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This is a Special Issue edited by Tommy J. Robertson, and it results from the Sam Houston State University conference held in April. We appreciate the opportunity to present the outstanding papers selected from the participants of that conference.

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Tommy J. Robertson, Jr.
Special Issue Editor
Sam Houston State University

THEORY OF NEGOTIAUCTION: CONDITIONS FOR APPLICATION

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ABSTRACT

It seems only Subramanian (2010) has looked at dynamics of the real world negotiations and auctions and found limitations in negotiation and auction theories. In the same vein, thus far only Teich et al. (2001) have comprehensively discussed relevant design issues that are concerned with how to construct a negotiauction. By combining these two perspectives: the real world perspective and the theoretical perspective of Subramanian (2010) and Teich et al. (2001), respectively, a number of propositions are proposed with respect to when to negotiate, when to auction, and when to negotiauction. Future research directions are opened up with the purpose of empirically investigating negotiauctions.

INTRODUCTION

Negotiations are an integral part of the lives of almost all people in the world, and people negotiate about almost all aspects of their life. A variety of definitions of what a negotiation is have therefore been proposed. Most of these definitions seem to have a common characteristic that they view a negotiation as a decision process in which two or more parties try to influence each other through different means of communication with the purpose of achieving their own as well as common interests.

Many people also negotiate in their role as employees or owners of organizations. This may be termed professional negotiating, since people carry out these negotiations in their professional capacity. This goes on at all levels in all organizations all of the time. Negotiations are also carried out between organizations for business purposes, an aspect of professional negotiating that may be termed business negotiations. Business negotiations most commonly take the form of buyer-seller negotiations. How such negotiations are carried out and the outcomes they create naturally have a great impact on organizations.

Besides negotiations, auctions are a market mechanism already introduced in the ancient world. Traditionally, they allow selling rare and unusual goods, and apply in situations where a more conventional market in which buyers consider the price as given, do not exist. With the widespread availability of the Internet and e-commerce technologies, there are a variety of formats applied to auctions; however, forward and reverse auctions are the most popular.

Forward auctions are often viewed as ascending price auctions and reverse auctions as ones in which prices start high and descend when the auctions progress.

Although both negotiations and auctions are viewed as two primary market mechanisms to sell and/or buy goods/services (Pinker et al., 2003), theories on them have limitations and they are often investigated in isolation (Subramanian & Zeckhauser, 2005). In negotiations, the main source of competitive pressure comes from the across-the-table dynamics. In contrast, in auctions, the competitive pressure comes primarily from same-side-of-the-table dynamics. The point here is that most real world situations include aspects of both same-side-of-the-table competition and across-the-table competition (Subramanian & Zeckhauser, 2004). So the objectives of this study are as follows:

- Examine characteristics of negotiations and auctions.
- Investigate limitations in theories on both negotiations and auctions.
- Analyze conditions in which negotiations/auctions are used.
- Build a set of relevant propositions relating to negotiations/auctions/negotiauctions
- Open up avenue for empirical research on negotiauctions

NEGOTIATION

Negotiation can be viewed as a decision making process through which consensus can be achieved. It is utilized in situations where entities like persons or organizations are very unlikely to pursue their goals unilaterally. Negotiations can be carried out in a variety of formats, in different circumstances, and impacted by many factors such as ethics, culture, and socioeconomics. Diversified backgrounds of negotiators and negotiation processes bring about many challenges facing researchers from multi-disciplines consisting of anthropology, psychology, sociology, political sciences, economics, law, and applied mathematics. There are a number of theories, models, and approaches for negotiations due to the fact that negotiations have been studied based on various assumptions and under different perspectives such as descriptive, prescriptive and normative.

The term negotiation in the literature is understood with different meanings. Under the economics perspective, negotiation and bilateral bargaining are utilized interchangeably (Bulow & Klemperer, 1995). Sebenius (1992) proposes a progressive negotiation process that commences with an inefficient offer and moves to an efficient (Pareto-optimal) compromise. Under negotiation analysis, some practical issues, for example, not fully rational behavior of negotiators, non-binding commitments, and incomplete information are stressed.

The negotiation process with the focus of interpersonal communication aimed at establishing and changing negotiation perceptions and attitudes have been extensively investigated by behavioral studies. In these studies, negotiation is considered as any process in which social interaction and communication consisting of allocation and reallocation of

resources, commitments, and power occur (Pruitt, 1981). The behavioral studies have been making many contributions by devising various heuristics and qualitative models and approaches that are proved to be useful in negotiation practice.

In order to thoroughly and comprehensively understand the negotiation process, models, concepts and approaches devised from law and social science and those from economics and management science are needed to be integrated.

By doing so, negotiation is viewed as a decision making process with interactive communications between two or more agents (parties or their representatives) who:

1. Are unlikely to gain their goals unilaterally;
2. Implement exchange processes consisting of offers and counteroffers;
3. Deal with interdependent tasks; and
4. Search for a consensus which is a compromise (Bichler et al., 2003).

It should be noted that a compromise or a disagreement can be resulted from a negotiation. In order for negotiations to occur, an agenda needs to be established. The agenda is aimed at specifically providing a negotiation framework that consists of specification of negotiated issues and format where they are presented, for example negotiated issues are implemented in a sequential or simultaneous manner. In addition, under the negotiation framework, rules need to be specified so that alternatives and concessions can be determined, analyzed, and selected. Among the rules, communication roles play an important role in making favorable conditions for offers, counter-offers, and arguments to be exchanged. In negotiations where some tasks can be implemented by software, it is necessary to specify rules so that a distinction between tasks implemented by a system and by human can be observed.

There are various strategies that negotiators can pursue in negotiation situations. However, the most popular strategies are collaborating and competing ones. These strategies are also named after Integrative vs. Distributive negotiation in the literature. Integrative negotiation is expected to be utilized in situations where parties want to develop a relationship such that joint outcomes can be maximized for all the negotiators. By using integrative negotiation, negotiators' objectives are likely to be achieved. By contrast, negotiators view key resources as being limited and controlled in a distributive negotiation. Put it another way, a distributive negotiation is considered as a fixed pie situation. Under fixed pie circumstances, it is unlikely to nourish a long term relationship due to the fact that the gain one party earns is the loss the other party incurs (Ruane, 2006):

Distributive negotiation: Under this strategy, a zero-sum game is assumed meaning that the gain one party earns is the loss the other party incurs (Ruane, 2006). Barry et al. (2004) argue that the outstanding reason for a distributive or a zero-sum situation to occur is that parties' goals are interrelated in such a way that correlation coefficient is negative meaning that when one party earns its goals, that of the other party gets blocked. In single issue negotiations, Johnson

and Johnson (2006) argue that under a distributive negotiation, one party earns benefits only if concession has to be made by the other party. Put another way, one is going to maximize their outcomes while minimizing that of the other parties. Whenever a short term relationship among negotiators is prevalent and their wants, needs and goals are critical, they often utilize the distributive approach. However, it should be noted that under this approach, deficient trust and sincerity are likely to be brought about. In turn, deficient trust and sincerity lead the negotiators to focus on only their outcomes while ignore the outcomes of the other ones.

If a distributive strategy is utilized by someone, someone must be able to respond to his or her opponent in a decisive manner. If not doing so, there is no challenge under the view of the opponent and the opponent may think that his counterpart has put down his guard. Keeping an offensive position and gaining control is very important because it helps the negotiators know directions for communications when they want to utilize offensive tactics (Donohue, 1981). It should be noted that many drawbacks rooted in distributive negotiations such as unfavorable effects on collaboration among the parties in the future. That is why under this strategy, people often assume that future relationships are not important. But the negotiators should be careful that the probability that they will not meet again is very small, and if it happens, revenge made by the opponents is highly possible. So it would be better for the parties to overcome conflicts by taking joint outcomes into consideration.

Integrative negotiation: Under this approach, joint gains are assumed to be created through creative communication and information sharing (Ruane, 2006). In other words, parties work closely in efforts to search for a solution that is beneficial for all of them by maximizing joint outcomes. By utilizing the integrative strategy, it is assumed that nourishing a good relationship with the other party is more important than focusing only on one's own interests (Johnson & Johnson, 2006). It is obvious that a positive correlation exists among the goals of the parties, and their goals can be gained via the integrative or non-zero-sum game (Barry et al., 2004). So, the negotiation environment is very cooperative (Donohue, 1981).

In an integrative approach, joint outcomes are pursued by both parties. The most important thing to do is to nourish a relationship based on mutual benefits. Therefore, integrative negotiation can be viewed as a very difficult process. For example, how members in a family live in harmony is vital. In order to maintain a long lasting relationship, each member has to think about reciprocity based on mutual responsiveness. In an integrative approach, if a cooperative long term relationship is pursued by the parties, they need to understand dynamics rooted in the relationship such as roles, responsibilities, interaction behavior, and other factors that are likely to reinforce their cooperation (Johnson & Johnson, 2006).

Another important concept in negotiation is BATNA. BATNA stands for Best Alternative to a Negotiated Agreement. BATNA is devised by Fisher and Ury (1981) in their bestseller - Getting to Yes: Negotiating without Giving in. BATNA is the alternative the negotiator can make if he or she finally thinks that a favorable outcome cannot result from

negotiating with a particular party. In other words, parties can stop the negotiation process if their BATNA is better than the outcome expected from the negotiation.

Good BATNAs are likely to bring about power for the parties. That is why a negotiator often makes great efforts to better his or her BATNA whenever possible. Skilled negotiators can guess when their opponent is desperate for an agreement. If this situation occurs, the negotiators are likely to demand much more based on the fact that their opponent will have to accept. In contrast, if there are numerous options for the opponent outside the negotiating table, the negotiator would try to make great efforts to better his or her BATNA before participating in the negotiation so that he or she can gain a better negotiation position.

Another important concept used in research on negotiations is the bargaining zone model devised by Raiffa (1982). Under this model, each negotiator has a reservation price – a price at which the negotiator would be indifferent between implementing the negotiation agreement or stopping it (Raiffa, 1982). Specifically, negotiators will not come into a negotiated agreement that is worse than their least acceptable outcomes. Therefore, if the negotiators' reservation prices are overlapped, the possible agreement zone will exist (Raiffa, 1982).

Recently, the Internet has been emerging as an important channel for business transactions including e-negotiations. As a matter of fact, many negotiations have been carried out electronically in e-commerce and e-business. Furthermore, many applications of computer and information technologies have been applied in attempts to make favorable conditions for negotiations, aid human negotiators, and facilitate software agent collaboration as well such as MIT Deep Ocean Mining model and IIASA RAINS model (for further information, see Kersten & Lai (2007)). In today's business arena that is characterized by interdependence and constant changes, negotiations are indispensable for businesses with respect to time and effort spent for them. Thus, systems based on computer power have an important role in upgrading negotiation efficiency and effectiveness that are likely to have keen effects on negotiation outcomes of organizations and individuals (See Kersten & Lai (2007) and cybersettle.com for further information on negotiation support and e-negotiation systems).

AUCTION

The word auction has its root in the Latin language that can be understood as "go up" (Webster, 1999). Under the traditional perspective, auctions are viewed as economic mechanisms to find prices for assets that are not placed on traditional markets for transactions and that have very unique and/or rare characteristics that are very difficult in determining the suitable prices on traditional markets. An auction brings about a forum that can be considered as a marketplace where potential bidders can gather. So, one of the outstanding functions that auctions take is to create liquidity for marketplaces where the asset prices can be set up that are expected to be close to true market value.

According to Klein (1997), auctions are described as efficient allocation mechanisms at which consumer items can be sold that are unlikely to be done via traditional market mechanisms because of the following:

- Items for example airline seats with their limited life time, or items that can be unusable after a given time.
- Items' older versions are separated from their new ones, or
- Items that may be reconditioned or discontinued.

Types of auctions:

McAfee and McMillan (1987) classified various types of auctions into four distinct groups: The English auction, the Dutch auction, the first price sealed bid auction, and the second price sealed bid auction.

English auction

English auctions or forward auctions are described as economic mechanisms where bidders can attend to openly compete with each other to have opportunities to buy an asset. The bidder who values the asset the most will become the winner. It should be noted that when the auction comes into the end, the final price is not necessary the true market price but the final valuation for the asset auctioned that is expected to be close to the true market value (McAfee & McMillan, 1987).

Dutch auction

Dutch auctions are viewed as descending auctions that present a perspective bidder with a price that may be contested with a competitive bid or bids in a downward direction until the auction comes into the end. The asset is sold to the lowest bidder at the close of the auction (first to stop clock wins the auction). It should be noted that the final price is not necessarily the true market price but the final valuation of the item auctioned that is expected to be close to the true market price (McAfee & McMillan, 1987).

Online reverse auctions share some common characteristics with Dutch auctions except for limited sharing of information. The information that is not shared with the bidders may consist of the buyer's identity, the bidders' identity, the asset's reserve price, and the historical piece price of the asset (McAfee & McMillan, 1987).

First price sealed bid auction

In a first price sealed bid auction, bidders submit their best bids only one time to the seller in a sealed envelope. All of these bids will be opened at the same time. In ascending auctions, the highest bidder is awarded the asset while in reverse auctions the lowest bidder is awarded the asset. First price sealed bid auctions do not provide bidders any opportunity to see bids of their competitors, make changes in their reserve prices, or resubmit new bids. The winning bidder is required to pay the amount submitted in his or her bid to the seller. First price sealed bid auctions are often utilized in governmental procurement (McAfee & McMillan, 1987).

Second price sealed bid auction

This kind of auction also known as the Vickrey auction is named after its classifier William Vickrey - the 1996 Nobel Prize winner in economic science. It should be noted that Vickrey (1961) discussed this kind of auction that share many common characteristics with the first price sealed bid auction except for one distinct thing. In spite of the fact that depending situations (forward or reverse) the winning bidder is the one who has the highest or lowest bid, he or she has to pay the amount listed on the bid of the second highest bidder.

Online reverse auctions

It is obvious that e-commerce has been changing the way firms are doing business. Information and communication technology plays an important role in today's business. In addition to the introduction of new technologies which help to streamline processes within companies, e-commerce has become the most recent trend. E-commerce can be described as business transactions that occur via open-networks, such as the Internet (Organization for Economic Co-operation and Development - OECD, 1997). These new information and communication technologies have been bringing about new opportunities and mechanisms for businesses to cooperate or to compete by effectively utilizing computer power, communication capabilities through the network. It also helps that an increasing number of people and businesses are simultaneously online. E-commerce has the potential to streamline and improve business-to-business, business-to-consumer as well as consumer-to-consumer transactions.

In terms of business-to-business e-commerce, online reverse auctions have been being used by a number of Fortune 1000 companies as a tool to drive down the price of purchased products and services (Emiliani & Stec, 2004). There are a variety of formats applied to auctions; however, forward and reverse auctions are the most popular (Emiliani, 2000). Forward auctions are often viewed as ascending price auctions and reverse auctions as ones in which prices start high and descend when the auctions progress. Emiliani (2000) simply defines that business-to-business online auctions are downward pricing and hence reversed. Smeltzer and Carr (2003)

argue that the reverse auction is a price-decreasing format. Jap (2003) defines reverse auctions as declining price auctions where sellers bid instead of the buyer (forward) auctions. Parente Entrepreneur al. (2004) suggest that the difference lies in the number of buyers and sellers, whereas reverse auctions have one buyer and many sellers.

However, it should be noted that in few situations, the bids do not necessarily go down during the auction event, instead they go up; but the nature of the auction is still "reverse" because it has one "buyer" and many "sellers". For example, some websites are working as market-makers for commercial banks and their consumers. One of them is MoneyAisle.com that can be viewed as the next generation online auction marketplace. MoneyAisle is different from other online auction sites due to the fact that it is a buyer concentrated auction, not seller concentrated one like eBay. By utilizing MoneyAisle, they claim that consumers are very likely to find good rates on Bank CDs and Saving Accounts. Specifically, whenever, a consumer posts the amount of money and duration he or she wish to invest in Bank CDs or Saving Accounts, via MoneyAisle, a number of banks actively bid against each other in a live (however with automatic bidding – no humans) auction and the interest rates continuously increase until there is one bank left with its highest rate given to the consumer. For further information about MoneyAisle, please visit MoneyAisle.com.

Online reverse auctions can bring about benefits for not only buyers but also suppliers. Via online reverse auctions, suppliers can gain market information, create new markets for better excess capacity management, and attract new customers from their competitors. In addition, online reverse auctions are expected to help suppliers distil valuable information with respect to their competitors' cost structures that are likely to make them become more efficient and effective in the long term.

Besides these above-mentioned benefits that online reverse auctions can bring about, concerns relating to online reverse auction adoption and usage have been pointed out. One of the major concerns is that online reverse auctions only concentrate on the interests of the buyer while ignoring that of the suppliers. It is likely that long-term relationships between buyer and supplier can be destroyed if final price is the only priority of the buyer and if winner determination procedures through the auctions are biased towards the buyer (Jap, 2007). Furthermore, the feeling of being taken advantage of stems from forces to continuously reduce prices makes suppliers put up resistance to attend online reverse auctions (Jap, 2002).

LIMITATIONS OF NEGOTIATION AND AUCTION THEORIES

Based on what are happening in the real world negotiations and auctions, Subramanian (2010) has distilled limitations in negotiation and auction theories as follows:

Limitations in Negotiation Theory

Although negotiation theories have been making many contributions to the understanding of the real world negotiations, they have some limitations in their own. One of the primary ones is related to the concept of BATNA - Best Alternative To A Negotiated Agreement. In spite of the fact that this concept is very helpful in many dispute resolution situations, there are other situations where the concept is less helpful. For example, think about a situation where one is making attempts to sell a product to a potential customer – this can be viewed as a classic negotiation. In this situation, a possible question is that what is their BATNA? Perhaps the expected answer is the possibility of some other deal. It should be noted that this BATNA is not an alternative to a negotiated agreement. In almost all situations, one can follow the alternative deal and follow the deal at the table. By utilizing the concept of BATNA, there is an assumption that the alternative deal and the deal at the table are mutually exclusive (Raiffa, 1982). However, the concept of BATNA in many deal-making situations in reality does not work due to the fact that deals are not mutually exclusive. For example, return to the above-mentioned example, one is able to sell to zero, one, two, or twenty potential customers. In other words, the concept of BATNA is not incorrect because they'd better prepare their BATNA prior to participating in any negotiation; however, as for more complex deals in reality, the concept of BATNA cannot go beyond the obvious (Subramanian, 2005).

Another limitation is related to empirical studies on negotiations. It should be noted that there is an increasing literature on negotiation behavior under perspectives of social psychology and behavioral economics. One important question is "Are these empirical studies useful to dealmakers in reality?" (Subramanian, 2010). If so, it is important that real dealmakers understand these studies so that they can effectively construct the ZOPA – Zone of Possible Agreement – an overlap between the negotiators' reservation prices.

In order to thoroughly answer this question, we should know how almost all empirical studies have been carried out. It is obvious that the researchers in these studies have intention to overlook real-world negotiations due to the fact that it is very difficult to collect data on real deals; or if possible, controlling for numerous factors that are expected to have effects on these negotiations in order to meaningfully compare deals is very difficult. More precisely, almost all empirical studies on negotiations have been carried out by utilizing data from students in undergraduate classes (Mithas & Jones, 2006). For example, there is one recent article that implemented a survey of all empirical negotiation studies published in top-tier, peer-reviewed journals in the 1990 – 2005 period. The surprising finding is that two thirds of these studies utilize classroom data (Bendersky & McGinn, 2008).

Real dealmakers have the tendency to overlook classroom data due to the fact that there are often no financial incentives for the experimental subjects to seriously pursue negotiations. Sometimes, there are other kinds of incentives for the subjects such as extra grades or so that they are expected to participate in negotiations well; however, such incentives are likely to make

the results to be difficult to be interpreted. Besides utilizing classroom subjects in negotiation experiments, economists tend to utilize laboratory environments at which a number of factors that are expected to have effects on negotiations such as incentives of participants are likely to be measured and controlled in a careful manner. In these laboratory environments, subjects go to the lab and carry out certain negotiation tasks that are expected to bring about knowledge relating to how negotiations work. Typically, there are some show-up fees plus additional monetary income depending on how well they do in the exercise (Subramanian, 2010).

It is not surprising that almost all of the lab participants are students in universities. Thus, there are many similar characteristics between lab contexts and classroom contexts at which negotiations are experimentalized; however, in the lab contexts, a notable difference exists in the sense that the subjects gain some financial incentives. But it is important that raising questions such as "if tiny financial incentives are sufficient to bring about impetus for the subjects to do well" and "if tiny financial incentives are very likely to create a difference between lab and classroom contexts need to be answered (Milgrom, 2004).

Another problem is whether or not inferences for real world negotiations can be made based on findings derived from the classroom and laboratory experiments. This can be considered as a basic problem in almost all efforts of the academic community. Think about one example that it is evident that a new drug is invented works for a kind of animal in laboratory experiments. However, the point here is will humans react the same way as the kind of animal? In the similar vein, it is very surprising that academics have spent little time and effort to examine if the findings derived from low stakes experiments done with university students inferred into negotiations in the real world (Subramanian, 2010).

Lastly, in negotiation experiments in lab or classroom contexts, BATNAs are utilized in a static manner. To put it another way, BATNAs are very well defined as the alternatives for the subjects if they are not successful in reaching their negotiated outcome. In the experimental studies, subjects are rarely allowed to pursue dynamic BATNAs but very often precisely defined BATNAs (Subramanian, 2007). However, it should be noted that negotiations in the real world are much more complicated than those in experimental studies with precisely defined BATNAs. In addition, precise specification of the negotiation process is required by these studies; however, almost all complex negotiations in reality have the process that is very murky and messy, and does not follow the precise specification. In a word, research done by using data from lab and classroom contexts is unlikely to dig into the way where real deals actually get done (Bapna et al., 2006).

Limitations in Auction Theory

Like negotiation theory, precise specification of the situation structure is required in auction theory. Thus, there is a big gap between auctions implemented in experimental contexts and those carried out by real dealmakers. As noted by well known auction theorist Klemperer

that much existent auction literature is insufficient for designing practical auctions (Klemperer, 2004). Obviously, the auction literature seems to concentrate on things that are not important and useful for those implemented in the real world (Hendricks & Paarsch, 1995).

From these above comments, problems rooted in the experimental studies are well defined situations in which auction rules are specified and strictly followed in a precise manner, so the only thing to do is to find an optimal strategy for both buyers and sellers. Another problem rooted in the existing auction theory is that almost all of auctions in reality seem to be pure auctions such as FCC spectrum license auctions and art auctions. These auctions are considered as important situations, and economists seem to concentrate on them due to the fact that clear rules are specified in them. It should be noted that with rules clearly specified, auction problems are likely to be tractable. However, tractable problems are quite far from what sophisticated real dealmakers are dealing with (Subramanian, 2010).

In reality, auctions are often carried out in a messy and murky manner. In other words, their rules are unclear and constantly changing. Price is one dimension among multiple ones interested. The seller (or the buyer depending on situations) is not a passive participant when the auction rules are set up. Thus, dynamics of factors that are expected to have influence on real world auctions do not conform to the fundamental assumptions made by almost all auction theories (Pinker Entrepreneur al., 2003). More specifically, it is unlikely to find out an answer from auction theories due to the fact that they have been ignoring interactions between negotiations and auctions, which can be considered as two facets of the same phenomenon (Subramanian, 2010). The rest of this paper is aimed at integrating auction theory and negotiation theory to form a new term – negotiauction – that is expected to jump over the aforementioned limitations rooted in both auction and negotiation theories.

NEGOTIAUCTION

What is a negotiauction? A negotiauction can be defined as a dealmaking situation where competitive pressure stems from both across the table competition and same side of the table competition (Subramanian, 2010). Or put it another way, negotiauction is a hybrid entity that combine characteristics of both auction and negotiation (Teich et al., 2001).

Before digging into how negotiauction works, there are several factors that need to be taken into consideration regarding when to hold an auction and when to hold a negotiation. These factors are distilled by Subramanian (2010) as follows:

Bidder Characteristics

Number of bidders

One of the very important factors in determining what economic mechanisms – auction or negotiation - to be used is number of bidders. If a significant number of bidders exist, it would be better for sellers to organize an auction; and by contrast, sellers are suggested to negotiate privately with a few of potential buyers. In other words, it is very likely for sellers to hold an auction as the number of serious potential buyers goes up. In situations with a significant number of serious potential buyers, sellers will have advantages stemming from high competition of the same side of table. In such situations, holding an auction is preferred over holding a negotiation because buyers are given discretion to drive the price up. Thus, we propose that:

Proposition 1: *Sellers are very likely to utilize auctions when there are a significant number of serious potential buyers.*

Proposition 2: *Sellers are very likely to utilize negotiations when there are a few of serious potential buyers.*

Certainty degree about bidders

Another important factor worth being considered is your certainty degree about who the bidders are so that one can make their final decision regarding how to hold an auction or a negotiation. For example, suppose that a government is seeking a contractor to construct a nuclear electricity generator plant, and of course there are just a few contractors that are valued as being qualified to implement such a multi-million dollar contract. In such a situation, it is evident that holding an auction does not make any sense. In such a situation, Subramanian (2010) states that the best thing to do is to go to negotiate with some contractors who are really capable of constructing the plant. However, there are some other situations in which it is very difficult for one to search for highly qualified buyers and of course doing so will cost them in terms of their time, money, and efforts. In such a situation with high search cost, organizing an auction by making it known to the world is better because highly qualified buyers will search for you. Thus, we propose that:

Proposition 3: *Sellers are very likely to utilize auctions when searching costs are very high.*

Proposition 4: *Sellers are very likely to utilize negotiation when there are a few of qualified buyers and certainty degree about such buyers is very high.*

Participation incentives

Bidders often take precaution of attending auctions. There are some circumstances in which they are highly inclined to utilizing a negotiation mechanism to bring bidders to the table. The implication here is that if BATNAs of the bidders are very good, they should negotiate privately with them in attempts to bring them to the table. In addition, it is possible that a number of bidders do not want to attend auctions because they are afraid of the fact that their expertise and knowledge can be taken advantage of by other bidders. Thus, we propose that:

Proposition 5: *Sellers are very likely to utilize negotiations when buyers have very good BATNAs.*

Proposition 6: *Sellers are not very likely to utilize auctions when buyers are afraid of their expertise and knowledge being taken advantaged.*

Valuation distribution

Lastly, bidders' value distribution plays an important role in deciding what economic mechanism – auction or negotiation – is used. There are some situations in which a significant number of bidders exist, but one still may want to negotiate privately if there is a big gap between the two top bidders. In such situations, one is likely to leave much value on the table by organizing an auction because the predicted outcome in an auction is the second-highest valuation plus the bid increment. Thus, we hypothesize that:

Proposition 7: *Sellers are very likely to utilize negotiations when a significant number of buyers exist but there is a big gap between the two top buyers.*

Asset Characteristics

Asset specification

An important factor that needs to be taken into consideration regarding whether to organize an auction or a negotiation is their ability to specify their asset. It is evident that the more they are able to specify what they want, the more likely they should be to hold an auction. For example, if they are buying or selling a commodity, utilizing an auction is the best. In addition, if their asset is not a commodity but they can build a utility function (scoring function) that precisely embraces their preferences, they can organize a multi-attribute auction that is expected to work well in such a situation. In cases where these above conditions are not satisfied, they would be very likely to negotiate privately with one or some serious potential buyers. Thus, we hypothesize that:

Proposition 8: Sellers are very likely to utilize auctions if assets are easily specified.

