proof work.

Were one to only count the number of finance journal articles published, one would conclude that finance is in large part an empirical discipline. Nevertheless, the large, important ideas in finance do not come from empirical studies. They come instead from theorem and proof work. Moreover, it also true that empirical work is not often successful in speaking to the quality of finance theory. Consider the famous case of the Sharpe (1964), Lintner (1965) Capital Asset Pricing Model, the CAPM, a theory produced by methods of theorem and proof that has been the subject of many, many empirical tests, yet none of these tests have been decisive.

Empirical testing of financial pricing models is often justified because some of the economic assumptions on which the logical derivations of asset pricing models depend are unrealistic: economic assumptions nominated only in the hopes that empirical, testable results could be obtained, not for any other reason. Freidman (1953) champions such a positive approach to model building, maintaining that what matters is the empirical tests of model predictions, not the realism of the economic assumptions. But decisive empirical testing of financial models is difficult to come by. As a case in point, the empirical testing of CAPM results that had been counted upon to sit as judge and jury concerning the validity of theory is itself called into serious question.

So perhaps Friedman (1953) is wrong. Perhaps the understanding that we seek as to why security prices in financial markets behave as they do can only come from logically derived models, like the CAPM and like the Black Scholes (1973) Option Pricing Model. If so, what is needed by those who study finance is not better econometrics but a closer attention to the logical derivation of theoretical results. To this end, this paper is about logical foundations of proof. The study of the propositions and the proofs that follow are motivated by the earlier work of Merton (1973) and of Jarrow & Turnbull (2000).

ARBITRAGE AND OPTION PRICING

Underlying assets (stocks, bonds, commodities, and so forth) trade in financial markets. The price of each underlying fluctuates as supply and demand conditions dictate. Investors who purchase these underlying are said to take a long position in the underlying. In this paper the symbol S(t) designates the market value of a long position in an underlying as of time period t. If an investor purchases one share of General Electric common stock (GE) today for $30 per

share, one could use the notation of this paper and write an equation: S(t) = $30 in order to describe this transaction. This notation is capable of being more specific in regard to time. If the time period of this purchase were today, then in a timeline one might describe the time of purchase as t = 0. In the notation of this paper one puts these ideas of time and dollar size together and writes: S(0) = $30. The future is unknown by investors, but perhaps it will be true that one period from now (T = 1) that the investor who today (t = 0) had purchased one share of GE for $30 sees one period from now that the market price of GE has increased to $40 per share. One could write this future value of a long position in GE as S(T) = $40. In the logical proofs of this paper, the results are not specific to any specific underlying or any specific future time period, so the symbol S(0) refers to the market value of a long position in some quantity of some underlying today where t = 0, and the symbol S(T) refers to the market value of a long position in that same underlying as of some point on a timeline T periods from now.

Contracts for the delivery of underlying also trade in financial markets. These too have market prices and these contract prices also fluctuate as market conditions change. The future value of these contracts are each a function of the future value of their corresponding underlying asset. There are different kinds of contracts for delivery that reference an underlying: futures contracts, forward contracts, swap contracts, and option contracts. No matter the kind of contract, terms of delivery always include a future delivery time, a delivery place, a delivery price, and whether or not delivery is to be done at the option of the party who purchased the contract. Futures contracts, forward contracts, and most kinds of swap contracts have no option feature.

In this paper the problem at hand is that of option pricing. In this regard, there are four kinds of options relevant to the proofs of this paper: European call options, American call options, European put options and American put options. Surprisingly to the uninitiated, the modifying terms American and European do not refer to geography in any way. These modifying terms instead define contractual provisions in option contracts. More about this is found below.

A European call option gives any purchaser of the contract, a right, but not an obligation, to call for delivery of the underlying on the expiry date = T and pay K dollars to the seller of the European call option at expiry for this underlying. Should the purchaser of a call option choose to compel delivery then that purchaser is said to exercise the option. This future date T, the expiry day of the contract, and the delivery price K, commonly called the exercise price, are both known by both buyer and seller of the call option at time t = 0, the day this call option is sold by the seller of the call to the buyer of the call.

A purchaser of a European call option is said to have the long position. The long position on the expiry day of the European call option must make a decision whether or not to exercise the option to command delivery of the underlying. Exercise is not required: the long position is not required to command delivery of the underlying and pay to the seller the exercise price K. But, if the long position does not exercise, then the call option expires worthless. Even so, the seller of the call option, the short position, keeps the money that was paid by the long position for the call option.

The price paid by the long position for the European call option is written c(0). The future value at expiry for the long position is c(T). The future value at expiry of the long position in a European call option is: c(T) = Max [S(T) - K, 0]. The price received by the short position for the sale of the European call option is symbolized with a negative - c(0) and the corresponding future value is written with a negative: - c(T) = - Max [S(T) - K, 0].

Consider a specific example to see how a European call option works. Suppose that the long position buys a call option today t = 0 on an underlying, one share of GE common stock.

Currently, at the time of purchase, the underlying, GE common stock is worth $30 per share. Therefore, given this as an assumption for this example, S(0) = $30. In this example assume as a given that the exercise price K which is agreed to under the terms of the contract is equal to $34 per share and also assume as given that the expiry date of the contract is one period from today. So by these assumptions T =1 and K = $34.

The future price of GE common stock at T = 1 is unknown at present, so S(T) = ? But, if at expiry, one period from now, GE is worth more than K, then the long position should choose to exercise their option which then would compel the seller of the call option to deliver the underlying and accept in payment the exercise price K = $34, thereby producing a payoff at expiry equal to $6 = $40 - $34 = S(T) - K. On the other hand, if a year from now at expiry the underlying GE trades at a price equal to or less than K, say S(T) = $32 instead of S(T) = $40, then the long position should permit the option contract to expire worthless and no payoff at expiry will be generated. The seller of the call option, the short position, keeps the price paid for the European call option, c(0), no matter what, even when the option contract expires worthless.

The delivery terms of American call option contracts differ from European call option contracts in only one respect: the long position in the American call may choose to exercise at any time after the American call is purchased up until the expiry day is over ($0 < t \leq T$). The price paid by the long position for the American call option is symbolized C(0). The future value of the long position in a American call option is designated: C(t) = Max [S (t) - K, 0]. The price received by the short position for the sale of the American call option is symbolized - C(0) and the corresponding future value: - C(t) = - Max [S(t) - K, 0].

Put option contracts are different from call option contracts. A European put option for the delivery of an underlying gives the purchaser of the put (the long position), a right, but not an obligation, to sell the underlying asset at expiry in for K dollars. Should the long position of a European put choose to compel the sale of the underlying then that option is said to be exercised. This future date T, the expiry day of the contract, and the delivery price K, commonly called the exercise price, are both known by both buyer and seller of the put option contract at time t = 0, the day a put option is sold.

On the expiry day of the European put option contract, the long position must make a decision whether or not to exercise the option. Exercise is not required: the long position is not required to make delivery of the underlying and receive from the seller of the put option the exercise price K. But, if the long position does not exercise the option at expiry, day T, then the contract expires and becomes worthless. Even so, the seller of the put option, the short position keeps the money that was paid by the long position for the put.

The price paid by the long position for the European put option contract is written p (0). The future value at expiry for the long position is p(T). The future value at expiry of the long position in a European put option is: p(T) = Max [K - S(T), 0]. The price received by the short position for the sale of a European put option is symbolized with a negative sign – p(0). The corresponding future value is also written as a negative number: - p(T) = - Max [K - S(T), 0].

Consider a specific example to see how a European put option works. Suppose that the long position buys a put option today t = 0 on an underlying, one share of GE common stock. The price of this European put option is equal to p(0) at t = 0. Currently, at the time of purchase of this put, the underlying, GE common stock is worth $30 per share. Therefore, for this example, S(0) = $30. In this example assume as a given that the exercise price K is equal to $34 per share and also assume as given that the expiry date of the contract is one period from today. So T =1 and K = $34.

The future price of GE common stock at T = 1 is unknown at present. But, if at expiry, one period from now, GE is worth less than K, say for the sake of this example S(T) = $25 then the long position will choose to exercise their option which compels the seller of the option to purchase the underlying for the exercise price K. Should this state of the world obtain, the long position produces a payoff at expiry: $9 = $34 - $25 = K - S(T). On the other hand, if one period from now at expiry GE trades at a price equal to or greater than K, then the long position will permit the put to expire worthless. The short position keeps the price paid for the European put option, p(0) no matter what, even if this put expires worthless.

The delivery terms of American put option contracts differ from European put option contracts in only one respect: the long position in the American put may choose to exercise at any time after the put is purchased until the expiry day is past ($0 < t \leq T$). The price paid by the long position for the American put option is symbolized P(0). The future value of the long position in a American put option is designated: P(t) = Max [K - S(t), 0]. The price received by the short position for the sale of the American put option is written as a negative: - P(0) and the corresponding future value is also negative: - P(t) = - Max [K - S(t), 0].

The proofs of this paper, in addition to the notions of call and put options discussed above, make use of four additional concepts from finance: portfolios, synthetic positions, the Law of One Price, and arbitrage. A portfolio is a collection of assets owned by an investor. Some portfolios contain only a single asset, but portfolios can and often do contain many assets. Some assets are held by investors as long positions: for example, underlying assets purchased in the hope that they will produce income and/ or capital gains, purchased call options, and purchased put options. Ceteris paribus, the long position in the call option desires the underlying to increase in value, while the owner of the put option desires the underlying decline. Other assets may be held within a portfolio as short positions. For example, an investor known as a short-seller borrows an underlying asset, sells it, and then later repurchases it in hopes that the underlying asset declines in value. Other short positions include selling a call option or selling a put option. The short position in the call option benefits from a decline in the value of the underlying, but the short position in the put option benefits from an increase in the value of the underlying. To understand the content of an investor's portfolio, one must know the market value of each asset contained by the portfolio and which assets are held as long positions and which are held as short positions.

Portfolios can also contain synthetic positions. A synthetic position is a portfolio of long and short positions that produces future values that are equal to the future value of another asset in every possible future state of the world. Consider an investor who wishes to create a synthetic position that will produce a future value on some expiry date equal to the future value of an underlying asset on that same date. If this underlying produces no income prior to expiry, then this investor can solve this problem of replicating the future value of an underlying by taking positions in three assets: purchase a European call on the underlying, sell a European put on the same underlying with the same exercise price and the same expiry as the call, and purchase a risk free asset with future value equal to the exercise price of the call and the put at expiry. This portfolio thus created by the investor is a synthetic position. It produces the same future value of the underlying at expiry in every possible state of the world.

The Law of One Price holds that assets and portfolios which have identical future values in every possible state of the world must also have identical price. Take two assets, say General Electric common stock and Wal-Mart common stock, if these two assets were to produce the same future values in every possible state of the world, then, by the Law of One Price, they both

must sell for the same price. Since they do not produce identical future values, they sell for different prices. Now consider the example above, the investor who creates a synthetic position in an underlying. Since this synthetic position (a long position in a call, a short position in a put, and a long position in a risk free asset) replicates the future values of the underlying, the Law of One Price holds that the price of the synthetic position must equal the price of the underlying.

In markets where investors are permitted to trade at no cost, the Law of One Price should hold. To see why, consider the opposite case. What if the Law of One Price does not hold true? Consider two assets, both with identical future values in every possible state of the world. Yet one of the assets has a higher price than the other. If this were true, then two things happen: first, investors simultaneously buy the cheaper of the two and take a short position in the more expensive, and then second, at some future point in time, close both positions -- sell the long position and use the proceeds of this sale to cover the short position. This first action of buying low and selling high produces a positive cash flow to the investor. This second action of selling the long position and covering the short produces a zero cash flow. This investment strategy is ended with the investor making a risk free profit in the first step and getting out of the market in the second step at no cost. With no investment the investor has generated a risk free profit, and has done so with no risk. No matter which way the market moves before the investor exits in step two, the future values of the long and short positions offset each other, so the net result is zero gain or loss. That is why there is no risk. So if the Law of One Price fails, investors make money with no net investment and no risk. If markets are working properly, in equilibrium, the Law of One Price holds true. In properly functioning markets, investors will compete with one another to buy the cheaper asset, thereby driving its price up; and sell the higher priced, thereby driving its price down. This continues until equilibrium is reached: assets with identical future values in every possible state trade at the same price.

Consider an investor who creates a synthetic position that mimics an underlying. (The underlying of this example produces no income prior to expiry.) This synthetic position is constructed so that it produces a future value at expiry exactly equal to the future value of an underlying. The synthetic position is itself a portfolio containing three assets: a long position in a European call option for the delivery of an underlying, a short position in a European put option for delivery of the same underlying and with equal an exercise price equal to that of the call, and a risk free investment large enough to produce a future value equal to this common exercise price. The left-hand side of the equation below describes this future value of the synthetic position at expiry and the right-hand side describes the future value of expiry of the underlying. The first term of the left-hand side is the future value of the long-position in the European call, the second, the future value of the short-position in the European put, and the third term is the future value of the risk free investment:

$$\text{Max} [S(T) - K, 0] - \text{Max} [K - S(T), 0] + K = S(T)$$

No matter the value of S(T) or K the synthetic position produces a future value equal to the future value of the underlying. To see this let the exercise price K = \$34 and let S(T) vary from \$1 to \$100. In every case the left-hand side of the equation above equals the right-hand side: in every case, at expiry, the future value of the synthetic position equals the future value of the underlying.

Now consider the consequences of the illustration of the previous paragraph for equilibrium in capital markets. There are only two possible cases to be considered. Case one: if

the price of the synthetic position is equal to the price of the underlying, then there is no incentive to prefer one over another because all of the possible the future values at expiry for the synthetic position are equal to those of the underlying. So the risk and the possible returns for both investments are exactly the same. Case two: if the price of the synthetic position is not equal to the price of the underlying, then investors should prefer a long position in the cheaper alternative and also prefer a short position in the more expensive choice. In equilibrium prices adjust such that the price of the synthetic position equals the price of the underlying.

The ability of investors to create synthetic positions using call and put options and risk free investments is closely related to the concept of arbitrage. Arbitrage has three essential properties. If an investor can construct a portfolio that costs nothing, has no risk, and yet produces a profit, then this investor has successfully executed an arbitrage strategy, and the profits of this strategy are known as arbitrage profits. Synthetic positions are created by investors in order to generate arbitrage profits. If the price of the synthetic position is not equal to the price of the underlying, then arbitrage profits are available. On the other hand, if the price of the synthetic position is equal to the price of the underlying, then no arbitrage profits are available.

Although investors have a personal interest in arbitrage, academicians look at the consequences of the ability of investors to generate arbitrage profits in order to explain how and why prices for call and put options behave as they do. Black and Scholes (1973) in work later recognized with a Nobel Prize in economics devised a logical argument connecting synthetic positions and arbitrage to option pricing. They show that calls and puts are priced such that no opportunities for arbitrage profits exist. Their argument remains influential in the later proofs of other scholars who work in option pricing. The proofs of this paper continue in that tradition.

SOME LOGICAL BACKGROUND

Theorem and proof work answers the question why one should believe that something is true, even in the absence of empirical data analysis. A logical proof is always concerned with how the truth of one statement affects the truth of another statement. A proof argument is a collection of statements where the proposition to be proven is the conclusion. The statements that justify the conclusion are called premises. Given the truth of the premises, a proof is a guarantee of the truth of the conclusion. Clear thinking in a logical proof first lays bare the justification for a conclusion, the premise statements that describe what is known or what is assumed to be true about reality. If each of the premise statements leading up to the conclusion is true, then the conclusion must also be true. On the other hand, if one or more than one of these premise statements are false, then the conclusion may be true or it may be false.

Some statements that can be used in proof arguments are necessarily true, true in every possible state of the world. Aristotle distinguishes between *de dicto* necessity and *de re* necessity. Statements that are necessarily true *de re* are true by virtue of definition. Consider the balance sheet equation as a first example, total assets equal total debt plus total equity. Consider now *de re* necessity. As a second example, the statement – the market portfolio contains all risky assets – is true as a matter of *de re* necessity. Why is this so? One of the essential properties of the market portfolio is that it contains all risky assets, essential in the sense that if this property is removed from this concept, the market portfolio, then its meaning is destroyed. (Whatever might remain after this portfolio is reduced can be something else, but it is no longer possible for this something else to be the market portfolio). Statements which are true as a matter of *de re* necessity are immune to any empirical efforts which might be mounted to disprove them. So, one can say that whether or not the value of the market portfolio can be measured with empirical

means, there is, both as a matter of concept and as a matter of fact, such a thing called the market portfolio. The same kinds of things can be said of the efficient set, systematic and unsystematic risk. These proof-generated concepts found in CAPM theory all are defined by their essential properties which obtain in every possible state of the world, including those of the real world. In this way it can be said that these theoretical objects exist both in theory and in reality as a matter of *de re* necessity.

By contrast, the matter of *de dicto* necessity is concerned with logical entailment, the relationship of the conclusion of an argument to the premises of that argument. As a second example of *de dicto* necessity, consider a logical consequence of the CAPM made famous by Roll (1977): given that the CAPM is true, the market portfolio is mean-variance efficient. This statement is true *de dicto*, for if the assumptions under which the CAPM is logically derived are all true, then it must be the case that the market portfolio is mean-variance efficient. The only legitimate way to deny the mean-variance efficiency of the market portfolio is to also deny the truth of one or more of the assumptions underlying the CAPM. Denial of the *dictum*, the conclusion, always entails denial of one (or more than one) of the premise statements used in order to justify the conclusion.

These two notions *de re* and *de dicto* necessity do not exhaust the concept of necessity. There are statements which are necessarily true that are not true as a matter of definition and not true in the same way that a conclusion which follows of necessity from its premises is true. Consider the following statement as an example – at present, human beings command limited economic resources. One would be hard put to posit a state of the world where this statement is false. If one claims that this statement is true in every possible state of the world, then one claims that this statement is necessarily true.

Some arguments produce conclusions that rest on assumptions contained within the premises that make sense in the real world, but some do not. Unrealistic assumptions put the conclusion in question. Belief is a matter of choice. This choice to believe or to refuse to believe is described in modern philosophy in connection with the notion of a warranted belief. Plantinga (1993) describes three essential properties of what is meant by this concept, a warranted belief. First, for a belief that a statement is true to be warranted this statement must be true. Second, the person considering this statement must believe that it is true. And third, this person must be justified in believing it to be true. This first requirement is a matter of truth or falsehood, the second a matter of opinion, the third a matter of evidence. The strength of an individual's opinion concerning the truthfulness of some statement varies with the quantity and quality of evidence available and their interpretation of that evidence.

PROOFS IN OPTION PRICING

Consider the proof below, a direct proof which moves from an assumption, step-by-step, to a conclusion. The first statement, labeled Result I, is the proposition to be proven true by the proof argument which follows it. Thus it is claimed that the proposition is true *de dicto*, which means that it must be true in the same states of the world where all of the premises contained in the proof argument justifying this conclusion are first true.

This Result I is a specific kind of statement, a material conditional. Material conditional statements are of the form if A is true, then B must be true. The A part is called the hypothesis of the material conditional, and the B part is called the consequent of the material conditional. The hypothesis of Result I below is a conjunction that has two parts, first that the price of an underlying is equal to zero and second that no arbitrage profits are possible. And the consequent

of the proposition below is also a conjunction of two parts, first that the price of an American call option written on that underlying asset is equal to zero and second that the future value of the underlying is equal also equal to zero.

Result I

If $S(0) = 0$ and if there are no arbitrage profits, then $C(0) = 0$ and $S(0 < t \leq T) = 0$.