Proposition 9: Sellers are very likely to utilize negotiations if assets are difficult to be specified.

Value creation

Another important factor worth being considered in deciding if to auction or negotiate is value creation possibilities. Auctions are traditionally viewed as mechanisms aimed at incorporating all dimensions to price; however, incorporating everything to price is completely different from what one would like to do in attempts to search for and take advantage of value creating opportunities. In situations where win-win moves are possible, implementing a negotiation with one or some serious potential buyers is better than organizing an auction. In such situations, implementing a negotiation is likely to bring about opportunities for one to learn each others' preferences, make tradeoffs across different issues, and construct a deal based on a larger pie, not a fixed one. Thus, we propose that:

Proposition 10: Sellers are very likely to utilize negotiations when value creating opportunities are emphasized.

Relationship importance

Lastly, factors like relationship, service, and/or deal execution need to be carefully investigated in terms of their relative importance they attach to what is being bought or sold. The more important these factors are the more likely one should be inclined to utilize negotiations. That is why in many situations, both buyers and suppliers have been very reluctant to utilize e-auctions in the procurement context. Specifically, in the context of supply chain management in which vertical partnerships are considered as a best practice, auctions do not work well. By utilizing these reverse auctions, a notable signal is elicited that the buyer is going to treat all the suppliers in the same way except for prices of auctioned items. It should be noted that focusing only on price is likely to create serious problems in the future that can have negative influence on both buyer and suppliers' final outcomes. Thus, we propose that:

Proposition 11: Sellers are very likely to utilize negotiations when future relationships between sellers and buyers are emphasized.

Seller Characteristics

According to Subramanian (2010), seller characteristics are worth being considered in making final decisions about whether to auction or negotiate. Among seller characteristics, there are two primary factors that often go in opposite directions with each other namely speed and

risk. It is expected that auctions are better than negotiations in terms of speed, thus whenever speed is emphasized, use an auction mechanism. However, speed often goes with risk due to the fact that you are provided with less time to change your strategy based on new information gained.

Speed

It takes time to identify interests, create options, and take advantage of value creating opportunities in almost all the moves happening in private negotiations. In addition, issues in negotiations are often handled in a sequential manner while those in auctions are handled in a simultaneous manner due to the fact that you are unlikely to negotiate with two or more different parties exactly at the same time. There are some circumstances in which they don't have this time because they are losing an opportunity to sell, or there is a chance that the asset is degrading if they keep it for a long time. In such circumstances, organizing an auction will ignore value creation opportunities in return for speed of sale. Thus, we propose that:

Proposition 12: Sellers are very likely to utilize auctions when speed is emphasized.

Risk

As noted above, auctions are expected to be faster than negotiations. However, speed goes along with risk with a positive correlation coefficient. One is likely to face a situation in which nobody shows up in an auction, or equally bad, there is only one bidder showing up in the auction. By contrast, one is allowed to move more slowly in negotiations in attempts to search for value creating opportunities to achieve a better outcome. Thus, we propose that:

Proposition 13: Sellers are very likely to utilize negotiations when risks (go along with speed of auctions) are emphasized.

Contextual Factors

There are two contextual factors that need to be taken into account to determine if an auction mechanism or a negotiation mechanism is preferred over the other. These factors are the need for secrecy and the need for transparency.

Secrecy

It should be noted that it is very difficult to keep bidders' information (identity) secret in auction mechanisms. Although confidentiality agreements are required between the seller and the bidders, it is very likely that information leak occurs increasingly as the seller shops the asset.

Thus, whenever secrecy is emphasized, the seller is suggested to negotiate privately with one or with serious potential buyers. Thus we propose that:

Proposition 14: Sellers are very likely to utilize negotiations when secrecy is emphasized.

Transparency

Another factor that is equally important as secrecy is transparency. Transparency is related to the concept of a level playing field under the view of bidders. It is expected that auctions are better than negotiations in terms of transparency, and whenever transparency is emphasized, it is likely that an auction should be organized. This is the reason that auctions are very popular and utilized in the area of most public procurement contracts and government privatizations, particularly in situations in which the government would like to erase criticisms about possible corruption/favoritism. Thus, we propose that:

Proposition 15: Sellers are very likely to utilize auctions when transparency is emphasized.

Common Design Features in Negotiauction

The following common design features are distilled by Teich et al. (2001). Actually, Teich et al. (2001) have developed a system for implementing negotiauctions, but no empirical studies have been so far carried out to investigate the economic performance of it:

1. Negotiauctions are better used in situations where there are several potential buyers, perhaps somewhere between three and ten. In case of more than ten buyers, it is extremely difficult for the seller to make a serious investment in negotiations with more than a few of them. In such a situation, an auction mechanism is often preferred over a negotiation mechanism, although it may apply some negotiation characteristics, especially when approaching towards the end.
2. There is often an asymmetric information situation where the situation structure is better known by the seller than the buyers at least at the beginning stage. One example is that the asset itself is often better known by the seller than the buyers. In addition, the seller is able to know who are serious potential buyers though he or she might not understand fully motivations under the buyers' interest. Also, information circulating among the buyers is controlled by the seller at least at the beginning stage. Finally, the seller dictates if, when, and how potential buyers understand the initial structure of the negotiauction situation.

3. One-on-one negotiations are carried out between the seller and various potential buyers. One of the outstanding reasons that negotiauctions deviate from traditional negotiation mechanisms is that the seller's BATNA is fluid, not static, due to the fact that negotiauctions are likely to bring about opportunities for the seller to negotiate with potential buyers on the same side of the table.
4. In negotiauctions, there are one or more rounds of bidding and other forms of direct competition among potential buyers in ways that resemble auctions. Unlike traditional auction mechanisms, the rules in these auction rounds of negotiauctions are expected to be murky and messy, and subject to potential changes that can bring about both opportunities and challenges for the bidders.

We propose that:

Proposition 16: Sellers are very likely to utilize NegotiAuction when a number of buyers are in a range of 3 – 10.

Proposition 17: Sellers are very likely to utilize NegotiAuction when BATNAs are fluid (not static).

Proposition 18: Sellers are very likely to utilize NegotiAuction when game rules are murky and messy.

Issues relating to the negotiauction design:

The following are major features of Negotiauctions in terms of design issues:

1. Negotiable Bid Issues and Bidder Attributes are used to take multiple issues into consideration with the purpose of differentiating among bidders:
   A. Negotiable Bid Issues: Issues other than price and quantity included in the actual bid. Discounts can be used for different levels of such issues. For example, a warranty level of 3 years with a discount of $0 and a warranty level of 4 years with a discount of $5 per unit, and so on.
   B. Bidder Attributes: Information on bidders (characteristics of bidders). For example, bidders are ISO certified or not.
2. Scoring, Rating and Ranking of bidders. Bid premiums (or penalties, also known as "set-asides") can be used to discriminate among bidders, without their knowledge.
3. A variety of constraints can be set up such as limits on quantity for each bidder or a group of bidders, limits on negotiable bid issues, and so on. The simplex algorithm is imbedded in the system so that all the constraints are met. The algorithm then makes suggested bids to the bidders to make their bid active in real time.

4. Three modes of the auction are:
   A. Auto Mode: Prices are suggested by the system to the bidders to make them active. This is the auction mode of the system.
   B. Manual Mode: By using this mode, negotiations between the auction owner and the bidder can be carried out one on one during the event.
   C. Pause Mode: Bidders can be put on the hold state during the event.

In matching the seller and the buyers, Negotiauction is believed to combine the best characteristics of auctions and negotiations. Negotiations can bring about much flexibility for discriminating among the bidders.

With the auto mode mechanism, the price suggested by the system to the bidder to make his bid active in the auction is computed based on NBI discounts, bid premiums, reserve prices and bid increments. This characteristic can be considered as an advantage to the bidder due to the fact that he is always aware of where he is standing and what decisions he has to make to become active. It should be noted that by using the system, only the seller has information on all bids from the bidders and the bidders can be confident that their rivals are unable to achieve a lot of information about their private pricing strategies.

In addition, with the auto mode, Negotiable Bid Issues can be processed in the way that preferred levels for an issue are given discounts. By utilizing this system, score or value functions over multi-issues are not needed and that is different from other research in the literature. In the same token, utilizing Bidder Attributes brings about favorable conditions for the seller to realize bid premiums on individual bidders aimed at discriminating among them.

Specifically, in the auto mode, each NBI is assigned a discount for each level whereas BAs are not given premiums for each level. To put it another way, the overall ranking of each bidder is taken into consideration such that bid premiums (penalties) can be set up for each bidder. Another characteristic of the system is that explicit constraints can be applied by the seller meaning that the bidders can be assigned limits on quantities and bidding levels on NBIs. This move brings about the advantage to the seller in the sense that the system algorithm can solve complex decision situations automatically that are quite different from traditional negotiations.

As for the manual mechanism, NBI discounts, bid premiums, and constraints are not applicable so that the request price button is no longer utilized. In this situation, one on one negotiations can be carried out between the seller and the buyers during the event. Each bidder can take advantage of making his bid more attractive in the eyes of the seller by providing new issues. By doing so, it is possible that the bid is locked by the seller. In the same vein, the seller can bring up new issues while the auction process keeps going with the other bidders.

In a word, the outstanding advantage that negotiauctions are expected to bring about for the seller is that it is likely to be used in complicated situations and all the bidders can be discriminated against by the seller based on the system characteristics. The seller has freedom to

negotiate with the bidders whenever he wants. As a benefit for both, it is expected that Pareto optimal outcomes may result and total time for the auction process may go down. The major advantage to the bidders is that the system automatically suggests to the bidders what to bid in order to make them active in the event. Thus, we propose that:

Proposition 19: Hybrid Mode (Negotiauction) > All Auto Mode > All Manual Mode, with respect to allocational efficiency, Pareto efficiency, cost savings for buyer, and profits for suppliers. The symbol > indicates BETTER. Specifically, we propose that:

Proposition 19a: Hybrid Mode (Negotiauction) > All Auto Mode > All Manual Mode with respect to allocational efficiency

Proposition 19b: Hybrid Mode (Negotiauction) > All Auto Mode > All Manual Mode with respect to Pareto efficiency

Proposition 19c: Hybrid Mode (Negotiauction) > All Auto Mode > All Manual Mode with respect to cost savings for buyer

Proposition 19d: Hybrid Mode (Negotiauction) > All Auto Mode > All Manual Mode with respect to profits for suppliers

FUTURE RESEARCH DIRECTIONS

Although there are minor differences in the concept of negotiauctions between Subramanian (2010) and Teich et al. (2001) (for example, there is one winner in Subramanian (2010) while there may be a group of winners in Teich et al. (2001)), their ideas from practical and theoretical perspectives respectively bring about a unique conceptual framework for better understanding negotiauctions that have not been comprehensively investigated thus far. This study proposes a number of propositions relating to decisions about when to auction, when to negotiate, and when to negotiauction under dynamic contexts. In addition, design issues regarding how to design a good dynamic negotiauction to achieve Pareto optimal outcomes for both buyers and sellers are analyzed.

The next step is to test the derived propositions. Each of the factors identified in the previous discussion will form the basis for analysis in the empirical study of negotiauctions. The conceptual framework presented in this paper is unique as there is no comprehensive theoretical and practical model for analyzing negotiauctions at present. None of the prior frameworks have taken into account the interactions between negotiations and auctions from perspectives of real world auctions and their theoretical design issues. This conceptual framework can provide an impetus for future research, structuring it along the lines of interactions between negotiations and

auctions, and negotiauctions' design issues that will expand the frontiers of knowledge in market mechanisms.

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THE WINDFALL ELIMINATION PROVISION OF SOCIAL SECURITY

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ABSTRACT

The Windfall Elimination Provision (WEP), a Social Security law enacted in 1983, was designed to differentiate between career low-wage earners and the low-wage earners who had other positions in the public sector and therefore did not pay into Social Security for the duration of their working careers. Research has shown the WEP adversely affects the low wage earner who had employment in both the private and public sectors, and in many cases gives the wealthy more Social Security income. Those "WEPed" paid into Social Security the same percentage amount as those not "WEPed"; however the "WEPed" retirees are denied the full benefits they paid for, including benefits to their spouses and surviving spouses. All of the proposed legislation to correct the problems since the WEP was instituted has died in the House Ways and Means Committee. This paper recommends two changes which have not been considered yet: require all employed in the United States to pay into Social Security, and "WEP" only those with incomes of $200,000 and above, those who are least likely to become the new poor. Further research is recommended because there is no clear accounting of the trillions saved by instituting the WEP.

INTRODUCTION

Gone are the days when the majority of workers have only one employer for an entire career, and thus, one retirement check. Today, having two or more positions and crossing the employment line between the private sector and the public sector is common. People who have worked in both sectors are entitled to two retirement checks, one from Social Security representing the private sector, and another check from the public sector for the public retirement benefits. The workers who have two retirement checks have reason to expect financial security in their retirement years. However, due to a Social Security law passed in 1983 known as the Windfall Elimination Provision (WEP), a portion of those who worked in both sectors will have their earned Social Security benefits reduced, whether fairly or unfairly. This paper will look at the law and its history, the amount of reduction in benefit checks, the policy model, strengths and limitations of the WEP, ethical issues, and recommendations for changes.

HISTORY

Until the 1980's, those workers who were entitled to retirement checks from both sectors received their Social Security based on the same benefit formula used for those workers who had only private sector employment. In the early 1980's, President Reagan set up the bipartisan National Commission on Social Security Reform, chaired by Alan Greenspan, to make Social Security recommendations which would shore up its finances (Gale Encyclopedia of US History, n. d., p. 4). The Windfall Elimination Provision (WEP), Public Law 98-21, enacted on April 20, 1983, was a result. The new law changed the original Social Security benefits formula for workers employed in both sectors who met certain criteria, and the result was a lower Social Security benefit for them (Social Security Administration, 2010, *Windfall Elimination*).

According to Warren (2010), a Social Security office manager for 15 years, the thinking behind the WEP was to prevent double dipping from two retirement plans, public and private. The government believed that an individual who had two retirement plans would be better off financially than those who had only one plan, Social Security. The rationale was that the public retirement plan would be sufficient, and Social Security benefits would become a supplemental amount. The WEP makes a clear distinction between the two types of workers who are eligible for Social Security benefits according to the American Federation of State, County and Municipal Employees (2011):

- Those who draw good pensions from primary jobs in non-covered employment, but whose low-wages or short work records in secondary jobs make them appear to be low-wage careerists to Social Security
- Workers who actually spent their entire work lives in low-wage jobs

The Social Security Administration in its Bulletin No. 05-10045 (2010) provides the following statement as its explanation of the WEP:

> The Windfall Elimination Provision primarily affects you if you earned a pension in any job where you did not pay Social Security taxes and you also worked in other jobs long enough to qualify for a Social Security retirement or disability benefit. The Windfall Elimination Provision affects how the amount of your retirement or disability benefit is calculated if you receive a pension from work where Social Security taxes were not taken out of your pay. A modified formula is used to calculate your benefit amount, resulting in a lower Social Security benefit than you otherwise would receive.

The financial impact of the WEP is profound. Given two workers who have public and private sector employment, it is very possible that one will receive full Social Security benefits,

the other very little. The formulas used for both the regular Social Security benefits and the WEP adjustment are identical except for the first threshold multiplier: 90% versus 40% of the first $761 of the AIME (Average Indexed Monthly Earnings). The AIME is computed by adding up all the payroll income for 35 years and dividing by 420 months to get that average monthly amount (Shelton, 2010). What does this mean in terms of actual dollars?

Two workers with the same AIME of $2,000, one affected by the WEP, the other not, would receive monthly Social Security benefits of $700.88 and $1,081.38, respectively, a difference of $380.50. In one year, the "WEPed" worker would receive $4,566.00 less and in ten years $45,660.00 less. In twenty years, at age 82, the "WEPed" worker would have received a total of $91,320.00 less in Social Security benefits. The WEP reduction also goes beyond the worker to affect that person's spouse or surviving spouse benefits. The spouse or surviving spouse benefits are administered through the Government Payroll Offset (GPO), whose official benefit statement according to Lingg (2008) is as follows:

> The GPO provides that a person's Social Security benefits as a spouse or surviving spouse is [sic] reduced by two-thirds the amount of any government pension the person received based on his or her own work in Federal, State, or local government employment not covered by Social Security.

In addition to the two-thirds reduction clause, the GPO formula can also totally eliminate any benefits for spouse and surviving spouse (Grobe, 2007).

POLICY MODEL

The WEP is a broad, politically contentious institutional act which affects millions of Americans. As part of Social Security, the WEP is federally mandated by Congress with the President's approval. The policy model, therefore, is one of legitimation (Kraft & Furlong, 2009). Proposals for Social Security change are submitted to the House Committee on Ways and Means, which then refers them to the Social Security subcommittee (*House Committee on Ways*, n.d.). The Social Security Administration history site gives the cost benefits for instituting the WEP: "The provision decreases the cost of the program by $0.1 billion for 1983-89 and has a long-range saving of .04 percent of taxable payroll" (Social Security Administration, 2011, *Social Security Amendments*). About 3.3% of the approximately 1.2 million Social Security beneficiaries were affected by the WEP as of December 2009 (Shelton, 2010). According to the Social Security Administration in 2009, the estimated cost to repeal the WEP "would increase the long-range deficit of the Social Security Trust Fund by 3%" (Congressional Research Service, 2009).

STRENGTHS AND LIMITATIONS

The Social Security decisions in 1983 were instituted to rescue Social Security finances, and the WEP was one of those results (Shelton, 2010). However, Social Security's official stance is that workers with two retirement plans, public and private, would possibly benefit from provisions aimed at low-wage earners and receive a windfall: "The impact of the WEP is as intended: it helps to ensure that workers with pensions from noncovered employment do not receive the advantage of the weighted benefit formula that is intended for career-long low earners" (Lingg, 2008). Research has shown minimal strengths for the WEP.

Once the WEP became law, efforts were immediately made to repeal it on the basis that it had unwanted implications for low-wage earners while benefiting the wealthy. A look at only three aspects gives a strong indication of the many inherent problems. First, an unfairness stems from the arbitrary fashion in which the WEP benefits are applied, such as the exemptions list (Social Security Administration, 2010, Bulletin 05-10045). Second, all workers contributing to Social Security pay the same percentage (6.2% in 2010) of Social Security tax known as FICA (Federal Insurance Contributions Act) for payroll deductions (Darwin, 2011). However, the "WEPed" do not receive their proportionate amount of benefits. Third, the worker's total retirement amount, private and public, is not considered before the WEP application. Contrary to an assumption made by Congress when they formulated the WEP, not all public employees are high wage earners, and therefore, the WEP created more low-income retirees (American Federation of State, County and Municipal Employees, 2011). As Shelton (2010) indicates in her analysis of the WEP, "SSA estimated that in 2000, 3.5% of recipients affected by the WEP had incomes below the poverty line."

Benefits to the wealthy are well hidden in the WEP formula. A brief look at two of them gives some indication of their magnitude. In her analysis of the WEP, Shelton (2010) refers to a 2008 extensive study of the WEP by Brown and Weisbenner which concludes that "for some high-income households, applying the WEP to covered earnings even provides a higher replacement rate than if the WEP were applied proportionately to all earnings, covered and non-covered." Another benefit for the wealthy is that once the annual payroll threshold of $106,800 (2010) is met, no more Social Security (FICA) deductions are taken out for the remainder of the year (Darwin, 201). Social Security benefits are based on the AIME, which averages all the payroll income amounts for 35 years. According to Nobel Laureate economist Milton Friedman, "High wage earners pay a lower percentage of their total income because of the income caps". Friedman goes on to point out another benefit: "Wealthier individuals generally have higher life expectancies and thus may expect to receive larger benefits for a longer period than poorer taxpayers (West Encyclopedia of Law, n.d.).

ETHICAL ISSUES

A brief look at Social Security sheds light on the complicated ethical aspects of the Windfall Elimination Provision. The original philosophy behind Social Security as a pension plan was twofold: to keep a large portion of those over age 65 from becoming a financial burden on the rest of society and to give this same portion of society purchasing power, which contributes to the overall welfare of the nation. President Franklin D. Roosevelt when setting up Social Security in 1935 expressed it well: "We put those **payroll** contributions there so as to give the contributors a legal, moral, and political right to collect their pensions." He went on to say, "With those taxes in there, no damn politician can ever scrap my social security program" (Gale Encyclopedia of US History, n.d.). Today there is a valid question as to whether or not these rights are still protected.

Three main ethical issues stand out: the inequalities in the implementation of the WEP; the disregard for the adequacy of retirees' total retirement income, public and private; and the political basis for the WEP formula. A clear look at the WEP shows two implementation inequities. First, there is a list of arbitrary exceptions as to who will not be affected by the WEP, even though these workers may meet the criteria (Social Security Administration, 2010, How the windfall). The second inequity is that in federal, state and local governments, approximately 25% of employees, including teachers, police, fire fighters, and general employees work in Social Security exempt positions and therefore cannot contribute (Benson, 2010). Workers within the same career category such as teachers are not treated the same: some school districts require Social Security to be withheld, others do not. The disparity ranges from state to state or within the same state, which can affect relocating workers (Shelton, 2010).

The second ethical issue is that the WEP has no formula for factoring in the retirees' total retirement income from both public and private employment (if applicable). Workers who receive low pay from their public positions often supplement their income with a second job in the private sector and become the very ones penalized by the WEP because of their low AIME.

The third ethical issue is a political compromise that appears arbitrary. While the WEP formula was designed, the House of Representatives proposed using the same benefits formula with the exception of the first threshold multiplier. They proposed a 61% first threshold multiplier to replace the 90% one, which was currently being used for all retirees. The proposal would result in a 30% reduction in benefit dollars. The Senate proposed a 32% first threshold multiplier, which would result in a 58% benefit dollar reduction. The compromise became the current 40% multiplier, which is a reduction of 50% of benefit dollars from the original formula for those now targeted (Shelton, 2010). The financial welfare of over a million retirees was affected by this arbitrary and politically motivated compromise.

Although not strictly an ethical issue, the WEP situation is a misleading semantics game. Windfall and double dipping have very deep connotations. No one wants to be known as condoning windfall money and double dipping, particularly when the funds come out of a federal

agency. The rhetoric made the WEP changes easy for the public to accept without delving deeply into the matter.

RECOMMENDATIONS

Three proposals were introduced in the 111th Congress to change the WEP which died in committee:

- The Social Security Fairness Act of 2009, S.484/H.R.235 asked for a complete repeal of the WEP and the GPO (Shelton, 2010).
- The Public Servant Retirement Protection Act of 2009, S. 490 /H.R. 1221) proposed a new formula which would factor together both the private (covered) and public (non-covered employment) before making any adjustment in Social Security benefits (Shelton, 2010).
- The Windfall Elimination Provision Relief Act of 2009, H.R. 2145 proposed a modification based on both noncovered and covered pensions amounts, and a baseline of $2,500 for the minimum Social Security benefit before any WEP type reduction can be used (Lingg, 2008).

I concur with all three possibilities with the exception of the $2,500 baseline in the Windfall Elimination Provision Relief Act of 2009. My recommendation is that this baseline amount should be raised to $4,000 or higher. Given the inflation rate and the cost of living increases, a higher amount would help cover future living expenses for retirees. In addition to these proposals which need to be reintroduced in the 112th Congress, the following recommendations are given for consideration:

- Require that Social Security be deducted from all employment in the United States. No group then would be exempt from paying into Social Security, and no group would be subjected to reductions of benefits created by the WEP or the GPO. This change would potentially add income to Social Security.
- Apply a modified inverse formula similar to the WEP only to the wealthy, taking into account both private and public employment amounts. This is the group who has excellent retirement benefits. Develop a formula that begins with those whose AIME is over $200,000 a year ($16,667 per month) with a sliding scale upwards. This "WEP style inverse" has the advantage of affecting only those who will have more comfortable retirement incomes and who will not be on the borderline of becoming the new poor. Their Social Security benefits would indeed become true supplemental income. The precedent for limiting benefits has already been legally set by the WEP law in 1983; the only change would be the group affected. The amount contributed by the wealthy would most likely offset the administration costs, and potentially add income to Social Security.