Proof

By hypothesis we are only considering circumstances where two things are both true: $S(0) = 0$ and there are no arbitrage profits. The truth of these two sentences require that $C(0) = 0$. Why? Investors in their desire to create arbitrage profits, create a two asset portfolio purchasing $S(0)$ and selling $C(0)$. Recall, by hypothesis we are considering only cases where $S(0)$ is equal to zero. Should it also be true that $C(0)$ is equal to zero, then there are no arbitrage profits. At $t = 0$ this two asset portfolio neither produces cash inflows nor requires cash outlays. By construction in every future time period until expiry the potential payoff of this two asset portfolio is equal to $S(t) - \text{Max}[\, S(t) - K, 0\,]$. By definition, when no arbitrage profits are available to a portfolio which initially costs nothing, the potential payoffs in every possible state of the world of that same portfolio must also equal zero. This is only the case when $S(0 < t \leq 0) = 0$ and $C(0) = 0$.
QED

Does it matter that we do not know the exact nature of underlying and the American call option that are bought and sold by an investor? No it does not. The proof argument is very general; it applies to anyone. Does it matter that we do not know who this investor is? Again, the proof argument is very general, it applies to anyone. Does it matter that investors can buy and sell without hindrance? Yes. The proof argument is driven by the assumption that there is no hindrance to buying and selling that would stop investors from taking advantage of arbitrage opportunities. If this is not so then the proof argument falls apart.

Below one finds an explanation of a second proof, another proposition of option pricing theory. In this next proof the student is invited to see the connections between a finance concept, arbitrage, and two additional logical concepts: logical equivalence and the contrapositive statement of a material conditional. Before going on to the next proof, the concept of arbitrage is reconsidered.

Arbitrage occurs if the Law of One Price is violated. Consider this Law of One Price which says that if two investments produce identical future cash flows in every possible state-of-the-world, then these two investments must have the same prices. If this law is violated, then investors will by the cheap asset and short the expensive asset thereby creating arbitrage profits. Arbitrage profits a risk free and without any net investment cost. It is easy to see that if arbitrage profits could frequently be generated then traders could become immensely wealthy without taking any risk and without investing any money. One of the major themes of modern finance theory is that prices in capital markets will move so that arbitrage profits become non-existent. After all when traders buy the cheap asset of the arbitrage and short the expensive asset they are driving up the price of the cheap asset and down the price of the expensive one, so arbitrage opportunities should be fleeting.

In the proof below the main idea is that the prices of call options and the underlying assets on which these call options are written must move in such a way as to eliminate any opportunities for arbitrage. In this proof there exists a call option written on an underlying asset.

The purchaser of this call option, prior to contract expiration, has the right to purchase the underlying asset referred to in the contract for a price equal to K. The price of this American call option today is equal to C(0), the contractual exercise price is equal to K, and the price of the underlying asset today is equal to S(0). Prior to the expiration of the option contract, the writer of the call option will pay the purchaser on demand an amount equal to max [0, S(0) - K] which is the maximum of two numbers, zero or the current value of the underlying asset less the exercise price.

As with the proof above, this proposition below is a material conditional. As you remember, material conditional statements are of the form: if A is true, then B must be true. The A part is called the hypothesis of the material conditional, and the B part is called the consequent of the material conditional. The hypothesis of the proposition below is: there are no arbitrage opportunities. The consequent is: $C(0) \geq \text{Max} [S(0) - K, 0]$. This proposition is rewritten as the contrapositive statement of this material conditional statement.

Result II

If there are no arbitrage opportunities, then $C(0) \geq \text{Max} [S(0) - K, 0]$.

Proof

Rewrite the proposition above in the contrapositive: If $C(0) < \text{Max} [S(0) - K, 0]$ then there are arbitrage opportunities. By hypothesis of the contrapositive statement one may say that we are only considering cases where it is true that: $C (0) < \text{Max} [S(0) - K,0]$. See if arbitrage exists in these circumstances by trying to create arbitrage profits:

(1) Immediately borrow an amount of money = C(0).
(2) Immediately buy C(0) with the borrowed money. Net investment is equal to zero.
(3) Exercise immediately and receive S(0) - K.
(4) Sell S(0) - K.
(5) Immediately repay loan. Investment positions are closed – thus there is no risk.

Profit is equal to S(0) - K - C(0) which is positive when C(0) < S(0) - K. An arbitrage profit has been created in these circumstances. Why? Net investment of zero produces a risk free profit. This is what is meant by arbitrage. The contrapositive has been shown to be a true statement. By logical equivalence it must also be that the original proposition is also a true statement.
QED

The contrapositive of the material conditional has the form: If the negation of B is true, then the negation of A must be true. B is written: $C(0) \geq \text{Max} [S(0) - K, 0]$. The negation of B is what must be true when B itself is false. So the negation of B is written: $C(0) < \text{Max} [S(0) - K, 0]$. Now consider A: there are no arbitrage opportunities. The negation of A is what must be true when A itself is false. So, the negation of A: there are arbitrage opportunities. Putting all this together for the proof work below, one may write the contrapositive of the proposition statement like this: If $C(0) < \text{Max} [S(0) - K, 0]$ then there are arbitrage opportunities.

When two statements are logically equivalent to one another they each have identical meanings, even though they may appear to not mean the same thing at all. The material conditional statement, IF A is true, then B must be true, is logically equivalent to its

corresponding contrapositive statement, If not B is true, then not A must be true. This means that the two statements (IF A is true, then B must be true) and (If not B is true, then not A must be true) have identical meanings in every possible circumstance. Why is this important? If one proves that the contrapositive is true, then one has also proven that the other is true too. The application here to this proof above is straightforward. In the proof above, the proposition: If there are no arbitrage opportunities, then $C(0) \geq \text{Max}[\ S(0) - K, 0\ ]$ is logically equivalent to If $C(0) < \text{Max}[\ S(0) - K, 0\ ]$ then there are arbitrage opportunities. Since the contrapositive is proven true then so is the original proposition proven to be true.

A proof by contradiction (*reductio ad absurdum*) works on the negation of a proposition that one wishes to prove to be true. If one can prove that the negation is false then it must also be that the original proposition is true. In this way, Result III below works on the negation of a material conditional (if A is true, then B is true). The negation of a material conditional can be written is several ways. The proof below writes the negation of if A is true then B is true as a conjunction: A is true and B is false. Specifically, consider the negation of the proposition: there are no arbitrage opportunities and $c(0) \neq S(0) + p(0) - B(0,T)\ K$. This proposition and its negation cannot both be true, and yet one must be true. If the negation is true then the original proposition above must be false. On the other hand, if the negation is false, then the original proposition above must be true. The task at hand is to show that this original proposition is true. This will be accomplished in the proof below by showing that the negation of this original proposition is false. This approach to proof is known as proof by contradiction.

Result III

If there are no arbitrage opportunities then $c(0) = S(0) + p(0) - B(0,T)\ K$.

Proof

The negation: there are no arbitrage opportunities and $c(0) \neq S(0) + p(0) - B(0,T)\ K$. This is proven to be false if one could show that either there are arbitrage opportunities and either $c(0) > S(0) + p(0) - B(0,T)\ K$ or that there are arbitrage opportunities and $c(0) < S(0) + p(0) - B(0,T)\ K$. If $c(0) > S(0) + p(0) - B(0,T)\ K$, then one can create an arbitrage portfolio, one which produces a positive cash inflow initially at $t = 0$ and a zero cash outflow at expiry, $t = T$. That is to say this portfolio requires no net investment and yet produces an immediate risk free cash inflow and no cash outflows, ever. It is now our task to prove that we can create this arbitrage. To do this we have to demonstrate how a portfolio can be created which will require no net investment and produce a net cash inflow with no risk. We create this arbitrage by doing the following. Initially, at $t = 0$, sell $c(0)$ and buy $[\ S(0) + p(0) - B(0,T)\ K\ ]$. This gives us a positive cash inflow when $c(0) > S(0) + p(0) - B(0,T)\ K$. So when we sell the call and buy the synthetic position there is then no net investment required and a risk free positive cash flow is generated. At expiry, $t = T$, one of only two things can happen. It will either be true that $S(T) > K$ or that $S(T) \leq K$. First, let's evaluate the future values of our portfolio that is created at time period zero under the assumption that $S(T) > K$.

Case I

If $S(T) > K$, then the portfolio that we created will produce the following future values at expiry, $t = T$. The equation of future values written below is ordered in the following manner: the

future value of the short position in the call, the future value of the long position in the underlying, the future value of the long position in the put, and the last term on the left-hand side of the equation below is the future value of the short position in a risk free asset.

$$[- S (T) + K] + S (T) + 0 - K = 0.$$

So, If $S(T) > K$, then the portfolio that we created will produce on net a zero future value. And at expiry, $t = T$, we, the owners of this portfolio, will no longer be obligated in anyway, we will no longer have any investment positions open. As a result the profits generated at $t = 0$ are kept safe.

Case II

If $S(T) \leq K$, then the same portfolio that we created initially at $t = 0$ will produce the following (different) future values at expiry, $t = T$. Again, the equation of future values written below is ordered in the following manner: the future value of the short position in the call, the future value of the long position in the underlying, the future value of the long position in the put, and the last term on the left-hand side of the equation below is the future value of the short position in a risk free asset.

$$0 + S(T) + [K - S(T)] - K = 0.$$

So, If $S(T) \leq K$, the future value of the portfolio is equal to zero in Case II. As a result the profits generated at $t = 0$ are kept safe. Either Case I or II must obtain. In both cases arbitrage profits are kept safe. Therefore, the negation statement: there are no arbitrage opportunities and $c(0) \neq S(0) + p(0) - B(0,T) K$ is shown to be false. Clearly, there are arbitrage opportunities when $c(0) \neq S(0) + p(0) - B(0,T) K$. Since the negation is shown to be false, the original proposition is proven true.
QED

Result IV below is a direct proof that uses the proof by cases technique. The cases that are employed to drive a proof are mutually exclusive of one another, and any listing of these cases is exhaustive. Too see how this approach might work, consider the sentence x is not equal to y. Such consideration would likely focus on two separate cases. In the first case x is less than y and in the second case x is greater than y. There is no third case because the first two are mutually exclusive of one another and, taken together, exhaustive.

Result IV

If there are no arbitrage opportunities then $c(0) = S(0) + p(0) - B(0,T) K$

Proof

The concept of "no arbitrage" admits to an essential property: portfolios that have zero present values produce zero future values in every future state of the world. The portfolio that we choose to consider is a short position in a European call, a long position in the underlying, a long position in a European put, and a short position in a risk free asset:

$-c(0) + S(0) + p(0) - B(0,T)\,K$

This portfolio produces a zero future value in every future state. To see this consider Cases I and II below.

Case I

Consider future states of the world where $S(T) > K$.

If $S(T) > K$, then the portfolio that we created will produce the following future values at expiry, $t = T$. The equation of future values written below is ordered in the following manner: the future value of the short position in the call, the future value of the long position in the underlying, the future value of the long position in the put, and the last term on the left-hand side of the equation below is the future value of the short position in a risk free asset.

$[- S(T) + K] + S(T) + 0 - K = 0.$

So, If $S(T) > K$, the future value of the portfolio is equal to zero in Case I.

Case II

Consider future states of the world where $S(T) \leq K$.

If $S(T) \leq K$, then the same portfolio that we created initially at $t = 0$ will produce the following (different) future values at expiry, $t = T$. Again, the equation of future values written below is ordered in the following manner: the future value of the short position in the call, the future value of the long position in the underlying, the future value of the long position in the put, and the last term on the left-hand side of the equation below is the future value of the short position in a risk free asset.

$0 + S(T) + [K - S(T)] - K = 0.$

So, If $S(T) \leq K$, the future value of the portfolio is equal to zero in Case II. Either Case I or II must obtain. In both cases the future values are equal to zero. Given that there are no arbitrage opportunities it is also the case that the present value of the portfolio under consideration is equal to zero.

$-c(0) + S(0) + p(0) - B(0,T)\,K = 0$

If there are no arbitrage opportunities then $c(0) = S(0) + p(0) - B(0,T)\,K$.
QED.

CONCLUSION

Theorem and proof work answers the question why one should believe that something is true. A logical proof is an argument that justifies belief in a proposition. There are different kinds of logical proof. A direct proof moves from an assumption step-by-step to a conclusion that must be true if the initial premises are first true. A proof by contradiction (*reductio ad absurdum*) works on the negation of a proposition that one wishes to prove to be true. If one can prove that

the negation is false then it must also be that the original proposition is true. A proof of a material conditional by the proof of its contrapositive equivalent is used when direct proof is difficult. A proof by cases approach divides a difficult proposition into separate, mutually exclusive parts so that the proof of this difficult proposition can also be divided.

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APPENDIX

Ancient Greek philosophers preferred (and some insisted) that each step in an argument be verified by way of empirical data analysis. In this connection both English words theorem and theater are derived from the same ancient Greek word *theoros*. This word from the classical Greek refers to a showing or to a demonstration. This word *theoros* was borrowed by Greek geometers of Euclid's day, who insisted that logical proofs of geometric propositions must begin and end with a demonstration, a showing of the equivalence between logical results and physical reality. The foundation of every acceptable logical proof for these geometers was an axiom structure thought to be nothing more than an accurate description of physical reality, the truth of which is beyond dispute. Authors of geometric proof of the time of Euclid named their conclusion a *theoros* only if two standards were met. First, the logical steps in the reasoning process must have been shown to be without defect; and second, the concluding statement of the proof must have been verified by empirical measurement. Such a practice of demanding a demonstration in the real-world of theoretical propositions was to these ancients a safeguard against error.

Even apart from geometry, a poor connection between logic and empirical reality in either the premises of an argument or in its conclusion rendered the reputation of that argument tenuous. Even before Aristotle began a systematic study of logic, scholars knew that meaningless results could be achieved with an application of a flawless logic to a foundation of flawed first principles. Plato, among the first of the western philosophers to know that the method of an argument can be known and studied separately from its contents, did not approve of sophists – those who entertained in ancient Athens by creating seemingly logical arguments which produced absurd results, which were contradicted by real-world experience. Sophists were able to produce these entertaining arguments because they built them atop an axiom set which contained a contradiction.

To defend logical argument from the manipulation of sophists, Plato and his contemporaries classified arguments into two categories. Demonstration proofs were those based in premises well-connected to physical reality. Dialectic proofs were not constrained by empirically verifiable premises. Plato insisted that neither demonstration proofs nor dialectic proofs contain a contradiction.

Demonstration proofs because of their strong connections to empirical reality were thought by the great philosophers of ancient Athens to be superior to dialectical proofs. Demonstration proofs were declared to be true always, immune from fallacy with regard to both form and content. By contrast, dialectical arguments were considered to be provisionally true and not immune from a contradiction which might come from a later discovery.

Euclid was very much concerned about the missing empirical connections for two of his ten axioms used to create plane geometry. To mitigate the possible mistakes associated with employing these two questionable axioms in theorem and proof work, Euclid was driven to derive as many theorems as he could without relying upon either the parallel line axiom or the axiom which states that a line segment can be extended to any length. The reluctance of Euclid to employ these two axioms was caused by an inability to demonstrate in the real-world that they are in fact true statements.

In fact, it was the replacement of these same two axioms which troubled Euclid and the willingness to interpret the notion of the line of Euclid's work as something other than a straight-line in a plane that produced Non-Euclidian geometries, initially the separate work of three mathematicians – Gauss, Lobatchevsky, and Bolyai. Scholars, including Gottlob Frege, Bertrand

Russell, and Alfred North Whitehead, responded to the creation of these Non-Euclidian geometries by doubting the ability of anyone to devise a single, unique axiom structure capable of adequately describing reality. Thus the advent of Non-Euclidian geometry caused many scholars to permit the divorce of mathematical space from physical space. If these two spaces are separate concepts, then the knowing of physical space is beyond the reach of pure mathematicians and at the same time irrelevant to their explanations of mathematical spaces. It was left to the mathematician Kurt Gödel to cast doubt upon the mathematician's ability to adequately describe the workings of mathematical spaces alone.

Prior to these mathematical advances, during the Enlightenment, David Hume and James Stuart Mill a rebelled against the notion that methods of theorem and proof could produce a coherent theory capable of describing a physical-material world. Hume held that there could be no such thing as logical proof. He believed that no proof argument could be understood in the same way by different individuals and he also doubted the ability of anyone to reason by way of a valid logical argument from an axiom structure to conclusions that could actually explain how the real world works. So Hume opposed the work of Euclid, and he also opposed the latter works of Galileo and of Newton, both famous during the Enlightenment for describing the workings of the physical universe as they reasoned from an axiom structure consisting of natural laws. It was Hume's position that they were mistaken: there could be no such thing as causal necessity used to explain the consistent behavior of a solar system nor could there be any such thing as logical necessity used to explain the working of a geometric argument and the connection of that argument to the real world.

Immanuel Kant reacted to Hume's work. Kant's position was that there are necessary truths and that theorem and proof work could be useful approach in scientific research. However, in Kant's view, there were limits to what theorem and proof work could accomplish. In these limits Kant sought to deny the medieval rationalism of St. Thomas Aquinas and of St. Anselm of Canterbury, both of whom claimed to have proven with the methods of theorem and proof alone the existence of God. It was Kant's view that rationalism, a belief that reason alone is capable of accurately describing what is beyond the reach of our senses, was flawed. Kant believed that the ability of human beings to accurately describe reality with theorem and proof was limited to matters that are understood in reference to a possible experience which someone might have in the real world.

However, Kant did not go on to heap praise on empirical data analysis. It was his view that empirical reality could not be understood as it really is by human experience. Instead, those who analyze data, perceive it and organize it according to the dictates of basic preexisting categories of the human mind. Because this process of analysis is both involuntary and subjective, it is not within the power of anyone to see clearly empirical reality. If Kant is right about this, then the practice of science is very difficult indeed.

Right or not, one of the vital contributions of Kant to the problem of knowing is in terminology. Kant used two broad categories to identify statements. In describing what is analytic, Kant followed after the work of Leibniz, who held that a valid definition of a concept may be had by a complete listing of its essential properties. Kant agreed that theorem and proof methods may employ analytic statements (definitions) even though these statements are immune to experimental investigation. Knowledge of analytic statements is always *a priori*.

Kant classified all statements that are not analytic as synthetic. A synthetic statement is a description of a concept in its relation to empirical reality. Kant accepted that some synthetic

statements are knowable in the absence of experience – knowable *a priori*, but knowledge of others - the synthetic *a posteriori* - are not understood without real world experience.

By contrast, those who are Logical positivists demand that all statements which describe reality be justified *a posteriori* – be justified only after the empirical evidence is evaluated. Logical positivism admits belief in necessary truths only in regard to language that defines or refers to empirical objects. Beyond this limited admission, experience remains a prerequisite for knowing the real world.

A foundational belief of logical positivism is that only a theoretical conclusion which is connected to what can be observed in the real world could have any meaning. Therefore, theoretical conclusions which are not referenced to physical reality should be out-of-bounds, not worthy of scientific consideration. This is the famous verification principle of logical positivism, attributed by Malcom (1967) to Wittgenstein, a twentieth-century philosopher who studied the connection of language to reality.

Such a demand for verification could be a mistake. Sir Karl Popper (1959) argued that this demand for empirical verification can never be met. Popper's position was that verification is an unworkable plan in any scientific program, for to verify theory with real-world data is a matter of comparing every possible observed value to its corresponding predicted value, clearly an impossible task when the number of possible outcomes and corresponding predictions is large.

Popper proposed an alternative to the verification principle that would yet permit the evaluation of theoretical predictions against real-world data. Popper's alternative is known as falsification, a search for empirical counterexamples in an attempt to prove a theory wrong. Unlike the demand for verification, a search for counter-examples need not go on forever. It can end when a sufficient number of counterexamples to theoretical predictions are found. At this point the theory is falsified and then abandoned.

Popper's doctrine of falsification also imposed requirements upon a theory. Popper held that in scientific work it must be the case that theoretical predictions can be measured and compared against actual outcomes. Much of the current discussion in philosophy of science is concerned with how old theories are adjusted to accommodate the finding of counter-examples, and how much evidence against a theory is to be tolerated before it is considered obsolete and overthrown in its entirety. In any case, the existences of these empirical counter-examples are only made possible when actual outcomes can be compared to the predictions of a theory. But not all theories are subject to being analyzed in this way. If theoretical predictions cannot be well-measured empirically, then they cannot be compared to actual outcomes. These theories then have no empirical content. They cannot be verified, they cannot be falsified, and such is arguably the case with the asset pricing models of financial economics.

THE LECTURE/LAB COMBINATION COURSE: AN INNOVATIVE WAY TO TEACH A LARGE WRITING COURSE

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ABSTRACT

The lecture/lab combination class as an alternative to teaching a large section format of a writing-intensive class, however this format has its own special challenges. This paper will present a multiple case study of two courses and how the lecture/lab format is administered. Findings can be used to inform administrators and instructors when offering a large section class that involves an extensive amount of interaction between instructor and students. Examining the unique course delivered at this university enabled the researcher to identify some significant areas of practice beneficial for other instructors to utilize in their own course designs. Instructors must be able to maintain a relationship with their students so that they can best deliver course material effectively. Each class and each student is different and it is important that the instructor is able to identify the needs and abilities of the students enrolled in their classes. The use of TAs can be beneficial, but it is important that the instructor be involved in the class assignments to accurately assess learning.

It is likely that universities will continue to offer large classes at various levels, but there must be a balance between budget allocations and student learning. As the class size increases, the chances of the class being taught as a lecture style course will increase and cause the instructors to lose their ability to connect with students. Students are more likely to feel detached from the subject matter if they have fewer opportunities to interact with the material being presented.

INTRODUCTION

Change is good, or so the saying goes. Using the excuse that this is the way it has always been done, will not hold up in an argument. Sometimes changing the way a course is delivered is beneficial, and sometimes this change is necessitated because of budget cuts. The budget is often a popular issue at educational institutions because administrators are worried about what the next legislative session will decide about governmental support. Colleges have become creative in how they have approached budget shortages by offering more online classes, cutting back staff, eliminating programs, and teaching more students in each class.

One solution, teaching more students in a class, creates a unique environment for teachers and students. It might not be an ideal situation, but if an educational institutional is forced to increase class size, the lecture/lab combination class may be a suitable alternative.

Moshiri and Cardon (2014) experienced problems with class sizes at their own institution. From 2008 to 2013, the actual class size in the business communications courses more than doubled because the university experienced a 20% reduction in its state funding. The possibility of other institutions facing similar budget cuts could cause other classes to increase in size. Based on this possibility, administrators and instructors of all classes should be informed about approaches to increased class sizes.

Purpose Statement

The purpose of this paper is to present the lecture/lab combination class as an innovative alternative to teaching a large section format of a writing-intensive class. Specifically, it will look at instructor and student perceptions of how the course functions at one particular university. Information gained from the study can be used to inform others who may be considering a unique approach to teaching a larger class that involves an extensive amount of interaction between instructor and students.

Significance of the Research

When universities promote their small classes, parents think the students receive more attention, students feel more engaged, and instructors believe the classes are more manageable. Yet, monetary issues have always been a consideration in scheduling classes and may cause some institutions to consider increasing their class sizes. When a university struggles with its budget, more classes are likely to be offered in the large lecture format. However, larger classes deter establishing relationships between teacher and student, and among students, which is one component to building critical thinking skills (Tierney, 2011). Not all courses may be suitable for a lecture delivery method.

Institutions of higher education must weigh the possible effects of larger classes as Tierney (2011) warns that "distance learning begins in the fifth row" (p. 64) which causes instructors to strive to make connections in the larger classes. If more classes are offered in the large lecture format, research needs to address the issues involved.

ATTRIBUTES OF LARGE CLASSES

Traditionally, college classes have been taught by the lecture method. In this way, students are passive because they are dependent on the teacher to transmit knowledge (McKeachie, 1969), and there is little interaction between students and teachers when the instructor is viewed as the so-called sage on the stage. However, as classes begin to increase in size, simply preparing a test can become time-consuming because photocopying and physical distribution are more complex. In addition, because of close seating arrangements, extra care must be taking to deter cheating (McKeachie, 1969). Some of the concerns cited by students included excessive noise in the classroom, difficulty concentrating during class time, and a feeling of being neglected by the instructor (Leufer, 2007). Kryder (2002) also noted that preparing for her large-section course meant there was more rigor in the course causing her to prepare her material sooner which created fewer opportunities for spontaneity during the class.

Examples of Large Classes at the University Level

Several studies have been published reporting on experiences teaching larger classes but few have been conducted at the post-secondary level. Chapman and Ludlow (2010) completed a longitudinal study of student evaluations and noted a negative relationship between larger classes and student perception about learning. They found that increasing class sizes created a burden to learning for both students and instructors. Additionally, another five-year study of undergraduate students found that students in large classes were less likely to pass exams (De Paola & Scoppa,

2011). Specifically, the researchers noted that "an increase of 50 students in a class size reduces the probability of passing an exam by about 9 percentage points" (p. 1064).

Examples of Large Classes in Business Communication Courses

Rieber (2004) studied an innovative way Business Communication courses were delivered. Facing budget constraints, the department hired professional teaching assistants (TAs) to help evaluate, grade, and comment on student papers. Similarly, Kryder's (2002) institution increased its enrollment one year to 100 students with one teacher and two professional TAs for each class. The class time was extended to add a 50-minute discussion class taught by a TA. Consequently, this additional discussion class only had 25 students per class, simulating the smaller class format. The study found that more than 90% of the students liked the model for their large lecture classes. Although the new format was successful, Kryder warned, "I do not recommend this as a preferred format for teaching, nor does my program" (2002, p. 89).

Cockburn-Wootten and Cockburn (2011) experimented with a large lecture class with 75 and 300 students in a course. Students were put into peer groups called Lecture Learning Groups, which allowed the larger class to be diminished to smaller groups to encourage the sharing of ideas. The activities during the semester were designed to apply communication skills that promoted lifelong learning skills and critical thinking.

RESEARCH METHOD

The research sites included two classes from a mid-sized university who offered Business Communication courses in a large section format. A case study was used to produce an in-depth interpretation of the unique situation of offering a writing intensive course in a large-section format. This course was offered in the large section format as a lecture course with a required additional lab course for the writing component. Under the assumption that larger class sizes will cause the course to morph, these cases were considered innovative in their offerings.

Each case was studied in its own environment as the researcher visited each case study location to interview participants, collect artifacts, and observe classroom interactions. The two different classes were studied independently, then compared as a multiple-case study to produce more reliable and generalizable results. Interview participants consisted of the business communication instructors of the course and a focus group of three to five students taking the class. In addition, the courses were observed during an actual classroom meeting to examine both instructor and students' behaviors and the actual delivery of the course. Artifacts, in the form of papers distributed in class and course syllabi, were used to verify information to aid in triangulation.

FINDINGS

A study of business communication courses in the United States found that almost 58% of courses were offered with 21-30 students per course section (Russ, 2009). Russ noted that instructors of business communication courses preferred smaller class sizes than what they were actually assigned: 17.3% of instructors actually taught courses with more than 31 students, but only 2.4% preferred doing so. Most instructors (70%) preferred less than 20 students in a course. Similarly, the study by Moshiri and Cardon (2014) found that 98% of instructors believed the class size should be less than 30 students.

This business communication course under study was a junior level course that met once-a-week in a traditional face-to-face format with enrollment over 140 students. Students were required to also enroll in a lab section of the course at also met once a week and enrolled 26 to 30 students. Instruction for the course was done in the large lecture course, but writing and other hands-on activities were completed in the lab section. The course consisted of the two-hour lecture class in the large section and a 1-hour lab in the smaller section.

Case 1 – Professor Mary

In some ways, Mary believed that the larger classes were beneficial because she felt the business communication curriculum could be tedious when teaching writing. She believed having more students in the classroom introduced more perspectives when students were able to share their experiences during classroom discussion. When asked about advantages of the larger class, one member of the focus group seemed to understand the value of having other students to ask questions to help in understanding.

Mary saw the main disadvantage of larger classes as their impersonal nature. She stated that because of the larger class, students were less likely to ask questions in the larger lecture course and would save their questions for the smaller lab class. The students acknowledged that they often would not ask questions during the large class. However, the lab instructors were often unable to answer the questions because they did not attend the lecture class.

Both Mary and the students agreed that smaller classes were better. Mary stated, "I seem like I have a more positive experience from an instructor's standpoint." One student agreed that the relationship formed in the smaller classes helped in understanding the material; "I think I am more likely to get an A in small classes because I actually form a relationship with the professor."

Case 2 – Professor Cathy

Cathy did not see an advantage to the instructor to teach the class in a larger section format, instead believed that money dictated the larger classes. She was very comfortable speaking to large groups, but felt the students needed the attention that the smaller lab provided. Cathy added that students often had the misperception that they only needed to attend their lab class, so she struggled with attendance in the large lecture course.

Although she admitted she had no facts to support her opinion, Cathy believed that students performed better in the smaller sections. Cathy said, "I know this is a model that we probably have to do, but I really prefer the small class." Previously, the class had about 35 students in each section and Cathy taught and graded everything herself. Six years earlier, the university changed to the lecture-lab combination format. Now, Cathy still taught the lecture course, and a teaching assistant graded for her lecture course. She added, "When you look at it, I have a wonderful job. All I do is I go in and say a few words, and the lab instructors grade everything." But she laments, "Again, I don't know the students very well." Students in the focus group stated that their upper level courses were usually smaller, so it was unusual to have a class so large at this level.

Cathy said the biggest disadvantage to the larger class was that she did not know the students. This is contrary to the reason she began teaching, which was the enjoyment she got from student interaction. On providing feedback, students stated that the lab instructors provided extensive feedback to improve, but some students noted that some instructors were not as strict.

The students believed there was consistency between what Cathy said and the lab instructors did, however their complaints seemed to be inconsistency between lab instructors. Apparently, some lab instructors were stricter in their grading requirements. Cathy informed students that grading was left to the lab instructors' discretions, so she avoided intervening.

One obstacle that she had to overcome was test administration, because Cathy had to be careful about handing out the exact amount of tests resorting to handing out tests as students walk in the door. Cathy said there were some coordination issues to consider when the lecture and lab were different courses. She joked she had to "make sure I have covered the chapter before their assignment is due" in the lab.

DISCUSSION

The two courses studied were three-hour courses that were split between a 2-hour lecture and 1-hour lab. The lecture courses were offered as late afternoon courses that met once a week, and students also enrolled for a once-a-week individual lab course.

Both instructors believed that smaller classes were better for students and the larger format was not ideal. They acknowledged that budget constraints were what forced the larger classes, so they understood the need. Students also viewed smaller classes as more beneficial. Both instructors cited the impersonal nature of the larger class as the main disadvantage of the large section format. Students acknowledged that they were less likely to talk in the larger class; instead saving their questions for their smaller lab class.

Both Cathy and Mary relied heavily on their lab instructors for writing instruction. Although both provided instruction on writing in the lecture, they deferred grading and remedial instruction to their lab instructors. Grading in the labs was stringent, and students seemed to begrudge the heavy emphasis on grammar and felt that grading was not always consistent across lab instructors.

Whether the time spent in lab was beneficial seemed to differ. The focus groups for Cathy' class felt that the lab time was rushed. They stated that the oral presentations were very time consuming. The focus group from Mary's class said they did not spend their entire scheduled class time in the lab, and students knew they would be dismissed early if they did not ask questions. Mary knew classes were not meeting their required times and addressed this with instructors, but the issue continued.

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The teaching of undergraduate Business Communications courses in the large section format is not common as shown in Russ' (2009) study and Moshiri and Cardon's (2014) studies that 98% of classes have fewer than 50 students. The delivery of this course was unique because it was delivered in the lecture-lab combination format with over 140 students.

Not surprising, the instructor was influential in class presentation. Both Cathy and Mary believed that students learned more in the smaller classes, although they did not have research to support their statements. However, they believed that there was value in keeping the lab sections smaller. Instructors and student focus groups all commented that getting to know students was harder in the larger classes, and students acknowledged that they were less likely to ask questions in the large class. Larger classes were also more likely to be noisy and distracting for the learning environment as discussed by Leufer (2007), and Mary and Cathy' classes also had a lot of noise

and movement within the room. Students could easily be distracted from the lesson in these classes.

Although each of the instructors had the ability to alter the class if needed, with so many students in a class, it would be difficult to stop and remediate each time a students expressed difficulty with a subject. Cathy admitted that care had to be taken to ensure material was covered in the lecture class to prepare the students for the lab class. These increases in course rigor supported the findings by Kryder (2002). In congruence with McKeachie (1969), Cathy also said that test administration was difficult with so many students in the room.

The instructors studied provided examples as what may be the more successful practice to teach writing. The students appeared to be visual learners and liked to be given clear instructions on what is expected of them. Providing the examples with clear instructions helped with writing because it provided guidelines to follow.

TAs can be helpful in managing the larger classes, and both instructors used TAs to some extent. Cathy seemed to rely heavily on TAs to answer questions and grade assignments, so she was less familiar with students' individual strengths and weaknesses. Mary was able to stay connected with her students because she still taught a smaller lab class.

Instructors attempted to foster a dialog during classroom presentation, and some students interacted in class. However, all students in the focus groups expressed reluctance to ask questions in the larger classes, and students with lab courses were more likely to save their questions for their lab instructor.

The teaching of the lecture/lab combination course at this university followed McKeachie's (1969) suggestion of teaching the large class in the large format some of the time (lecture), then in smaller sections at other times (labs). McKeachie also discussed the budget constraints acknowledged during the interviews of participants was likely the reason for teaching courses in the larger sections.

Following Tierney's (2011) stance that, "distance learning begins in the fifth row" (p. 64), the University adapted to larger classes by offering the lab classes, which allowed increased opportunities for interactions. Similarly, Kryder's (2002) study reviewed a Business Communication course that was forced to increase its enrollment because of high demand. As a part of this increased enrollment, it added the lab course and used TAs to support the instructor. The course had positive feedback from students, but Kryder maintained that neither she nor her department recommended the larger class as more beneficial. The lecture-lab design was instituted because of budget constraints, but the instructors acknowledged that it was not an ideal learning situation.

Both instructors viewed the large classes as necessary but not necessarily as effective, which is similar to Russ' (2009) study and Moshiri and Cardon's (2014) study. This lecture/lab combination course delivery does not appear to be common to other universities as it was not addressed in either of the studies.

Implications

Examining the unique course delivered at this university enabled the researcher to identify some significant areas of practice beneficial for other instructors to utilize in their own course designs. Instructors must be able to maintain a relationship with their students so that they can best deliver course material effectively. Each class and each student is different and it is important that the instructor is able to identify the needs and abilities of the students enrolled in

their classes. The use of TAs can be beneficial, but it is important that the instructor be involved in the class assignments to accurately assess learning.

It is likely that universities will continue to offer large classes at various levels, but there must be a balance between budget allocations and student learning. As the class size increases, the chances of the class being taught as a lecture style course will increase and cause the instructors to lose their ability to connect with students. Students are more likely to feel detached from the subject matter if they have fewer opportunities to interact with the material being presented.

The lecture-lab course allowed for mass-delivery of content in the lecture course, but it provided the small-class atmosphere from the lab course and provided the students opportunities to interact with their instructors and receive the feedback necessary to improve their learning experiences. Students acknowledged that their lecture classes were large and intimidating, but the lab class provided a comfortable atmosphere to seek feedback.

Recommendations for Further Study

Expanding the study to include other types of schools in other states would provide additional situations that would provide more insight into teaching large classes. Studying more classes would further strengthen the generalizations that can be made from the study. A longitudinal study over several semesters could provide a more detailed description of course deliveries as changes are likely to occur between terms. This would show how instructors adapted their courses based on feedback provided from students in course evaluations.

Recommendations for Practice

The recommendations for practice propose that administrators try to offer courses in as small a class size as economically possible. Most instructors realize the importance of the interactions necessary for effective learning and, as found by Tierney (2011), building relationships between student and instructor helps to build critical thinking skills. Most students are more comfortable in classroom discussions when the class is smaller; therefore these relationships are more likely in the smaller classes. Smaller classes also allow more flexibility in course delivery and provide more opportunity for instructor feedback.

The use of TAs can aid in classroom management, but they must be used strategically to ensure that the instructor stays informed on students' needs and abilities. Limiting TAs to marking assignments, entering grades, and taking attendance can relieve instructors of tedious duties. Even if a TA is allowed to grade assignments, the instructor should still review each paper before a final grade is entered.

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A MODEL OF BUSINESS PERFORMANCE IN THE US AIRLINE INDUSTRY: HOW CUSTOMER COMPLAINTS PREDICT THE PERFORMANCE?

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ABSTRACT

Customers are one of the most important assets in many sectors, including the airline industry, since they are a revenue source for the firms. When customers have unpleasant experiences with airline companies, they are likely to complain. Through an in-depth literature review, this conceptual study investigates customer complaints' effect on the US domestic airline industry's business performance. In the proposed model, leading factors surrounding customer complaints are examined and then the complaints are linked to business performance. Customer-service quality, service fees, and important events are analyzed as predictors of customer complaints. Customer-service quality indicators considered are involuntary-denied-boardings, on-time percentage, flight delays, cancellations, diversions, and mishandled baggage. Service fees explored are those for baggage, cancellation and airfare. Important events identified are economic downturns and fuel-price spikes.

INTRODUCTION

The airline industry deals with not only increasing operational costs and changing customer demands, but also fluctuating trends worldwide (D'Alessandro & Kletzel, 2013). These challenging conditions make the airline industry a complex sector to investigate. For example, following times of durable demand and reasonably decent profits for airline carriers, demand can become fragile and financial indicators become unfavorable (Accenture, 2007). Such situations illustrate the airline industry's quickly changing conditions.

The airline industry's changing environment can be understood by considering the last 25 years. In the early 1990s, wars in the Middle East and the global financial crisis resulted in a decline in air travel, thus reducing the industry's size (Rhoades & Waguespack Jr, 1998, 2004). After this downturn period, the industry's profit levels increased in the late 1990s (Harris, 2014). However, in the beginning of the 21st century, the 9/11 terrorist attacks created concerns about passenger safety. As a result, the US airline industry's volume declined by 25 percent, followed by increased unit costs and financial problems (Belobaba, 2005; Gowrisankaran, 2002). According to the Bureau of Transportation Statistics' (2014) operating revenue data, the airline industry fully recovered in 2004 from the negative effects of 9/11. Between 2004 and 2007, the industry's operating revenue gradually increased with an annual growth rate of 7 percent (Wagner, 2014). Yet as a result of the 2008 worldwide financial crisis, the industry's revenues dramatically decreased from 2008 until the mid 2011s (Bureau of Transportation Statistics, 2014).

The US airline industry has not only faced economic downturns, but also changing fuel prices. Based on the Energy Administration Information's (EIA) data (2014), fuel prices peaked

in late 2005, 2008 and 2011. These price changes are considered critical factors that may have an impact on US airline industry's operation (Avro, 2012; Waguespack & Rhoades, 2014). One of this study's aims is to investigate the effects of these peaks on the airline industry's performance.

The airline industry became very competitive after the US Congress passed the 1978 deregulation law, which removed entry barriers to the industry, thus making entering the industry easy (Kole & Lehn, 1999). During the two years following deregulation, 31 new airlines entered the industry (A. Johnston & Ozment, 2011). However, this pattern did not last long. In the second half of the 1980s, especially during the recession in the early 1980s, many airline companies either closed or merged with other carriers (Borenstein, 1992; Kahn, 1988). Carriers continued failing after the 1990s' recession. Between 1990 and 1994, the airline industry recorded a loss of $20 billion, and major airlines such as Pan American and Eastern closed down (Wagner, 2014). Over the last 15 years, 10 major carriers merged with 4 major airlines due to economic difficulties. For example, Northwest joined Delta, and AirTran joined Southwest (CNNmoney, 2014).

As discussed earlier, in the airline industry's highly fluctuating atmosphere, successful performance is a difficult to achieve. Thus, understanding the key factors affecting business performance is vital. In order to face such challenges as global economic downturns, fuel price changes, and growing competition, it is necessary to focus on customers' needs and wants as well as perceptions of service quality (D'Alessandro & Kletzel, 2013; Mccutcheon, 2013).

Airline passengers are not always happy with the industry. Since the early 1980s, passengers have filed complaints about airline carriers with the Department of Transportation (DOT). The last 17 years' complaint numbers reported in *Air Travel Consumer Reports* (DOT (Department of Transportation), 2014) revealed that during periods of financial well-being and increased air travel, the number of complaints peak. For example, in 1999, the recovery time after the economic crisis of the early 1990s, the number of complaints reported to the DOT reached the highest level. In the mid-2000s, just before the financial crisis of 2000-2001 and the terrorist attacks of 9/11, the number of complaints reached the second-highest level. In 2007, just before the 2008 financial crisis, while the airline sector experienced economic wellbeing again and complaints seem to reach another high level. Finally, after the recovery from the 2008-2011 economic downturn, the number of complaints peaked again in 2012.