PROGNOSIS

The current political and economic climates are unstable. With a Republican majority in Congress for the next two years, the prospects of any valuable overhaul of the Social Security system appear dim. However, President Obama recently appointed the Deficit Commission to review Social Security and give recommendations (Lassiter, 2010). Hopefully, the Commission will recommend changes which will prevent scenarios such as the following posted on WashingtonWatch.com (2011), a blog for personal comments about the WEP:

> **Arlene Smith** June 16, 2009, 11:26am
> I work for a school district in Texas and although I have my 40 quarters in from previous work, I will not be entitled to my full social security. I feel that this is unfair since I have had not choice as to whether I pay social security or teacher retirement. I feel that I have earned both and I think I can speak for many people in my position.
>
> **Cath** June 16, 2010, 1:32am
> I worked in the private sector from age 18 until 30, and paid full Social Security. Then I taught for 25 years in Texas, and retired with a teacher pension. I went back to the private sector for the last 4 years, to total 16 years under Social Security so far. I don't understand why I get the retirement benefits from my teacher years, but will only get a fraction of the benefits from my private sector years. It would have been more beneficial to choose one or the other and stick to it all my life. The interesting thing is that 12 school districts in Texas subscribe to Social Security as well as Teacher Retirement and will get no WEP. I, like most of you, only learned of all this after it was too late. A Texas teacher can get wise and move to one of the "lucky" districts, but you have to be there 5 years for this to work. Also, you would have to be able to relocate….

The complexity and difficulty of making a well-balanced public policy is evident. The WEP is an unethical and inequitable law, which adversely affects the low-income workers and benefits the wealthy. Besides repealing the WEP, viable options for a fairer distribution of Social Security benefits include the federal requirement for all workers to contribute, and a renamed "WEP style inverse" for the wealthy. President Roosevelt's original Social Security philosophy to keep the nation from having a large population of retired poor would then be upheld.

FUTURE RESEARCH

The WEP was instituted in 1983 for two main reasons: to shore-up Social Security, and to create a savings buffer for the time when the Baby Boomers retire. The savings buffer came from the annual Social Security payroll contributions income (FICA) not spent in retirement benefits

each year. For the past 28 years the excess funds were transferred into the Social Security Trust Fund which has a current estimated value of over $15 trillion (Social Security Administration, 2008, July, Actuarial Note 2008.1). Because federal government agencies can 'borrow' from that account, several questions arise:

- Are there any funds left to compensate for the many Baby Boomers now retiring?
- Has those "WEPed" supported the federal government with the annual surplus balance of Social Security funds instead of the full population through increases taxation?
- Is this how the government managed, in part, to stay in business without raising taxes?

A full study of this issue and its impact on the future generations of workers and the Baby Boomers now retiring is recommended.

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PERSISTENCE IN MUTUAL FUND RETURNS FOLLOWING GOOD AND BAD MARKET STATES

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ABSTRACT

Prior studies have found a relation between fund flow and performance of mutual funds. In this paper, I test whether investing in top performing funds is a successful investment strategy by examining the best-performing quintile of funds against the lowest quintile for a three-year tracking period. I further divide the study both by good and bad investment states and by no-load and load funds. I find that the most consistent positive returns are from portfolios formed from the top performing funds following poor market states for both load and no-load funds. This implies that seeking out the best funds may be potentially more profitable when doing so after a poor market. .

INTRODUCTION

Mutual fund investors tend to invest greater amounts of money into top performing funds. In this paper, I attempt to answer two questions: 1) is investing in top performing funds a profitable strategy; and 2) are portfolio returns based upon the state of the market. I attempt to find the aswers by examining the best-performing quintile of funds against the lowest quintile for a three-year tracking period. Past evidence is conflicting, as Gruber (1996) finds investors can boost return by 1% per year by moving from the bottom decile to the top, while Frazzini and Lamont (2005) find that investors reduce their wealth by reallocating to prior period top performing funds.

I find that the most consistent positive returns are from portfolios formed from the top performing funds following *poor* market states. This implies that seeking out the best funds may be potentially more profitable when doing so after a poor market. However, flow to performance sensitivity is higher for all classes of funds during *good* markets. Interestingly, for the portfolios formed following good market states, the bottom quintile outperformed the top for most tracking periods. This suggests a contrarian philosophy following a good year may be more profitable. Not only may investors be more successful by seeking out relatively good performers during down markets, they should be cautious about investing in top funds after good years as returns tend to fall in the next few years.

LITERATURE REVIEW

The relation of asset flows to past performance has received much attention since Sirri and Tufano's (1998) finding that the sensitivity of flows to performance is higher for funds with relatively good performance compared to funds with relatively poor performance. Investors tend to chase returns, but do not divest of poor performers. Lynch and Musto, (2003) rationalize this non-linear relation of flows to performance by suggesting that a fund's return conveys two forecasts: the expected future performance of the manager and the likelihood that manager will remain with the fund. If performance is poor, the manager is more likely to be replaced, so it may not matter how low returns are below a certain threshold.

Evidence on the differences in fund flows for load and no-load funds has been mixed. Ippolito (1992) finds more reluctance to remove money from load funds but a stronger reaction of load fund flows to better performance. However, by decomposing net flows into purchases and redemptions, O'Neal (2004) finds that while load funds have a longer holding period, declining performance leads to greater redemption of load shares than of no-load. Further, strong performance leads to greater purchase rates in load funds. This implies greater performance sensitivity among professional advisors than among individuals. Nanda, Wang and Zheng (1999) examine flows as they relate to the introduction of new share classes and find fund flows increase after introducing new share classes with the most volatile flows for class C shares. This may be due to C shares having lower transaction costs than either A and B shares.

Friesen and Sapp (2007) provide evidence suggesting that financial advisors do not add value to the timing of mutual fund investing. They find a greater gap in time-weighted and dollar-weighted performance for load funds than for no-load, suggesting that load fund investors' market timing is worse. The authors find greater turnover among load funds and posit that advisers encourage active trading at the expense of overall return.

Since the overall relation of flows to performance has been established, a question arises of whether investing in recent over-performing funds is a successful investment strategy. Several studies examine the performance of funds which attract proportionately greater flows. Zheng (1999) finds that funds that receive money subsequently perform better, suggesting that investors are able to make buying and selling decisions based on good assessments of short-term future performance. Gruber (1996) describes actively managed funds as investment vehicles that allow sophisticated investors to invest in good funds while divesting of poor, enabling them to earn positive returns compared to the market. He posits that investors can boost return by 1% per year by moving from the poorest decile of funds to the best. However, since sophisticated investors compose a minority of the investor population, overall performance of mutual funds is still below the market. Ippolito (1992) also argues that allocating money to the latest best performing fund is rational given that poor performers persist. In the absence of transaction costs, choosing a recent good performer dominates a strategy of random investing. However, Frazzini and Lamont (2005) find that retail investors reduce their wealth in the long run by

reallocating to prior period top performing funds. The authors examine funds' underlying stocks, and find that investors moved their money into funds which invested in stocks that had low future returns.

SAMPLE

Data are collected from the CRSP survivor-bias free mutual fund data base for the period of January 1991 through December 2007 for domestic equity funds with assets greater than $10 million. Sector funds are excluded, and any fund involved in a merger is removed from the sample for the year of the merger. I divide the funds into load and no load share class categories following Nanda, Wang, and Zheng (2009) by examining the name of each fund, the vast majority of which include the share class. For load funds, I use class A shares only to avoid duplication of funds across share classes. I also check load charges and 12b-1 fees reported in CRSP to remove potentially mislabeled funds. The final sample includes 14,710 fund year observations for 2388 unique funds. No-load funds account for 5263 (35.8%) of the observations.

Descriptive statistics are shown in Table 1. Panel A includes the summary for the class A shares and panel be for the no load funds. Since many of the means involving size are skewed to the right, I report the medians for all variables. The median fund size for sample funds has fallen over the sample period, due the addition of new funds and new share classes. Median percentage flows are greater for no-load funds, despite their larger size, and the standard deviation of percentage flows is similar across share classes. Expenses are lowest for no-load funds, due to their lack of 12b-1 fees.

RESULTS

Flows have been shown to be more sensitive to good performance than to poor. A question that follows is whether the past 12 months of return is actually related to future performance. If so, this would justify the flow-performance relationship. To examine this, I divide the sample of all no-load and class A funds into quintiles each year based upon raw return, with quintile 1 the lowest return and 5 the highest. I then track the following 3 years of performance, treating each quintile as a portfolio of funds, with equal weighting for each fund[1] . I do this for class A and no-load separately to check for differences in returns for the two groups. Results are shown in Table 2. The date in row 1 indicates the year-end in which the portfolio is formed (i.e. the year of data used to determine quintile rank). For example, the 1991 column uses returns from 1991 to form quintiles, then tracks performance for 1992-1994. The returns listed for each quintile are the total compounded monthly raw returns over the 3 year period. I also report the CRSP value-weighted index returns for the 3-year portfolio tracking period.

Differences between the top and bottom quintiles are reported in the lower half of Table 5 Panel A. The full period results are similar to Carhart (1997) in that the difference in raw return between the top and bottom quintiles for the full period is not significant. However, examining each 3-year tracking period provides additional insight. A positive difference indicates the top quintile portfolio performed better than the lowest during the three-year tracking period. Of the nine years in which the difference between the top and bottom quintile is significant, there is a nearly even split of 5 instances of the top quintile outperforming and 4 in which the lower does better. Further, for 4 of the 5 periods in which the upper quintile outperformed the lower, the portfolios were formed following years defined as bad market states. This means that selecting top performing funds immediately after a below average market year led to over-performance during the following three years. Further, all four of the periods in which the bottom quintile outperformed the top began with portfolios formed after a good year. There is only one instance of a "good" market year resulting in the top quintile portfolio outperforming the bottom over the following three year period. The pattern becomes more defined after 1997. This may have been caused by a significant change in the equity market in 2000. A trend of 5 years of strong performance ended, and a string of 3 consecutive years of negative market returns began. Portfolios formed from the upper quintile of funds at the end of 1997, 1998, and 1999 lagged behind portfolios formed from the lower quintiles for the 3-year tracking periods covering 1998 though 2002, each of which includes at least one bad market state. The largest differences are in the tracking period of 2000 through 2002 for portfolios formed at the end of 1999. In contrast, those portfolios formed from the upper performing quintile at the end of 2000, 2001, 2002, and 2003 produced returns that were greater than the portfolios from lower performing funds for the tracking periods including 2001 through 2006. It appears that for periods since 1997, investors would have profited from a strategy of investing in the top performing funds immediately following bad market states and by investing in lower performing funds following good market states. However, results outlined previously in this paper reveal that performance sensitivity is stronger during good states than bad. Investors actually seek out the top performing funds more actively in good states, when bad states may present a more consistent record of top funds outperforming.

Panel B of Table 2 reports the results for no-load funds, which follow the same basic pattern as the class A shares. It appears that any differences in sensitivity between no load and load funds are not caused by a history of differences in performance. That is, the 3-year returns do not appear to provide a basis for load investors being more sensitive to performance.

One possible explanation for the pattern in returns is market rotation from one objective to another. For example, large growth funds produced an average return of 20.1% in 1999 while income and growth funds averaged of 3.1%. Subsequently, in 2000, growth funds lost 1.7% on average while growth and income produced a 5.8% mean return. Income and growth funds moved from the lower quintiles toward the top over the tracking period. However, style rotation

cannot explain the full extent of the difference since results are very similar when forming portfolios based on excess objective return.

CONCLUSIONS

I test the success of a strategy of investing in past top performing funds using a simple method of examining a portfolio of upper performing funds against a portfolio of lower performing funds for a three year tracking period. I find that the most consistent positive returns are from the top performing portfolios formed in poor market states and from past poorly performing fund during good market states. However, flow to performance sensitivity is higher for all classes of load fund during *good* markets. Investors might be well rewarded to focus more on return ranking during the poorer markets states. A contrarian strategy in a good market may also lead to above average returns.

ENDNOTE

[1] I also form quintiles based on objective return, and results are similar.

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TABLE 1: SUMMARY STATISTICS FOR NO-LOAD AND CLASS A

This table reports annual summary statistics for all funds in the sample. The sample includes 14,710 fund year observations and 2388 unique domestic equity funds from the CRSP survivor-bias free mutual fund data base from January` 1991 through December 2007. Sector funds and funds with less than $10 million are excluded, and any fund involved in a merger is removed from the sample for the year of the merger. For each year, I report the number of funds in each class as well as medians for the following measures: total net assets, expense ratio, 12b-1 fee (first available in 1993), management fee (first available in 1993), annual dollar flow, annual percentage flow, standard deviation of percentage flow, annual return, excess objective return, and standard deviation of monthly return. Dollar amounts are in millions.

Panel A: Class A Funds											
Year	Number of funds	TNA	Exp ratio	12b1 fee	Mgmt fee	Annual flow	% flow	Std dev % flow	Fund ret	Excess obj ret	Std dev of return
1991	163	205.78	0.0104	n/a	n/a	1.87	0.021	0.6996	0.3049	-0.0121	0.0478
1992	235	167.26	0.0100	n/a	n/a	10.20	0.122	0.8521	0.0696	-0.0005	0.0255
1993	251	189.80	0.0113	0.0018	0.0100	7.26	0.077	0.7454	0.1147	0.0006	0.0234
1994	309	147.39	0.0116	0.0020	0.0100	1.14	0.023	0.7487	-0.0282	0.0004	0.0301
1995	343	188.76	0.0117	0.0025	0.0100	-1.86	-0.025	0.8334	0.3305	-0.0030	0.0209
1996	388	202.82	0.0120	0.0025	0.0103	4.85	0.069	0.6170	0.1780	-0.0028	0.0320
1997	450	196.92	0.0124	0.0025	0.0105	1.30	0.018	0.7407	0.3035	0.0102	0.0446
1998	391	180.50	0.0125	0.0025	0.0103	9.27	0.096	0.8475	0.0835	-0.0005	0.0689
1999	559	150.80	0.0125	0.0025	0.0103	1.41	0.026	0.9540	0.1371	-0.0232	0.0455
2000	595	147.90	0.0125	0.0025	0.0104	-0.66	-0.009	0.5963	-0.0100	-0.0026	0.0576
2001	656	126.00	0.0124	0.0025	0.0102	1.69	0.024	0.7080	-0.1405	-0.0023	0.0596
2002	727	86.20	0.0127	0.0025	0.0105	0.24	0.006	0.4449	-0.2830	-0.0046	0.0580
2003	806	116.95	0.0133	0.0025	0.0111	4.40	0.081	0.9365	0.2214	-0.0088	0.0361
2004	871	117.80	0.0136	0.0025	0.0113	0.48	0.008	0.8847	0.0964	-0.0006	0.0283
2005	865	132.60	0.0132	0.0025	0.0110	-3.26	-0.075	0.9720	0.0892	-0.0017	0.0289
2006	915	137.80	0.0128	0.0025	0.0105	-0.80	-0.021	0.6542	0.0949	0.0038	0.0245
2007	923	145.80	0.0125	0.0025	0.0102	-2.05	-0.040	0.6574	0.0404	0.0002	0.0307
full period		140.50	0.0125	0.0025	0.0103	0.65	0.012	0.7771	0.0895	-0.0012	0.0364
fund years	9447										
unique funds	1487										

Panel B – No-load funds											
Year	Number of funds	TNA	Exp ratio	12b1 fee	Mgmt fee	Annual flow	% flow	Std dev % flow	Fund ret	Excess obj ret	Std dev of return
1991	60	341.20	0.0102	n/a	n/a	18.30	0.169	0.8441	0.3361	-0.0127	0.0460
1992	134	121.35	0.0096	n/a	n/a	7.14	0.122	0.9824	0.0754	0.0016	0.0249
1993	132	175.28	0.0107	0.0000	0.0100	14.06	0.141	0.6020	0.1188	0.0029	0.0238
1994	164	117.26	0.0103	0.0000	0.0100	6.05	0.060	0.4925	-0.0226	0.0035	0.0305
1995	194	174.45	0.0102	0.0000	0.0098	4.44	0.080	1.1267	0.3462	0.0137	0.0216
1996	227	205.84	0.0106	0.0000	0.0100	12.10	0.107	0.8152	0.1885	0.0075	0.0316
1997	250	275.96	0.0106	0.0000	0.0102	0.90	0.037	1.3075	0.3136	0.0242	0.0445
1998	180	196.80	0.0100	0.0000	0.0100	11.52	0.091	1.0781	0.0860	-0.0009	0.0684
1999	252	217.25	0.0103	0.0000	0.0100	0.31	0.004	0.8900	0.1395	-0.0301	0.0450
2000	278	247.10	0.0103	0.0000	0.0100	-3.70	-0.045	0.9489	-0.0069	-0.0073	0.0572
2001	321	219.70	0.0102	0.0000	0.0100	1.94	0.028	0.8980	-0.1311	0.0253	0.0599
2002	370	186.10	0.0100	0.0000	0.0098	4.91	0.047	0.6053	-0.2694	0.0044	0.0584
2003	451	216.00	0.0105	0.0000	0.0100	15.76	0.152	0.8503	0.2312	-0.0023	0.0361
2004	502	227.65	0.0110	0.0000	0.0103	3.76	0.059	0.7961	0.0992	0.0017	0.0285
2005	560	207.10	0.0110	0.0000	0.0101	-2.64	-0.048	0.7653	0.0866	-0.0027	0.0304
2006	587	222.60	0.0101	0.0000	0.0099	1.02	0.015	0.5929	0.0964	0.0045	0.0245
2007	601	195.70	0.0102	0.0000	0.0099	-1.20	-0.017	0.5440	0.0365	-0.0028	0.0307
full period		208.40	0.0104	0.0000	0.0099	2.47	0.037	0.8196	0.0915	0.0016	0.0352
fund years	5263										
unique funds	901										

TABLE 2 QUINTILE THREE YEAR RAW RETURN.

This table reports performance by quintile of all no-load and class A funds from the sample. Quintiles are formed each year based upon previous year raw return, with quintile 1 the lowest return and 5 the highest. Trailing 3-year performance is reported, treating each quintile as a portfolio of funds, with equal weighting for each fund. The date in row 1 indicates the year-end in which the portfolio is formed (i.e. the year of data used to determine quintile rank). The returns listed for each quintile are the total compounded monthly raw returns over the 3 year period. CRSP value-weighted index returns for the 3-year portfolio tracking period are also reported. Differences between the top and bottom quintiles are reported in the lower half of each table. The sample includes 14,710 fund year observations and 2388 unique domestic equity funds from the CRSP survivor-bias free mutual fund data base from January 1991 through December 2007. Sector funds and funds with less than $10 million are excluded, and any fund involved in a merger is removed from the sample for the year of the merger.

Panel A: Class A funds															
	Portfolio Formation Year-End														
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	All years
3-year index	0.208	0.502	0.631	1.142	0.931	0.996	0.363	-0.011	-0.375	-0.065	0.191	0.615	0.410	0.338	0.329
Quintile															
High -5	0.114	0.532	0.536	0.996	0.550	0.744	0.271	-0.078	-0.498	0.011	0.250	0.653	0.365	0.248	0.291
4	0.115	0.501	0.517	1.051	0.714	0.589	0.201	-0.062	-0.409	-0.043	0.063	0.567	0.337	0.293	0.270
3	0.165	0.462	0.504	1.119	0.713	0.670	0.315	0.055	-0.342	-0.232	-0.025	0.480	0.330	0.244	0.254
2	0.154	0.390	0.526	1.029	0.738	0.741	0.365	0.078	-0.228	-0.305	-0.049	0.452	0.305	0.239	0.252
Low -1	0.234	0.379	0.542	1.005	0.581	0.729	0.370	0.253	-0.100	-0.352	-0.107	0.489	0.265	0.231	0.255
5-1	-0.120	0.153	-0.006	-0.009	-0.031	0.015	-0.100	-0.331	-0.399	0.362	0.357	0.165	0.100	0.017	0.035
significance	< 5%	< 1%					< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%		
initial state	good	bad	bad	bad	good	good	good	good	good	bad	bad	bad	good	neutral	
N	110	160	125	160	170	180	200	240	295	300	335	335	505	525	3640

	Panel B: No load funds.														
	Portfolio Formation Year-End														
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	All years
3-year index	0.208	0.502	0.631	1.142	0.931	0.996	0.363	-0.011	-0.375	-0.065	0.191	0.615	0.410	0.338	0.329
Quintile															
High -5	0.111	0.542	0.498	1.038	0.669	0.798	0.260	-0.063	-0.436	0.139	0.285	0.600	0.329	0.264	0.310
4	0.255	0.435	0.572	1.147	0.888	0.647	0.276	0.067	-0.377	-0.016	0.106	0.567	0.360	0.253	0.297
3	0.217	0.527	0.573	1.107	0.731	0.735	0.281	0.095	-0.271	-0.193	0.014	0.466	0.356	0.245	0.271
2	0.258	0.479	0.583	1.086	0.656	0.701	0.276	0.164	-0.158	-0.247	-0.053	0.440	0.301	0.250	0.254
Low -1	0.256	0.422	0.565	1.062	0.611	0.742	0.664	0.222	-0.067	-0.333	-0.129	0.547	0.258	0.219	0.268
5-1	-0.145	0.120	-0.068	-0.024	0.059	0.057	-0.404	-0.285	-0.369	0.472	0.414	0.053	0.070	0.045	
significance							1%	1%	1%	1%	1%		1%		
initial state	good	bad	bad	bad	good	good	good	good	good	bad	bad	bad	good	neutral	
N	55	95	60	75	85	100	110	125	170	185	220	240	355	375	2250

WORKPLACE RELIGIOUS ACCOMMODATION ISSUES FOR ADHERENTS OF ISLAM

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ABSTRACT

America has long been a haven for religious freedom. This diversity of religious practices has resulted in tensions in the workplace. Many of today's workplace conflicts related to religion are a result of the growing presence of workers of the Muslim faith of Islam. This paper focuses on Title VII of the Civil Rights Act of 1964 and its required regulatory compliance related to religious discrimination and accommodation.

INTRODUCTION

For hundreds of years, people from around the world have looked to America as a beacon of religious freedom. But, as the United States has become more pluralistic with a diversity of religious practices, the workplace interactions between followers of different religions has become more complicated. A major driver of the increasing religious diversity is the growing presence of followers of the Muslim faith. Islam is the second largest religion in the world (Lewis and Churchill, 2008) and the fastest growing religion in the United States (Geaves, 2010). Though growth in the Muslim community is significant, Muslims still represent only a small proportion of the general population, accounting for approximately 0.8 percent of the total population in the United States in 2009 (Pew, 2009).

Although religious freedom is prized highly in American culture and law, there has been significant religious disagreement between employers and Muslim employees. The United States Equal Employment Opportunity Commission (EEOC) reports that the number of employment-related complaints received from Muslim employees has jumped from 697 in 2004 to 1,490 in 2009 (Greenhouse, 2010). Muslim Americans accounted for nearly one-quarter of all religious discrimination charges filed with the Equal Employment Opportunity Commission (EEOC) in 2010 (Greenhouse, 2010). This is over 30 times higher than their proportional representation in the population at large.

What is driving these charges is of importance to all employers. This paper reviews employment law related to religious practices in the American workplace, especially concerning regulatory compliance obligations imposed under Title VII of the Civil Rights Act of 1964 and related court decisions on religious discrimination regarding Muslims. After summarizing the

pertinent sections of Title VII (sections 701 and 703), we focus on the critical applications of "religious accommodation" and "religious harassment" as the likely major sources of potential EEO complaints to arise from Muslim employees and applicants. Finally, guidance is provided for employers having to deal with these issues.

TITLE VII AND RELIGIOUS DISCRIMINATION

Title VII of the Civil Rights Act of 1964 makes it unlawful for a covered employer to discriminate against any individual employee or applicant in compensation, terms, and conditions of employment because of "such individual's race, color, *religion*, sex, or national origin" (42 U.S.C. § 2000e-2(a)). This portion of the Act is referred to as section 703, and it essentially makes it illegal for a covered employer to make any employment decision in which the employee's or applicant's religious beliefs are taken into consideration and the individual is subjected to different treatment in the workplace (EEOC, 2011, § 12-1). Hence, if an employer harbors an animosity against a member of the Roman Catholic faith and refuses to hire anyone he or she believes to be a Roman Catholic, that employer has violated section 703. This form of discrimination is technically known as "disparate treatment" (Krieger and Fiske, 2006). Because the employer knowingly (intentionally) discriminated against an individual because of his or her affiliation with a particular class (in this example a religion), it is also known as "intentional discrimination" (Robinson, Franklin, and Wayland, 2010).

Treating someone "differently" in his or her terms and conditions of employment due to a particular religious belief violates Title VII (that is, constitutes unlawful discrimination). However, the protected class of religion, unlike the other Title VII protected classes (race, color, sex, and national origin), imposes another obligation on employers. Under section 701 of the Act, employers are required to "accommodate" an employee's religious observance or practice unless the employer shows that he or she is unable to reasonably accommodate that practice without suffering an undue hardship on the conduct of the employer's business (42 U.S.C. § 2000e).

This means that an employer is required to reasonably accommodate an employee's religious beliefs or practices. Once the request for accommodation is made, the only defense available to an employer is that it would cause more than a minimal burden on the operations of the employer's business. Generally, this means an employer may be required to make reasonable adjustments to the work environment that will allow an employee to practice his or her religion (Brierton, 2002).

Typical religious accommodations include voluntary exchanges with other employees to allow the observance of religious worship (*EEOC v. Robert Bosch Corp*., 2006). One example in this context would be to allow flexible scheduling and/or to authorize scheduling changes to accommodate late arrivals or early departures, permitting employees to make up the lost time in religious observance through such arrangements (Puckett, 2008). The individual may also be

laterally transferred to another job in the organization which has a work schedule which does not conflict with the religious observance, provided that it does not result in less pay (*Shelton v. University of Medicine & Dentistry of New Jersey*, 2000).

Unreasonable Accommodation

The law is vague on when a requested accommodation is unreasonable. It merely states that an accommodation is unreasonable when it imposes an undue hardship on the employer (42 U.S.C § 2000e(j)). But what constitutes an undue burden? This lack of specificity in the law means that every request for accommodation must be handled on a case-by-case basis and evaluated on its own unique circumstances (*Smith v. Pyro Mining Co*., 1987; *Tooley v. Martin Marietta Corp.*, 1981).

Cost is one factor in considering whether an accommodation may cause undue hardship. In *Trans World Airlines, Inc. v. Hardison* (1977), the Supreme Court defined accommodation hardship as anything more than "*de minimus*" cost. It may also be an undue burden if "it compromises workplace safety, decreases workplace efficiency, infringes on the rights of other employees, or requires other employees to do more than their share of potentially hazardous or burdensome work" (EEOC, 2011). Additionally, accommodation may create an undue hardship depending on the number of employees who are affected by the accommodation and its impact on business operations. In one instance, 40 Muslim factory workers requested permission to take a break from the production line for their sunset prayers. The employer refused the accommodation on the grounds that to allow all employees to leave the assembly area would effectively shut the line down. Shutting the line for prayers would result in an undue hardship because of their absence (*Farah v. Whirlpool Corp*., 2004).

Moreover, when the requested accommodation by an employee differs from a proposed accommodation by the employer, the employee's suggested accommodation may be held to be unreasonable (*Ansonia Board of Education v. Philbrook,* 1986). In one case, a Muslim driver requested a longer lunch break on Fridays in order to attend prayer services. His employer permitted him to bid for another schedule; two were available which would enable him to attend services. The driver was asked to bid on a night-shift schedule that would enable him to have no daytime work duties on Fridays or to go to the mosque on Friday during his lunch period, provided that he was back at work within an hour. The employee chose not to bid on the other shift and claimed that because of the work location (distance from the nearest mosque) he could not meet the one-hour time limit. The court found that the issue is not which accommodation was better; rather, the issue is whether the employer's accommodation was reasonable. In this case, the employer's accommodation was held to be reasonable (*Elmenayer v. ABF Freight Systems*, 2001).

Must Accommodate All Religions

Implementing an accommodation for a specific religious group in the workplace may be a double-edged sword. By allowing individuals of one religious faith to practice their religion at work while simultaneously denying similar accommodation to members of other faiths is a recipe for litigation. This is what happened in the case of *Delelegne v. Kinney Systems* (2004) in which a parking garage attendant who was an Ethiopian Christian was not allowed to bring his Bible to work, pray, or display any religious objects or pictures in his booth. Meanwhile, his employer permitted several Somali Muslim employees to take prayer breaks. The employer even allowed his Muslim employees to display religious materials in their booths. The effect was that the Somali Muslim employees were allowed to practice their religion at work, while the employer was simultaneously precluding the Ethiopian Christian from practicing his. From a strictly legal perspective, two different work rules were in operation, one for Muslims and the other for Christians (or more accurately, non-Muslims), and thus this is a representative example of a violation of Title VII's intent to prohibit different treatment of individuals based on their religion.

RELIGIOUS ACCOMMODATION AND EMPLOYER DRESS CODES

Dress codes and appearance policies may be required to be modified, in some instances, to permit exemptions for some religiously-required apparel (*EEOC v. United Parcel* Service, 1996). Consequently, if an employer has a policy regulating the appearance of those employees who come into contact with its customers, that policy may be challenged on religious grounds. However, when the dress code is specifically part of the "trade dress" of the employer, or part of the branding to distinguish the company in the marketplace, the accommodation question is more complicated (Adcock, 2002; Cline, 2005).

The required accommodation of employee's religious beliefs for dress or grooming practices is parallel to a request for schedule changes or leave for religious observances. Should a dress code or appearance standard conflict with an employee's religious practices, the employer is expected to make modifications to the dress code *unless* doing so would result in undue hardship. But, dress code conflict may prove to be more likely with Muslim employees than employees who practice more prevalent religions. Islam requires certain dress of its adherents, such as women and men wearing particular head coverings or other garments. There also may be religious sanctions that prohibit members from wearing certain clothing; for example, Muslim women are prohibited from pants or miniskirts.

The accommodation that the employer offers does not have to match the employee's desired accommodation; it only has to satisfy the religious practice or observance (EEOC, 2010). To illustrate, a cashier (implying she had direct contact with the employer's customers) claimed that her facial piercings were part of her religious observance as a member of the Church of

Body Modification. The employee's requested accommodation was that she be exempted from the employer's appearance policy. The employer's accommodation was that she either cover her facial piercings with flesh colored Band-Aids while at her work station or that she transfer to a stocking job in which she would have minimal contact with customers. A federal court ruled that the employer's accommodation was reasonable and that the employee's requested accommodation of allowing her to display her piercings would have posed an undue hardship on the employer (*Cloutier v. Costco Wholesale Corp*., 2004).

Still, the larger the company, in terms of financial resources and number of employees, the greater the expectation is for that company to make an accommodation, and the higher the bar for establishing undue hardship. Consider the out-of-court settlement between the EEOC and Electrolux, whereby the employer agreed to a religious accommodation request of 165 Somali Muslim employees at its Electrolux Home Products plant in St. Cloud, Minnesota. The employees were allowed time to conduct at least five daily prayers, two of which had to be observed within a restricted time period of between one and two hours (EEOC, 2003). Electrolux further agreed for all managers (top, middle, and first-level) to attend mandatory diversity training and that it would also make a monetary donation to a local Islamic Center.

RELIGIOUS HARASSMENT

Religious harassment is often initiated by offensive remarks about an individual's religious beliefs or practices. The remarks must go beyond simple teasing, offhand comments, or isolated incidents that are not very serious. Religious harassment is only actionable under Title VII if it becomes so pervasive (frequent) or severe that it creates an abusive or intimidating work environment, or when it culminates in an adverse employment actions (i.e., the victim is terminated, transferred, or demoted). The legal standard is not that the religiously-motivated comment or conduct is subjectively perceived by the victim to be abusive, but that it is "severe or pervasive enough to create an objectively hostile or abusive work environment -- an environment that a reasonable person would find hostile or abusive" (*Harris v. Forklift Systems., Inc.*, 1993). A reasonable person's determination of the level of abuse in the work environment "turns on common sense and context, looking at the totality of the circumstances" (*Faragher v. City of Boca Raton*, 1998). Some of the considerations include the frequency of the conduct, was it isolated, or did it recur on a frequent basis (*Williams v. Gen. Motors Corp*., 1999)? Or, was the behavior in question offensive, derogatory, or disparaging toward the victim (*Bains LLC v. Arco Products Co*., 2005)? Courts and enforcement agencies will also consider whether the conduct was humiliating or physically threatening (*Jones v. United Space Alliance*, 2006).

According to the EEOC, religious harassment that is actionable under Title VII occurs when employees are: (1) required or coerced to abandon, alter, or adopt a religious practice as a condition of employment (this is often referred to as *quid pro quo* religious harassment because it involves the loss of tangible job benefits), or (2) subjected to unwelcome statements or conduct

that is based on religion and is so severe or pervasive that the individual being harassed reasonably finds the work environment to be hostile or abusive, and there is a basis for holding the employer liable (this is hostile environment religious harassment) (EEOC, 2011).

Because *quid pro quo* harassment involves tangible job benefits, only supervisory and management personnel can actively be involved this type of harassment (meaning that there is a smaller pool of potential harassers that an employer has to monitor). However, federal courts have held that since the employer has granted the *quid pro quo* harasser the ability to control the employee's job benefits (hence abetting the harassment), the employer is held to the higher standard of vicarious liability (*Faragher v. City of Boca Rato*n, 1998). Vicarious liability means that the employer is responsible for the harassment regardless of whether the employer took action to preclude the harassment or to prevent its recurrence. That is, once tangible job benefits are involved, the employer becomes automatically liable for the supervisor's harassment.

Hostile environment religious harassment involves a far broader range of potential harassers. Coworkers are by far the most common source, but religious harassment can include supervisory personnel (provided that there is no evidence of job benefits being involved), customers, vendors, and other non-employees. Here the standard is generally one of direct liability. In direct liability, the employer is only liable if he or she knew of the harassment and failed to take prompt and appropriate corrective action to prevent its recurrence (29 C.F.R. § 1606.8). As an example, in *Sheikh v. Independent School District* (2001), a Muslim teacher was ostracized by colleagues when he refused to shake hands with female colleagues because of his religious prohibition against touching members of the opposite sex who are not relations. The employee claimed that his coworkers created a hostile work environment and sued his employer. Under the theory of direct liability, a federal district court ruled that employer was not liable because it took prompt steps to stop alleged harassment of the Muslim employee by his coworkers (*Sheikh v. Independent School District*, 2001).

In the case of supervisors engaging in the hostile environment harassment, a higher level of liability is imposed. Even if no tangible benefits are involved, the employer will be held to be vicariously liable, unless she or he can carry a two-part affirmative defense: (1) that the organization took *reasonable care* to prevent the harassment from occurring, or prevent its recurrence, and (2) that the victim *unreasonably failed* to take advantage of the employer's protective policy (*Faragher*, 1998; *Burlington Industries v. Ellerth*, 1998). In order to satisfy the first requirement of the affirmative defense, that the employer took reasonable care, a comprehensive anti-harassment policy must typically be in place, as well as an explicitly stated assurance that it will be enforced (EEOC, 1999). Reasonable care is further substantiated by proof that management has investigated complaints and has consistently enforced the policy as dictated by the investigation outcomes (*Hurley v. Atlantic City Police Department*, 2000)**.**

The second part of the affirmative defense, that the victim unreasonably failed to invoke the policy, requires that employer first establish that the victim was aware of the policy and chose not to avail him or herself of the complaint procedure provided by the employer.

Obviously, if the employee had no knowledge of the anti-harassment policy and procedures, he or she would not invoke it. Therefore, the employer must demonstrate that the victim was aware of the procedure for filing a complaint. The employer accomplishes this by first showing that the policy was disseminated to all employees (employee handbooks, discussed at new employee orientations, posted on bulletin boards, etc.). Then the employer documents that the victim was personally informed of the disseminated policy (signed receipt of employee handbooks, sign rosters for anti-harassment training, etc.) (Robinson, Franklin & Wayland, 2009).

Even if supervisors are not the source of hostile environment religious harassment, it is the employer's responsibility to maintain a harassment-free work environment, regardless of who is doing the harassing (29 C.F.R. § 1604.11(f)). In a Texas case, coworkers of an American convert to Islam created a working environment which a district court described as "malicious and vitriolic" (*Khan v. United Recovery Systems, Inc.*, 2005). Several coworkers taunted the Muslim employee with remarks that "all Muslims should be bombed because they are [expletive deleted] terrorists" and that "all these Muslims were wiped off the face of the earth" and inquired whether the employee was "connected with terrorists" (*Khan v. United Recovery Systems, Inc.*, 2005, p. 53). On one occasion, a coworker expressed the sentiment that the employee might get shot for wearing an Islamic pendant. It was also alleged by the Muslim employee that her immediate supervisor was of the habit of putting newspaper articles on her desk about mosques in Afghanistan that taught terrorism (*Khan v. United Recovery Systems, Inc*., 2005).

In another case, a Muslim employee who wore a kufi (a Muslim prayer cap) as part of his religious observance was subjected to hostile work environment religious harassment when coworkers made fun of his appearance by continually calling him "towel head." They also questioned his allegiance to the United States, suggested he was a terrorist by frequently referring to him as "Taliban," and assailed him with remarks associating all Muslims with meaningless violence (*EEOC v. Sunbelt Rentals, Inc*., 2008).

THE FUTURE FOR EMPLOYERS IN RELIGIOUS DISCRIMINATION CASES

No doubt, the disproportionate level of EEOC religious discrimination cases from Muslim employees will continue. In part, this is due to the natural challenges inherent in the larger scale introduction of a "new" (or at least new to American employers) religion in the workplace. However, the standards of dress, types of holidays, and daily religious practices (such as interruption within the workday for required prayer times) in Islam are also different enough from other religions to create unique complications. In particular, the dress requirements for some groups within Islam may be in conflict with the branding and presentation objectives of employers. Since "unreasonable accommodation" is determined on a case-specific basis, there will be potential differences between courts and decisions on what is reasonable and what is not reasonable, such that standard guidance will not be feasible for years into the future.

Definitions on what is "reasonable" may also vary considerably between employers and advocacy groups. Obviously, advocacy groups are going to take the employee's side in employer/employee religious discrimination disputes, and as a result, there will be likely be increased litigation, especially on behalf of Muslim employees in the areas of appearance policies and harassment. For example, the advocacy group Council on American Islamic Relations (CAIR) has established a complaint filing system on its website (CAIR, 2011). CAIR, in its executive summary, lists among its purposes: "The vast majority of CAIR's work deals with civil rights and anti-defamation" (CAIR, 2011).

There will also likely be greater pressure to raise the undue burden standard to more than *de minimus* costs through either legislative action or the court system. For instance, there have been several attempts over the years in Congress to accomplish this by the creation of the proposed Workplace Religious Freedom Act (WRFA) to amend Title VII. The 2010 version of this bill was introduced in the Senate by Senator John Kerry (S. 4046, 111th Cong., 2010). The WRFA was intended to "provide a comprehensive Federal prohibition of employment discrimination on the basis of religion, including that denial of accommodations, specifically in the areas of garb, grooming, and scheduling . . ." (Workplace Religious Freedom Act § 3 (2)). The WRFA would have explicitly prohibited employers from enforcing some policies and dress codes when an employee claimed religious conflict. While this bill did not pass the Congress in 2010, given the bipartisan support the WRFA has received over the years, it is expected that this bill or similar legislation will be re-introduced in Congress.

CONCLUSION

Employers are required to maintain a work environment free of religious harassment and, where reasonable, accommodate religious beliefs, practices, and dress. The increasing numbers of followers of Islam in the workplace and the significant increase in EEOC claims signals that employers must take further care in avoiding possible religious discrimination claims. In particular, the development of company policies, training, and documentation prohibiting religious harassment is essential. Proactively facilitating the voluntary exchange of schedules to accommodate Islamic prayers, special ceremonies, and holidays may also be in the "enlightened self-interest" of many employers. However, given that dress codes are often part of the "branding" of companies in their appeal to customers, appearance differences based on religious practices will continue to be a significant area of conflict and discrimination cases for employees for the foreseeable future.

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A REANALYSIS OF THE PREDICTIVE VALIDITY OF THE GENERAL APTITUDE TEST BATTERY

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ABSTRACT

Investigators have found that racial bias exists in supervisory ratings of job performance. Black supervisors rating black employees tend to rate them a third to a half a standard deviation higher than white supervisors rating those same black employees. These findings suggest that, employment tests, such as intelligence tests, that predict lower job performance for blacks might not be correct when based on ratings provided by black supervisors. This article re-examined the differential prediction and differential validity of the General Aptitude Test Battery (GATB). The results indicate that the most highly endorsed and, therefore, most widely used strategy for assessing test bias, the Cleary test, is not valid when the job-performance criterion is supervisory ratings. Industrial psychology and human resource management must abandon this approach and find other ways to evaluate their employment tests for test bias.

INTRODUCTION

The question of bias in mental ability (intelligence) tests is an important one and is of great interest to employers, educators, and the public in general. Generally, standardized tests have contributed to more fair selection, however, some scholars believe that these "tests were used intentionally to restrict opportunity for groups that were powerless or out of favor." (Wigdor & Garner, 1986, p.82)

In employment selection, in order to determine if bias exists in ability tests, researchers examine how well these tests predict job performance. Finding a suitable measure of job performance to use as the criterion in these studies is important. In the vast majority of cases, supervisory ratings are used. An influential government study conducted under the auspices of the National Academy of Sciences by the National Research Council (Hartigan & Wigdor, 1989) raised the possibility that supervisory ratings themselves might be biased. While the NRC concluded that the ability tests they examined appeared to be unbiased, they did express a concern that some researchers were finding evidence of bias in supervisory ratings and that this bias might mask bias in the tests. If this were the case, then their study and countless others like it concluding that ability tests are not biased might instead be found to be inconclusive.

The NRC study reviewed the U.S. Employment Service's (USES) General Aptitude Test Battery (GATB). The GATB is "a test of cognitive, perceptual, and motor skills used in state Job

Service offices since 1947" (Hartigan & Wigdor, 1989, p. 18) It was developed and chiefly used by the USES to improve the nation's economic health. Even though mental measurement specialists have pointed out that cognitive ability tests cannot measure all the attributes that are necessary for successful job performance, the tests are still considered to be the most informative job-performance predictor for most jobs (Schmidt, Hunter, McKenzie, & Muldrow, 1979).

In the early 1980s, industrial psychologist John Hunter conducted a series of technical studies for the Department of Labor that provided support for this view (e.g., Department of Labor, 1983). Hunter reported that individual differences in ability accounted for most of the variation in productivity and that economic gains would be made by using the tests scores to select a new employee out of the candidates. Many firms viewed his findings as a very beneficial reason to adopt the test. Furthermore, these firms saw the GATB as a way to pass the expense of testing applicants to the State, and it could keep them from being vulnerable to law suits regarding unfair employment acts. USES officials were encouraged by Hunter's findings and implemented a new job referral system based almost exclusively on the GATB (Hartigan & Wigdor, 1989). Test score percentile ranks were observed with the population categories of whites and minorities. There were significant findings that showed that black percentile scores on the GATB were well below the percentile of scores of whites, a disparity that is well established in the psychological testing literature, the reasons for which are hotly debated (see, e.g., Jencks & Phillips, 1998).

The NRC's study noted, however, that the supervisory ratings in the GATB database were supplied mainly by white raters and cited evidence that raters tended to rate members of their own race more favorably than members of other races (Kraiger & Ford, 1985). Based on this information, the NRC reported that, despite their findings, they could not rule out the possibility of bias in the GATB.

In response to the NRC's concern, industrial psychology claimed to find evidence that the NRC's concerns were unfounded—there was no evidence of either racial or gender bias in supervisory rating of job performance (Landy, Shankster, & Kohler, 1994; Latham & Wexley, 1994; Sackett & DuBois, 1991). The most significant investigation of bias in supervisory ratings in response to the NRC report was conducted by Sackett and DuBois (1991). The study incorporated data from the two largest programs of study in existence at that time. Information was observed from the U.S. Army's Project A (Campbell, 1990) and the USES GATB database. Using these large-scale data sets, Sackett and DuBois concluded that there was no bias in the supervisory ratings. Other studies based on these same data reached similar conclusions (e.g., Pulakos, White, Oppler, & Borman, 1989), and reviews of this literature were quick to cite the Sackett and Dubois analysis as evidence that the NRC's concerns about bias in supervisory ratings were unfounded (Landy, Shankster, & Kohler, 1994; Latham & Wexley, 1994).

Stauffer and Buckley (2005), however, noticed that the Sackett and DuBois analysis focused on one particular type of bias and that the supervisory ratings might well suffer from another type of bias. Stauffer and Buckley looked at the same two databases and extracted a

subset of workers who had been evaluated by both a black and a white supervisor. The advantage of using these data was that black and white supervisors were observing the same, identical performance, so the true performance differences between what the black and white supervisors were observing were zero. Sackett and DuBois (1991), however, relied on observations made on different workers, some black and some white, and, therefore, did not control for true performance differences. This research shows that, when observing the same, identical performance by black workers, black and white supervisors disagree substantially in their ratings of that performance.

Figure 1

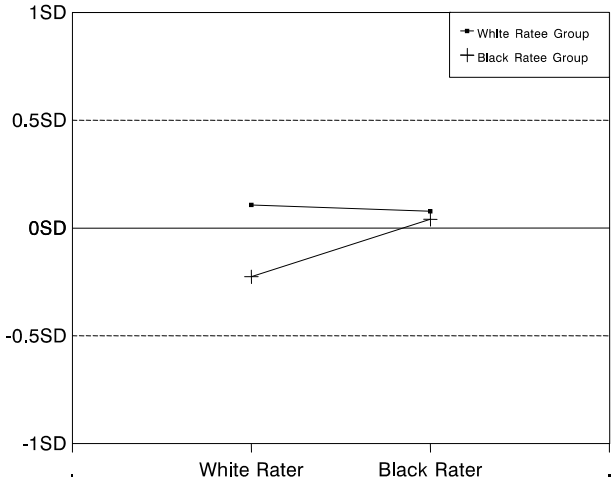

Figure 1 show this bias, as it occurred in the USES GATB data. The same pattern was found in the Army's Project A data. When observing the same white employee performance, black and white supervisors essentially agree on the level of performance. When observing the same black employee performance, they disagree substantially. Depending on how these values are corrected for unreliability, this disagreement on black performance ranges from a third to half a standard deviation. Given that the true performance differences are known to be zero, these data provide clear evidence of bias. While it is not clear why black and white supervisors disagree on the level of black employee performance, the fact that this bias exists means that the NRC's concerns remain valid.

Validity, Prediction, and Bias

At the heart of the NRC study was an analysis of the test's *differential validity* and *differential prediction*. In educational and employment selection, a test's validity refers to the strength of its correlation with the criterion, in this case supervisory ratings of job performance. Differential validity refers to differences in these correlations for one group of test takers versus another. Those who assert that ability tests are biased against blacks posit that the correlations with black job performance would be lower than that for white job performance.

Differential prediction looks for differences in the regression line when predicting job performance from ability test scores. This analysis provides better information than that for differential validity, since it is possible for two data sets to have different regression lines even though they have the same correlation. In fact, differential prediction is currently the most widely used and most highly endorsed definition of test bias in educational and psychological measurement (e.g., Joint Committee on Testing Practices, 1988; Society for Industrial and Organizational Psychology, 2003). It is more commonly known as the Cleary (1968) definition of test bias.

Under the Cleary (1968) definition, even if black and white employees perform equally well on the job, and black employees perform lower on the selection test, no matter where a cut score is drawn, more white applicants will receive job offers than blacks. This will result in a scatter plot that shows equal validity but unequal predictor means. This, according to Cleary, is an unfair, biased test.

For a test to be considered unbiased in terms of no differential prediction or validity, under the Cleary (1968) definition, mean group performance differences on the test are supposed to translate into mean group differences in job performance. Some test critics claim that tests appear to be unbiased only because artifactual differences in mean group test performance are offset by artifactual mean group job performance differences.

This was a concern the NRC raised when it issued its report on its investigation of test bias in the GATB. In general, the NRC found the GATB to be unbiased. Applying the Cleary (1968) definition of test bias, the NRC found that a single regression equation relating GATB scores to supervisory ratings of job performance would not be biased against blacks. That is, applicants, black or white, with the same test score would have the same probability of succeeding on the job. Using the same decision rule, in the form of a single regression equation, would be expected to result in the same proportion of false negatives (people who would have done well on the job but did not pass the test) for blacks as it would for whites.

Although there are several definitions of selection fairness, they all have differing sensible and ethical suggestions that can conflict. Many of the definitions of selection fairness, for example, cause adverse impact on minorities. Furthermore, the Cleary definition fails to consider the validity or the utility of the criterion, in this case, performance appraisals. A performance appraisal obviously cannot accurately measure job performance. The performance

appraisal scores are different depending on whether they are given by a black or white supervisor. Reilly and Chao (1982 p. 55) concluded that "there is no reason to expect alternate predictors to behave differently because, test fairness research has, with few exceptions, supported the predictability of minority groups even though adverse impact exists," but once again, the validity of the criterion that these tests predict *was not* taken into consideration.

Based on this new information, this study reanalyzed the USES GATB data to assess differential validity and differential prediction.

HYPOTHESES

Because the NRC's analysis was dominated by white supervisor ratings, we expected that the analysis based on the white supervisor ratings of this group would produce results similar to the NRC's and that a significant differential validity or prediction would exist. Based on the finding that black supervisors rate black worker performance nearly as high as white worker performance (Stauffer & Buckley, 2005), it was expected that the validities and regression lines computed using black supervisor ratings would not be equal.

H1: *Differential Validity, Black Supervisor Scores: The correlation between black test scores and black supervisor ratings will be significantly less than that for white test scores and black supervisor ratings.*

H2: *Differential Prediction, Black Supervisor Scores: The slope of the regression of black supervisor ratings on black test scores will be significantly less than that of black supervisor ratings on white test scores.*

H3: *Differential Validity, White Supervisor Scores: The correlation between black test scores and white supervisor ratings will be not be significantly different from that of white test scores and white supervisor ratings.*

H4: *Differential Prediction, White Supervisor Scores: The slope of the regression of white supervisor ratings on black test scores will not be significantly different from that of white supervisor ratings on white test scores.*

METHOD

Subjects who were rated simultaneously by both a white and a black supervisor were identified. There were 349 black workers and 244 white workers who were rated by both a black and a white supervisor. Differential validity and differential prediction analyses were conducted on this group of subjects using first their white supervisor ratings and then their black supervisor ratings.

H1 and H3 were tested using a procedure outlined in Hays (1988, pp. 590-591). The computed correlations were transformed to Z scores (i.e., standard normal variants) using a Fisher *r*-to-*Z* transformation. The standard error of this transformed *Z* is 1/(N-3), where N is the

sample size. The test statistic is then the difference between the *Z* for black employees and the *Z* for white employees divided by the square root of the sum of the standard errors:

$$\frac{Zwhite - Zblack}{\sqrt{1/(Nwhite-3)+1/(Nblack-3)}}.$$

A multiple regression interaction test was used for H2 and H4 to test the differences between two regression slopes (Pedhazur, 1982, pp. 440-442). This procedure introduces a new variable (X1), coding black workers with a value of 1 and white workers with a value of -1. A second variable (X2) indicates the worker's score on the GATB. A third variable (X3) is created by multiplying X1 and X2. A multiple regression is run. If the regression weight for X3 is significant, then there are significant differences in the slopes for the two worker groups.