Recently, ancillary service fees in the airline industry have also received considerable attention. Since 2007, airline companies have charged fees for some previously free services (Tuzovic, Simpson, Kuppelwieser, & Finsterwalder, 2014; Waguespack & Rhoades, 2014). The services for which carriers charge ancillary fees include extra baggage (or in some cases, all baggage); seat alignment; food; reservation changes; and priority boarding (Higgins, 2010; Martin, 2011; Stellin, 2010). Ancillary fees are of interest because they provide airline companies substantial amounts of revenue. When ancillary service fees were introduced in 2007, air carriers earned $2.45 billion in additional revenue, while in 2013 that amount increased to $31.5 billion (IdeaWorks, 2014). While these fees generate significant revenue for the airlines, customers are not necessarily satisfied with those fees (McCartney, 2008). As these fees increase so do customer complaints about them (Thornton, 2003; Tuzovic et al., 2014). Because ancillary fees are extra costs, customers may want to avoid them or may expect extra quality service in return.

According to the literature, the antecedents of business performance are customer service and customer complaints (Dresner & Xu, 1995; Steven, Dong, & Dresner, 2012). However, the impact of economic downturns and service fees on consumer complaints and business

performance have not been investigated enough. Studies have examined the relationship between customer-service elements (such as mishandled baggage reports, involuntary denied boardings, delays, cancellations) and customer complaints (Behn & Riley, 1999; Dresner & Xu, 1995; Sim, Song, & Killough, 2010; Steven et al., 2012). These studies linked customer complaints to financial performance. Furthermore, several studies have explored how economic trends have influenced the airline industry's quality and customer complaints (Rhoades & Waguespack Jr, 1998, 2000, 2005, 2008, 2004; Waguespack & Rhoades, 2014). According to these studies, as the economy evolves and fuel prices change, service quality and customer complaints fluctuate. However, to the best of our knowledge, the effects of economic trends and fuel costs on customer complaints have not been statistically analyzed.

Furthermore, ancillary airline service fees have been discussed in various contexts in both popular business media (Higgins, 2010; Martin, 2011; McCartney, 2008; Stellin, 2010; Thornton, 2003) and in scholarly articles (Ancarani, Gerstner, Posselt, & Radic, 2009; Gila E. Fruchter, Gerstner, & Dobson, 2010; Tuzovic et al., 2014). However, to the best of our knowledge, the effects of the airlines' ancillary service fees on customer complaints have not been empirically studied.

This study's purpose is to propose a model about business performance's antecedents in the US airline industry, focusing on domestic flights. Based on the proposed model, this research discusses the effects of customer service, service fees, and important events (economic recessions and fuel-price changes) on business performance based on customer complaints. First, the proposed model links customer service, service fees, and important events to customer complaints. Then, the model links customer complaints to business performance.

A MODEL OF BUSINESS PERFORMANCE

After the deregulation in 1978, the US airline industry became very sensitive to the global environment's ups and downs, such as changing customer needs, economic recessions, terrorist attacks, and changing fuel prices. This industry has also dealt with financial challenges, such as high operational costs and low profit margins (Sim et al., 2010). Focusing on customer needs seems a feasible option for handling the difficulties and enhancing performance indicators, such as operating revenue, net income, and revenue passenger miles. The proposed model in this paper analyzes customer complaints in an effort to enhance business performance (Figure 1). The literature review is in three parts. The first part discusses the proposed antecedents of customer complaints including customer service, service fees, and important events. The second part explores the business performance's antecedent, customer complaints. The last part discusses the model's outcome variable, business performance. Each of the model's constructs is discussed in depth.

REVIEW OF LITERATURE

Customer Service Quality

Customer service quality is an essential factor for customers in choosing a service provider (Blodgett, 1995). The literature has proposed two types of service quality: technical and functional (Parasuraman, Zeithaml, & Berry, 1985). Technical service quality pertains to what is delivered to the customer, whereas functional service quality involves personal interactions during delivery (Parasuraman et al., 1985). In terms of the airline industry, technical service

quality includes involuntarily denied boardings, on-time arrival percentage, flight delays, cancellations, diversions, and mishandled baggage.

Customer service quality has been studied in various contexts, including customer satisfaction, customer complaints, and business performance. Babakus, Bienstock and Scotter (2004) investigated the relationship between perceived service quality, customer satisfaction, and retail store performance. They found that perceived service quality has a significant positive impact on customer satisfaction and that customer satisfaction has a significant positive impact on store performance.

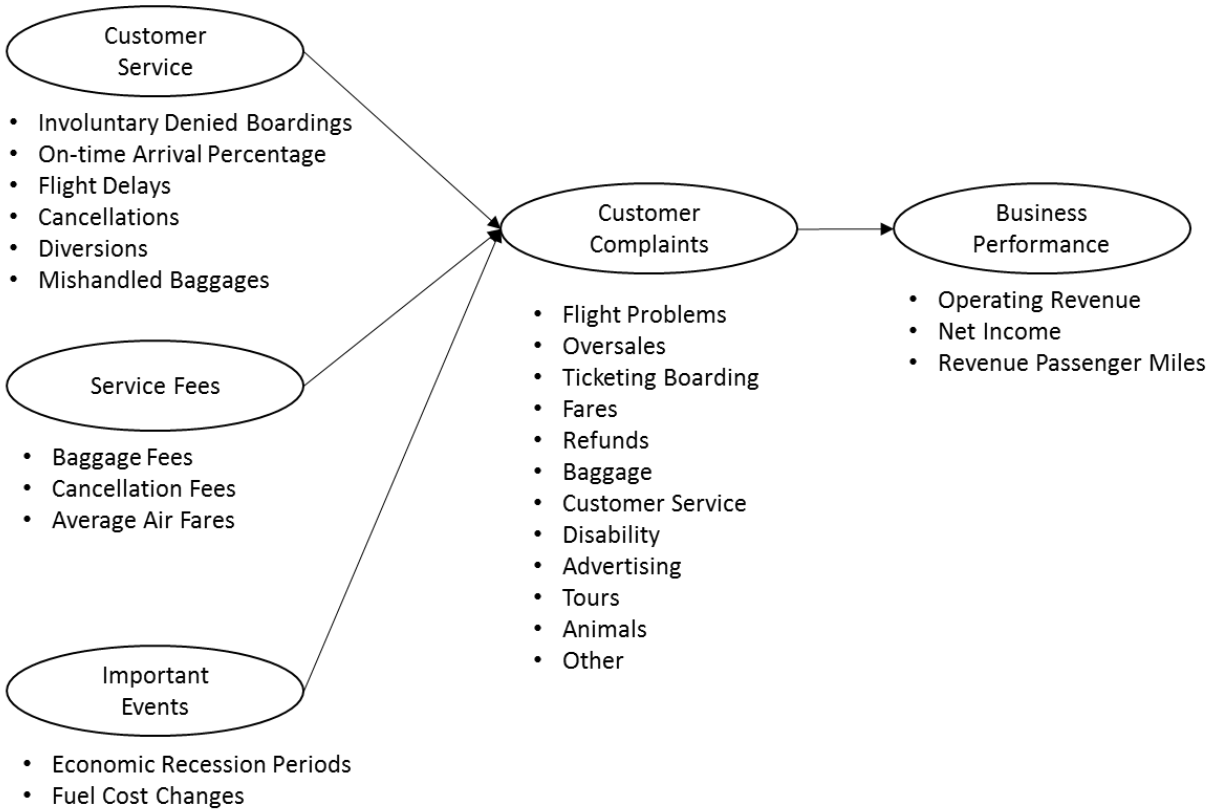
Examining the connection between service failures measured by flight delays in the airline industry and customer satisfaction, Anderson, Baggett and Widener (2009) found that those failures negatively affect customer satisfaction. They also investigated how this relationship changes according to who is responsible for the service failure. If the air carrier is responsible for flight delay, satisfaction levels are much lower than if external conditions such as weather cause the delay. Brady and Cronin (2001) investigated service quality as a mediator between customer orientation and customer satisfaction. Their empirical study involved customers of auto lubrication centers, amusement parks, and video rental stores. Their results showed that customer orientation positively affects service quality and that service quality positively influences customer satisfaction. Yee, Yeung, and Edwin Cheng (2010) studied the link between service quality and customer satisfaction by surveying customers of various high-contact shops in Hong Kong. They also found that service quality has a positive influence on customer satisfaction.

Park, Robertson and Wu (2004) studied three aspects of customer service in the airline industry: service expectation, service perception, and service value. Their study of Korean airline passengers found that passengers' expectations of service negatively influence satisfaction, meaning if passengers have high expectations they will have lower satisfaction levels. They also found a positive relationship between service perception and satisfaction; if passengers perceive service quality is high, they will likely be more satisfied. Lastly, service value was found to be positively related to satisfaction, implying that when airline customers receive high value from the services, they are more satisfied.

Several studies focused on the relationship between customer service and customer complaints in the airline industry. Dresner and Xu (1995) investigated the link between customer service, customer satisfaction, and firm performance. They used on-time arrival, mishandled baggage, and involuntary denied boardings (ticket oversales) to measure customer service quality. They used customer complaints to measure customer satisfaction on the basis of DOT data from 1988 through 1990. Higher levels of customer service quality (higher number of on-time flights, lower amount of mishandled baggage, and lower number of oversales) were found to be positively related to higher numbers of complaints. Complaints were found to be negatively related to firm performance, implying that as the number of complaints increase, firm performance decreases. (Behn & Riley, 1999) also used the same variables for customer service that Dresner and Xu (1995) used with one additional different variable, the revenue load factor, which indicates how crowded a flight is. They found customer service elements as predictors of the number of complaints. Additionally, they found that as the number of complaints rises, the air carrier's financial performance (measured by operating income and revenue) declines. (Behn & Riley, 1999) also used quarterly data from DOT between 1988 and 1996. Steven et al. (2012) investigated the link between customer service, complaints and business performance. They used the number of flight cancellations to measure customer service quality in addition to using

Dresner and Xu's (1995) customer service variables. Higher levels of customer service were found to predict lower levels of customer complaints. Customer complaints were also found to negatively influence performance with the moderating role of competition, meaning if competition is high, customer complaints' effect on performance is higher.

Figure 1
A MODEL OF BUSINESS PERFORMANCE IN AIRLINE INDUSTRY



The relationship between customer service and customer complaints has also been studied in the restaurant sector. Chang, Khan and Tsai (2012) investigated how service failures affect customer complaints by surveying customers of five different restaurants. Different types of service failures lead to different types of complaints. For example, old and unclean food results in more complaints. Susskind (2005) studied how unpleasant service experiences affected complaint behavior among customers of a mall's food court. They found restaurants' compliant-handling efforts are positively associated with customer satisfaction.

Some studies of the US airline industry used customer complaints to measure customer satisfaction (Behn & Riley, 1999; Dresner & Xu, 1995; Steven et al., 2012). On the other hand, some of the studies saw customer complaints as reflections of service quality (Rhoades & Waguespack Jr, 2000, 2005; Sim et al., 2010). Since controversy exists in the literature about what customer complaints reflect, this study uses customer complaints as a variable instead of regarding them as the measure of another variable.

The service customers receive during their interactions with firms affects customers' future behaviors toward those firma. Based on previous studies, the customers who receive

unpleasant or below-expectation service are unlikely to be satisfied. Also, unsatisfactory customer service triggers customer complaints. For instance, a customer complained to Consumer Affairs about the cancellation of his direct flight at 9:45 a.m. from Miami to D.C. (Consumer Affairs, 2015). The company offered another flight at 8:15 p.m., meaning the customer lost an entire work day. After the customer contacted the company, a morning flight with a layover was arranged to arrive at 1.30 p.m., meaning half a work day was lost. That customer was very unsatisfied and complained. Because firms do not like to have complaints, they should increase their attention paid to customer service in order to lower the number of complaints. Customer-service quality in the airline industry is expected to be associated with customer complaints because customers who do not receive the desired service are more likely to complain about the service or the firm. A customer whose luggage was lost and who complained, saying that the firm, whose advertisements claim it is customer oriented, could not even handle baggage. Based both on the assumption that dissatisfied passengers are more likely to complain and on the evidence provided by the literature, the first proposition involves the connection between customer service quality and the number of customer complaints:

P1 Customer service quality will be negatively related to customer complaints.

Service Fees

Ancillary service fees are the charges added to the core product's price for extra services (Ancarani et al., 2009). These fees are commonly used in various industries, including the hotel (Martin, 2011), banking, telecom, package delivery, retail, and airline industries (Thornton, 2003). This study focuses on the ancillary service fees in the US airline industry. Almost every carrier in this industry imposes several ancillary fees for services including baggage, seat selection (Macguire, 2014), reservation cancellation (ticket change), priority boarding (Hobica, 2014), entertainment, food, and pets' air travel (Ellis, 2014).

Based on the literature review, research exploring service fees has not been extensive. The first references to ancillary service fees in the pricing literature focused on unfair pricing and price differentiation. Herrmann, Xia, Monroe, and Huber, (2007) investigated the link between the perception of price fairness and satisfaction among car owners who bought cars from major dealerships in Germany. When dealerships' prices are perceived as fair, customers are more likely to be satisfied with the service. In a conceptual study, Cox (2011) proposed that differential pricing may result in negative customer reactions (e.g., regarding the situation as unfair) unless companies explain pricing strategies or sustain goodwill with customers. Cox observed Amazon's customers who experience various prices for different customer segments.

Over the last several years, service fees have been addressed in the literature. Ancarani et al. (2009) explored how the following fees affect prices consumers pay: cancellation fees in the hotel and airline industries, restocking fees in the retail industry, nonrefundable shipping and handling fees in the online retail industry, and cover charges in the restaurant industry. When not applied separately, these fees are bundled into the total price, which is much higher in the investigated sectors. For example, if airlines do not charge cancellation fees, airfare is more expensive. As another example, Fruchter and Gerstner (1999) investigated the effect of full refunds without a restocking fee. They concluded that without a restocking fee (full compensation of returns) the total price is higher than when a restocking fee is charged.

Non-refundable fees for cancellations, restocking, and shipping were studied in the price partitioning literature before the ancillary service fees became popular. Hess, Chu and Gerstner's

(1996) study of price partitioning revealed that full-price compensation for product returns in the retail sector may result in consumers with no intention of using the product when buying it in the first place. The study also investigated how nonrefundable shipping fees proportional with the product's price in online retailing helps to reduce the number of refunds. This study found that non-refundable cancellation fees are charged to discourage customers' frequent buying, using and returning merchandise without genuine interest to own. In another study, Morwitz, Greenleaf, Johnson, and Morwitz (1998) proposed that firms offer non-refundable service fees such as shipping and handling in retailing and gratuities in restaurants to decrease costs for consumers and increase demand. When this proposal was tested in an auction experiment, the results showed that the perceived total cost decreases when certain fees are charged separately because consumers may not correctly perceive the total cost (i.e., base price and additional prices). This incorrect perception leads to increased demand. This finding contradicts Ancarani et al.'s (2009) and Fruchter and Gerstner's (1999) findings, which stated that separating service fees from the base price actually reduces costs for consumers, showing that customers may not perceive the fees as financially favorable.

Xia and Monroe (2004) investigated the effect of additional fees on college students' purchase intention when shopping for a PC. They found that customers are more likely to buy an item when there is one additional fee (shipping and handling). However, two additional fees lessen purchase intention. Xia and Monroe also found that as the number of additional fees increases, the store's perceived trustworthiness decreases. These results suggest that a high number of supplementary fees may have negative effects on both consumer reactions and on companies' business performance. This finding may have implications for the airline industry, which charges ancillary fees for baggage, cancellations, priority boarding, and even food. Such fees may evoke unpleasant feelings among airline customers.

Chung and Petrick (2012) studied ancillary service fees in a price fairness context by investigating consumer responses to price changes and extra fees. Surveying US domestic airline passengers, they found that when the passengers perceive price changes and extra fees as unfair, they are more likely to have unpleasant emotions such as anger, stress, and disappointment, in turn leading- to complaints.

O'Connell and Warnock-Smith (2013) studied how international airline customers perceive ancillary service fees. Based on their survey, customers' acceptance level of ancillary fees seemed low, suggesting that customers may not have pleasant feelings about those fees. In Tuzovic et al.'s (2014) study of the link between ancillary airline service fees and US domestic airline customers' behavior, entertainment fees were found to have the highest acceptability whereas baggage fees have the lowest acceptability. In terms of behavioral outcomes, this study found that ancillary service fees lead to anger, which in turn leads to customer complaints.

Revenue gained from service fees has risen substantially since 2007. IdeaWorks (2014) showed that revenue gained from airline service fees rose more than 300% between 2007 and 2014. Yet, customers' attitude towards these fees is not clear enough in the literature. Some studies have suggested that when the prices are regarded as unfair, negative customer emotions and behaviors result (Chung & Petrick, 2012; Cox & Lyn, 2001; Herrmann et al., 2007). Studies have also found that service fees are not generally acceptable to customers (O'Connell & Warnock-Smith, 2013; Tuzovic et al., 2014). Based on these studies, a logical assumption is that customers may not welcome ancillary service fees and that increasing service fees may have a negative impact on customers. Therefore, based on the above discussion, the following proposition is offered:

P2 Service fee costs are positively related to customer complaints.

Important Events

One of the main purposes of this study is to explore how important events (e.g., economic downturns, terrorist attacks, and increased fuel prices) affect not only the airline industry but also customer reactions, such as complaints. In the US airline industry's history, deregulation in 1978 was a major event that aimed to enhance consumers' wellbeing by eliminating entry barriers to the industry and by allowing intense competition among carriers (Borenstein, 1992). From the consumers' perspective, after the deregulation more of the following were available: seats, cheaper plane tickets, and frequent-flyer programs (Federal Aviation Administration, 1999). Since 1978 deregulation, air fares declined 30 percent for domestic flights (Federal Aviation Administration, 1999). These results make it reasonable to think that deregulation has been advantageous for the customer. However, airlines' service quality has declined since deregulation, although no empirical studies support this claim (Rhoades & Waguespack, 2000).

Studies have noted the historical pattern of customer complaints in the US airline industry. Rhoades et al. (1998) investigated annual customer complaint rates between 1987 and 1996. These rates were calculated using the total number of complaints reported to the DOT divided by the total number of flights. Results showed complaint rates declined between 1987 and early 1990s. The sharpest decline was at the beginning of the 1990s, when the severe effects of a global financial crisis were experienced. This finding suggests that the financial crisis did not negatively affect customer-complaint rates. At the end of the 1990s, the airline industry experienced a very successful period with very high levels of air traffic and great numbers of passengers; but this situation caused the industry to work above its limits, leading to increased customer complaints (Rhoades & Waguespack Jr, 2004). The DOT data reveals that the number of customer complaints more than doubled between 1998 and 2000 and that complaints increased 20.24% between 1999 and 2000.

Another important event, the September 11, 2001 attacks, had a substantial economic impact on the airline industry. Furthermore, based on the National Bureau of Economic Research (2014), the US had been facing an economic recession for a couple of months before those attacks. As a result of those attacks, passenger demand drastically declined and US air carriers faced noticeably higher costs (Gowrisankaran, 2002).

The effect of these important events on customer complaints in the US airline industry has also been studied. For example, Rhoades and Waguespack (2004) observed how the rates of customer complaints, late arrivals, oversales, and mishandled baggage changed between 1987 and 2002. These rates rapidly declined during the years of the financial crisis. For example, the customer complaints dropped 5% from 1990 to 1991 and another 8% from 2000 to 2001. The main explanation for these drops is the passenger load factor. During crises, there were fewer passengers to complain or to oversell, and fewer passengers made being on time easier for air carriers b (Rhoades & Waguespack Jr, 2004). Another study examined customer complaints per departure from 1996 to 2004 (Rhoades & Waguespack Jr, 2005). Complaint rates declined for three years after 2001. These results suggest, as did those of Rhoades and Waguespack's(2004) study, that the rate of these problems declined after 2001. To determine if this pattern also applied to the 2007 crisis, Waguespack and Rhoades (2014) used a rating system similar to the one Rhoades and Waguespack (2004) used and called it a "disquality index." They found that the disquality rating declined between 2008 and 2011, during the Great Recession's economic

difficulties. The main reason for this result is the decreased number of passengers causing less passenger enplanements during this period. Similarly, after the introduction of baggage fees in 2007, the decreased number of complaints about mishandled baggages is due to the decrease in the amount of checked baggage (Waguespack & Rhoades, 2014).