RESULTS

Table 1 displayed below shows sample sizes, means, and standard deviations for the data.

Table 1. Means & Standard Deviations

Ethnic Group		White Supervisor Score	Black Supervisor Score	Total GATB Score
White	**Mean**	22.1926	22.0738	903.2090
	N	244	244	244
	Std. Deviation	3.93880	3.95690	132.23713
Black	**Mean**	20.4756	21.6418	795.7221
	N	349	349	349
	Std. Deviation	4.40645	4.20462	108.77497
Total	**Mean**	21.1821	21.8196	839.9494
	N	593	593	593
	Std. Deviation	4.30083	4.10662	130.13695

The average score given to white workers by white supervisors (22.1926) minus the average score given to white workers by black supervisors (22.0738) is equal to 0.1188, which is not a significant difference. The average difference between scores given to black workers is 1.6375. The average score given to black workers by black supervisors (21.6418) minus the average score given to black workers by white supervisors (20.4756) is equal to 1.662, which is a significant difference. A Levene test (of the homogeneity of variances) showed that the standard deviations were not significantly different from each other.

Table 2. Regression Coefficients, Black Supervisors Rating White Workers					
	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
Intercept	18.082	1.737	--	10.413	.000
Slope	.004	.002	.148	2.323	.021

Table 3. Regression Coefficients, Black Supervisors Rating Black Workers					
	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
Intercept	19.022	1.660	--	11.456	.000
Slope	.003	.002	.0855	1.593	.112

Table 4. Regression Coefficients, White Supervisors Rating White Workers					
	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
Intercept	17.203	1.717	--	10.017	.000
Slope	.006	.002	.185	2.936	.004

Table 5. Regression Coefficients, White Supervisors Rating Black Workers					
	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
Intercept	17.403	1.739	--	10.010	.000
Slope	.004	.002	.095	1.783	.075

As indicated in the tables above, the regression slope for black supervisors rating white workers is .004 whereas white supervisors rating white workers is .006. Ratings given to black workers by white supervisors have a regression slope of .004, and ratings given to black workers by black supervisors had a regression slope of .003.

Table 6. Test for Equality of Regression Coefficients, White Ratings					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Intercept	17.303	1.244		13.910	.000
Total GATB Score	.005	.001	.142	3.240	.001
Interaction	-.001	.001	-.163	-.574	.566
a Dependent Variable: White Supervisory Rating Score					

Table 7. Test for Equality of Regression Coefficients, Black Ratings					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Intercept	18.552	1.213		15.293	.000
Slope	.004	.001	.122	2.730	.007
Interaction	-.001	.001	-.116	-.399	.690
a Dependent Variable: Black Supervisory Rating Score					

Tables 6 and 7 show the results of the interaction test for the equality of two regression coefficients (slopes). A significant interaction suggests that the two regression coefficients are different. In this case, I tested for the difference between the slopes of the regression of supervisory ratings on GATB scores for black versus white workers. Table 6 shows the results using white supervisor ratings. Table 7 shows the results using black supervisor ratings. Neither is significant (p = .566 for white supervisor ratings, p = .566 for black supervisor ratings), suggesting that, like the validity coefficients, black and white worker regression slopes are not different after all.

DISCUSSION

Although the hypotheses were not supported, These findings make an important contribution to personnel selection. The failure to find differences in the validities and regression slopes between white and black workers presents a problem for employment testing. These results suggest that there is no differential validity or prediction in the GATB. That means that the GATB would be expected to show no signs of bias regardless of who did the rating, white or black supervisors.

There are two problems with that expectation. First, one of the fundamental assumptions in the Cleary definition of test bias is that there is no bias in the criterion. That is clearly not the

case here. As can be seen in Table 8 below, there *is* bias in the criterion measure. White raters view a significant difference in the average performance of black and white workers in this sample, whereas black supervisors see no significant difference in the mean performances of the same group. Because of this bias, the Cleary definition loses its anchor and is thus incompetent to make any reliable determination of test bias. The apparent lack of differential prediction in such a situation is inconclusive.

Table 8. Differences in Black and White Worker Means

		Sum of Squares	df	Mean Square	F	Sig.
White Supv. Score	**Between Groups**[a]	423.341	1	423.341	23.767	.000
	Within Groups	10526.990	591	17.812		
	Total	10950.331	592			
Black Supv. Score	**Between Groups**	26.792	1	26.792	1.590	.208
	Within Groups	9956.901	591	16.848		
	Total	9983.693	592			
Total GATB Score	**Between Groups**	1659098.102	1	1659098.102	117.193	.000
	Within Groups	8366792.380	591	14157.009		
	Total	10025890.482	592			

a White Worker Group Versus Black Worker Group

These results illustrate the errors that can be made in employment test validation when not taking into account the bias that may exist in the criterion measure. In fact, relying on examinations of differential validity and differential prediction may mask the presence of criterion bias and falsely indicate that no bias exists in either the test or the criterion. Table 8 shows that a difference in mean GATB test scores will translate into a difference in mean job performance *only* if we use mainly white supervisory ratings as the criterion. In the eyes of black supervisors, there is no mean performance difference between black and white workers, so the performance gap predicted by the GATB is an illusion, regardless of whether or not we fail to find differences in the regressions and correlations between the two.

The bottom line is that differential prediction and differential validity may not be of much use without a good, unbiased criterion, as demonstrated in this study. This is especially true for differential prediction (the Cleary definition). Unfortunately, the Cleary definition is by far the most widely used method for determining test bias, and supervisory ratings are the most commonly used measure of job performance. We know that bias exists in these supervisory ratings. What we are not so sure about is if our earlier findings of no test bias in the GATB are correct. This study demonstrates that our methods for detecting bias in the GATB may not have been able to do that. It is at least open to debate and warrants further investigation. In any event,

it is fairly clear that employment testing researchers need to consider abandoning the unsound practice applying the Cleary definition when the criterion is supervisory ratings of job performance.

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UNIVERSITY STUDENTS' COMPUTER SECURITY PRACTICES IN TWO DEVELOPING NATIONS: A COMPARATIVE ANALYSIS

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ABSTRACT

We, as university professors, are perturbed by the constant barrage of reports indicating that computer systems and proprietary information all over the world are being successfully compromised. The nefarious success of these viral intrusions is partly an indication, we believe; that employees do not have the requisite information and security procedures to protect these systems. We therefore designed this study to investigate and compare security practices of university students (prospective employees) in two cultures, Nigeria and Turkey, since these two countries have embraced technology with avid interest. The justification for studying students is based on the fact that students are the corporate employees of the future and must possess the required knowledge and practical procedures required for computer systems protection. The findings reveal statistically significant differences in computer security practices between the two groups and also between genders. More important is the fact that the students in this study do not use sophisticated security measures such as biometric authentication, multifaceted authentications, and placement of passwords on e-mail attachments before sending.

INTRODUCTION

Files, data, and computer systems vulnerabilities are discomforting attributes of contemporary computing that can no longer be excused. The continuous vulnerability of data is partly a function of the lack of appropriate knowledge and unwillingness of end-users to apply known security measures with ardent and purposeful interest. This end-user laxity is more apparent among young college graduates who carry to the workplace the same college-days computer security disinterest that were perpetrated in college. This study therefore compares college students' interest and applications of selected security measures in their interactions with computers in two developing countries: Nigeria and Turkey. The justification for studying students is based on the fact that students are the corporate employees of the future and understanding their stance on computer security issues of today will provide a better handling or

alleviation of the problems of the future. These security practices investigated are the use of simple passwords, use of sophisticated passwords, daily computer system scan, scan of e-mail attachments, use of anti-virus software to check for viruses, placement of passwords on e-mail attachments, functions of biometric authentication, functions of firewalls, functions of intrusion detection systems, and functions of multifaceted authentication systems.

The boost in the use of computer technology and the Internet in developing countries has increased the likelihood that vital information will be stolen and misused (Yin & Prostakova, 2003). A particular concern is information security and university students' regularity in practicing safety and security measures in their digital environments. Globally, millions of university students log on the Internet routinely. Stoller (2009) contended that the majority of computer breaches are committed by individuals who have gained access to information on computer network systems either legitimately or illegitimately. Thus, it is pertinent for individuals such as university students to have computer security practices in place to protect information for themselves and their prospective employers.

RELATED LITERATURE

Several factors call for a reexamination of the security of our electronic information in contemporary society. It is common knowledge that computer technology and Internet utilization are intertwined and are growing geometrically; it is also known that within the last decade, students in developing countries have become savvier in the use of these technologies. A cursory look at the news on media outlets detects reports of computer security violations, successful intrusions, malware, and virus invasions into files to compromise computer systems. These continuous growth and system vulnerabilities add to the likelihood that vital information will be stolen and misused increasingly (Yin & Prostakova, 2003). A recent case in point is the charge against Private First Class Bradley E. Manning currently in prison for wrongfully introducing classified United States Department of State cables into an unsecured system (Charge Sheet, 2010). In a related publication, Jacob (2010) reported that Bradley E. Manning is suspected of being a source of the worldwide leaks of confidential government information to *WikiLeaks.* The state of continuous connectivity of government, corporate, and academic computer systems to the World Wide Web adds to this unparalleled defenselessness (Crowley, 2003). Millions of university students navigate the Internet daily. Since this large group of users will eventually become the next group of corporate and government employees, it is pertinent to determine their computer security practices before they graduate from college and join the global workforce.

Globally, there are many security concerns that are similar; however, the importance that each country places on security measures varies (Chen, Medlin, & Shaw, 2008). Also, different countries place varying conduct codes to information technology use to enhance information security awareness and ethics (Bia & Kalika, 2007).

Yin and Prostakova's (2003) research revealed that as individuals rely more on computers, there is an increase in the inappropriate use of computers and an increased need to secure information stored on them. CompTIA researched information technology breaches and found that the main reason was human error (Gross, 2003; Stoller, 2009). They recommended more training and certification of information technology workers to help deter cyber-threats. Smith (2003) reported that hardware failure is the main reason (40%) for data loss, human error such as deleting information is 29%, and hardware damage, software corruption, viruses, and theft account for 31%.

According to Yin and Protstakova (2003), there are various ways to protect information that is stored in computers and as it travels over the Internet. The authors recommend using a combination of security measures such as protecting information with passwords, installing anti-virus software, formulating a plan, using encryption, securing laptops, and training employees, faculty, and students.

Passwords

Protecting information with passwords has drawbacks because people tend to choose poor passwords (Birget, Hong, & Memon, 2006) that are short and derived from personal data that are easy to guess (Brown, Bracken, Zoccoli, & Douglas, 2004). Simple passwords are easy to hack, makes authentication easy to execute, and are easy to use to access information systems. However, sophisticated passwords are harder to figure out and consist of a combination of consonants and vowels, numbers, and unusual characters, which make them more hacker-proof (Weinshall & Kikpatrick, 2004).

An intruder can gain access to a password since they may be written and revealed in various ways (Stoller, 2009). Mitnick, who was once a hacker, but is now a security consultant, maintains that it is easier to trick individuals into giving their password than it is to hack into a computer system to obtain them. Hackers play a sophisticated con game called social engineering, which results in employees and students giving them the information to access their computer systems (Mitnick & Simon, 2002).

Yin (2004) reported that a social engineer gains computer access to information by two ways: hacking into the computer information system off-site and through their physical presence on-site by gaining a person's trust. Orgill, Romney, Bailey, and Orgill (2004) studied social engineering threats physically posing as an employee in a business's computer support department. The researcher asked the participants specific information such as their usernames and passwords. The study's findings revealed that 80% of the participants provided their usernames and nearly 60% provided their passwords. Greening (1996) studied undergraduate computer science students at Sidney University using an e-mail approach. E-mails were sent to the students requesting their usernames and passwords under the disguise of intrusion detection

and computer information system upgrade. Forty-seven percent of the students provided their usernames and passwords.

Computer System Scan

Computer system scans can be programmed in computers to be automatic or they can be performed manually. An automatic computer system scan occurs each time the computer is turned on. Edge (2010) recommends using the following five SOLID software principles to protect your computer network: a) Simplicity (how easy to access the network), b) Obscurity (easy or difficult to understand), c) Layering (build layers of defense), d) Impeding (hinder intruders), and e) Diversity (use diverse computer platforms). The researchers recommend running a complete scan of the computer system with anti-virus and anti-spyware software every week.

Antivirus Software for Virus Check

Anti-virus software is designed to protect computer systems from being infected by viruses. The first virus occurred in 1987 when ARPANET was infected. Now, computer virus infections are an epidemic with new viruses being introduced weekly (Schulz, 2004). The more recent polymorphic viruses are of particular concern since they can change their signature when they replicate and infect different file types to prevent detection (Teer, Kruck, & Kruck, 2007).
Teer *et al*. (2007) researched the security practices of undergraduate students majoring in Art, Computer Information Systems, and Integrated Science and Technology. The majority of the students (91%) used an antivirus program, 71% regularly updated their antivirus program, and 43% conducted an antivirus scan weekly. Forty-nine percent of the undergraduate students had no viruses in the last 12 months, 47% had from less than five to more than ten viruses, and 3% were unsure whether they had a virus in their computers.

Biometric Technology

Orlowski (1997) contends that encryption is a basic tool that is used to protect information technology. However, Piper (2005) maintains that encryption does not prevent interception of information while it travels over the Internet or when it is stored in the computer. Furthermore, individuals can read the information at the sending and receiving end of the transmission if the environment is insecure. However, stronger protection for computer systems is being developed using biometric technology. It uses an individual's biometrics such as fingerprint to encrypt other data. With biometric technology, the individual's biometric encrypted template is retained. Therefore, if the hackers access the biometric, they will not get

the biometric template, they get a meaningless password that the individual's biometric was used to encrypt (Stoller, 2009).

According to Jain (2004), fingerprint recognition is the most used method of biometric authentication and it is considered a secure authentication method since it is unique to each individual. Al-harby, Qahwaji, and Kamala (2008) maintained that a major drawback with biometric authentication such as fingerprint and face recognition is acceptance and trust. If the authentication system is secure or efficient it is still not beneficial if people are not willing to use it. The researchers' study focused on the feasibility of biometric authentication systems in e-commerce in Saudi Arabia. The study revealed that the participants were in favor of the use of biometric authentication, and the majority of the respondents (81.2%) self-reported that they preferred the fingerprint authentication system.

Firewall Protection

Another way to secure information is to use a firewall. There are two basic types of firewalls: software and network. The software firewall is specialized software that runs on an individual computer. The network firewall is a dedicated device that protects one or more computers. Firewalls protect information by preventing unauthorized access to networks connected to the Internet; however, it limits access to information. Firewalls are usually the first defense mechanism against hackers especially since more broadband connections are on continuously, which make computer intrusion more likely (Meiselwitz, 2008).

Teer, Kruck, and Kruck's (2007) study found that 53% of the undergraduate students use firewall protection, 33 % do not use a firewall, and 14% were unsure of the presence of a firewall on their computers system.

Intrusion Detection System

Computer technology intrusion detection systems are tools that assist in keeping information secure using automated systems or manual devices. Intrusion detection is defined as "the primarily reactive security work of monitoring network activity for signs of malicious or abnormal behavior" (Goodall, Lutters, & Komlodi, 2009, p. 2). Network security is a pressing concern for organizations, and costs for a security breach can be as much as $14 million. Another concern is new forms of cyber warfare which can virtually shut down Web sites for extended periods of time (Hall, 2005).

Intrusion detection systems (IDSs) assist preventative controls which include anti-virus software and firewalls. IDSs assist in securing information by detecting intrusions of external hackers who bypassed preventative controls as well as intrusions of internal hackers (Escamilla, 1998).

Multifactor Authentication Systems

Using more than one authentication factor at the same time increases hacker frustration and prevents ease of intrusion. Multi-factor authentication combines three distinct factors: a) password (something you know), b) smart card (something you have), and c) fingerprint (something you are). However, multifactor authentication systems though sophisticated are expensive considering the cost for cards, associated equipment, technical maintenance, and management.

Even with the high expense, smart-card technology is growing fast since it has been widely adopted in the retail industry. In addition, cellular phones and landline phones are emerging on the scene as second factor authentication devices because they are ubiquitously owned. Cellular phones are equipped with software that interact with smart cards that can be installed on a landline phones or laptop computers (Stoller, 2009).

Gender vs. Technology

There are mixed findings among the topics of learning differences in technological fields between genders. Among many self-evaluation survey results, He and Freeman (2010) suggested that females feel less confident with computers because they have learned less and practiced less, and feel more anxious about using computers when compared with male counterparts. However, Wasburn and Miller (2006) stated that females expressed confidence in their own abilities in technology. Shannon (2008) also found that females have a higher level of communication skills than the males who evaluated themselves. In addition, there was no significant difference between genders when comparing the comfort levels with digital life environment (Shannon, 2008). Considering the issue of digital divide, males and females have not been found to demonstrate significant differences in technology knowledge and learning outcomes (Coolbaugh, 2004; Lipinski, 2005).

RESEARCH METHODOLOGY AND DATA COLLECTION

This study uses part of the data from an original broader study that explored practical applications and familiarity with information systems security measures among Nigerian public university students in fall 2008. A section of the constructs that formed the original survey (see Appendix A for English version and B for Turkish version) adapted from (Lomo-David & Shannon, 2009) for the previous study was translated into Turkish, administered to Turkish public university students in spring 2009, and the results were compared with the Nigerian university students' survey. In the current study, ten survey questions focused on the regularity of usage of computer security practices on the one hand and eight demographic characteristics questions on the other. The first ten constructs specifically requested respondents to indicate how

often (<10%, 11-30%, 31-50%, 51-80%, >80%) they have practiced usage of the ten computer security measures (see Table 1) in the past twelve months. For analysis purpose, the percentage of frequency was converted to the scale of 1 to 5 which 1 is less than 10% and 5 is greater than 80%. In Turkish version of the survey "never, rarely, sometimes, most of the time, always" scale was used instead of (<10%, 11-30%, 31-50%, 51-80%, >80%). There were a combined total of 1,117 (Turkish = 575 and Nigerian = 542) students whose survey responses were used in the study. Based on the standards of minimal total sample sizes for different hypothesis tests with alpha at 0.05 level of significance and with statistical power at 0.7 level, 620 is the recommended sample size (Gall, Gall, & Borg, 2003). The usable sample size of 1,117 from this study is greater than the minimum of 620 which provided a sufficient data to continue the analysis process.

Demographics Characteristics

Demographic characteristics of the respondents revealed Turkish males to be 225 (39.13%) and females 350 (60.87%); and Nigerian males 264 (48.71%) and females 278 (51.2%). The age range for Turkish students is 18 to 30 and for Nigerian students it is 18 to above 50 years. The computer experiences of participants included expert, very good, good, poor, and novice (see Appendix A). For analysis purpose, the responses were converted to a scale of 1 to 5 where 1 is expert and 5 is novice. Since the questionnaire requested participants to self-report their level of expertise with computers, the reported levels of expertise were not verified. These results were obtained by analyzing the data with SPSS 17 employing descriptive statistics and t-tests.

DATA ANALYSIS

The most regularly used security measure by respondents was anti-virus software to check for viruses (Mean: 2.84, S.D.: 1.29). Other more regularly used security measures were simple passwords, e-mail scan for viruses, and daily computer system scan (Table 1). The least regularly used security measure by respondents was biometric technology (Mean: 1.46, S.D.: 0.83). Other least regularly used security measures were multifaceted authentication systems, placement of passwords on e-mail attachments, and intrusion detection systems. These results show that undergraduate students in these countries do not use sophisticated computer security measures. This validates other studies (Teer *et al*., 2007; Orgill *et al*., 2004; Greening, 1966) that have reported minimal security consciousness among end-users and undergraduate students.

Differences between Turkish and Nigerian Students' Regularity of Security Practice

Responses from Turkish students indicate that 30.6% of respondents always practiced the use of anti-virus software to check for viruses. Also, more than 45% of them never use placement of passwords on e-mail attachments. The most regularly used security measure by Turkish students was anti-virus software to check for viruses. The least regularly used security measure by Turkish students was functions of biometric authentication (56% never use it and 1.7% always use it) (Table 2).

Table 1: Descriptive Statistics Of Students' Regularity Of Security Practice

Computer Security Measures	Mean	SD
Use of anti-virus software to check for viruses	2.84	1.29
Use of simple passwords to protect your computer data and usage	2.72	0.96
Scan of e-mail attachments	2.72	0.96
Daily computer system scan	2.70	0.93
Use of sophisticated passwords to protect your computer data and usage	2.19	1.23
Functions of firewalls as security measures	2.02	1.10
Functions of intrusion detection systems as security measures	1.82	1.07
Placement of passwords on e-mail attachments	1.71	0.97
Functions of multifaceted authentication systems as security measures	1.66	1.01
Functions of biometric technology as security measures	1.46	0.83

Table 2: Regularity Of Security Practice In Turkey

	Never	Rarely	Sometimes	Most of the time	Always
Use of simple passwords	16.0	24.2	31.7	22.1	6.1
Use of sophisticated passwords	20.7	21.0	21.9	27.0	9.4
Daily computer system scan	22.1	27.8	28.3	14.3	7.5
Scan of e-mail attachments	25.7	25.6	23.7	16.7	8.3
Use of anti-virus software to check for viruses	14.3	13.4	19.3	22.4	30.6
Placement of passwords on e-mail attachments	45.9	26.4	17.6	8.0	2.1
Functions of biometric technology	56.0	23.3	13.0	5.9	1.7
Functions of firewalls	25.2	33.0	22.3	12.0	7.5
Functions of intrusion detection systems	36.7	28.5	17.6	11.5	5.7
Functions of multifaceted authentication systems	36.7	30.1	18.4	10.6	4.2
Note: The percentage of times respondents practiced security measures in the past twelve months.					

Nigerian respondents (Table 3) used all the listed security measures less than 51% of the time during the past 12 months. Specifically, 92% of Nigerian respondents used scan of e-mail attachments between 31% to 50% of the time; and 89% used a daily computer system scan 31% to 50% of the time. Regarding simple passwords, 80% of respondents used it 31% to 50% of the time; while 59% used sophisticated passwords less than 10% of the time.

Table 3: Regularity of Security Practice in Nigeria

	< 10% %	11%-30% %	31%-50% %	51%-80% %	>80% %
Use of simple passwords	14.0	5.5	80.4	0.0	0.0
Use of sophisticated passwords	59.0	30.3	10.7	0.0	0.0
Daily computer system scan	5.2	5.5	89.3	0.0	0.0
Scan of e-mail attachments	3.0	5.0	92.1	0.0	0.0
Use of anti-virus software to check for viruses	20.8	36.2	43.0	0.0	0.0
Placement of passwords on e-mail attachments	71.2	10.3	18.5	0.0	0.0
Functions of biometric technology	85.2	12.9	1.8	0.0	0.0
Functions of firewalls	59.8	22.5	17.7	0.0	0.0
Functions of intrusion detection systems	71.0	18.3	10.7	0.0	0.0
Functions of multifaceted authentication systems	88.7	9.4	1.8	0.0	0.0

Note: The percentage of times respondents practiced security measures in the past twelve months.

HYPOTHESES TESTED

H1 *Nigerian and Turkish undergraduate students use computer security measures with the same level of regularity.*

H2 *Female and male undergraduate students use computer security measures with the same level of regularity.*

The primary interest of this study was to test for statistically significant differences between Nigerian and Turkish students regarding regularity of computer security practice. Mean comparison using independent samples t-test reveals that there was a significant difference between Nigerian and Turkish students for all listed computer security practices at the 5% level (Table 4). The results show that Turkish students use all of the listed security practices except daily computer system scan and scan of e-mail attachments more regularly than Nigerian students.

Differences between Male and Female Students' Regularity of Security Practice

The second hypothesis was to test for a statistically significant relationship between gender and regularity of security practice. T-test results show that there was a significant difference between male and female students in 4 of 10 listed security practices at the 5% level

(Table 5). There were 489 males (43.8%) and 628 females (56.2%). Significant differences exist between males and females in the following security practices: daily computer system scan, placement of passwords on e-mail attachments, functions of firewalls, and functions of intrusion detection systems. Females' mean score is higher than males for only placement of passwords on e-mail attachments. (Females' mean: 1.76, Males' mean: 1.65). It is interesting to note that there is a pattern of practicing on the security items, which males had a higher frequency than females. This pattern could suggest further investigation in the phenomena of females practicing security protection less frequently than the males.

Table 4: Results of Independent T-Test between Nigerian and Turkish Students

	Nigerian Students		Turkish Students		
	Mean	SD	Mean	SD	P
Use of simple passwords	2.66	0.71	2.78	1.14	0.039*
Use of sophisticated passwords	1.52	0.68	2.83	1.29	0.000*
Daily computer system scan	2.84	0.49	2.57	1.19	0.000*
Scan of e-mail attachments	2.89	0.40	2.56	1.26	0.000*
Use of anti-virus software to check for viruses	2.22	0.77	3.42	1.41	0.000*
Placement of passwords on e-mail attachments	1.47	0.79	1.94	1.07	0.000*
Functions of biometric technology	1.17	0.42	1.74	1.01	0.000*
Functions of firewalls	1.58	0.77	2.43	1.20	0.000*
Functions of intrusion detection systems	1.40	0.67	2.21	1.22	0.000*
Functions of multifaceted authentication systems	1.13	0.39	2.15	1.15	0.000*
Note: *Indicates significance at the 0.05 level.					

Table 5: Results of Independent T-Test between Male and Female Students

	Female Students		Male Students		
	Mean	SD	Mean	SD	p
Use of simple passwords	2.72	0.94	2.72	0.98	0.992
Use of sophisticated passwords	2.19	1.24	2.20	1.21	0.922
Daily computer system scan	2.61	0.96	2.82	0.87	0.000*
Scan of e-mail attachments	2.68	1.00	2.78	0.91	0.068
Use of anti-virus software to check for viruses	2.81	1.27	2.87	1.31	0.436
Placement of passwords on e-mail attachments	1.76	0.99	1.65	0.95	0.050*
Functions of biometric technology	1.44	0.82	1.49	0.85	0.306
Function of firewalls	1.94	1.00	2.12	1.22	0.008*
Functions of intrusion detection systems	1.69	0.94	1.97	1.20	0.000*
Functions of multifaceted authentication systems	1.62	0.94	1.71	1.09	0.156
Note: *Indicates significance at the 0.05 level					

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CONCLUSION AND DISCUSSION

The main aims of this study are to investigate the differences in computer security practices of Nigerian and Turkish university students and to compare gender differences in computer security practices. Based on data produced by the descriptive statistics, the four most regularly used computer security measures are the use of antivirus software to check for viruses, use of simple passwords, scan of e-mail attachments, and daily computer system scan, where each has a mean not less than 2.70. The study results indicate that undergraduate students in both countries do not use sophisticated computer security measures. This finding supports previous research results. According to the results of this study, Turkish students use all of the listed security practices except daily computer system scan and scan of e-mail attachments more regularly than Nigerian students. Significant differences between genders are found in the following security practices: daily computer system scan, placement of passwords on e-mail attachments, functions of firewalls, and functions of intrusion detection systems. The males' mean score is higher than females' for all security measures except use of simple passwords and placement of passwords on e-mail attachments. Male students are more cautious about computer security than female students.

The lack of implementation of system security can contribute to reduced productivity and thus lack of bottom line growth. Students are prospective human resource personnel and are expected to contribute to productivity enhancement while employed. Universities have the duty to ensure that students are equipped with computer security practices as they graduate and join the workforce. These computer security measures must be properly implemented to ensure reduced time lost to system downtime in case of successful intrusions. Training undergraduate students to avoid disastrous computer activities before graduation from the university could save corporations millions of dollars in the cost of information security risk management in the future and also reduce potential problems on campus (Booker, Rebman, & Kitchens, 2009).

The results documented in this study lead us to believe that teaching computer security measures is a critical and important duty for education institutions today. Whatever the students' discipline, the curriculum should present information system security measures with equal interest as other components of the subject. It is expected that as students are taught computer security threats and these measures, they will use computers with carefulness on campus and in business.

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TEACHING ASYMMETRIC INFORMATION: LESSONS FROM THE 2008 FINANCIAL CRISIS

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ABSTRACT

Introductory economics and finance textbooks devote coverage to problems of asymmetric information such as moral hazard and adverse selection, but often only provide examples of these problems limited to the "lemons" problem, insurance and principal-agent issues. We have found that students learn more effectively when given contemporary examples directly related to the material, so in this paper we suggest an improved approach to classroom discussion of a variety of asymmetric information issues. We begin with a basic coverage of asymmetric information problems and then suggest new examples that illustrate the concepts clearly using the economic downturn of 2008 as a backdrop.

INTRODUCTION

In his lecture before the Nobel Committee in 2001, Joseph Stiglitz pointed out that he began his study of information economics based not on what he observed in markets, but from a curiosity about what he could not observe:

> *"The problems that we saw with the models that we were taught was not only that they seemed wrong, but that they left a host of phenomena and institutions unexplained – why were IPO's typically sold at a discount? Why did equities, which provided far better risk diversification than debt, play such a limited role in financing new investment?"* (Stiglitz, 2001, page 476)

We argue that our students should have some of the same questions and insights when they are studying corporate finance. Indeed, by asking them to reflect and meditate on the current financial crisis we are inviting these discoveries, and it helps to have clarifying examples and explanations ready when they ask.

Here Be Dragons[1]

The economics of asymmetric information and agency theory offers explanations for a large body of observed behavior in corporate finance, markets, and institutions. Unfortunately, contemporary corporate finance textbooks offer discussions that may be limited to dividend

signaling, capital structure decisions, control or compensation. If we are to do justice to information problems and their pervasive nature it often means that we will be entering a realm that puts chilling terror in the hearts of undergraduate and graduate students alike:

A full treatment of asymmetric information and agency theory is "not in the book."

Most of us worked through these topics in graduate school by adding to our understanding one article or working paper at a time. Our students benefit from a more practical approach, one that follows observed behavior from their own (sometimes limited) experience. The time-honored examples of the "lemons" problem: insurance, labor markets, perquisite consumption and bank lending go over much better than leading into a discussion with terms such as "bonding costs," "screening," and "signaling equilibria."[2] We often use education as an example of signaling behavior, and used cars for adverse selection. Insurance provides a ready example of moral hazard. Real estate brokers are a staple for discussing agency theory. Too often, though, this may be where our basic coverage ends; later classes will need students to be familiar with these ideas for understanding agency problems and capital structure or dividend issues. The recent crisis provides a natural backdrop for filling that gap by extending examples of many of these phenomena and making their explanations more relevant to our students.

We start by offering a synopsis of what students need to understand about asymmetric information and agency issues when they are learning the basics. From class-testing, we've found that this treatment complements the topics in corporate finance, from an introductory undergraduate course to the advanced graduate course in financial policy. After setting up this foundation, we give some examples of adverse selection, moral hazard and agency problems from the current financial environment and we offer other suggestions for working with students on these topics and for assessment of their knowledge on the topic.

What do students need to know?

Asymmetric information in markets creates two distinct economic problems: adverse selection and moral hazard; it contributes to yet another phenomenon - the agency problem.

Adverse selection

Adverse selection is the information problem that occurs before a contract is settled. Any offered contract selects (or is pursued most vigorously by) parties who would obtain the greatest surplus from the contract, an adverse outcome for the contract proposer. In extreme cases, this can lead to the collapse of markets. George Akerlof received a Nobel Prize in Economics for his 1970 work describing adverse selection in insurance markets as similar to a "lemons" problem, where sellers of "good" used cars would pull out of the market if their car wasn't priced

according to its value, but sellers of "bad" used cars would flock to the market to take advantage of the information asymmetry and perhaps sell their car for more than it was actually worth. At the same time, buyers would focus on the average value, and assign an average price, likely driving out the sellers of good cars, decreasing the average value of the remaining cars, and thus the average price offered, and creating a cycle that would collapse the market. This particular problem can be solved by the intervention of used-car dealers who substitute their reputations for those of the sellers, by warranties from individual sellers, or by certification of used cars by a third party such as an ASE-certified mechanic. The question of "if it's such a great car, why are you selling it?" must be answered, somehow, before markets can clear.

In loan markets, potential borrowers may have better information about their creditworthiness than lenders, who must avoid lending to applicants who will not repay ("lemons"). Traditionally, banks have controlled the problem by requiring collateral, lending short-term, and conducting counterparty surveillance: diligently assessing the assets, history, and character of borrowers to determine the likelihood the bank will be repaid.

Similarly, in corporate finance, a common example of a "lemons" problem is the market for seasoned equity offerings (SEOs). Firms may avoid issuing equity because the market will expect rational managers to only want to sell equity when it is overvalued.[3] Better firms will withdraw from the public issuing process and create debt or obtain private financing, leaving a predominance of weaker firms to come back to the market for equity on a periodic basis. Even the largest companies may avoid SEOs for this reason, choosing to wait as long as possible before issuing new shares.

In insurance markets, if insurance companies cannot determine which applicants are riskier they may not issue policies to anyone. To bond the interests of policyholders to the insurer, insurance companies will use deductibles and coverage limits. Higher premiums will not discourage bad risks, nor will higher deductibles by themselves, so insurance companies seek out better information about the character and creditworthiness of applicants (such as a FICO score).

Moral hazard and the agency problem

Moral hazard in a contract occurs after the deal is signed, and reflects the ability of one party to the transaction to unexpectedly change the characteristics of the deal in its favor afterward. This often involves changing the risk of the contract to the other party. A common example is that of a bank borrower who, in the absence of contract devices to prevent it, might tell the bank that the loan is for a safe purpose beforehand and instead use the loan proceeds to invest in something far more risky after receiving the funds.

Moral hazard also contributes to difficulties in the principal-agent relationship, or what is known as the agency problem. This problem arises because it is difficult and costly to engage someone to act in one's behalf, design their compensation, and monitor their performance.

(Jensen & Meckling, 1976; Fama, 1980). Fama refers to the phenomenon of "ex post risk-shifting" as a consequence of moral hazard and poor contract design. For example, without sufficient monitoring managers will follow their own incentives to shirk, take inefficient risks, and/or maximize earnings in the short-run rather than the long-run. Similarly, absent monitoring, shareholders will be tempted to change the risk of the firm after corporate bonds have been issued. If the risk of these problems occurring is high enough, there will be little to no demand for equity and debt securities at prices worthwhile to the firm to issue them.

Contracts that align the incentives of the agent (e.g. a manager) with the principal (e.g. shareholders) can overcome moral hazard problems, but designing and bargaining over incentive contracts is error-prone and costly. A credible contract benefits the agent when the principal benefits, and costs the agent when the principal is harmed with appropriate monitoring mechanisms (Jensen & Meckling, 1976). The perfect solution, *in theory*, is to shift all gains to exerted effort onto the agent (e.g. sell the house to the Realtor, sell your civil suit to your lawyer, or sell the firm to the managers). However, this is often unworkable in a practical sense, and markets gravitate towards means that minimize transactions costs.

Generic fixes: bonding, monitoring, signaling, and screening

In a general sense, asymmetric information and agency problems can be fixed with either bonding mechanisms or by structured monitoring. Jensen and Meckling (1976) use the terms *bonding* and *monitoring* in order to be consistent with the agency and contracting literature. *Bonding* forces the party whose behavior "matters" (e.g. agents, borrowers, the insured) to bear the costs of a bad outcome. To be effective, the cost of the bond must be consequential to the bonded, and it must be directly related to any incentive that they may have to "cheat." *Monitoring* imposes costs on the passive party (e.g. principal, lender, insurance company), and focuses on intermediate behavior or performance rather than merely outcomes. Bonding aligns the incentives of the parties in a contract and creates benefits for performance and costs for non-performance. Monitoring is as it sounds – principals watch carefully the behavior of the party after the contract and also structure the contract, in advance, to require disclosure. [4]

Even though most bonding activities work to fix adverse selection problems, and therefore occur before the transaction (the development of one's reputation, for example), bonding is still of use in reducing moral hazard. A good example of this is the traditional home mortgage, where owners were bonded with a 20 percent down payment requirement. This amount served two functions: it absorbed any loss in market value and made sure that the *owner* lost the first dollar of any loss taken, and it made sure that owners had the creditworthiness necessary to save enough for the down payment to start with and therefore were, in theory at least, better credit risks. Such a large requirement ensured that only the most stable borrowers could afford to ask for loans in the first place, but also made it less likely that borrowers would

walk away from their payments in the event of trouble (thus again reducing the moral hazard problem).

Signaling and *screening* are terms for the bonding and monitoring mechanisms that markets use to solve information problems. For example, in order for a seller to demonstrate that her car is in fact a "good" car, for instance, she must give some piece of expensive, credible information to potential buyers - she must send a *signal*. The signal *bonds* her statement that the car is valuable.

A signaling example that students find relevant comes from Spence's 1973 paper on job-market signaling. Low-ability workers may find it too costly to obtain credentials (i.e. the effort to succeed at making high grades and/or keeping good jobs is too high given the immediate rewards), while high-ability workers find the cost relatively low. As such, employers who see these credentials on a candidate's resume can credibly assume the candidate is high-ability, hiring and rewarding them appropriately. Because it is a type of bonding, the cost of signaling with an education investment must be substantial or all types of sellers will acquire the same credentials and their value as a signal will drop to zero.

In the market for corporate debt, the issuer of a security pays for the credit rating (a costly signal) up front. Although this is an apparent conflict of interest, as the credit rating helps determine the yield required on the new bond issue, having potential buyers pay would not work out of both fears of paying to rate a lemon and free-riding on the rating by non-paying potential buyers.[5] Instead, certification through a bank ends up being a popular way to solve this problem, because the bank has a reputation of its own, earns rents on this reputation and therefore bonds its own credibility by putting its valuable reputation at risk.

For the initial public offering (IPO) market, Leland and Pyle (1977) discuss how companies confident of success should signal as such. In their example, owners who keep control of a large percentage of the company have their own money on the line and credibly signal their confidence. Their level of commitment is signaled or bonded by their individual investment. Similarly, individuals who are conscientious of their credit scores wish to raise or maintain them to signal their low borrowing risk and obtain lower rates.

With signaling the party with the information advantage sends the signal; in screening, the party with the information disadvantage decides what information it will use to distinguish between applicants. An effective job market screen will impose enough costs on undesirable candidates that they will decide to not take the contract. For example, internships serve as a screening mechanism, and they are more and more popular each year. Employers impose the cost of an internship on the applicants and observe whether their transcripts convey their actual abilities or not. Good applicants have a higher opportunity cost, but also have more to gain from the internship and they don't have to worry that some deception will be revealed. In education, exams are a form of screening mechanism because they end up being low-cost to high-ability, high-work-ethic students, and high-cost to low-ability, low-work-ethic students. Credit scores

are an obvious financial example. Requiring large down payments on home mortgages is another.

Lemons in the Recent Crisis

In this section, we describe specific examples from the recent economic crisis that can be used to explain to students the importance of asymmetric information problems. We start by discussing the role of banks and credit rating agencies in signaling and screening. We also examine how adverse selection problems cause and exacerbate liquidity crises.

Signaling and screening

As mentioned above, the signaling (bonding) and screening (monitoring) ideas of Spence (1970) are both potential solutions for adverse selection. Over the past century, various institutions have evolved that specialize in helping participants evaluate and convey information. For students, the role that banks play in understanding counterparty risk is straightforward. Banks act as screeners by requiring the disclosure of information from potential borrowers such as employment history, financial records, credit score, and they have the resources to obtain and process these records at low cost. Because banks have traditionally kept the loans that they made, they had the proper incentives to screen appropriately. Later we discuss the impact of the originate-to-distribute (OTD) model, where a *moral hazard* problem led banks to screen poorly.

Credit ratings

Borrowers with good credit want to distinguish themselves from riskier borrowers, and thus have the incentive to try and send a signal of their relative quality. They purchase credit ratings from credit agencies in order to signal the quality of their assets (or are screened by credit ratings if lenders require them). If these ratings are accurate, this removes the information asymmetry regarding the default risk and the adverse selection problem is eliminated. Essentially, credit rating agencies fill the screening role of banks writ large. Without functioning and reputable credit rating agencies, the information asymmetry between the issuers of securities and potential buyers would be so large that a serious "lemons" problem would result.

The recent financial crisis caused a loss in confidence in credit rating agencies. Credit rating agencies were tasked with the duty of rating securities spun out of complicated instruments of structured finance, particularly those involving tranching rather than pass-through securitization.[6] Adverse selection drove the choice of tranching, as tranching creates very low-risk assets in the form of senior tranches with a primary claim on the collateral, so more assets are created that are viewed as riskless and do not require a lemons discount (Myers & Majluf, 1984; Gorton & Pennacchi, 1990; as reported in Benmelech & Dlugosz, 2010).

As it became apparent in 2007 that the riskiness of some tranches was underestimated, a rash of downgrades took place. "Sixty-four percent of all rating downgrades in 2007 and 2008 were tied to securities that had home equity loans or first mortgages as collateral. Collateralized debt obligations (CDOs) backed by asset-backed securities (ABS) accounted for a large share of the downgrades….ABS CDOs accounted for forty-two percent of the total write-downs of financial institutions around the world." (Benmelech & Dlugosz, 2010, page 3). As investors lost confidence in credit ratings, the market for structured finance dried up. CDO issuance fell to its lowest level since the mid-1990s. The number of all new structured finance tranches issued between January and September 2008 fell to 6,644 from a peak of 47,055 in 2006. Thirty-one percent of the downgrades in the first three quarters of 2008 involved AAA-rated tranches. As confidence in ratings plummeted, fear of buying lemons increased, which helped exacerbate a liquidity crisis already in progress.

Additionally, the existence of ratings themselves creates moral hazard - participants will rely on ratings and fail to measure risk on their own, or free-ride on announced ratings if regulators allow them to. Former Federal Reserve Chairman Alan Greenspan blames the 2008 crisis on this phenomenon, in part, and refers to it as "the collapse of private counterparty credit surveillance." (Greenspan, 2010, page 3)

Discount window borrowing

In addition to trying to send good signals, institutions must also avoid sending signals that may be perceived as an indicator of weakness. The Federal Reserve has had much frustration trying to get banks to borrow from the discount window, because banks "fear that discount window borrowing might signal a lack of creditworthiness on the interbank market". (Brunnermeier, 2009). Likewise, banks that needed to raise equity during the recent crisis were reluctant to do so because of the fear that the need for funds could be construed as a sign of weakness.[7]

Adverse selection and the liquidity crisis

A financial crisis can be caused or exacerbated if the problems of adverse selection occur en masse. For example, if an asset is being put up for sale, the buyer must consider whether the sale is due to a need for liquidity or because the asset is of low quality. In the recent financial crisis, it was difficult to ascertain the underlying quality of many of the new, esoteric instruments.

In 2007, the market for subprime-mortgage backed securities (SMBS) suffered a liquidity crunch. As Kirabaeva (2009, page 2) writes, "When the economy is in a normal state with strong fundamentals, the asymmetric information does not significantly affect the value of mortgage-backed securities [because loans can always be refinanced using higher home prices if needed].

However, when an economy is subject to a negative shock, the value of the security becomes more sensitive to private information and the adverse selection may influence trading decisions."

The impact of declining housing prices on MBS depended on the exact composition of mortgages that backed the securities. Some MBS were affected more than others. Due to the complexity of structured financial products and heterogeneity of the underlying asset pool, those receiving payments have an informational advantage in estimating how much these securities are worth. This asymmetric information about the true value leads to the lemons problem, wherein a buyer does not know whether the seller is selling the security because of a sudden need for liquidity, or because the security is toxic (Krishnamurthy, 2008).

The failure of confidence that results as adverse selection problems worsen aggravates the problem. As uncertainty regarding the true value of assets increases, trading decreases. As trading decreases, market confidence decreases. The lack of trading partners concerns investors, as they fear there will be even fewer potential buyers for the securities in the future. Uninformed traders prefer to trade when other uninformed traders are in the market. They fear being taken advantage of by an experienced trader, and so desire to wait until market activity picks up, which in turn increases market confidence (Morris & Shin, 2010). With the more exotic financial securities, most traders were "uninformed" and liquidity crashed. These assets could not be sold, nor could they be used as collateral. Brunnermeier (2009) states that "Financiers are also unwilling to accept assets as collateral if they fear receiving a particularly bad collection of assets. [They are] worried that [borrowers] sold the good "sellable" assets and left as collateral only the bad, less valuable 'lemons'."

Moral Hazard During the Crisis

The recent turmoil gives us a host of excellent examples of moral hazard for both undergraduate and graduate level finance courses. We limit our discussion here to some of the most-widely-cited cases, such as large-scale corporate and sovereign bailouts, subprime consumer lending, and the compensation structure and excessive risk taking of managers in financial institutions.

Bailouts

Regulatory or go vernment rescues, also known as bailouts, represent transfers from the government to companies or their creditors to avoid bankruptcy or alleviate its consequences (Green, 2010). The moral hazard occurs when the firm or borrower anticipates that it will be bailed out by the government and takes considerable risks which otherwise would have been avoided. Bailouts create distortions in the market evaluation of risk, because subsequent investors will come to expect the ex post shifting of risk onto other parties. The creditors' opinion of the riskiness of the company in this case is based on the perceived probability of the

company to get bailed out rather than on the investing and operating decisions and the efficiency of the firm (Poole, 2009).

The moral hazard of "Too Big to Fail"

n a larger context, moral hazard can occur in the financial markets when institutions are deemed "Too Big to Fail" and regulators end up keeping them from failing. A well-known example of this occurred in 1984 when Continental Illinois, a state-chartered bank in Chicago, experienced sudden loan losses and was on the brink of failure (FDIC, 1997). In order to protect the bank's depositors and other counterparties to its highly leveraged investments in the oil and gas industry, FDIC and other regulators assisted in an orderly recapitalization of the bank. The original contract for deposit insurance specified that banks without enough equity capital (due to losses, perhaps) were supposed to be closed to protect depositors and the system itself. By not following through with this, regulators implicitly revised the contract terms of other large institutions and also helped create a merger boom that continued throughout the 1980s and 1990s.

The failure of Long-Term Capital Management (LTCM), the hedge fund founded in part by Robert C. Merton and Myron Scholes, is another potential moral hazard event that students can learn from. The Federal Reserve convened large stakeholders to recapitalize LTCM before the markets and smaller counterparties could suffer from a panic. Regulators have to balance moral hazard issues such as this very carefully, as discussed before Congress by Federal Reserve Chairman Alan Greenspan in 1998:

> [H]ow much weight should concerns about moral hazard be given when designing mechanisms for governmental regulation of markets? By way of example, we should note that were banks required by the market, or their regulator, to hold 40 percent capital against assets as they did after the Civil War, there would, of course, be far less moral hazard and far fewer instances of fire-sale market disruptions. At the same time, far fewer banks would be profitable, the degree of financial intermediation less, capital would be more costly, and the level of output and standards of living decidedly lower. Our current economy, with its wide financial safety net, fiat money, and highly leveraged financial institutions, has been a conscious choice of the American people since the 1930s. *We do not have the choice of accepting the benefits of the current system without its costs.* (italics added; Greenspan, 1998)

The mortgage meltdown in 2008 caused write-downs of billions of dollars by banks and other financial institutions which had exposures to mortgage-related securities. Several examples during the market turmoil in 2008 stand out. Bear Stearns' liquidity situation deteriorated

significantly in March 2008 and the Federal Reserve Bank of New York had to step in and arrange their acquisition by JPMorgan Chase (Brunnermeier, 2009).[8] Two of the largest players in the credit default swaps market had a very different fate from each other. The U.S. Treasury and the Federal Reserve refused to bail out Lehman Brothers, but provided a credit-liquidity facility access and acquired an equity stake in AIG because the size and the interconnectedness of the company posed a threat to the system (it was "Too Big To Fail").

Sovereign bailouts have not been uncommon either. A recent example is Greece, with public debt of 120 percent of GDP and a government budget deficit of 11 percent of GDP in 2010 (Gros & Mayer, 2010). An emergency rescue package of Euro 110 billion was provided to Greece by European Union countries. The Greek bailout poses a challenge to the European policymakers as to how to strengthen incentives for budget discipline in the member states.

The IMF (International Monetary Fund) is known as a "quasi-lender of last resort" for providing financial support packages to troubled countries. Lee and Shin (2008) study the effect of IMF bailouts on bond spreads. They show that the expectation of an IMF bailout brings about excessive capital flows which they interpret as an evidence of investor moral hazard.

Fannie and Freddie

In the 1970s and 1980s, the Federal Home Loan Mortgage Corporation ("Freddie Mac") and the Federal National Mortgage Association ("Fannie Mae"), hereafter F&F, were available to help securitize home loans and distribute the geographic (concentration) and extension (long-term fixed rates) risks that banks faced from holding mortgages (Michael, 2010; Wallison, 2009). F&F, and to a lesser extent the Federal Home Loan Bank system and the Government National Mortgage Association ("Ginnie Mae"), provided tangible benefit to the housing market and home ownership in the United States through the early 1990s. Beginning sometime in 1991 or 1992, however, the Department of Housing and Urban Development (HUD), specifically the Federal Housing Administration (FHA - the ex-officio parent of Fannie), took a special interest in developing markets for individuals unable to access traditional, full-down-payment mortgages. FHA, in particular, began to commit funds to a substantial number of households with incomes below the local or regional median.[9]

"Encouraging" private market participation and the involvement of the banking system was done in several ways. One was through the Community Reinvestment Act (CRA), requiring banks to lend in the areas where they actually take deposits. CRA compliance was eventually refined and included in the Gramm-Leach-Bliley Act of 1999 - firms that wanted to expand their business scope and diversify across industries (and compete effectively with their offshore counterparts) would have received a "Satisfactory" CRA rating for each subsidiary. Another regulatory "push" toward F&F is documented by Friedman (2009) and Acharya and Richardson (2009) as being part of the FDIC Improvement Act of 1991 and the gradual implementation of the initial Basel Accord capital standards (Basel I). The measurement of a bank's risk-weighted

assets would require more capital if the bank held the actual mortgages than if the bank sold the mortgages to Freddie or Fannie.[10] The difference is slight, but for smaller banks the struggle to raise equity can be substantial. Small bank exposure to Freddie and Fannie bond downgrades and the requirement that these securities be carried at fair value has been cited as leading to bank failures in at least one instance during the current crisis.[11]

Once F&F had a dominant role in the market, two aspects drove the moral hazard that ended in disaster. First, there was an implicit guarantee that F&F bonds were backed by the "full faith and credit" of the U.S. government, even though neither of these was a government entity. Second, the structure of the underlying securities meant that rating agencies, and buyers, and sellers in some cases, had difficulty understanding not only how to value these products but also how to model their risks after creation.

The Originate-to-Distribute model

Financial intermediaries have the ability to reduce the costs of adverse selection and moral hazard through screening and monitoring their borrowers. In the traditional portfolio model of lending, the banks have a strong incentive to monitor the borrowers since the loans stay on the bank's balance sheet. If the borrower defaults, the bank suffers a loss. The originate-to-distribute (OTD) model, which was pervasive during the events that led to the subprime mortgage crisis, changes the incentive of loan originators to screen and monitor borrowers because the loans are sold to third parties without recourse.