Fuel price changes are also important events for the airline industry. Hayashi and Trapani (1987) investigated how fuel cost changes influenced ticket prices, capacity, load factor, and number of passengers during 1971, 1976, 1977 and 1979. While they did not have an impact on air fares, increased fuel prices led to a decline in both capacity and passenger demand with a rise in load factor. In another study Oum, Fu and Zhang (2009) analyzed the effects of fuel prices, 9/11, and economic recessions on international air traffic measured by revenue passenger kilometers between 1990 and 2010. They found that a 10% increase in oil prices led to a 0.6% decrease (a significant difference) in air traffic. Other important events (i.e., the 9/11 attacks and economic recessions) also resulted in a decline in air traffic. Contradicting Hayashi and Trapani's (1987) findings, Oum et al. (2009) explained that declining air traffic resulted from increasing air fares. A report of the United States Government Accountability Office (GAO) (2014) supports the findings of previous studies about the link between fuel prices and air traffic. The report discusses increasing fuel prices' role in reducing the hours passengers flew.

The general view in the literature about important events, such as economic recessions and fuel price spikes, is that they have an impact on air traffic. This impact is reflected in decreased passenger demand and decreased miles or hours passengers fly. Decreased air traffic during an economic recession or a fuel price spike can be explained by various passenger reactions to these events. For example, during an economic recession, people may feel economically insecure and may want to limit their spending on flying. In turn, air carriers may offer fewer flying schedules during recessions for economic reasons. All these situations may reduce passenger demand or miles flown. When fuel prices increase, air fares are expected to increase, too (Helfand, 2012; Thisdell, 2011). Increased air fares may also result in low passenger demand. This study examines the influence of important events, such as economic recessions and fuel price spikes, on customer complaints. In studies focused on the relationship between customer complaints and economic recessions (Rhoades & Waguespack Jr, 2005, 2004; Waguespack & Rhoades, 2014), all the researchers found a decline in customer complaints during economic crises as a result of reduced passenger traffic. While sources generally agree that spikes in fuel price lead to reduced passenger traffic (Hayashi & Trapani, 1987; Oum et al., 2009; United States Government Accountability Office, 2014), no study, to the best our knowledge, has investigated the link between fuel price changes and customer complaints. As previously stated, studies have explained that when the number of enplaned passengers declines so do the number of customer complaints (Rhoades & Waguespack Jr, 2005, 2004; Waguespack & Rhoades, 2014), mainly because airports and planes are less crowded, leaving fewer people to complain. Thus, if passenger numbers decrease during an important event such as an economic recession or a fuel price spike, it is logical to assume that customer complaints also decrease. Based on this assumption, we propose that economic recessions and increased fuel prices lead to decreased customer complaints. Based on the literature and on the stated assumption, the following proposition is offered:

P3 Important events are negatively related to customer complaints.

Customer Complaints

According to Best and Andreasen (1977), complaint process can be defined as the procedure whereby customers complain to a service provider about their dissatisfaction with services. These researchers also proposed a three-stage life cycle for complaints:

> Perception of a problem, voicing of a complaint, resolution of the complaint (p.701)

The last stage of this cycle implies the necessity for a company to resolve customer complaints because unresolved complaints may lead to unwanted outcomes, such as reduced business performance. In terms of financial performance, obtaining new customers is more expensive than retaining existing ones (Fornell & Wernerfelt, 1987). In competitive environments, such as the airline industry's, a cost-effective method of retaining customers may be considering customer complaints.

Few studies have examined customer complaints' influence on business performance. Instead, complaints have been primarily investigated from the perspective of complaint management. For example, complaint management's effect on customer satisfaction (Davidow, 2003; Goodman, 1999; Zairi, 2000) and the link between customer satisfaction and financial performance (Banker & Mashruwala, 2007; Ittner & Larcker, 1998; Wiele, Boselie, & Hesselink, 2002) have been well documented. Examining complaint management's effect on financial performance based on profits, R. Johnston (2001) found that effective complaint management may result in enhanced financial performance.

The link between customer complaints and business performance in the airline industry has been investigated in several studies because customer-complaint data are publicly available through DOT. Examining the relationship between the number of complaints and the air carriers' profitability, Dresner and Xu (1995) found that as the number of complaints increased, profitability decreased. Riley, Pearson and Trompeter (2003) investigated the effects of customer dissatisfaction, measured by customer complaints, on the air carriers' financial performance, measured by stock returns. They found a negative relationship between complaints and stock returns, indicating that increasing customer complaints lead to diminishing stock returns. (Behn & Riley, 1999) also studied the association between customer complaints and business performance. They used three indicators of business performance — operating income, revenue and expenses — and found that complaints are negatively associated with operating income and revenue, while positively associated with expenses. Sim et al. (2010) used return on investment (ROA) and return on assets (ROA) to measure future financial performance and found that higher numbers of customer complaints predict lower values of ROA and ROS in the airline industry. Similarly, Steven et al. (2012) studied the link between customer complaints and profitability and showed that customer complaints negatively predict profitability in the airline industry.

Among the unhappy customers, only four percent complain (Plymire, 1991) a huge portion of unsatisfied customers who do not voice their concerns. As Sim et al. (2010) found, airline customers who voice their complaints to DOT are a minor percent of unhappy customers, who must be very angry and who may not be willing to use the service or company they are unsatisfied with again. If the angry customers stop using the service, the air carrier's business performance may decline. Given this logic, it is not surprising that studies have found a negative association between customer complaints and financial performance in the airline industry. Indeed, airline managers also think that pleasing customers will help reducing customer

switching behavior, hence improving performance measures. For example, in response to Delta Airlines' offering more routes in the Northwestern United States, Alaska Airlines launched a program called "Alaska Beyond" in 2015. Clancy (2015) reported that Alaska Airlines substantially improved in-flight services related to comfort, food, and entertainment in hopes of reducing complaints, though the impact of this program on customer retention and business performance has yet to be seen.

This study proposes that revenue passenger miles as well as operating income and operating revenue are business performance indicators. Revenue passenger miles, "the basic measure of production" in the airline industry (American Airlines, 2014), are calculated using the number of passengers multiplied by the distance flown (Bureau of Transportation Statistics, 2014). Based on the literature review, the following proposition is developed for this study:

P4 Customers complaints are negatively related to business performance.

DISCUSSION

In this research, leading factors related to the US airline industry's business performance have been discussed. Customer service quality, service fees, and important events linked to business performance have been thoroughly investigated.

In examining the relationship between customer service quality, customer complaints, and business performance, studies have found relationships among the three variables (Behn & Riley, 1999; Dresner & Xu, 1995; Sim et al., 2010; Steven et al., 2012). Our proposed model supports the literature's general idea about those relationships. Although Parast and Fini (2010) did not find a direct relationship between customer service quality and business performance,, they did find that on-time arrivals do not affect profitability, probably because on-time arrivals' direct effect on performance was measured. As several studies showed and as this study has proposed, customer service quality may have an indirect effect through complaints about business performance.

This study's two main contributions to the literature are two variables, service fees and important events, which are discussed as the customer complaints' precursors. Service fees are significant for the airline industry because substantial amounts of air carriers' revenue are from service fees. A few studies have examined service fees' indirect effect on customer complaints in various industries. However, service fees' direct effect on customer complaints has not been discussed to the best of our knowledge. Thus, the impact of this important part of airline companies' revenue on customer complaints is one of this study's main topics. Several newspaper articles have noted that customers are unhappy about service fees. This dissatisfaction is discussed in this study's literature review.

In this study, important events, including economic downturns and increased fuel prices, are also considered as precursors of the airline industry's customer complaints. Economic downturns are difficult for customers because they must limit their spending in certain sectors. Our proposition is that customer complaints are reduced during recessions because of the reduced number of passengers. This proposition supports the findings of several studies that investigated complaint numbers during economic recessions (Rhoades & Waguespack Jr, 2005, 2008; Waguespack & Rhoades, 2014). As Waguespack and Rhoades (2014) indicated, during economic recessions fewer people are in airports, leading to reduced wait times at airport gates, reduced passenger-boarding time, and more available seats. As a result, passengers are more

satisfied and tend to complain less. Also, as the number of passengers diminishes, fewer people are available to complain; thus, fewer complaints are not surprising.

Another major proposition in this study is that customer complaints negatively affect business performance. Complaining customers are just a small portion of all dissatisfied customers (Plymire, 1991). This small portion may be the most dissatisfied. Not surprisingly, complaints may lead to diminished performance since complaining customers are so unhappy about the service that they may no longer do business with the company. Another reason complaints may decrease business performance is that unsatisfied customers may engage in "word of mouth" behavior (Sim et al., 2010), sharing their unpleasant experiences with other people. In turn, this behavior may affect other customers' purchase intentions. The idea of customer complaints reducing business performance has managerial implications for the airline industry. To increase performance, managers should heed customer complaints and the main reasons for them. The DOT receives complaints in several categories, which managers can examine to understand customers' main concerns. For example, DOT data reveal that between 2007 and 2014, people mostly complained about flight delays, customer service, and mishandled baggage. Therefore, airline managers monitor these areas and find ways to satisfy their customers. Another managerial implication of this study is that to decrease customer complaints and, in turn, increase business performance, customer-service quality should be monitored carefully and improvements should be made regarding such problems as over sales, late arrivals, cancellations, and mishandled baggage.

FUTURE RESEARCH AVENUES

Although this study analyzes the relationship between complaints and business performance, it does not consider market competition. On the other hand, some studies have analyzed competition's effect in the airline industry. For example, Steven et al. (2012) explored competition as a moderator in the link between customer complaints and performance. Results showed that when competition is intense, the customer complaints' effect on profitability increases. However, when competition is low, customer complaints have the reverse effect with profitability decreasing. Mazzeo (2003) studied the competition's effect on customer-service quality by measuring on-time performance. In high competition he found that the number of delayed flights decreases, while in low competition that number increases. Both of these studies showed that when competition is low or non-existent, customers, even if they complain, must choose from the existing air carriers. Therefore, customer complaints' effect on business performance may be less adverse. Also aware of this situation, the carriers may choose not to pay enough attention to flight delays. Thus, competition's effect on the relationship between customer complaints and business performance should be considered in future studies. Also, competition's effect on the number of complaints could be studied since in a high-competition environment, customers may have high expectations, which may affect their evaluation of air carriers.

This study concentrated on and provides a general picture of the US airline industry. Future studies should consider whether the proposed model is relevant in the international airline industry, thus providing an opportunity to determine the generalizability of this study's results. Future studies could test the model for the entire US airline industry or for each carrier separately. Testing the model for each carrier separately would provide the opportunity to determine the strength of relationships for each specific carrier. Future research could also consider different business-performance measurements, such as profitability ratio (operating

revenue over operating cost) (Steven et al., 2012), return on assets versus return on sales (Sim et al., 2010), percentage changes in revenues and expenses, and gross profit over assets (Behn & Riley, 1999). One or more of these variables may also be used to indicate business performance in future studies.

For proposed models in future studies, data on customer service and complaints are available from the Department of Transportation (DOT) while business-performance data are available from the Bureau of Transportation. It should be noted that the DOT always uses statistics for the carriers "that have at least one percent of total domestic scheduled-service passenger revenues," while the Bureau of Transportation's statistics include all the carriers. Future studies may consider the differences in data from different organizations while testing the model.

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DESIGN OF PROCEDURAL CONSTRAINTS: CASE STUDY BASED ON PARTICIPANT OBSERVATION REGARDING MANAGEMENT OF EMPLOYEE CREATIVITY

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ABSTRACT

In the business environment, employee creativity has been regarded as a critical resource that contemporary companies should possess. With regard to this, researchers have investigated the mechanism of creativity and clarified the management of creativity. In the creativity literature, numerous studies have focused on employees' intrinsic motivation. In addition, these studies have argued that constraints tend to inhibit employee creativity since they decrease intrinsic motivation. Conversely, some studies have found that constraints can enhance employee creativity since they facilitate idea generation and the best use of resources, thereby increasing intrinsic motivation. Therefore, since constraints have been shown to have paradoxical effects on creativity, the present study focuses on procedural constraints and investigates how to design them in order to enhance employee creativity.

This study employs a single-case study approach based on participant observation at a vocational advertising school in Japan. This particular school has fostered numerous students who have gone on to win student awards for television commercials. On the basis of participant observation, this study found that teachers positioned procedural constraints as useful tools that promoted idea generation, evaluation, and improvement. In addition, the teachers explained why the students should follow these procedures to facilitate their understanding. In this case, the teachers' use of procedural constraints enhanced students' creativity instead of inhibiting it. The implication of this study is that managers can design procedural constraints and utilize them as tools to promote employees creativity.

INTRODUCTION

In the business environment, employee creativity has been regarded as a critical resource that contemporary companies should possess. With regard to this issue, researchers have investigated the mechanism of creativity and clarified the management of creativity. In the creativity literature, numerous studies have focused on employees' intrinsic motivation. Moreover, these studies have argued that constraints tend to inhibit employee creativity and decrease intrinsic motivation, thus requiring a reduction of constraints in an organizational context. Conversely, some studies have shown that constraints can enhance employee creativity, thus requiring the promotion of constraints in an organizational context. Therefore, since constraints have been shown to have paradoxical effects on creativity, the present study focuses on procedural constraints and examines how to design them to enhance employee creativity.

This study utilizes a single-case study approach based on participant observation at a vocational advertising school in Japan. This particular school, which dates back to more than two decades, has fostered numerous students who have gone on to win student awards for television commercials. On the basis of participant observation, this study found that teachers positioned procedural constraints as useful tools that promoted idea generation, evaluation, and improvement. Overall, the teachers' use of procedural constraints enhanced students' creativity instead of inhibiting it.

THEORETICAL BACKGROUND

Importance and Definition of Creativity

In recent years, the subject of employee creativity has gained considerable attention in management research (Anderson, Potočnik, & Zhou, 2014). In previous studies, employee creativity has been regarded as the first step toward organizational innovation (Amabile, 1988), because employee creativity is necessary in new product development or generating new business model. Although managers have attempted to promote employee creativity, they have struggled to facilitate such creativity. Moreover, researchers have had difficulty clarifying how to manage employee creativity. For these reasons, the present study focuses on the management of creativity.

The definition of employee creativity is one of the problems in creativity research. In her pioneering research, Amabile (1996) conceded that it was very difficult to define employee creativity. Furthermore, Anderson, Potočnik, and Zhou (2014) revealed that there remains a lack of general agreement regarding the definition of creativity. Although those problems have remained, Runco and Jaeger (2012) argued that creativity requires the two essential elements of originality and effectiveness, and the elements were supported by other studies (Amabile, 1988; Shalley, Zhou, & Oldham, 2004; Sternberg & Lubart, 1999). In particular, in the business field, the effectiveness of an idea is important because ideas that are too novel are difficult to apply to existing products or services. Thus, employee creativity has to fulfill the criteria of novelty and usefulness.

On the basis of the two elements mentioned above, previous studies attempted to capture employee creativity. Considering the definition of creativity, a majority of researchers focus on ideas that are novel and useful (e.g., Amabile, 1988). Other researchers focus on the process of generating ideas. (e.g., Zhang & Bartol, 2010). This study focuses on the idea itself because practitioners require to understand not how to engage in a creative endeavor but how to produce novel and useful ideas. In consideration of what has been iterated above, employee creativity is defined as the production of ideas or solutions that are novel and useful (Amabile, 1996).

Intrinsic Motivation and Constraints

In the creativity literature, intrinsic motivation is the most important factor that facilitates employee creativity (Amabile, 1988, 1996). Numerous researchers have investigated factors that promote or decrease employees' intrinsic motivation. These factors have been defined as social

and contextual factors and have been classified in terms of individual, job, team, and organizational levels. In particular, previous studies have defined factors that decrease intrinsic motivation as external constraints. Thus, the present paper clarifies the effects of constraints on employee creativity.

Constraints are defined as "factors that are intended to control or could be perceived as controlling the individual's performance on the task in a particular instance" (Amabile, 1996, p. 92). According to this definition, constraints have a negative connotation. Since the general theories of creativity understand that a constraint is the opposite of freedom, Amabile (1996) concluded that constraints kill employee creativity. Conversely, some studies have clarified that constraints can enhance employee creativity (Andrews & Farris, 1972; Bear & Oldham, 2006; Unsworth & Clegg, 2010). According to these findings, it is apparent that constraints have mixed effects on employee creativity. Therefore, the present study defines the mixed effects as the paradox of constraints on creativity.

In the next section, this study reviews the mechanism that inhibits employee creativity and the mechanism that enhances employee creativity. Through the review of these mechanisms, the objective is to consider the paradox of procedural constraints.

The Mechanism that Inhibits Employee Creativity

As mentioned above, the intrinsic motivation perspective has dominated the creativity literature. In addition, previous studies on employee creativity have focused on the importance of intrinsic motivation for creativity (Amabile, 1988; Shalley, 1991; Shalley & Oldham, 1997). Thus, the mechanism that inhibits creativity is based on motivation theories. In other words, this literature has argued that employees tend to generate creative ideas/solutions when they have high intrinsic motivation and that constraints inhibit employee creativity.

Next, this paper considers the mechanism in more detail. To promote employees' intrinsic motivation, organizations or managers must maintain their employees' autonomy and self-determination. However, constraints have been shown to have negative effects on autonomy (Amabile, Schatzel, Moneta, & Kramer, 2004; Hennessey & Amabile, 1998; Shalley, Zhou, & Oldham). Furthermore, these studies have argued that constraints violate employees' need for autonomy; thus, constraints inhibit employee creativity. Studies have also shown that constraints have negative effects on self-determination (Freedman & Phillips, 1985) and make employees' thinking and behavior more rigid (Deci & Ryan, 1987). As a result, it becomes extremely difficult to generate new ideas when constraints undermine creativity. Therefore, studies have suggested that managers remove constraints and utilize the motivational approach, which is based on the idea that freedom is one of the main conditions in which employees expand their creativity.

The Mechanism that Enhances Employee Creativity

The creativity literature has considered that constraints inhibit employee creativity since they undermine intrinsic motivation. However, some studies have shown that constraints can

enhance employee creativity. Thus, this section describes the mechanism that enhances employee creativity.

Although many studies based on the motivational approach insist that it is difficult to produce novel, useful ideas under certain constraints, some studies have argued that it is more difficult to produce such ideas without constraints. Ward (1994) and Ward, Patterson, Sifonis, Dodds, and Saunders (2002) clarified the tendency to follow the path of least resistance. According to this theory, employees tend to be uncreative when they are given free rein to generate ideas. In other words, employees generate ideas in the quickest, easiest manner available when there are no constraints.

In addition, the total lack of constraints means there is no clear goal in the organization. The absence of such a goal can result in lower performance (Hirst, Van Knippenberg, & Zhou, 2009). Locke and Latham (1990) argued that goal setting is an effective motivational technique. Thus, constraints can be considered factors that facilitate intrinsic motivation and the best use of employees' resources. Roskes (2015) argued that constraints encourage employees to focus their resources more effectively. Furthermore, constraints have also been shown to inspire novel solutions (Stokes, 2001). Li (1997) argued that constraints help describe the problem and clarify the aims, methods, rules, and standards, all of which promote employee creativity.

Based on the previous discussion, the present study revisits the paradox of constraints. In the creativity literature, numerous studies have investigated the effects of constraints on creativity, which has produced mixed results. However, it is possible to improve creativity by reducing and promoting constraints. For example, constraints never reduce employees' intrinsic motivation when they impose some constraints on their work. Instead, constraints help employees generate new ideas while maintaining their self-determination and autonomy. In the following section, this study reviews specific constraints to clarify their overall effects on employee creativity.

Time, Resource, and Procedural Constraints

Previous studies have shown that time, resources, and procedures are the main constraints that influence employee creativity (e.g., Rosso, 2011). Thus, this section reviews the specific constraints and explores how they facilitate employee creativity. First, the present study clarifies the effects of time constraints on creativity. Amabile (1996) argued that time pressure makes it difficult to explore another approach and generally results in the use of a status quo approach. Gruber and Davis (1988) conducted a case study of the doctoral dissertation process and stated that "creative work is not a matter of milliseconds, minutes, or even hours, but of months, years, and decades" (p. 265). Furthermore, Andrew and Smith (1996) investigated the negative relationship between time pressure and employee creativity. In contrast, some studies have investigated the positive effects of time pressure. Andrews and Farris (1972) found a positive relationship, moreover Bear and Oldham (2006) found a curvilinear relationship between time pressure and employee creativity. In addition, longitudinal studies have found similar effects on creativity (Amabile, Hadley, & Kramer, 2002; Ohly, Sonnentag, & Pluntke, 2006).

Next, the present study clarifies the effects of resource constraints on creativity. Amabile (1998) argued that resource constraints have negative effects on creativity since the lack of

resources makes employees feel uncomfortable and unable to be creative. In addition, numerous studies have shown that innovation requires financial resources (Camisón-Zornoza, Lapiedra-Alcamí, Segarra-Ciprés, & Boronat-Navarro, 2004). Conversely, some studies have clarified the positive effects of resource constraints. Shalley and Gilson (2004) argued that resource constraints encourage employees to find novel approaches and solutions. Moreover, Moreau and Dahl (2005) found that individuals generate novel solutions when they have limited resources.

Finally, this study examines the effects of procedural constraints. De Alencar and De Bruno-Faria (1997) clarified that routine tasks tend to inhibit employee creativity, moreover Choi, Anderson, and Veillette (2009) found that task standardization negatively affects employee creativity when employees have high levels of creative ability. To the contrary, some studies have clarified the positive effects of procedural constraints. Sutton and Hargadon (1996) showed that procedures help generate novel ideas, moreover Gilson, Mathieu, Shalley, and Ruddy (2005) found that employees generate more creative ideas when they have certain routines.

To sum up, time, resource, and procedural constraints have paradoxical effects on creativity. However, depending on the situation, such constraints can still enhance creativity. The following section considers the need to design constraints despite the paradox.

Need to Design Procedural Constraints

In the creativity literature, some studies have found a way to avoid falling into the paradox of constraints by considering their balance. Tatikonda and Rosenthal (2000) argued that successful product development requires a balance between firmness (i.e., applying a formal process) and flexibility (i.e., allowing leeway). In addition, Joyce (2009) found that too many constraints inhibit creativity and that too few constraints also inhibit creativity. Furthermore, Rosso (2011) concluded that managers need to find the right balance of constraints to promote team creativity. This perfect balance of constraints is referred to as the "sweet spot of creativity" (Onarheim & Biskjaer, 2015). However, it is difficult to find this sweet spot since the balance of constraints is constantly changing. Particularly in relation to time and resource constraints, it is more difficult to clarify the sweet spot because time and resources are limited in organizations, and the balance is quantitative.

With regard to procedural constraints, organizations can design their work procedures or routines by themselves. Moreover, in terms of the sweet spot of procedural constraints, the balance is qualitative. In other words, managers can determine what type of constraint can enhance employee creativity. In previous studies, some researchers focused on the effect of design constraints and discussed their importance (Caniëls & Rietzschel, 2015). However, few studies have examined how to design procedural constraints. Based on the above, this study presents the following research question:

RQ *How can managers design procedural constraints to enhance employee creativity without inhibiting it?*

METHODS

This study employs a single case study approach based on participant observation. This approach is characterized by two points. First, it allows the study to understand management practice holistically and comprehensively (Yin, 1984). Second, it enables the study to explore and develop new theories (Yin, 1984). Thus, the present study argues that it is reasonable to employ a case study methodology to explore the design of procedural constraints.

In this study, participant observation was conducted eight times (from June to August 2015) at a vocational advertising school in Japan. From 1996 to 2015, this particular school has fostered numerous students who have gone on to win student awards for television commercials. Thus, it is apparent that the school has successfully supported creativity. This author participated in lectures at the school (as a student) and eventually produced a television commercial that won a student award (the bronze medal). Furthermore, this author conducted semi-structured interviews with the teachers and attempted to clarify the intent behind their teaching methods. Of the abovementioned resources, the most prominent sources of data included participant observation (as a student) and data collection through the interviews.

This study adopts a positon of social constructionism to reveal the nuances of the management of creativity. In previous studies that conducted participant observation, many researchers tried to understand the social reality in more detail from the standpoint of social constructionism (Whyte, 1943). Thus, the author of this study also adopted the same perspective to clarify the reality. Furthermore, the author intended to describe the case thickly and continue to introspect in order to understand the social reality because for this study, the author collected and interpreted date all by himself.

CASE SYNOPSIS

This study chose a vocational advertising school as the object of study. The school, founded by a business company that specializes in the production of television commercials, offers weekly lectures that focus on creative, successful advertising approaches. By hiring creative directors in the advertising field, the school aims to produce future employees who will find success as television commercial directors, copy writers, and creative directors of television programs. Thus, the school recognizes that winning awards is an important indicator of whether the school can produce high-quality individuals.

In this participant observation, this author was involved in the special curriculum (consisting of lectures by two teachers) that aimed to produce a television commercial that could win the student award. One of the teachers presented lectures three times, and the other teacher offered lectures five times. These eight lectures focused on how to understand the critical features of the products, how to generate critical ideas that describe the features, and how to refine these ideas.

RESULTS

Based on the participant observation, this study reveals the procedural constraints and their design. First, the school imposed procedural constraints during the following two processes: 1) attempting to understand the features of the products; and 2) evaluating and improving ideas. Regarding the first process, the teachers stated, "If you determine the product's features, then you should ask two questions. First, what is the product? Second, what does the product give you?" Initially, this procedural constraint appears to restrict the way of thinking. However, when producing advertisements, this is essential for understanding the features of the products, especially since effective advertisements must describe the critical points of the products through novel descriptions. Thus, this procedural constraint promoted efficient and effective thinking.

With regard to the second process, the teachers stated, "Your ideas need to be evaluated according to three categories. The first category is 'commonplace' ideas. The second category is 'make sense' ideas. The third category is 'incomprehension' ideas. The good ideas from the advertisement fall in the second category. So, you should brush up your ideas from the first category to the second category and maintain your ideas not for the third category, but for the second category." At first, this procedural constraint appears to restrict the method of evaluating and improving ideas. However, when producing advertisements, this is essential for describing novel ideas and for producing clear and useful ideas. Thus, this procedural constraint promoted an efficient, effective method of evaluating and improving ideas.

Second, this study describes the design of the procedural constraints. In the school, the teachers repeatedly argued the importance of following procedures. For example, the teachers stated, "If you aim to win the award, then you should comply with the procedures" and "These procedures improve your ideas since they can help you focus on the important points and generate good ideas." Furthermore, when the teacher found the ideas of one student to be somewhat boring, he stated, "It is not a good idea because you didn't follow the procedures." Thus, teachers positioned these procedural constraints as useful tools that promoted idea generation, idea evaluation, and idea improvement. In addition, the teachers explained why students should follow these procedures to utilize the constraints as useful tools. In other words, the vocational advertising school designed the procedural constraints as useful tools to enhance student creativity. As a result, the school produced two students who went on to win the gold and bronze medals for their television commercials.

DISCUSSION

Why Procedural Constraints Enhance Creativity

Based on this study's participant observation, procedural constraints can promote employee creativity. Such constraints can make it easier for employees to focus on the important points of idea generation, idea evaluation, and idea improvement as well as the efficient, effective use of resources. Previous studies have clarified the mechanism of constraints that can enhance employee creativity. For instance, Sutton and Hargadon (1996) showed that procedures support employee creativity, moreover Gilson et al. (2005) found that employees generate more

ideas when they have certain routines. Furthermore, Sagiv, Arieli, Goldenberg, and Goldschmidt (2010) argued that constraints allow employees to understand tasks. In addition, Rosso (2014) showed that constraints help define employees' tasks. As mentioned above, the findings of this study are consistent with those of previous studies. In the following section, this study discusses how to design procedural constraints that enhance employee creativity without inhibiting it.

How to Design Procedural Constraints that Enhance Employee Creativity without Inhibiting It

This study clarified the design of procedural constraints through participant observation. In the vocational advertising school, the teachers positioned the procedural constraints as useful tools. In addition, they explained why the students should follow the constraints. As a result, the students understood that if they aimed to generate novel, useful ideas, they should follow the procedural constraints, even if such constraints restricted their ways of thinking.

In the creativity literature, constraints inhibit employee creativity since they decrease intrinsic motivation (e.g., Amabile, 1988; Shalley, 1991; Shalley & Oldham, 1997). However this study clarified that design constraints can prevent them from inhibiting creativity. Moreover, by positioning procedural constraints as useful tools, they can encourage employees to follow them. In this regard, such constraints do not decrease intrinsic motivation. Furthermore, since employees understand that these design constraints do not disturb their idea generation, these constraints improve their overall creativity. Therefore, managers should design and utilize procedural constraints to enhance the creativity of their employees.

CONCLUSION

This study conducted a participant observation at a vocational advertising school to investigate the design of procedural constraints. The results of this study show that managers should position procedural constraints as useful tools to generate novel ideas among their employees. In addition, managers should explain why their employees should follow the tools to increase their understanding of the merits of the procedural constraints. This design enhances employee creativity by imposing certain constraints in order to improve idea generation and the best use of resources.

Based on the findings, this study includes theoretical and practical implications. Theoretically, this study argues the negative and positive effects of constraints. Previous studies indicated that constraints have paradoxical effects on employee creativity. However, through participant observation, the present study clarifies a design that solves this paradox. Practically, this study clarifies the specific design of procedural constraints that promote employee creativity. In the management context, numerous managers understand the need for creativity, but they do not understand the management of creativity. Thus, this study includes practical implications for business managers who aim to enhance their employees' creativity.

Although this study includes the aforementioned implications, there are several limitations. First, this study is based on a single case study. Future studies should be based on comparative case studies. Second, this study conducted a participant observation at a vocational

school. There could be differences between a business organization and a school even if the school primarily focuses on creativity. Third, the author of this study interpreted data all by himself. The author participated in a vocational advertising school as a student and later conducted semi-structured interviews with the teachers. Thus, there are concerns regarding the process of interpretation because the same person collected and interpreted the data. In participant observation, other researchers have had the same concern; they overcame the concern by thinking from the standpoint of social constructionism. According to social constructionism, a researcher should understand social practice by thick description and continued introspection. Hence, the author of this study also tried to describe thicker and introspect.

Therefore, future studies should investigate the design of procedural constraints for business organizations. Finally, future studies should include detailed investigations about various procedural constraints in organizational contexts. All these possible studies would greatly contribute to the management of employee creativity.

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EXPLORING GREEN ENERGY PRODUCTION AND SUPPLY CHAIN ISSUES

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ABSTRACT

Logistics plays a large role in each person's life. It allows people a means to travel from place to place, receive goods or services, conduct business, and acquire energy. All these aspects are highly important to citizens and the community; however, these things come with a cost. Most logistical methods are not environmentally friendly and thereby causing many challenges and problems. These are detailed and analyzed in this study to find green solutions.

This study examines environmental performance in terms of air emissions and climate temperature changes as well as the types of energy sources being utilized. This is an effort to detail the current state of non-green environmental usage and effects and then to propose alternatives from available opportunities.

An empirical investigation was conducted on the perceptions of managers at various companies. This was an effort to gauge insight into the effects each of these may have upon sustainability, green and environmental issues. After statistical analyses, it appears that there is indeed proof that offers some optimism to increasing green initiatives at the corporate level.

INTRODUCTION

In the simplest terms possible "Greening" simply equates to making more environmentally friendly. Supply chain management (SCM) is a combination of the logistic activities of material management and physical distribution, as well as marketing, sales, finance, strategic planning and information technology (IT). Much of this study will focus on logistical activities but other areas will play an important supporting and secondary role as well.

Although interest is growing in the so-called greening of logistics, relatively few empirical studies have dealt with environmental issues in logistics. This research will analyze the areas of energy transportation and the different modes of transportation of goods. It will then discuss various problems of each and research means of resolving the harmful effects of each, which are both many and serious according to (Moore, 2008).

The first goal of this research is to fully analyze the current state of the environment's level of pollution and associated climate change due to logistical systems. Secondly, this research will discuss current energy usage and production by types. Next, it will proceed to analyze carbon emissions and climate temperature changes over historical periods of times. Production sources of energy will be discuses next followed by green logistics and supply chain issues. This study will briefly attempt to show that a competitive advantage is feasible through green means. In closing will be a discussion and conclusion section. In essence, this research will scrutinize what will be the effects (benefits) on the environment if logistic modes switch to green energy alternatives. The impact of this research will include aspects of statewide, national, and international information.

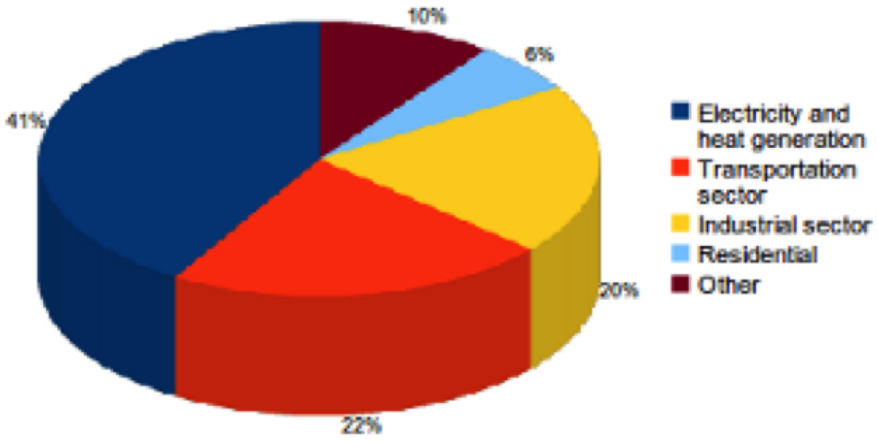
Finally, in an effort to gain insight from both a managerial and academic perspective, a questionnaire was administered. The survey focused on issues of energy efficiency, supply chain coordination, local fuel usage, sustainability, supply costs, bioenergy usage, and total costs.

LITERATURE REVIEW

Carbon Emissions

It has been argued that a concentration on energy resources is a valuable route towards the attainment of environmental sustainability. Still today, a great deal of carbon emissions from logistics is energy related (McKinnon, 2011).

Figure 1
CARBON DIOXIDE EMISSIONS FROM FOSSIL FUEL COMBUSTION



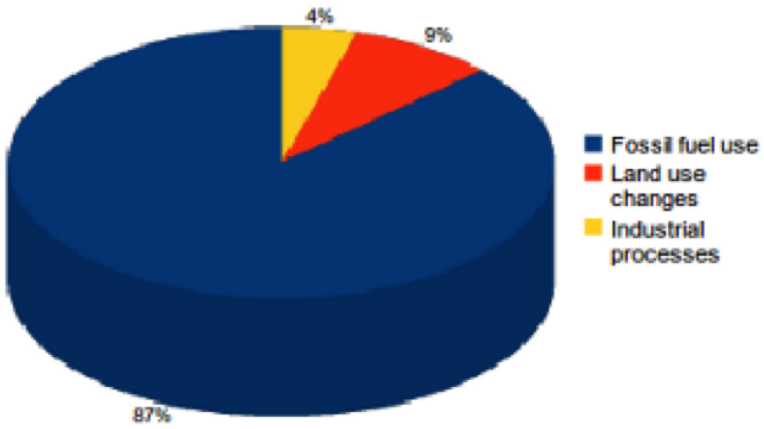
Source: CO2 Emissions from Fuel Combustion (2012), International Energy Agency.

Figure 1 provides data on these emissions important to this study. Emissions from a production perspective account for at least 20% of the overall level. However, this number is misleading as production could also entail emission from some of the other categories such as transportation and electricity generation. Fossil fuels such as petroleum, natural gas and coal accounting for 94 per cent of the total energy supply to the manufacturing and transportation sectors. These sectors are also major contributors to the emission of greenhouse gasses (Golicic *et al.*, 2010). So the next logical question is what is the source of the carbon emissions. Figure 2 details that the overwhelming percent derives from the use of fossil fuels. The type and use of energy resources has a significant impact on the carbon intensity of industrial operations that range from discrete processes to global supply chains (Halldorsson and Svanberg, 2013).

Some studies refer to this concept as climate change or global warming. This concept fosters much heated debate. Instead, this research simply chooses to analyze actual verifiable climate temperature over a historical period.

Although, not statistically analyzed in this study, several of the discussed items have an undeniable effect on climate temperature. Therefore, it is important to analyze data to see if any trends are presents. As can be viewed from Graph 1, the global temperature has increased slowly but constantly over time.

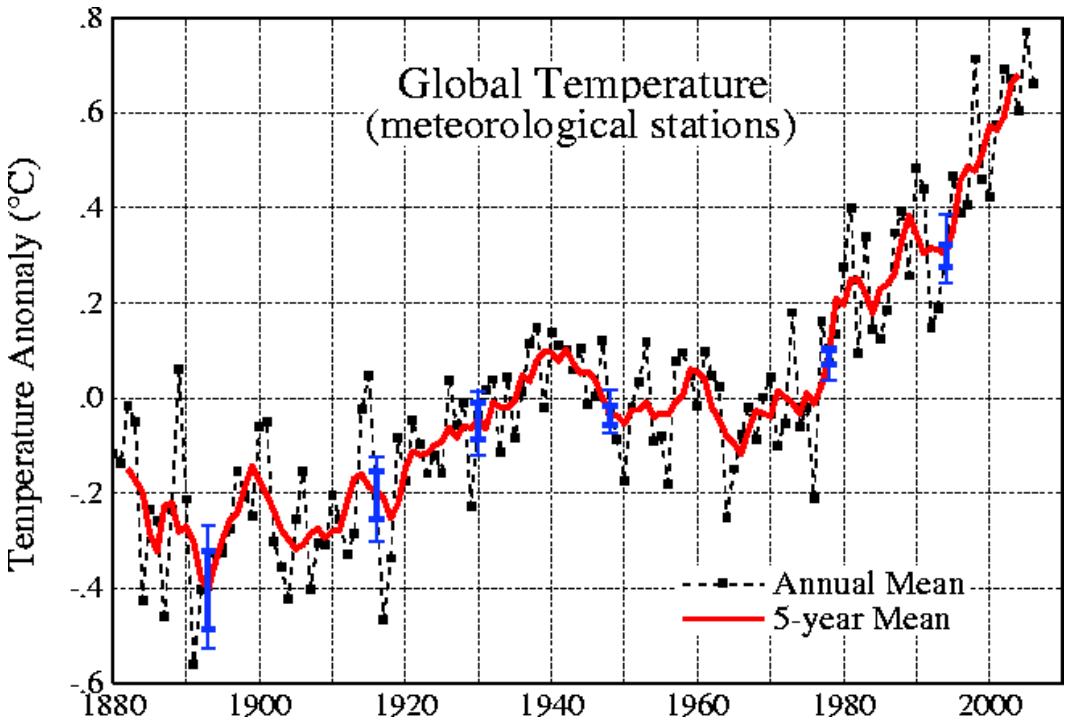
Figure 2
HUMAN SOURCES OF CARBON DIOXIDE



Source: Le Quéré, C. et al. (2013). The global carbon budget 1959-2011.

2.2 Climate Temperature

Graph 1
GLOBAL TEMPERATURES OVER A 122-YEAR PERIOD



Source: NASA 2002 surface temperature summation.