A good topic to discuss with students is whether the banks' participation in OTD contributed to the subprime mortgage crisis. According to a recent study by Purnanandam (2010), since credit risk was passed on to third parties in the securitization process, the banks had an incentive to grant poor quality mortgage loans and maximize their revenue from collecting origination fees. The effect was more pronounced for banks with lower levels of regulatory capital (Purnanandam, 2010). As mentioned above, Friedman (2009) documents the perverse incentives that existed for commercial banks to sell mortgages to the GSEs; these began with implementation of the Basel I capital standards in the early 1990s. Finally, Acharya and Richardson (2009) suggests that in 2005 large issuers of mortgage-backed securities began holding their own securities and relying on high ratings that they knew to be contrived.

Moral hazard's impact on the intermediaries' screening and monitoring functions in the OTD model was not limited to mortgage loans. Berndt and Gupta (2009) study U.S. publicly listed firms who borrowed in the syndicated loan market and conclude that borrowers whose loans are sold in the secondary market underperform the borrowers whose loans are retained by the bank by 8 to 14 percent per year. The study also shows that poor performance can be explained by banks selling the bad loans in secondary markets ("cherry picking") and/or the diminished bank monitoring of the borrower's investment choices.

The examples of moral hazard in the subprime mortgage market go further than the loan originators. It should be straightforward to show students how securities pool managers, credit rating agencies, credit insurance issuers, to name a few, all had similarly wrong incentives, which ultimately resulted in amplifying the excessive risk taking and exacerbating the financial crisis.

Compensation in financial companies

A common example of moral hazard in corporate finance textbooks is the principal-agent problem between managers and stockholders of the corporation. The separation of ownership and control creates moral hazard for managers to act in their own best interest, instead of maximizing the wealth of the shareholders. Managers may have the incentive to engage in excessive risk taking if their compensation arrangement includes a steep bonus structure focused on short-term gains. Alternatively, management may have the incentive to misrepresent financial statements, again for their own financial gain.[12]

A good question for classroom discussion is whether the bonus structure in financial companies contributed to the crisis. Many argue that excessive risk taking and greed of fund managers played a significant role in the year preceding the crisis. Diamond and Rajan (2009) point out that one of the causes for the credit crisis was the financial sector's substantial investment in real estate-related securities, which was driven by the culture of excessive risk taking in banks.

> *"Indeed, traders who bought AAA MBS were essentially getting the additional spread on these instruments relative to corporate AAA securities (the spread being the insurance premium) while ignoring the additional default risk entailed in these untested securities."* (Diamond and Rajan, 2009, page 608)

Furthermore, private equity funds and hedge funds typically paid out 20 percent of the gains out as bonuses (Dowd, 2009). Dowd (2009) also asserts that the high compensation of hedge funds attracted financial professionals from other financial institutions, and therefore banks had to offer similar bonus packages to prevent the "talent" from leaving.

Asset managers may be inclined to take much higher risks since they are managing other people's money. If a fund manager is remunerated for gains, but he is not punished for losses, he will seek to take positions with higher volatility. Additionally, hedge funds become highly leveraged to magnify their profits. Hedge fund managers typically receive a flat management fee of 1 to 2 percent and a performance-based fee of 20 percent.[13] The performance-based fee could take the form a high-water mark fee, which is received only if the fund value exceeds a previous high. As Hodder and Jackwerth (2007) show this compensation structure could promote risk taking below the high water mark and lead to low-risk strategies above the high water mark.

Top executives, on the other hand, should have their interests aligned with the shareholders because they also have stakes in the company. Executive compensation at Lehman Brothers and Bears Sterns has received tremendous attention in the press and is also a cornerstone in the discussion whether compensation should be regulated. Opponents of the regulation argue that executives lose when companies go bankrupt since they hold shares of the company. A study by Bebchuk, Cohen and Spamann (2010) shows that over the 2000 – 2008 period top management at Lehman Brothers and Bear Sterns received $1 and $1.4 billion, respectively, from bonuses and sales of shares. The net payoff to the executives was still positive even after consideration of their initial holdings of shares.

Common Mistakes When Discussing Adverse Selection and Moral Hazard

After providing numerous examples of information problems in financial markets and recognized and proposed solutions to these problems, it is often useful to provide examples of what adverse selection and moral hazard are not, and examples of how not to try to solve information problems.

An adverse selection problem occurs when the selection of unfavorable counterparties is *accidental*. An excellent question to open discussion and illustrate this concept is whether or not the use of NINJA (No Income No Job or Assets) or "liar" loans represents an example of adverse selection. Pearlstein (2007) has a laundry list of alternative financing terms popular during the run-up to the crisis. After discussion of moral hazard in the subprime crisis, students will often want to see subprimes as an adverse selection, but the problems of adverse selection result when the selection of risky borrowers is accidental from a larger pool. *Deliberately seeking out and lending to* unsteady borrowers because of regulatory pressures or an expectation that home prices would continue to rise may not qualify. The escalating policy of lending to less-than-creditworthy borrowers en masse is more likely due to a moral hazard in which investors and policymakers alike consider it most likely that the GSEs will be bailed out by the US Treasury if and when there is trouble in housing markets, even though a guarantee of this kind did not exist.

When asked about solutions to adverse selection, students will often answer with solutions to moral hazard, or solutions that don't solve either type of problem. When asked how banks or insurance companies may screen risky borrowers and policyholders, for example, a quick answer may be "by charging them more." There are two ways in which this answer facilitates learning. The first is to point out that charging them more implies that the "bad" types are able to be sorted from the good types in the first place, and discuss the difficulties and requirements to doing so. The second, and more enlightening, is to point out why charging "bad" types more doesn't work.

Higher rates are charged to marginal borrowers and risky policyholders to compensate lenders and insurers for taking on greater risk. Higher interest rates only increase the costs of loans that are actually going to be repaid, so raising interest rates to screen out bad borrowers is

counterproductive. "Bad" borrowers plan to default and not pay the additional interest anyway; "good" borrowers who plan to repay are chased away by higher rates. Likewise, higher premiums for high-risk groups does not solve the adverse selection problem, but simply creates an adverse selection problem within each group (e.g. charging higher car insurance rates to young males results -- in the absence of laws requiring auto insurance – in the highest-risk young males buying insurance and the lowest-risk males going without). Indeed, the legal requirement to purchase auto insurance is designed as a solution to the adverse selection problem.

The term "moral hazard" can mislead students into believing that unethical or immoral behavior is necessary for observed behavior to be evidence of moral hazard. Default on a loan by itself is not sufficient to indicate moral hazard. Moral hazard is evident when behavior using "house money" is different than behavior using own assets, such as taking on additional risk after getting a loan. It should be emphasized to students that moral hazard is an *effect* of contracts, rather than an underlying characteristic of individuals.[14]

CONCLUSION

Asymmetric information issues are pervasive in finance, with the fingerprints of moral hazard and adverse selection present in contract design, the evolution of financial intermediaries, and the creation and exacerbation of financial crises. The consequences of asymmetric information (and agency problems) should be an important part of our students' knowledge base at all levels, not just for understanding financial intermediation (the traditional case) but also to help strengthen their understanding of the market events encountered in corporate finance. In this paper, we offer a summary of what undergraduate and graduate finance students need to understand about asymmetric information issues. We supplement our discussion of the basics of moral hazard and adverse selection with examples from the 2008 financial crisis. We also provide a number of essay and multiple choice questions in the Appendix which could be used as for assessment of learning for the topics presented.

Furthermore, the confidence of the public in the ability of financial institutions to decipher signals and appropriately screen borrowers is a *necessary* condition for efficient markets. The same ability in regulators is crucial for effective regulation. It is our hope that students, many of whom have been directly affected by the recent recession, will engage with the importance of asymmetric information in financial markets through the use of these examples.

NOTES

1. Cartographers in ancient times labeled areas for which they had insufficient information as "Here be Dragons" (on water) or "Here be Lions" (on land). We felt that this was a good label for the topic of asymmetric information as well as students' fears of things "not in the book."
2. Brigham and Houston (2010) and Brigham and Ehrhardt (2011) discuss agency problems early in both texts, and then signaling when discussing capital structure in later chapters. Ross, Westerfield, Jaffe and

Jordan (2009) refer to "expenses that arise from the need to monitor management actions" on page 13, and have extensive coverage of agency later in the book. This text also mentions signaling in reference to capital structure and dividend policy. Brealey, Myers and Allen (2009) discuss asymmetric information with respect to new equity issues, and they also have an extensive discussion of the subprime crisis, its causes and its relation to agency issues. Berk, DeMarzo and Harford (2008) discuss the "lemons" problem in their capital structure chapter and throughout. The most complete coverage of any corporate finance book that we have seen is from Ogden, et al (2003) - this text devotes a chapter to the works of Nobel Prize winners in this area and then incorporates them throughout. Unfortunately, this text is no longer available.

3. Answering one of Stiglitz's questions from the introduction. This topic is given extensive coverage as a "lemons" problem in Berk, DeMarzo and Harford (2008).
4. As a textbook treatment, Mishkin (2009) gives a menu of fixes for adverse selection, moral hazard and agency problems in much simpler terms than we have offered here.
5. During the recent crisis there have been more lamentations about a conflict of interest that exists for the rating agencies because they are paid by the sellers of bonds for ratings in advance of an issue. Friedman (2009) notes also that the three main rating agencies enjoyed an oligopoly via the "Nationally-Recognized Statistical Rating Organization" designation from 1975 through 2008. In any event, any reregulation will need to consider that the "seller" must be the one, ultimately, to pay for the signal, or the signal won't have any effect on fixing the asymmetric information or agency problem.
6. From Benmelech and Dlugosz (2010): "With pass-through securitization, the issuer pools a set of assets and issues securities to investors backed by the cash flows. A single type of security is issued so that each investor holds a proportional claim on the underlying assets. [With tranching], after pooling a set of assets, the issuer creates several classes of securities, or tranches, with prioritized claims on the collateral."
7. "In July 2003, the Federal Reserve, together with the Federal Deposit Insurance Corporation, the Office of the Comptroller of the Currency, the Office of Thrift Supervision, and the National Credit Union Administration, issued a press release stating that the occasional use of the Fed's discount window facilities 'should be viewed as appropriate and unexceptional.'" (Miller and Van Hoose, 2007)
8. "Bear Stearns had about 150 million trades spread across various counterparties. It was therefore considered "too interconnected" to be allowed to fail suddenly." (Brunnermeier, 2009).
9. This is outlined in the Dodd–Frank Wall Street Reform and Consumer Protection Act, H.R. 4173, Section 1491.
10. This is clearly outlined in several editions of Koch and MacDonald, dating back to the early 1990s. To our knowledge, Friedman (2009) and Acharya and Richardson (2009) in the same volume is, to our knowledge, the first time this relationship has been written about in an academic context.
11. Guaranty Bank of Austin, TX, was absorbed by BBVA in 2009-2010 due to $1.7 billion in book losses from revaluing mortgage-backed securities involving Freddie and Fannie.
12. Most recent corporate books contain examples of accounting fraud using Enron, now Lehman Brothers can be cited for accounting gimmicks with the Repo 105 transactions helping them represent financing as sales. See Hordahl and King (2008) for details of the U.S. repo market during the financial crisis.
13. See also Ferguson (2008) for a discussion of the troubles of hedge fund managers.
14. Guiso, Sapienza and Zingales (2009) examine the relationship between "strategic defaults" and homeowner value systems.

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APPENDIX

Assessment Examples

Essay Questions:

- Describe a couple of ways in which moral hazard contributed to the recent economic crisis.
- Why are insolvent large banks often rescued by authorities while insolvent small banks are allowed to fail? Specifically, explain how the tradeoff policymakers make when bailing out a large bank does not apply to small banks.
- Explain the terms “asymmetric information”, “moral hazard”, and “adverse selection”.
- What is a “lemons” problem? What causes it? Be able to give two detailed examples of lemons problems in finance and specific examples of how to fix them.
- We discussed “certification” as a critical component of any solution to a lemons problem. Explain what “certification” means and how it relates to bonding. Explain several examples of certification for fixing lemons problems. Be very specific.
- What are at least two examples of moral hazard problems in markets or institutions? Explain each example and several ways to try to solve it.
- Explain the principal/agent problem in the equity market and at least two very specific ways to try to fix it.

- List and explain at least two common examples where managers may be working in their own best interests rather than working strictly on behalf of the interests of shareholders.
- What is monitoring and what is bonding? Give some very specific examples of each. Also, give an example of how bonding can be used to fix moral hazard and how monitoring can be used to fix adverse selection.
- Give your own personal example of a moral hazard problem, and two things could be used to fix it. Be very specific.
- Give your own personal example of a lemons problem, and two things could be used to fix it. Be very specific.
- How can we fix a moral hazard problem using debt? What if marketable debt (issuing bonds) doesn't provide enough monitoring or bonding to fix the problem?
- Explain the very limited role of government in fixing asymmetric information problems. Why can't government solve asymmetric information problems by itself? Explain one example of how government (perhaps the SEC) works with the private sector in creating a "level playing field" among regulated firms.

Multiple Choice Questions:

1. Which of the following is a consequence of adverse selection?
   A. A bank refuses a line of credit to a company that is about to change its board.
   B. A bank engages in risky speculation to raise its reserves to the legal requirement.
   C. A bank offering loans with low documentation requirements has a large amount of subprime loans in its portfolio.
   D. A bank on the verge of bankruptcy chooses to take a great deal of risk.

2. Which of the following is NOT an adverse selection problem?
   A. If pre-existing conditions are required to be covered by health insurers, sick people will be more willing to purchase insurance unless everyone is required to.
   B. Individuals who are unable to repay loans are more willing to borrow at any interest rate.
   C. An attorney who is incompetent and cannot win a case will be more attracted to an hourly fee than a share of any winnings.
   D. Your real estate agent, paid only 3% of the purchase price of the house, has an incentive to sell your house quickly instead of at the highest possible price.

3. Which of the following is a consequence of moral hazard?
   A. A solvent bank chooses to take more risks because its staff has been indicted for fraud.
   B. A bank is reluctant to make a student loan because it fears the student will buy a car with the money.
   C. A bank fails to diversify its holdings and becomes illiquid in a market downturn.
   D. A bank free-rides on other banks participating in a payment-system consortium.
   E. A bank chooses to pay its executives large bonuses despite losing money that year.

4. Which of the following is NOT a moral hazard problem.
   A. Banks are able to sell mortgages to government sponsored enterprises, and thus do not take care to screen loan applicants properly.
   B. Individuals wearing seat belts drive more recklessly than individuals not wearing seatbelts.
   C. Individuals who are very hungry are more likely to eat at an all-you-can-eat buffet.
   D. A bank that is "too-big-to-fail" decides to take on more risk than a smaller bank would.

5. Which of the following should reduce moral hazard associated with automobile insurance policies?
   A. Requiring a deductible
   B. Requiring a co-payment
   C. Requiring a good driving record.
   D. Requiring a deductible and a co-payment are both correct.

6. Which of the following should not reduce moral hazard associated with borrowing?
   A. Requiring collateral
   B. Requiring covenants
   C. Conducting a strict background check on the borrower before the loan is made.
   D. Neither collateral nor covenants reduce moral hazard.

7. Which of the following should reduce adverse selection associated with automobile insurance policies?
   A. Requiring a deductible
   B. Requiring a co-payment
   C. Requiring a good driving record to get the policy.
   D. Both A and B are correct.

8. Which of the following should NOT reduce adverse selection associated with borrowing?
   A. Charging a higher interest rate on the loan
   B. Requiring that qualified borrowers have a certain level of assets.
   C. Conducting a thorough background check on the borrower.
   D. Neither background checks nor asset requirements reduce adverse selection.

Answers:
1. C
2. D
3. B
4. C
5. D
6. C
7. C
8. A

EXPLORING GENDER COMMUNICATION VIA YOUTUBE

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ABSTRACT

This article describes a business communication assignment that used YouTube videos to explore communication styles of men and women.

INTRODUCTION

Technology-mediated communication is unquestionably a game changer. Business communication has become increasingly virtual, intercultural, and change driven given new technologies, workforce diversity and the globalized business arena. Subsequently, common barriers such as gender, race, culture, choosing the most appropriate medium for a message, personal biases, change resistance and others continue to affect the communication process. These barriers can cause "what we see and/ or hear" to be objectively "flat-wrong."

RELEVANT LITERATURE

As business professionals grapple with keeping abreast of technologies, they must be cognizant that business communication has changed given innovative technological tools to aid interpersonal communications. In fact, reasonable minds may become blurred given the variety of technology mediated tools available. Selecting the right communication technology is challenging; it can become an enhancement or hindrance with respect to contextual and audience matters.

In citing the results of several research studies that focus common barriers that affect business communication, …. communication isn't as simple as saying what you mean. How you say what you mean is crucial, and differs from one person to the next, because using language is a learned behavior: how we talk and listen are deeply influenced by cultural expectations. For example, men and women are like people who have grown up in two subcultures - they have two broad different styles of speaking and establishing social status (Tannen, 1991a/b, 1994, 1995; Carli,2000; Chaney &Martin, 2000; Adler, Rosenfeld & Proctor, 2001; Beamer & Varner 2001; Gray, 2002; Sadri & Tran, 2002; Ashcraft& Allen, 2003; Vinas,2003; Dawkins, 2004; Field, 2005; Gallo, 2006; Weissman,2006; Muir, 2007; Lehman & DuFrene, 2008; Burress, 2008).

Subsequently, it's plausible to posit that these same barriers related to how men and women communicate could be replicated and/or have their own culture, morals and expectations via virtual environments. In both instances, these miscommunications could affect technology-

mediated communication that corporations use when performing various daily interactions or operational processes as well as maintaining the corporate web page-image. There are considerable benefits to be gained by paying close attention to the words of business leaders (Amernic & Craig, 2006).

Similar benefits are gained by observing nonverbal signals, i.e. facial expressions, gestures, vocal characteristics, personal appearance and use of time and space (Graham & Unrue, 1991; Richmond & McCroskey, 2000, Lawlor, 2006).

With this in mind, business communication professors can use technology-mediated communication to help students developing and/or enhancing skills required within a reality-based curriculum that are transferable to the real world of work. Some examples of technological tools that can be used include: online videos, virtual meeting spaces, electronic whiteboard, podcasts, blogs and videoconferencing. While these technology-mediated communication tools are innovative, they are viable tools to use when exploring real world problematic issues, e.g. communication styles of men and women, caused by common communication barriers.

THE ASSIGNMENT

Essentially all business communication courses and texts include discussions and assignments that focus miscommunications that can occur when managing a diverse workforce. The assignment discussed in this article, communication styles of men and women, is designed to give students the opportunity to explore a real world business issue and produce a diversity training video. Some instructional strategies that can be used to help students develop or enhance skills during this assignment include.

Discussion of theory integrated with real world or simulated (e.g. online videos of the television show - The Office) examples of men and women communication styles in various traditional and virtual business settings: daily operational interactions and task assignments, board meetings, presentations at stakeholders meeting and training sessions.

Review of Relevant Literature- Have students locate articles independently or refer students to resources that discuss issues related to communication styles of men and women and strategies employed by various organizations for dealing with these differences.

Real World Application -Conduct a field study (discuss identified differences from practical experiences) or interview business professionals (men/women) to obtain their perceptions on the issue of communication styles of men and women.

YouTube –Examine (gender based) diversity training videos documenting (points illustrated) at least five identified differences related to communication styles of men and women.

Technology-mediated communication should be integrated throughout discussions to raise learners' awareness of the issue. To jumpstart and liven the discussions, examine YouTube videos from the television show – The Office - The Office "Diversity Day" Promo (2007); The Office Diversity Day Full Episode and The Office: Diversity Day Jim & Pam. These videos provide humorous exposure to common gender barriers, e.g. use of exclusionary language that reinforces gender stereotypes, illustrated points of nonverbal gender behavior-extended eye

contact used by male characters or smiles used by women characters that depicts lack of confidence, via online videos that prepare and engage students focusing communication style of men and women.

Students (diversity consultants) should identify and discuss differences of communication styles of men and women while viewing the videos. The diverse findings provide lively discussions full of contextual and audience differences that can be used when creating the diversity training videos. The YouTube videos allow students to visualize and reflect on contextual and audience challenges for diverse perceptive.

Examples of learner outcomes include; understanding gender related perceptions in the organization, virtual training policies to make the work environment more gender equitable, and strategies for organizations to implement which could circumvent gender-based miscommunications.

ASSESSMENT OF ASSIGNMENT FOR LEARNERS

Technology-mediated communication has made the world "flat." Learners benefit from exposure to various technologies while applying their understanding to the guiding principles-context matter and consider your audience. In addition to learning about issues associated with communication styles of men and women, learners benefit from technological tools which can be used to reduce occurrences of miscommunication in the diverse workforce. Preparing a diversity training video provides application and assessment with respect to course objectives inclusive of critical thinking, technology, diversity, team environment, legal and ethical challenges.

Students' feedback on this assignment supports my assessment of effective messages: videos that capture the audience while building interest with convincing contextual findings; gained knowledge by using electronic media in a professional context and active participation rather than passive recipients. Findings from this assignment can be used for a number of lively discussions focusing business communication in our diverse workplace.

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LABOR NEGOTIATIONS AND COLLECTIVE BARGAINING AGREEMENT: THE NATIONAL FOOTBALL LEAGUE'S DILEMMA?

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ABSTRACT

With the expiration of the National Football League's (NFL) current collective bargaining agreement (CBA) in March 2011, two of the key issues, on which both sides cannot agree upon, are the current salary structure of the league and how revenues should be shared between owners and players. League owners are citing financial distress as a primary reason to shift a greater portion of league revenues back to their side. However, the National Football League Players' Association (NFLPA) has accused NFL owners of hiding wealth through creative accounting practices and insists that players, not owners, should retain the largest percentage of league's $9 billion in annual revenues. Furthermore, among the four largest and most profitable professional sports leagues in the country, including Major League Baseball (MLB), the National Hockey League (NHL), and the National Basketball Association (NBA), the NFL is the only league that does not offer guaranteed player contracts. In the NFL, teams may opt out of a player's contract and, subsequently, their financial responsibility to that individual by simply cutting the player or placing him on waivers. While guaranteed contracts for NFL players would not resolve all the current obstacles within the currently expired CBA, player representatives assert that guarantees would provide a form of financial security lacking on behalf of the players, thus, alleviating a few of the difficulties the two sides are experiencing in reaching an agreement. The NFL owners continue to maintain that they will vehemently oppose the consideration of guaranteed contracts, so the players are instead attempting to provide for resolutions for the issues created by not having the same guaranteed contract structure as other leagues. But do guaranteed contracts make sense for the NFL? With such a short average career for players and the high risk for significant injury, many argue whether guaranteed contracts would be an improvement to the current financial stability of the league or an impediment to the league's steady sustained progress over the last half century. This paper will evaluate the financial elements and options presented by the ensuing labor dispute, and explore the potential impact that guaranteed contracts could have on the landscape of the National Football League.

INTRODUCTION

There's an old proverb that states: "The answer to 99 out of 100 questions is money." This axiom could certainly be applied to the case of labor negotiations in professional sports. Since 2004, three of the "Big Four" professional sports leagues (National Hockey League, National Football League, and National Basketball Association) have suffered work stoppages as a result of labor disputes between ownership and players. The current structure of collective bargaining in these leagues, guided by federal labor laws, mandates that both sides agree on the terms and conditions of employment and comprehensive guidelines in terms of wealth distribution, league rules, and free agency/arbitration issues. In the case of the latest NFL labor negotiations, the major source of contention appears to be deciding how to divide league revenues between players and owners of the league. In 2008, league owners voted unanimously to opt out of their current collective bargaining agreement (CBA) with the National Football League Players' Association (NFLPA) following the 2010 season (Silver, 2010). The last CBA from 2006-2009 allocated roughly 53 percent of the league's $9 Billion in revenue to the players. However, the owners have now proposed to reduce the players' share of revenue citing increased expenditures associated with construction of new stadiums ("Players got," 2011). Another disputed element of the current CBA involves a proposal by league owners to extend the regular season from 16 games to 18 games. Owners argue that season expansion will result in increased revenue in terms of both gate receipts and broadcasting dollars. However, players maintain that an extended regular season would mean a higher risk of injury that could threaten both players' careers and their bank accounts. Also among the topics being negotiated are benefits for retired players. Essentially, any resolutions involving the current NFL labor dispute hinge on two key elements: money and security. Regardless of the outcome, both sides have much at stake. Like most labor disputes between management and employees, the outcome of this CBA will most likely be determined by bargaining power and desperation.

BARGAINING POWER

At the 2010 NFL owners meeting in Orlando, Florida, Carolina Panther's majority owner, Jerry Richardson, implored fellow league owners to "take back our league" (Silver, 2010). The 2011 NFL Lockout is a good indication that Richardson's message was heard loud and clear. According to Vrooman (2011) since 1970, when the American Football League (AFL) and the National Football League (NFL) merged, owners have held the greatest position of power among the "Big Four" North American sports leagues. However, perceptions of league control between owners and players could not be more different. Ownership maintains that because players receive nearly 3/5ths of league revenue, they, in fact, have the upper hand in terms of monetary advantage. However, players contend that their share of league revenues do not constitute an equitable proportion, especially since the vast majority of contracts are based on

the pay for play model. Regardless of perception, bargaining power will be key determinant of outcome in this labor dispute. The NFL owners' ongoing claims of financial distress will continue to be the primary reason cited in support for their bargaining positions. However, financial experts and the players' association continue to maintain that the owners substantiate their claims of financial distress through "creative accounting" procedures. Through such practices, the owners are able to shelter the revenue streams thorough reallocation of expenses, thus making the teams' financial position look much worse than what it really is. For decades, league officials and team owners have been allowed to consistently report large losses and threaten impending financial demise of their businesses. Since the majority of professional sports franchises are privately owned by individuals, families or either through closely held corporations or similar private entities, such as a limited liability company, it is virtually impossible to verify the actual extent and magnitude of these claims. Furthermore, there is no legal obligation to disclose detailed financial information about their teams, since most are not publicly traded companies (Howard & Crompton, 2004). As such, owners have refused to comply with NFLPA's request for financial transparency citing a lack of precedent in which employers of private organizations should be required to open their financial books to their employees. Players use this lack of compliance to suggest owners are more financially solvent than they would like to reveal, a perceivably common strategy among owners and management of all professional sport organizations. Current President and CEO of the Toronto Blue Jays Professional Baseball Organization, Paul Beeston, one said "Anyone who quotes profits of a baseball club is missing the point. Under generally accepted accounting principles, I can turn a $4 million dollar profit into a $2 million dollar loss, and I can get every national accounting firm to agree with me" (Zimbalist, 1992).