Energy

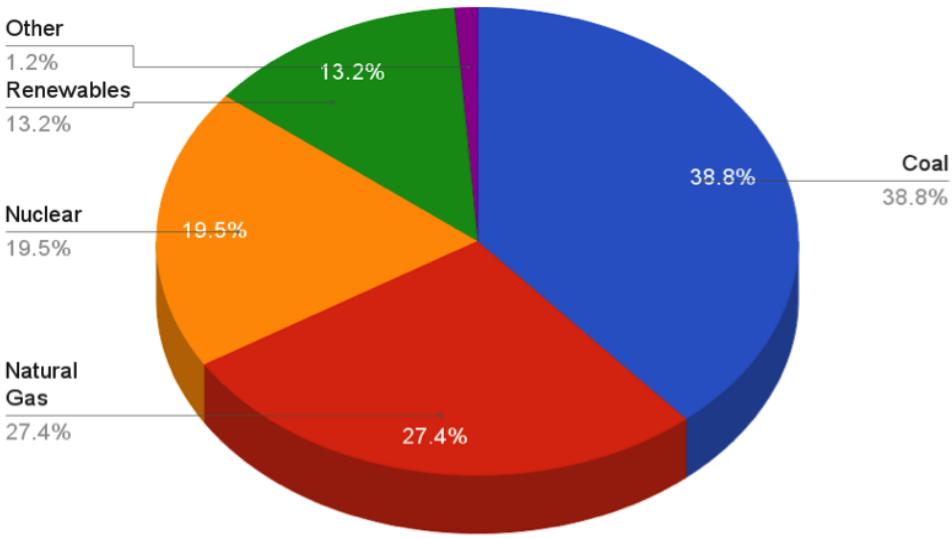
Production of energy is the process of (Halldorsson and Svanberg, 2013). Energy is a source of power that is produced through using different technologies such as solar, wind, or combustion. Various energy carriers (biomass, crude oil, sunlight, coal, natural gas, wind) transform this energy to a consumable form of (electricity, vehicle fuel, heat, etc.…). This paper will not delve into specifics on coal vs. solar for instance as much has already been written on each of the various energy methods.

Figure 3 breaks down the means by which the U.S. generates electricity for consumption. It becomes clear fossil fuels dominant the current used source and renewable means are a negligible 13.2%. Table 1 provides a means of comparison to benchmark the U.S. with other countries in this regard. While the U.S. is not quite the largest user of fossil fuels, percent-wise, it is far from the leader or even in the middle of the pack. Recent evidence ranks "reduced costs due to energy efficiency" as the second highest potential "sustainability benefit" for organizations, only superseded by improved brand reputation (Haanes *et al.*, 2011). However, this sole work needs supporting research to confirm results. Therefore:

Hypothesis 1 *As energy efficiency (EE) improves, overall, total costs (TC) will be reduced.*

An examination of respondents will also try and confirm if brand reputation is indeed regarded as having the highest “potential” over reduced costs. Clearly, as the U.S is economic superpower, there is room for industry improvement. As a supplemental, Appendix A, is attached to show a state-by-state comparison. This will allow, among other things, a means to determine where efforts could begin.

Figure 3
U.S. 2014 ELECTRICITY GENERATION BY TYPE



Source: U.S. Energy and Information Administration. 2016.

Table 1
ELECTRICAL ENERGY PRODUCED BY FOSSIL FUEL COMBUSTION (BILLION KILOWATTHOURS)

G8 Nation	Fossil Fuel Combustion	Total	%
Canada	136.31	622.98	21.90%
France	44.65	532.57	8.40%
Germany	340.38	567.33	60.00%
Italy	286.35	201.7	70.40%
Japan	759.93	1031.22	73.70%
Russia	668.26	996.82	67.00%
United Kingdom	244.5	342.48	71.40%

Source: International Energy Statistics Database (2011), Energy Information Administration

The context of the energy sector itself is changing; terrorist threats, increased frequency of natural disasters, geopolitical disruptions, the aging of a highly complex infrastructure, climate change and regulatory and economic risks are a threat to a sustainable supply of energy (Bouffard and Kirschen, 2008). Sustainable options tend to offer more energy independent options as well as lowering risks of violence. For instance, nuclear plants are guarded against attacks, which could prove catastrophic for millions. Wind turbines and solar arrays pose little to no threat to the public if attacked. Crude oil is highly volatile in demand and price as much is imported from abroad. Sustainable means, either onsite or offsite, offer more security and less risk.

Green Supply Chain Logistics

Supply chain management incorporates the concepts of logistics, transportation and renewables, as well as some environmental issues. According to Murphy (2003), these separate yet distinct fields have a direct effect upon each other. Green concerns will broaden the scope of logistics as well as influence the way logistics managers do their jobs. (Murphy, 2003).

Supply chain management of bioenergy has been overlooked (Iakovou *et al.*, 2010; An *et al.*, 2011; Halldorsson and Svanberg, 2013). McCormick and Kåberger (2007), identify "supply chain coordination" as a key barrier to "obstructing the expansion of bioenergy". Stock *et al.* (2010), identify energy as a distinct opportunity for further research in SCM. The connection is clear. Abundant opportunity exists waiting to be seized. Therefore, it can be presumed that:

Hypothesis 2 *As supply chain coordination (CC) improves companies tend to be more accepting and willing to switch to sources of bioenergy (BE), hence percent used increases.*

Some relationship conceptualization between supply chain management and environmental sustainability has been done (Seuring and Mueller, 2008; Carter and Rogers, 2008). Svensson, (2007) has explored renewable resources as an element of supply chain. Some research (Browne *et al.*, 2006, Leonardi and Browne, 2010, and Golicic *et al.*, 2010) acknowledges the role of energy resources as a contributory factor with regards to transportation. Song *et al.* (2012) extended this to include a framework for the logistics service industry.

Although some research has begun in this broad field, it is far from abundant or sufficient. The challenges of energy supply chains vary, depending on technology and mode of energy production (solar, biomass, wind, water).

With current oil (energy) volatility, finite supplies, and emerging technologies, the present is not only a feasible time but an optimal one for a transition to more sustainable methods. Many of the producers of green technology, such as Toyota, "have failed to recognize the mass-market appeal of their vehicles and its significant contribution to a cleaner environment and to less dependency on oil" (Bockmam, 2009). Organizations realize that a strong supporting logistics function is an important organizational offering from both the commercial and the consumer perspective (Sarkis, 2004).

Competitive Advantages

Firms can increase their competitive advantage as a result of a stronger triple bottom line, (composed of social, economic, and environmental issues or people, planet, and profit) propositions are created from a natural-resource-based view of the firm perspective that is supported using accounting theory, management strategy, green logistics and supply chain literatures (Markley 2007). Other countries have begun realizing the importance of green logistics and energy (Jiang, 2007). Research in this area could indeed help the entire country and world but, more importantly, it would pave a way to improve local communities and economies. Hence, additional studies in these areas would be a natural extension of existing programs for the emerging field of green logistics. Take for instance a study done by Ranta and Korpinen (2011), in which they found using local fuels actually lowered supply costs as well as making supply more sustainable. This proved to be an ideal situation. So,

Hypothesis 3 *As the overall percent of local fuels (LF) used increases, supply costs (SC) will decrease.*

Hypothesis 4 *As the overall percent of local fuels (LF) used increases, overall sustainability (ST) improves (meaning sources of fuels tend to be green).*

Rogers *et al.* (2007) conclude that accessibility of petroleum-based fuels still makes these economically feasible over alternative sources of energy, and such "access to plentiful and inexpensive fuels has been an important part of building successful supply chains". Rogers *et al.* (2007) further concluded that supply chains have been built on the assumption that "petroleum-based fuel would be inexpensive and plentiful for a long time". Christopher (2010) stresses the same urgency: "When many of today's supply chains were originally designed, the cost of oil was a fraction of what it is today". Competitive advantage potentials not only exist, they are becoming more easily created. This is due to numerous factors such as higher gasoline prices, lower costs of alternate energy sources such as solar and wind, and governmental incentive programs for "green" initiatives.

METHODOLOGY

Questionnaire Design and Measure

The survey item was designed to obtain responses on a five-point Likert scale. A score of 3 represents average. A score of 1 represents very poor while 2 being poor. A score of 4 is classified as very good and 5 is excellent. Actual, quantifiable data is excruciating limited in this

type field. This may be one reason more research in this area has not been previously done. Therefore, perceptions of observed or suspected benefits were asked. This was one reason the survey was sent to a tactical or strategic level manager, so they would have the expertise and knowledge on which to draw upon for these type questions.

Questionnaires were emailed when there was an option to do so. The remaining surveys were mailed via United State Postal Service (USPS) to the operational manager at each facility. Each questionnaire included a self-addressed, postage paid return envelope.

Sampling and Data Collection

This study utilized primary data collection methods for sourcing. Data was collected from various types of industries located in the United States, Mexico and Canada using the survey instrument that was developed.

These individual companies' emails addresses were collected through a few various means. However, all came via the Internet. A partial list of the companies was found via Google searches, and some from the website Kellysearch.com. Others were found through ThomasNet. The combined population size is over two thousand companies. However, it was not, in all cases, possible to know with certainty if a certain company was involved in environmentalism or sustainability on any level. Therefore, some surveys may have been sent to companies who did not respond due to an inability to answer.

A total of 1000 surveys were mailed to various firms throughout the United States, Mexico and Canada. 128 surveys were returns. Fortunately, only 2 of the 128 were found to be unusable. This brought the effective sample response rate to 12.6%. Other supply chain related studies have found response rates typically to be much, much higher than 12.6% (Swink et al., 2007; Devaraj et al., 2007; Koufteros et al., 2005; Rosenzweig et al., 2003). This may be due to several factors, among them was no prior personal relationship with any of the firms being surveyed and that no contact was made at any time via the telephone with any firms. This could have potentially increased the viable response rate. If an answer was illegible, then that questionnaire was added to the unusable stack.

Tables 2 and 3 show a profile of respondents as well as some brief demographic descriptors. Approximately 75% of those who answered the survey were mid to upper management, had more than 6 years' experience, and possessed a Bachelor's degree or higher. Therefore, it is felt these individuals should be knowledgeable in regards to the information asked of them, as was expected.

Table 2
RESPONDENT CHARACTERISTICS

Position	% of respondents	Years Experience	% of respondents	Age Group	% of respondents	Highest Education Level Completed	% of respondents
Upper Management	12.8	<5 years	5.9	<30 years	2.2	High School	15.8
Mid Management	62.5	6-10 years	30.5	30-39 years	22.6	Associates	7.7
Other	22.2	11-15 years	43.7	40-49 years	43.5	Bachelor	38.9
No response	2.5	16-20 years	10.7	50-59 years	22.6	Graduate	24.7
		>21 years	6.8	>60 years	2.6	Post Graduate	6.2
		No response	2.4	No response	6.5	Other	2.9
						No response	3.8

Table 3
DEMOGRAPHIC PROFILE OF RESPONDING COMPANIES

Size of Company base on labor force	% of respondents	Size of Company base on market capital	% of respondents	Region of Responding Company	% of respondents	Company Public or Private	% of respondents
<50	2.5	>$1M	0.4	Northeast	13.93	Public	43.7
50-100	13.8	$1-5M	6.2	Northwest	12.19	Private	46.8
100-200	32.5	$5-10M	9.4	Central	14.43	No response	9.5
200-500	38.6	$10-25M	27.7	Southwest	14.93		
>500	8.1	$25-100M	32.7	Southeast	12.69		
No response	4.6	>$100M	18.9	Canada	31.34		
		No response	4.8	No response	0.5		

Reliability and Validity

Confirmatory factor analysis (CFA) was used to test the latent variables. Confirmatory factor analysis was chosen since it provides a more demanding testing of theory compared to that of exploratory factor analysis (EFA), yet it extends the results generated from the EFA to those presented in the measurement model. Also, CFA allows the researcher to evaluate a priori relationships whereas EFA does not require a priori specifications for theorized relationships prior to model testing. CFA permits the indicators to load only on certain pre-selected factors, while EFA permits the data and statistical technique to determine the measurement model (Hair et al., 1998).

Byrne (2001) said the assessment of the model adequacy must be based on a number of criteria that includes practical and theoretical considerations as well as statistical. Wheaton (1987) agrees and states that a model can be incorrectly specified by all indices and still fit the data well. Therefore the multiple indices will be used to assess model fit.

A basic premise of construct validity is that the determination of each item on the scale contributes to its underlying theoretical construct. During statistical analysis it was found that all factor loadings measured at least twice that of each error term, thereby establishing convergent validity according to Anderson and Gerbing, (1988). Discriminant validity has been used to find the degree to which the constructs are unique. A confidence interval constructed around the correlation between any two constructs can be used for discriminant validity (Anderson and Gerbring, 1988). This estimate should not include the value 1.0, and if it does then the constructs are not distinct and discriminant validity is present. This situation would mean that the constructs under testing are not unique and are in fact similar. Table 4 provides a correlation matrix of the proposed constructs and details the level of significance for each, providing evidence to proceed with the study. Statistical Package for Social Sciences (SPSS, 2012) software version 21 was used to perform the reliability analysis and exploratory factor analysis (EFA).

Table 4
CORRELATION MATRIX OF THE RESEARCH CONSTRUCTS

	Energy Efficiency	Supply Chain Coordination	Local Fuel Usage	Total Costs	Bioenergy Usage	Supply Costs	Sustainability
Energy Efficiency	1						
Supply Chain Coordination	.257***	1					
Local Fuel Usage	.072*	.176**	1				
Total Costs	.287***	.458***	.063*	1			
Bioenergy Usage	.425***	.289***	.115**	.257***	1		
Supply Costs	.367***	.477***	.188**	.386***	.165**	1	
Sustainability	.344***	.265***	.108**	.083*	.515***	.068*	1

*** Significant at the 0.001 level.

** Significant at the 0.01 level.

*Significant at the 0.05 level.

To assess the model consistency, reliability coefficients (Cronbach's alpha) were used to verify each factor's consistency. The typical recommended cutoff value for Cronbach's alpha is 0.70 or higher, but can be lowered to 0.60 or greater for exploratory research (Nunnaly, 1978; Crocker and Algina, 1986; Hair, et al., 1998). For this research, all construct alpha's are at least .90, indicative of a very good fit.

According to Fornell and Larcker (1981), the average variance extracted (AVE) gives another indicator of the overall convergent validity of a construct. This measure tells the variance amount, which is explained by the construct, relative to the amount of variance that can be attributed to measurement error. For convergent validity to be present, this value should exceed .50. The goodness-of-fit index (GFI) measures the variance and covariance amount in the sample data that can be explained by the model. This is an absolute index since it compares a hypothesized model to no model (Byrne, 2001). The GFI provides information about how

closely the models fitted compare to one of a perfect fit (Maruyama, 1998). GFI's NFI's, and CFI's should all be close to .9 for an indication of excellent fit.

Hair et al. (1998) tell that reliability determines the extent to which an observed manifest variable measures the concept is supposed to measure. The composite reliability measure should exceed .50 to be considered good. Average variance extracted (AVE) is one measure of overall validity shown in the table. The AVE is defined as "the sum of squared loading of a scaled divided by the number of items per scale (Fornell and Larcker, 1981). The AVE value should exceed .5 to be considered a very good fit. Garver and Mentzer (1999) recommend using a root mean square error of approximation (RMSEA) .8 or below. However, Hu and Bentler (1999) and Browne and Cudeck (2003) provide evidence that the RMSEA must be .06 or below for an acceptable level of fit. As evidenced by Table 5 all statistical finding are well within range for good fit.

Table 5
MODEL INDICES

	Energy Efficiency	Supply Chain Coordination	Local Fuel Usage	Total Costs	Bioenergy Usage	Supply Costs	Sustainability
Goodness of Fit (GFI)	0.928	0.975	0.955	0.937	0.978	0.963	0.967
Root mean square error of approximation (RMSEA)	0.058	0.045	0.048	0.052	0.054	0.049	0.05
Normed fit index (NFI)	0.905	0.931	0.927	0.918	0.935	0.932	0.937
Comparative fit index (CFI)	0.924	0.96	0.948	0.93	0.962	0.955	0.958
p-value	0.00464	0.00388	0.00435	0.00445	0.00371	0.00429	0.00315
Average Variance Extracted (AVE)	0.688	0.714	0.735	0.77	0.695	0.73	0.795
Composite Reliability	0.9	0.96	0.93	0.91	0.96	0.94	0.95
Cronbach's Alpha	0.9195	0.9678	0.9348	0.9232	0.9715	0.9454	0.9472

Table 6 provides several goodness-of- fit statistics to judge how well the model explains the observed data from the aspects of: absolute fit, incremental fit, and parsimonious fit (Tanaka, 1993; Maruyama, 1998). The absolute fit measures of GFI, AGFI, and the Normed chi-square indicate a good fit of the model to the data (Bentler and Bonnet, 1980; Bagozzi and Yi, 1988).

ANALYSES AND RESULTS

Table 6
VALIDITY STATISTICS

Goodness of fit indices	
Absolute fit	
Normed Chi-square	1.3200
Goodness of Fit Index (GFI)	0.9398
Adjusted Goodness of Fit Index (AGFI)	0.9370
Incremental Fit	
Normed Fit Index (NFI)	0.9210
Incremental Fit Index (IFI)	0.9190
Comparative Fit Index (CFI)	0.9185
Parsimonious Fit	
Root Mean Square Error of Approximation (RMSEA)	0.5280

Within Table 6, three incremental fit indices are mentioned. Normed Fit Index (NFI) represents the proportion of total covariance among observed variables explained by a target model using a baseline null model (Devaraj et al., 2012). Incremental Fit Index (IFI) is a ratio of the discrepancy of the proposed and baseline models over the difference of their respective degrees of freedom (Bollen, 1989). Comparative Fit Index (CFI) governs incremental fits and approximates non-centrality parameters of the model (Gefen et al., 2000). The small RMSEA value means a low residual variance and hence a good parsimonious fit. The validity statistics in Table 6 provide convincing evidence of good model fit. A summary of the hypotheses test results, performed using IBM SPSS 21, is presented in Table 7. The results of the analysis provide support for H1-H4.

Table 7
STATISTICAL MODEL

Parameter	Hypothesis	Standard Error (S.E.)	Critical Ratio	Standardized regression weights	P-value	Supported
EE>TC	H1	.054	4.454	0.394	.000	Yes
CC>BE	H2	.044	4.645	0.410	.000	Yes
LF>SC	H3	.076	4.538	0.388	.000	Yes
LF>ST	H4	.092	4.323	0.374	.000	Yes

DISCUSSION AND CONCLUSION

This research will combat this misinformation in an effort to increase not only consumer awareness, but also that of the suppliers. Generally, green logistics resources are renewable, but not always, and sometimes renewables are not green (Ausbel, 2007). So, it is not enough to look at only renewable energies. Also, it is not enough to look at clean energy sources without

applications. Once green methods are identified as viable, there should be a seamless transition to implement these methods into society.

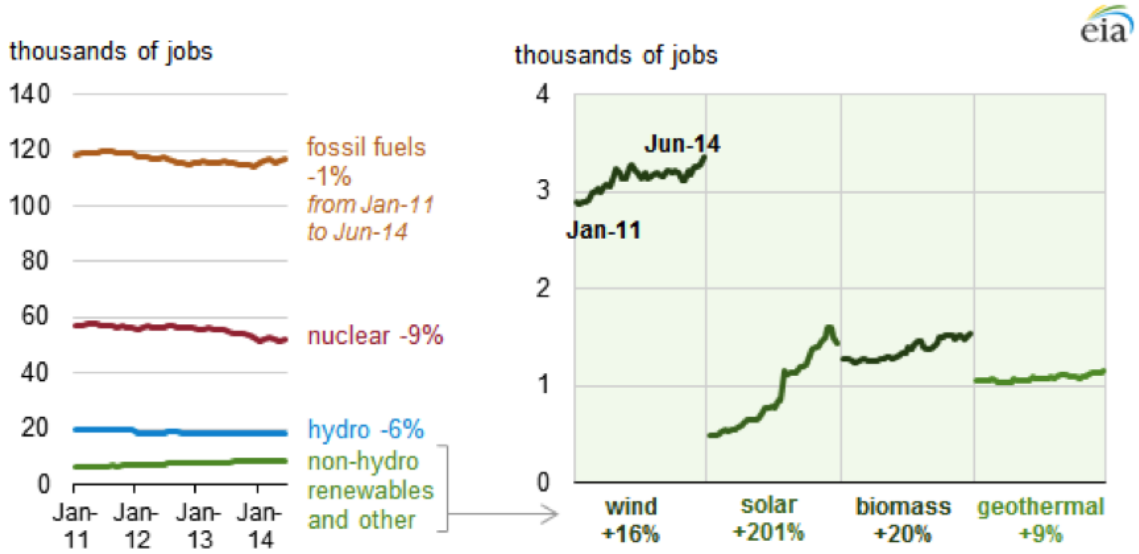
Rao (2004), found that education of the public can prove to be beneficial with regard to change. He asserts that the public often, through informal channels, exerts pressure and influence on the polluters of the environment. A recent report from the BLS (2014), Figure 4, provides hope of moving to more environmental and sustainable energy means. The study finds solar use increasing at 200% and other "green" methods showing positive gains, although much smaller.

Although renewable resources have been referred to in a positive vein in this paper, further understanding of these in a SCM context must consider the negative effects these may have on the wider system, such as noise, visual intrusion, health and safety, water pollution, and traffic generation (Allen *et al.*, 1998). Another issue that must be dealt with is supply risk, in which a key component is dependency

Stock *et al.* (2010), identify energy as a distinct opportunity for further research in SCM. This reinforces this papers findings that present day pollution, carbon emissions, and climate temperatures are increasing while use of fossils fuels is increasing in volume, if not percent. Therefore, energy remains an elusive opportunity for advancement of "green" ideals that will be environmentally helpful and arguably productively and financially beneficial to industry.

Future studies could focus on many different aspects. One of which might be climate temperature. According to Graph 1, it appears that in the 1970's this temperature began to sharply increase and continues to do so. Investigation could be done to provide a solid corollary between greening of energy and production, sustainability, environmentalism, etc… and lowering of the climate temperature.

Figure 4
U.S. ELECTRIC POWER SECTOR JOBS IN GENERATION BY ENERGY SOURCE (JAN 2011-JUNE 2014)



Source: Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages

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Appendix A
PERCENT ELECTRICITY GENERATED WITHIN THE BORDERS OF EACH STATE

State	Nuclear	Coal	Natural Gas	Petroleum	Hydro	Geothermal	Solar/PV	Wind	Biomass/Other
Alabama	27.5	31.5	32.2	0.1	6.5	0	0	0	2.2
Alaska	0	9.2	49.3	12.8	24.9	0	0	2.5	1.3
Arizona	28.8	38	24.3	0.1	5.5	0	2.8	0.4	0.2
Arkansas	23.5	53.9	15.7	0	4.2	0	0	0	2.6
California	8.6	0.4	60.5	0	8.2	6.4	5	7	3.9
Colorado	0	60.3	22.5	0	2.8	0	0.5	13.6	0.2
Connecticut	47.1	2.5	43.6	1.5	1.1	0	0	0	4.2
Delaware	0	11.3	84.9	2.1	0	0	0.8	0.1	0.8
District of Columbia	0	0	100	0	0	0	0	0	0
Florida	12.1	22.6	61.6	0.2	0.1	0	0.1	0	3.4
Georgia	25.9	36.1	32.4	0.1	2	0	0.1	0	3.4
Hawaii	0	15.1	0.3	69.4	0.8	2.5	0.5	5.9	5.4
Idaho	0	0.6	16.4	0	60.4	0.3	0	18.3	3.9
Illinois	48.4	43.2	2.9	0	0.1	0	0	5	0.5
Indiana	0	83.3	12.4	0.1	0.3	0	0.1	3	0.7
Iowa	7.3	60	2.6	0.1	1.3	0	0	28.5	0.3
Kansas	17.1	57.5	3.5	0.1	0	0	0	21.7	0.1
Kentucky	0	93.2	2.7	0.1	3.4	0	0	0	0.6
Louisiana	16.6	23.4	55.8	0	1	0	0	0	3
Maine	0	0.6	33.7	2.3	25	0	0	8.3	30.1
Maryland	37.7	46.3	6.9	1.3	4.3	0	0.3	0.9	2.4
Massachusetts	18.5	9.4	58.5	3.2	1.6	0	1.3	0.7	6.7
Michigan	29.5	51	11.9	0.1	0.7	0	0	3.7	3
Minnesota	22.4	50.2	6.8	0.1	0.9	0	0	15.9	3.6
Mississippi	18.5	19.6	59.2	0	0	0	0	0	2.7
Missouri	10.5	82.6	4.5	0.1	0.8	0	0	1.3	0.1
Montana	0	53.7	1.8	0.1	37.1	0	0	6.5	0.9
Nebraska	25.5	63.2	1.1	0.1	3	0	0	6.9	0.2
Nevada	0	18.1	63.1	0	6.7	8.3	2.8	0.8	0.1
New Hampshire	51.9	6.7	22.4	1.5	6.9	0	0	2.1	8.4
New Jersey	46.7	3.8	45.7	0.7	-0.3	0	1	0	2.3
New Mexico	0	63.4	27.1	0.2	0.4	0.1	1.7	7	0.1
New York	31.6	3.4	39.6	1.6	18.4	0	0.1	2.9	2.5
North Carolina	31.8	38.7	22.4	0.3	4	0	0.7	0	2.1
North Dakota	0	75.1	0.2	0.1	7	0	0	17.6	0.1
Ohio	12.1	67.7	18.2	0.2	0.3	0	0	0.9	0.6
Oklahoma	0	42.6	38	0	2	0	0	16.9	0.5
Oregon	0	5.3	21.2	0	58.5	0.3	0.1	12.7	1.9
Pennsylvania	35.5	36.2	23.9	0.3	1	0	0	1.6	1.5
Rhode Island	0	0	94.7	1.5	0.1	0	0.3	0.1	3.3
South Carolina	54	29.8	11.6	0.3	2	0	0	0	2.3
South Dakota	0	23.3	3.6	0.1	47.7	0	0	25.3	0
Tennessee	34.5	44.7	7.8	0.2	11.3	0	0	0.1	1.3
Texas	9	33.9	47.3	0	0.1	0	0.1	9	0.5
Utah	0	76.3	19	0.1	1.5	1.2	0	1.5	0.4
Vermont	72.3	0	0	0.2	16.1	0	0.4	4.4	6.6
Virginia	39.1	27	27	1.5	0	0	0	0	5.5
Washington	8.2	5.8	9.8	0	68.2	0	0	6.3	1.7
West Virginia	0	95.5	0.8	0.2	1.7	0	0	1.8	0
Wisconsin	15.5	62.3	13.2	0.1	3.4	0	0	2.6	2.8
Wyoming	0	87.7	1.6	0.1	1.7	0	0	8.9	0

Source: ABB Velocity Suite / Energy Information Administration. 2015

ACCEPTABLE CHEATING BEHAVIORS?

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ABSTRACT

The investigation of academic dishonesty is timely, relevant and important to the global business environment. There appears to be a link between acceptance of academic dishonesty and ethical business decisions. S*tudent attitudes towards academic dishonesty have been widely studied across cultures in the last decade. International (Vietnamese) and domestic students differ in their acceptance of specific forms of academic dishonesty. A total of 621 business students responded to our survey. Respondents were either domestic or international and graduate or undergraduate students. They responded to five statements and two questions about academic dishonesty. Analysis of contingency tables indicated that international and undergraduate students a higher acceptance for specific forms of cheating and that there is more difference by gender among the international students.*

INTRODUCTION

Business student cheating conjures up deep concerns since business leaders have been known to act unethically (Smyth, Davis, and Knoncke, 2009). Chapman and Lipton (2004) refer to cheating as a "widespread, insidious and global problem". "There is an increased need for business schools to address academic dishonesty because what students learn as acceptable behavior in the classroom impacts their expectations of what is acceptable professionally." Iyer and Eastman (2006 p. 102). Obviously, academic dishonesty has importance far beyond the academic setting and is being researched because of its global importance.

This study addresses the gap identified by Lupton, Chapman and Weiss (2000 p. 232) when they stated "To date, there is little cross national cheating research". Lin and Wen (2007) also mention that more studies of Asian students are needed, since Asians are participating in the workforce and a propensity to cheat could carry on into their careers.

We add to the literature on academic dishonesty and on cross national differences as well as differences by class level and gender. We report on the acceptance level of specific forms of academic dishonesty by international students, domestic students, graduate and undergraduate students. Comparisons of male and female acceptance levels add to the gender literature on this topic. A total of 621 students from one US public university responded to identical self-reported statements and questions in English. There were 237 graduate students and 379 undergraduate students. Of these, 217 were in international classes and 399 were in domestic classes, while 356 were female and 254 were male.

LITERATURE REVIEW

Three broad research topics are relevant to this topic, academic dishonesty: 1) gender differences, 2) international and domestic differences and 3) undergraduate and graduate student differences.

Gender differences were explored in the late 20th century primarily in the United States. Earlier studies during this period seemed to indicate that there were gender differences, while later studies (possibly as women participated more in many activities outside the home) showed fewer statistically significant differences between the male and female perceptions of academic dishonesty. Early conjecture by several authors raised several possible explanations for the reported gender differences; the most common was attributed to variations in the male and female socialization process. More recent studies demonstrate a convergence in attitude, possibly because the academic environment is equalizing for men and women.

"Gender differences have been widely studied, but results are mixed as to whether there truly are differences between men and women due to sex socialization" (Bailey and Bailey, 2011). The two articles by Bailey and Bailey (2011) include a detailed discussion of 20th century literature relating to gender differences as well as a more comprehensive summary of several early 21st century international studies.

Lupton, Chapman and Weiss (2000) reported doing an extensive literature search on cross national cheating research. There were only three articles that included international comparisons. Since 2001 there has been increasing interest in how students from different cultures view academic dishonesty. The three articles reported here are representative of wide spread interest in international attitudes and comparisons.

Research by Jurdi, Hage and Chow (2011) surveyed 321 students in a Canadian university in 2007, but disagreed with the previous discussions based on gender and age as subgroups.

Chapman and Lipton (2004) focused on cross national differences in beliefs about cheating when they compared US and Hong Kong students. They surveyed 443 US students and 622 Hong Kong students.

Lupton, Chapman and Weiss (2000) compared attitudes, perceptions and tendencies toward cheating between undergraduate business students. They surveyed 443 US students and 192 students in Poland.

Lin and Wen (2007) document the results from a 2068 Taiwanese students surveyed on four domains of academic dishonesty.

Iyer and Eastman's (2006) article contained a comprehensive literature review on studies comparing responses to academic dishonesty questions between business and non-business students. They summarized multiple authors as finding that "younger, immature students cheat more than do older, mature students; juniors and seniors cheat less than do freshmen or sophomores; older students are more likely to view scenarios of academic dishonesty as serious offenses; the ethics of graduate business students are similar to those of undergraduates, despite graduate students perceiving themselves as more ethical than undergraduates." (Bailey, Bailey and Nott, 2014).

Rakovski and Levy (2007) found that graduate students were less likely than undergraduates to participate in cheating. Iyer and Eastman (2006) also reported lower self-reported cheating among graduate students. In addition they found no support for the hypothesis that non-business students engage in lower levels of academic dishonesty than business students.

This study adds to the literature on academic dishonesty in three areas. Our contingency table analysis of the survey responses show significant differences in students in different countries, in different levels of class work and of different genders.

METHODOLOGY

All students surveyed were attending classes at a single university in the United States (domestic) or in Vietnam (international). The students were attending undergraduate or graduate business classes. Table 1 shows the level of class work and the gender breakdown of the students surveyed.

Table 1
DESCRIPTION OF SAMPLE RESPONDENTS

	All		Nationality		
			Domestic	International	
All students surveyed	**621**		**399**	**217**	
Undergraduates	**379**		**187**	**192**	
Graduates	**237**		**212**	**25**	
Males	**254**		**158**	**96**	
Females	**356**		**239**	**117**	

The survey had two parts. The first set of statements portrayed an academic situation where another student was cheating on an exam using prohibited notes. The analysis of the student responses to these five statements are reported in "International Students Do View Cheating Differently" (Bailey, Bailey and Nott, 2014).

The two additional questions on the survey were:

1. Which of the following behaviors do you personally feel is acceptable and shouldn't constitute an academic honesty violation? (Check all that apply).
2. Which of the following do you feel you might do if you felt there would be no legal or academic repercussions from it? (Check all that apply).

The possible responses to these two questions were:

1. Copying short passages or a few sentences from a book, periodical, or the internet without providing a citation
2. Copying short passages or a few sentences from a book, periodical, or the internet and providing a citation, but not using quotation marks
3. Giving a friend or acquaintance hints about what is included on an exam that you took already but they haven't taken yet
4. Giving a friend or acquaintance copies of questions which were included on an exam that you took already but they haven't taken yet
5. Taking an exam for another person
6. Using notes on an exam when you are not supposed to
7. Asking a classmate for an answer on an assignment or exam
8. Copying an answer from another classmate without them knowing about it
9. Turning in copies of solutions you found on the internet for solved problems as your own
10. Using a published test bank or instructor's manual to take tests or do graded homework

11. Copying large amounts of material from published sources and presenting it as your own (nearly all of a report, term paper, etc.)
12. Using published term papers purchased on the internet
13. None of the above

Table 2 shows the variables recorded from the student information and the survey statements and questions.

Table 2
VARIABLES

Group	**Categories in Groups**	
Nationality	Domestic	International
Graduate Status	Undergraduate	Graduate
Gender	Male	Female

Five statements:
Description of cheating situation: If I became aware of a classmate cheating on an exam by using notes that were not allowed, I would: Ignore it Ask the person to stop Notify the instructor anonymously Personally tell the instructor Tell an authority not the instructor

Original Statement Responses*				
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Two questions:
Which of the following behaviors do you personally feel is acceptable and shouldn't constitute an academic honesty violation? (Check all that apply). Which of the following behaviors do you feel you might do if you felt there would be no legal or academic repercussion? (Check all that apply).

Original Statement Responses Summarized As	
None selected	One or more selected

*The statement responses were summarized into Agree, Neither Agree nor Disagree (ambivalent), and Disagree. Results are reported in Bailey, Bailey and Nott, 2014.

Here we wanted to see if one group of students would feel more strongly that any specific type of cheating or plagiarism is wrong, regardless of the type of behavior, so for these two questions, we recorded the survey results into a binary set:

1. One or more responses (other than "none of the above") indicating acceptance of that form of behavior.
2. None of the above

We employed chi-squared goodness of fit analysis to the responses to both parts of the survey. Statistically significant results are presented in contingency tables (Table 5, 6, 7 and 8). The respondents' answers are displayed in Tables 4 through 8 in the Results section. We examined differences between the following groups: international versus domestic students, graduate versus undergraduate students, and male students versus female students. We also examined differences within the sub groups.

RESULTS

A summary of the results of Question 1 is in the table below. Question 2 had very similar results except as shown in Table 7. Broadly, there were statistically significant results between all groups, and between most sub groups within the groups. Detailed results and descriptions are shown in the remainder of this section.

Table 3
SIGNIFICANT RESULTS FOR QUESTION 1

	There are differences between these sub groups	**P values for Question #1**
Group		
All	Domestic, International	.000
All	Undergraduate, Graduate	.000
Undergraduate Students	Domestic, International	.000
Graduate Students	Domestic, International	.000
Domestic Students	Undergraduate, Graduate	.000
International Students	Undergraduate, Graduate	.000
International Students	Male, Female	.037
Female	Domestic, International	.032
Male	Domestic, International	.001

More international students are inclined to accept some form of academic dishonesty. That is true for both international graduate and undergraduate students. Among the international students there is a difference in view between males and females with females indicating that say than none of the behaviors are acceptable more often. The significant results are summarized in Table 4 - 6.

Table 4 **STATISTICALLY SIGNIFICANT CHI-SQUARED RESULTS FOR QUESTION 1**			
Question 1: Which of the following behaviors do you personally feel is acceptable and shouldn't constitute an academic honesty violation? (Check all that apply).			
All	None checked	Some checked	Total
Domestic	176	225	401
International	59	161	220
		Chi sqr = 17.6	p-value = 0.000
Undergraduate	None checked	Some checked	Total
Domestic	15	173	188
International	53	139	192
		Chi sqr = 24.9	p-value = 0.000
Graduate	None checked	Some checked	Total
Domestic	161	52	213
International	6	22	28
		Chi sqr = 34.1	p-value = 0.000

When the students are first grouped by class level with undergraduate and graduate students as separate groups, there are differences in attitudes between domestic and international students. Graduate domestic students tend to view all of the behaviors as unacceptable at a much higher rate than graduate international students, but the reverse is true at the undergraduate level.

Domestic students tend to feel none of the behaviors are acceptable at a much higher rate than international students. This is true among female domestic students and among male domestic students as separate groups. International female students tend to feel none of the behaviors are acceptable at a much higher rate than international male students (Table 5).

Very significant differences in undergraduate to graduate comparisons are consistent across genders. For both females and males the graduate students voiced a higher level of non tolerance for any form of academic dishonesty. Among the international students there is a difference between females and males with more males being inclined to tolerate some forms of academic dishonesty (Tables 5 and 6).

Table 5 **STATISTICALLY SIGNIFICANT CHI-SQUARED RESULTS FOR QUESTION 1**			
Question 1: Which of the following behaviors do you personally feel is acceptable and shouldn't constitute an academic honesty violation? (Check all that apply).			
All	None checked	Some checked	Total
Domestic	176	221	397
International	57	156	213
		Chi sqr = 18.1	p-value = 0.000
International	None checked	Some checked	Total
Female	38	79	213
Male	19	77	28
		Chi sqr = 4.3	p-value = 0.037
Female	None checked	Some checked	Total
Domestic	106	133	239
International	38	79	117
		Chi sqr = 4.6	p-value = 0.032
Male	None checked	Some checked	Total
Domestic	70	88	158
International	19	77	96
		Chi sqr = 15.763	p-value = 0.001

Table 6 **STATISTICALLY SIGNIFICANT CHI-SQUARED RESULTS FOR QUESTION 1**			
Question 1: Which of the following behaviors do you personally feel is acceptable and shouldn't constitute an academic honesty violation? (Check all that apply).			
All	None checked	Some checked	Total
Undergrad	66	307	373
Graduate	167	70	237
		Chi sqr = 170.9	p-value = 0.000
Female	None checked	Some checked	Total
Undergrad	41	169	210
Graduate	103	43	146
		Chi sqr = 93.1	p-value = 0.000
Male	None checked	Some checked	Total
Undergrad	25	138	163
Graduate	64	27	91
		Chi sqr = 77.6	p-value = 0.000

As expected, the responses to question 2 closely mirror the responses to question 1. However, the differences in the responses are intriguing. Among international students, there no longer appears to be a difference in view between males and females - and among graduate students, there no longer appears to be a difference in view between international and domestic students. However, among international students, graduate international students are more likely to feel they would not employ any of the behaviors than do undergraduate international students. (Table 7).

Table 7 **STATISTICALLY SIGNIFICANT CHI-SQUARED RESULTS FOR QUESTION 2**			
Question 2: Which of the following behaviors do you feel you might do if you felt there would be no legal or academic repercussions from it? (Check all that apply).			
International	None checked	Some checked	Total
Undergrad	0	192	192
Graduate	9	19	28
		Chi sqr = 64.3	p-value = 0.000

CONCLUSION AND RECOMMENDATIONS FOR FUTURE RESEARCH

"American educators should understand that it is very likely that their non-American students (at home or abroad) have a different perception of what is or is not cheating. Further, the non-American students and a U.S. educator may also have very different perspectives concerning the role instructors should play in the prevention of cheating." (Lupton, Chapman, Weiss, 2000, p. 235). We continue on the early direction of research which was primarily US-based and studying characteristics, attributes and situations of the students. We add to the current research which is looking at students across cultures and across education levels. Since 2000 there have been several studies that document the differences between students at one international site or country, but the topic has not been fully explored. Our results quantitatively validate the perceived difference in international students that has been observed by instructors as they teach in different countries.

We also looked at the self-reported opinions of students towards academic dishonesty and found less difference in domestic male and female students but statistically significant differences between international students and domestic students and between graduate and undergraduate students. Also, similar to Iyer and Eastman (2006), we found some evidence to suggest gender differences do exist, but lessen as students proceed to graduate status.

The scope of this survey is narrow. It could improve with additional questions. It would be interesting to expand the survey questions to query "why," in order to identify student reasoning. In the future, we would like to expand our survey to include other forms of academic dishonesty.

Just as many current studies are reporting, we found that there are differences in the perceptions and tolerance of students from different countries. International students appear more tolerant of academic dishonesty than their domestic counterparts. The gender-based analysis of the responses produced no surprises. There are more gender-related differences among the international students and fewer differences among domestic graduate students.

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