There are numerous reasons why a professional sports team owner might engage in creative accounting practices including tax breaks, empathy, increased bargaining power, and, especially, public perception (Howard & Crompton, 2004). Think about it. If the public perceived a professional team owner as a greedy entrepreneur whose main objective is to turn a profit, fans might be disheartened and ultimately disconnected, especially if the aforementioned owner did not produce a competitive winning product. Instead, it's much more advantageous to owners for fans to believe that their favorite sports team is provided to a given city merely as a public service from a generous philanthropist who is much more interested in psychic income than monetary income. The same can be said for the perception of players as well. Perhaps it's human nature to want a bigger piece of the pie, or in the case of the current NFL labor dispute, a larger portion of league revenues. Or maybe both sides wanting a larger portion of league revenues is simply the structure of business, or perhaps even inherent greed. Regardless, if owners are able to convince players that their profits are smaller or that they are even losing money, then players may not be as apt to demand more, which, ultimately, bodes well for ownership and increases their bargaining position. However, unfortunately for owners, the

creative accounting strategies that may work for the general public and the Internal Revenue Service, is not as effective in persuading the other side of the negotiating table.

GUARANTEED CONTRACTS

Perhaps one of the chief financial issues in the current and former collective bargaining agreements is the structure of player contracts for both rookies and veterans in the league. Among the four largest and most profitable professional sports leagues in the country, including Major League Baseball (MLB), the National Hockey League (NHL), and the National Basketball Association (NBA), the NFL is the only league that does not offer guaranteed contracts to all players in the league. Essentially, players can be cut or waived at anytime, subsequently voiding their contracts and entitling them only to a prorated amount based on the number of days employed. According to the National Football League Players' Association (2011), the average tenure for players in the league is only 3.6 years, a short career by any industry standards. As a result of the short duration of playing careers, along with the fact that football is a violent sport and the risk for injury is high, players want more financial security.

Currently, the only guaranteed money for all players is signing bonuses. Signing bonuses are only refundable if a player retires or is unable to fulfill the terms of the contract. Elite players do have guaranteed money as a portion of their contracts, but this simply does not apply to the vast majority of players. There may be, however, a shift of salary structure on the horizon as evidenced by some owners' willingness to guarantee a substantial portion of top rookie contracts. According to well known sports agent, Leigh Steinberg (2011), this may be the first indication of a lack of solidarity in unified owner opposition to guaranteed contracts. Consider the first pick in the NFL Draft from 2008-2010. In 2008, the Atlanta Falcons selected Boston College quarterback, Matt Ryan, with the first overall selection. Ryan signed a six year contract with the Falcons for $72 million with $34.75 million guaranteed. This means that approximately 48.26 percent of Ryan's contract is guaranteed regardless of performance. In 2009, the Detroit Lions drafted Georgia quarterback, Matthew Stafford, and signed him to a reported $72 million contract with 41.7 million guaranteed, which accounts for 57.91 percent. The first pick in the 2010, NFL Draft was Oklahoma quarterback, Sam Bradford, who signed a $76 million deal with the St. Louis Rams with $50 million in guaranteed money equaling 65.78 percent (Vrooman, 2011). Now consider, Cam Newton, the first selection in the 2011 NFL Draft whose rookie contract given by the Carolina Panthers and the aforementioned majority owner, Jerry Richardson, was 100% guaranteed ("Cam Newton signs," 2011). There is an obvious trend developing. This willingness to offer guarantees on the part of NFL owners could signal a paradigm shift on the horizon. The rationale is that if certain owners are breaking away from the traditional pay for play model in order to offer unproven rookies, players who have never even put on a uniform or stepped on a practice field, a substantial portion of guaranteed money, then perhaps we could see a similar trend for proven veterans in the near future where guaranteed

contracts become the standard rather than the exception. This opens the door to the obvious question: Are guaranteed contracts good for the NFL? This question has been debated for years and is the central divisive component of salary structure arguments between players and owners in the league.

According to sports agent, Leigh Steinberg (2011), if one of the ancillary benefits of the NFL's new collective bargaining agreement is more guaranteed salaries, it may turn out to be a positive structural shift in league compensation. However, there are obvious reasons why ownership has been so resistant to offer guaranteed salaries in the past. The pay for performance structure that currently exists in the NFL is obviously slanted in favor of team owners. Yet, the league's players' union (NFLPA) is seeking to establish a more equitable arrangement in the form of guaranteed labor contracts. Determining whether the implementation of guaranteed contracts is a good business practice for any organization involves evaluating how increased job security and monetary reward systems affect variables such as employee attitudes, behaviors, motivation levels, effort, and, ultimately, productivity. In fact, allegations of production declines and disincentives due to long-term job security and guaranteed contracts have long been associated with both professional athletes and university faculty (Krautmann, 1990).

According to Estes (in press), when measuring sabermetric performance of Major League Baseball free agents over a 28 year period, productivity declined as a result of guaranteed long-term contracts. This finding dispels the theory that professional athletes are intrinsically motivated and immune to complacency and shirking. Sports agent, Lee Steinberg, disagrees with respect to his NFL clientele. Steinberg (2011) states: "Fears that guarantees will lead to player's 'coasting through on their guaranteed years' with no motivation don't accurately assess the competitive nature of players" ("Guaranteed contracts come to the NFL," para. 12). The actual impact of league-wide guaranteed contracts may not be known for some time, if at all. Guaranteed salaries for players in other professional sport leagues was a consequence of free agency and, subsequently, a trickle down effect of the desire to win and increase revenue. If current trends are indicative of the willingness of owners to offer guaranteed salaries, then, perhaps, we will see a change in the salary structure of the league and an abandonment of the pay for play model.

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TECHNICAL ANALYSIS OF THE DANISH STOCK MARKET

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ABSTRACT

We investigate the predictive power of various trading rules with different combination of the popular six indicators in technical analysis for the Danish stock index over the period of July 1st of 1993 to June 30th of 2010. Our empirical results for the Danish stock index show that all the buy-sell differences under trading rules of either two-indicator or three-indicator combinations are positive with significant t-stats to reject the Efficient Market Hypothesis. Technical analysis has been proved to have solid predictive power and can discern recurring-price patterns in the case of the Danish stock index in which RSI3 serves as the best indicator in any combination with other indications for trading rule development.

INTRODUCTION

Technical analysis is based on the idea that prices move in trends, which are determined by the changing attitudes of traders towards various economic, political and psychological forces. The art of technical analysis, for it is an art, is to identify a trend reversal at a relatively early stage and ride on that trend until the weight of evidence shows or proves that the trend has reversed (Pring, 1991). Murphy (1999) defines technical analysis as the study of market action, including price, volume, and open interest, through the use of charts for the purpose of forecasting future prices. We therefore define technical analysis as a method of evaluating commodities and stock prices by analyzing statistics generated by market activities, volume, open interest, past prices, and various indicators based on prices and volumes. Technical analysts do not attempt to measure a security's intrinsic value; instead, they look for patterns and indicators on the charts that will determine whether you should go long or short or stay neutral for any security. Over a century, practitioners have been using the qualitative aspect of technical analysis which involves pattern recognition such as head and shoulder, tops and bottoms formations, double and triple tops and bottoms, rectangle tops and bottoms, rounding tops and bottoms, diamond formation, V-formation, broadening formation, triangles, wedges and pennants formations and so on. The purpose of this paper is to determine whether technical analysis can have predictive power and can discern recurring price patterns in the Danish stock

market given the data period from 1993 to 2010. Our results confirm the predictive power and indicate a particular rule of technical analysis as the best indicator. Section II discusses a brief literature review. The data and methodology are shown in Section III. Section IV presents our findings and the final section concludes.

LITERATURE REVIEW

In his renowned article for the Efficient Market Hypothesis (EMH), Fama (1970) defined an efficient financial market in which the market prices fully reflect all available information. The nature of unpredictable news will also lead unpredictable price changes which may follow a random walk. Followers of the EMH believe that investors cannot drive profits above a buy-and-hold strategy by applying any trading rule which depends solely on the past market information such as price or volume. In 1960s and 1970s, many researchers documented the futility of technical analysis to support the market efficiency hypothesis (e.g. Larson, 1960; Granger & Morgenstern, 1963; Fama, 1965; Fama & Blume, 1966; Jensen & Benington, 1970). By the end of 1970s, as a result, most of finance and economics professors believed in the EMH and ruled out the predictability of stock market by technical analysis.

Since the 1980s, the EMH has been challenged on both theoretical and empirical ground. One important theoretical challenge comes from the behavioral finance theorists who have challenged the rationality of investors by suggesting cognitive psychology to describe investor's behavior. They have also challenged the theoretical foundation of EMH by arguing that arbitrage is risky and limited in the real world. Many articles have been published to support the usefulness of technical trading rules. Sweeney (1986) applied various filter rules in the foreign exchange markets to conclude that one third of the cases directed by trading rules were significantly profitable in statistics. Lukac, Brorsen & Irwin (1988) used a variety of technical trading rules on 12 US futures markets to support the profitability of technical analysis. Brock, Lakonishok & Lebaron (1992), the cornerstone article for technical analysis, analyzed moving averages and trading range breaks on the Dow Jones Industrial Index from 1897 to 1985. They tested both long and short moving averages to confirm the predictive power of technical analysis in stock market.

Based upon the methodology in Brock, Lakonishok & Lebaron (1992), many other researchers have tested various technical trading rules for different financial markets to generate a myriad of articles mostly in favor of technical analysis. Park & Irwin (2004, 2007) in their excellent survey articles summarized most of these researches by 2007. Loh (2007) applied moving average in conjunction with practitioners approach for five Asian countries to confirm the predictive power of technical trading in forecasting the stock price. Although McKenzie (2007) tested technical trading rules in seventeen emerging markets and concluded that there is no trading rule systematically generating significant forecasting accuracy, market conditions appear to be important in determining the usefulness of trading rules. Savin, Weller & Zvingelis

(2007) used the Head and Shoulder (H&S) price formation to conclude that the H&S price pattern trading should be used with a passive indexing strategy to improve the risk return trade off. They showed that the passive index strategy combined with H&S strategy can reproduce the volatility of the market and yield excess return up to 8%. Qi & Zhao (2008) applied two moving average indicators (i.e. Breath and Trin) for both large-cap and small-cap stocks and found that the Breath indicator can generate significant profits net of transaction costs especially for small-cap stocks. Metghalchi, Chang & Marcucci (2008) used various moving average trading rules to the Swedish stock market and showed that some moving average strategies could beat the buy-and-hold strategy even accounting for transaction costs and data snooping. Andrea-Felix & Fernández-Rodríguez (2008) employed a wide category of mechanical trading rules through statistical learning methods for the NYSE composite index to conclude that although their model is unable to overcome the returns of the buy-and-hold (B&H) strategy during rising price periods, it does beat the B&H during falling periods. Zhou & Zhou (2009) investigated the use of moving average rules from an asset allocation perspective based upon the S&P 500 data from 1926 to 2004. Their results showed how investors can add value to their investment by using technical analysis. Metghalchi, Du & Ning (2009) confirmed the predictive power of moving average technical trading rules by recurring-price patterns in four Asian markets. Finally, Balsara, Chen & Zheng (2009) investigated major U.S. stock indexes from 1990 to 2007 and found that the regular applications of moving average, trading breakout, and Bolinger Band rules underperform the B&H strategy; however, they indicated that significant positive returns can be generated by the contrary version of the three trading rules, even considering a .5 percent one-way trade on all transactions.

DATA AND METHODOLOGY

In this study, we choose the daily closing level of the OMXC20 stock index, a market value weighted index that consists of the 20 most-traded stocks in the Copenhagen stock exchange, from July 1st of 1993 to June 30th of 2010, to explore the predictive power of technical analysis in the Danish stock market. The starting date of the study is defined based on the availability of open, high, low index prices required for various indicator estimations. For the money market rate, we use the Denmark Interbank 3-month offered rate. All data are collected from DataStream and are expressed in Danish Krone.

Six technical trading rules are examined including Standard Moving Average (SMA), Increasing Moving Average (IMA), Relative Strength Index (RSI), Parabolic Stop And Reverse (PSAR), Directional Movement System (DMS), and Moving Average Convergence Divergence Histogram (MACDH). Except the commonly used SMA and IMS, the other four trading rules are explained in the following. The RSI developed by Wilder (1978) is a ratio of the upward price movement to the total price movement over a given period of days in which the Market Master, Welles Wilder, suggested using 14 days. In our study, in addition to 14 days, we also test

9 and 3 days. The simple trading rule of RSI is that we will be in the market if RSI is greater than 50 and out of the market if RSI is less than 50. The PSAR is also developed by Wilder (1978). It counts a value of .02 for the accelerating factor and caps it at .2 in which a buy signal is emitted when the index level is above the value of PSAR, and a sell signal is emitted when the price level is below the value of PSAR. The DMS indicator, also designed by Welles Wilder, compares two directional indicators called +DI and –DI. A buy signal is emitted when +DI is above –DI and a sell signal is emitted when +DI is below –DI. The last one, MACDH indicator, is developed by Appel (1974). Gerald Appel first estimated MACD as the difference between two Exponential Moving Average (EMA) of closing prices of 12 and 26 days. He then built the signal line which is the 9-day moving average of MACD. Based upon MACD Histogram (MACDH) divergence, the MACDH is then estimated by subtracting the signal line from MACD. A buy (sell) signal is emitted when the MACDH is greater (less) than zero.

The following summaries the 29 models examined in our study based on the above indicators:

1. SMA 20 - a buy signal is emitted when the index level breaks the 20-day Moving Average (MA20) from below and a sell signal is emitted when the index level breaks the MA20 from above.
2. IMA 20 - a buy signal is emitted when the index level breaks the MA20 from below and the MA20 is increasing, and a sell signal is emitted when the index level breaks the MA20 from above or the MA20 is decreasing.
3. RSI14 - a buy signal is emitted when the 14-day RSI (RSI14) is above 50, otherwise it is a sell signal.
4. RSI9 - a buy signal is emitted when the 9-day RSI (RSI9) is above 50, otherwise it is a sell signal.
5. RSI3 - a buy signal is emitted when the 3-day RSI (RSI3) is above 50, otherwise it is a sell signal.
6. PSAR - Using Wilder's recommended value of .02 for accelerating factor and cap it at .2, a buy (sell) signal is emitted when the index level is above (below) the value of PSAR.
7. Histogram - a buy (sell) signal is emitted when MACDH is greater (less) than zero.
8. DMS - a buy a (sell) signal is emitted when plus DI is greater (less) than minus DI.
9. Stochastic1 - a buy signal is emitted when 14-day %D is above 14-day %K and percent K is increasing, otherwise we will be out of the market (sell day).
10. Stochastic2 - a buy signal is emitted when 14-day %D is above 14-day %K, otherwise we will be out of the market (sell day).
11. Stochastic3 - a buy signal is emitted when 9-day %D is above 9-day %K, otherwise we will be out of the market (sell day).
12. Combination of IMA20 and Stochastic1
13. Combination of DMS and Stochastic1
14. Combination of RSI3 and Stochastic1
15. Combination of RSI3 and MA20

16. Combination of RSI3 and DMS
17. Combination of RSI3 and PSAR
18. Combination of RSI3 and MACDH
19. Combination of RSI3 and Stochastic2
20. Combination of RSI3 and Stochastic3
21. Combination of RSI9 and Stochastic1
22. Combination of RSI9 and Stochastic2
23. Combination of RSI9 and Stochastic3
24. Combination of RSI3 and Stochastic2 and MA20
25. Combination of RSI3 and Stochastic2 and DMS
26. Combination of RSI3 and Stochastic2 and PSAR
27. Combination of RSI3 and Stochastic2 and MACDH
28. Combination of RSI9 and Stochastic2 and MA20
29. Combination of RSI9 and Stochastic2 and DMS

We assume that a daily trader can look at these indicators a few minutes before the close of the market then execute an order to buy or sell securities in order to adjust his holdings for the following day. If at the end of the day a buy (sell) signal is emitted, then the next day is a buy (sell) day. The next day's return will be the difference between the logarithm of the closing price next day and the logarithm of closing price the previous day.

EMPIRICAL FINDINGS

Table 1 displays the results of models from (1) to (11), based on single indicator trading rule for the entire 17 years. In Table 1, X_B denotes the mean daily buy; X_S denotes the mean sell; number of buy and sell days are N_B and N_S respectively; and their standard deviations are denoted by SD_B and SD_S. The average daily return for the buy and hold (BH) strategy is 0.00033, or .033 percent per day with standard deviation of 0.01223.
Following Kwon & Kish (2002), the test statistic for the mean buy days over the mean buy-and-hold return is defined as

$$t = \frac{X_B - X_H}{\sqrt{VAR_B / N_B + VAR_H / N_H}} \qquad (1)$$

where VAR_B and VAR_H are the variances of buy and buy-and-hold returns respectively and X_H is the daily mean of BH strategy. Equation (1) is also used to test the mean sell return over the mean buy-and-hold return and the mean buy return over the mean sell return by replacing the appropriate variables in the *t*-statistic formula. In this paper, we compare all t-statistics with 1.96, the critical t-value at 5 percent level for large numbers of observations for a two-tailed test.

Table 1: Results for Single Indicator Trading Rules							
Rules	**Buy X_B**	**Sell X_S**	**$X_B - X_S$**	**SD_B**	**SD_S**	**N_B**	**N_S**
MA20	0.00070 (1.37)	–0.00022 (–1.40)	0.00099 (2.30)*	0.01027	0.01463	2641	1794
IMA20	0.00071 (1.37)	–0.00007 (–1.13)	0.00078 (2.11)*	0.00994	0.01425	2276	2159
RSI14	0.00060 (1.04)	–0.00012 (–1.07)	0.00072 (1.72)	0.00984	0.01536	2753	1682
RSI9	0.00067 (1.29)	–0.00020 (–1.32)	0.00087 (2.15)*	0.01013	0.01486	2677	1758
RSI3	0.00089 (2.01)*	–0.00041 (–2.02)*	0.00130 (3.41)*	0.01071	0.01395	2516	1919
PSAR	0.00035 (0.08)	–0.00030 (–0.08)	0.00065 (0.13)	0.01076	0.01397	2539	1896
MACDH	0.00051 (0.59)	–0.00014 (–0.56)	0.00055 (0.99)	0.01135	0.01309	2264	2171
DMS	0.00062 (1.09)	–0.00003 (–0.95)	0.00065 (1.70)	0.00981	0.01461	2419	2016
Stochastic1	0.00095 (1.81)	–0.00009 (–1.39)	0.00104 (2.77)*	0.01230	0.01217	1774	2661
Stochastic2	0.00095 (1.81)	–0.00026 (–1.39)	0.00121 (2.77)*	0.01233	0.01211	2158	2277
Stochastic3	0.00090 (1.81)	–0.00021 (–1.39)	0.00111 (2.77)*	0.01229	0.01216	2157	2278
Note: The numbers marked with * denote statistical significance at the 5% level for a two-tailed test. The figures inside the brackets are the t-statistics.							

The results of Table 1 are mixed. Only the RSI3 mean buy (sell) returns are positive (negative) with all significant t-statistics which reject the null hypothesis that the mean buy (sell) returns equal the mean buy and hold return. However, if we check buy minus sell returns, the results are much better in which 7 out of 11 single indicator trading rules are positive with significant t-statistics to beat the equality of the mean buy with the mean sell days. For all 11 trading rules, the numbers of buy days are generally a little bit more than those of sell days. In addition, the standard deviations of buy days are smaller than those for sell days in all 11 trading rules. The results imply that the market is less volatile for buy periods than sell periods. The mixed results for using a single indicator cannot confirm the predictive power of technical analysis. We next investigate the rules combining the indicators to seek the improved predictive power.

Table 2 presents the results of trading rules combining two indicators, models (12) to (23).

Table 2: Results for Two-Indicator Trading Rules							
Rules	**Buy** X_B	**Sell** X_S	$X_B - X_S$	SD_B	SD_S	N_B	N_S
IMA20 & Stochastic1	0.00115 (2.21)*	0.00011 (–0.77)	0.00104 (2.68)*	0.00984	0.01279	939	3496
DMS & Stochastic1	0.00114 (2.21)*	0.00011 (–0.77)	0.00103 (2.68)*	0.00972	0.012282	948	3487
DMS & Stochastic1	0.00102 (1.82)	0.00010 (–0.79)	0.00092 (2.30)*	0.01106	0.01258	1081	3354
RSI3 &MA20	0.00098 (2.07)*	–0.00020 (–1.57)	0.00118 (3.12)*	0.01016	0.01380	2085	2350
RSI3 & DMS	0.00087 (2.01)*	–0.00003 (–2.02)*	0.00090 (3.41)*	0.00969	0.01365	1765	2670
RSI3 & PSAR	0.00073 (1.34)	–0.00003 (–0.92)	0.00076 (1.96)*	0.01034	0.01346	1886	2549
RSI3 & MACDH	0.00086 (1.69)	–0.00002 (–1.11)	0.00088 (2.42)*	0.01078	0.01309	1759	2676
RSI3 & Stochastic2	0.00112 (2.45)*	–0.00018 (–1 .66)	0.00130 (3.58)*	0.01117	0.01285	1740	2695
RSI3 & Stochastic3	0.00110 (2.35)*	–0.00014 (–1.54)	0.00124 (3.40)*	0.01109	0.01286	1685	2750
RSI9& Stochastic1	0.00110 (2.21)*	0.00004 (–0.99)	0.00106 (2.84)*	0.01027	0.01288	1206	3229
RSI9& Stochastic2	0.00112 (2.43)*	–0.00006 (–1.29)	0.00118 (3.28)*	0.01029	0.01307	1462	2973
RSI9& Stochastic3	0.00105 (2.19)*	–0.00001 (–1.11)	0.00106 (2.92)*	0.01023	0.01305	1411	3024
Note: The numbers marked with * denote statistical significance at the 5% level for a two-tailed test. The figures inside the brackets are the t-statistics.							

Compared with Table 1, the results of Table 2 are much stronger to support predictive power of technical trading rules. 9 out of 12 two-indicator trading rules show the mean buy return beats the mean buy and hold return significantly. Furthermore, as for buy minus sell days, all the 12 two-indicator combinations are positive with highly significant t-statistics rejecting the null hypothesis of equality of the mean buy with the mean sell days. The predictive power of technical trading rules is confirmed.

Finally, we test the more complicated three-indicator trading rules for predictive power in Table 3. The results of the six trading rules, models (24) to (29), are similar to those in the two-indicator models. All buy minus sell returns are positive with highly significant t-statistics, rejecting the null hypothesis of equality of the mean buy with the mean sell days. In addition, 4 out of 6 buy days returns beat the mean buy and hold return. However, compared with the results in Table 2, it seems that the best results of technical trading would be to combine two indicators

for trading and in the case of the Danish stock index. The most interesting finding here is that among the six single indicators, the combination of RSI3 and any one of the other five indicators expresses the strongest predictive power. RSI3 can serve as the best indicator of technical analysis in the Danish stock market.

Table 3: Results for Three-Indicator Trading Rules

Rules	Buy X_B	Sell X_S	$X_B - X_S$	SD_B	SD_S	N_B	N_S
RSI3 & Stochastic1 & MA20	0.00117 (2.48)*	0.00004 (–1.24)	0.00113 (3.28)*	0.01046	0.01291	1347	3088
RSI3 & Stochastic1 & DMS	0.00119 (2.21)*	0.00004 (–0.77)	0.00115 (2.68)*	0.00972	0.012282	1110	3325
RSI3 & Stochastic1 & PSAR	0.00094 (1.69)	0.00011 (–0.77)	0.00083 (2.18)*	0.01073	0.01273	1186	3249
RSI3 & Stochastic1 & MACD	0.00116 (2.13)*	0.00006 (–0.96)	0.00110 (2.72)*	0.01129	0.01251	1095	3340
RSI9 & Stochastic1 & MA20	0.00119 (2.56)*	–0.00005 (–1.27)	0.00124 (3.89)*	0.01032	0.01297	1362	3073
RSI9 & Stochastic1 & DMS	0.00115 (2.37)	0.00005 (–0.95)	0.00110 (2.97)*	0.00982	0.01293	1117	3318

Note: The numbers marked with * denote statistical significance at the 5% level for a two-tailed test. The figures inside the brackets are the t-statistics.

CONCLUSION

In this paper we investigate the predictive power of various trading rules with different combination of the popular six indicators in technical analysis for the Danish stock index over the period of July 1st of 1993 to June 30th of 2010. Theoretically, if markets exhibit weak form efficiency; that is, all past prices of a stock are reflected in today's stock price, then we should observe that the buy days returns do not differ appreciably from sell days returns. Our empirical results for the Danish stock index show that all the buy-sell differences under trading rules of either two-indicator or three-indicator combinations are positive with significant t-stats to reject the Efficient Market Hypothesis. Technical analysis has been proved again to have solid predictive power in stock market and can discern recurring-price patterns in the case of the Danish stock index in which RSI3 serves as the best indicator in any combination with other indications for trading rule development. The next step based upon our findings will be

considering the transaction costs of trades to examine whether any two-indicator or three-indicator trading rule with PSI3 can beat the market or not.

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