

## **CHAPTER 1**

### **INTRODUCTION**

The Securities and Exchange Commission views insider trading as a serious problem in the United States. When individuals in a position of trust take advantage of the public, investors lose trust in the market place and this increases the cost of capital for all companies. The Security and Exchange Commission spends a great deal of time and money in the detection and prosecution of cases involving insider trading. Over the last two decades there has been a heightened awareness of insider trading. “More Americans are investing in the stock market than ever before and Americans now have twice as much invested in the stock market as in commercial banks”(Newkirk and Robertson 1998). The increase in individual investors in the marketplace has raised concerns over the fairness of financial markets.

The Enron scandal brought accusations of extensive insider trading. Enron’s top management were accused of knowing that the company’s financial statements were not fairly presented and selling their stock based on this information while the public was unaware of the situation. Ultimately, thousands of people lost their investments and some lost their life savings. There is serious concern among Congress, policy makers, and above all, the general public, that investing in the United States stock markets may not be a fair game. This perceived lack of fairness could lead to less investment in the stock market. Lower investing capital makes it more difficult for new companies to raise

capital to create and market new products, which ultimately leads to slower economic growth for the country as a whole.

The purpose of this study is to address the issues that affect compliance with insider trading laws. More specifically, this study addresses how policy makers can increase compliance with insider trading laws. Increasing compliance makes investing safer and, in the long run, raises investor confidence. This should increase private investing and allow more funds to flow into the corporate sector of the economy, thus stimulating economic growth.

“America banned most forms of insider trading in 1934 –though enforcement since has often lacked vigor – but it did not become illegal until 1980 in Britain and 1994 in Germany. During the 1990s, the number of stock markets on which insider trading is a crime soared from 34 out of 79 markets to 87 out of 103”(McCarthy 1-22-2000). It is not universally accepted that insider trading is bad for capital markets. “An alternative view holds that profitable trading by insiders is an efficient contractual arrangement to compensate insiders for their innovations without costly renegotiations”(Seyhun 1992, 150). Some people believe insider trading does not damage society and, therefore, should not be viewed as wrong, while others view insider trading as very wrong.

It is critical to differentiate between legal and illegal insider trading. It is perfectly acceptable for insiders to invest in the companies for which they work. Companies even encourage corporate insiders to invest in company stock through the use of stock options and other incentives. However, this trading activity is not to be based on insider information. An insider can trade stock as part of a regular buying and selling pattern. If he/she trades the stock in a timely manner to take advantage of private information, then he/she is breaking the law. Neither Congress nor the public has an interest in separating management’s goals from the goals of investors. However, investors would like to prevent insiders from taking advantage of private information to the detriment of other stockholders.

Although the SEC did not specifically define insider trading, the 1934 Act made it illegal for company insiders to trade based on nonpublic information. After numerous scandals and questions about the integrity of United States financial markets, the SEC has strengthened the laws against insider trading over the past 20 years. Fines for insider

trading increased during the 1980s from \$10,000 to \$1,000,000 and jail sentences also increased dramatically (Seyhun 1992). Changes in the law in the 1980s made top management responsible for insider trading by the firm's employees. The laws now provide for civil damages up to three times the insider trading profits. *The Insider Trading and Securities Fraud Enforcement Act*, passed in 1988, allows the SEC to give a bounty of up to 10 percent of the insider trading profits to informants (Seyhun 1992).

In the 1990s, some companies began selectively disclosing material nonpublic information to certain analysts and institutional investors before making the information available to the general public. The disclosures could keep companies on the "good list" with these important market players. The SEC pursued charges against selective disclosure under the existing insider trading laws. However, after losses in several court cases, including *Dirks v. SEC*, the SEC changed its tactic by adopting Regulation FD on August 10, 2000. Regulation FD requires that when a company discloses material information, it must do so to the general public. The information cannot be selectively disclosed (SEC Written Statement Concerning Regulation Fair Disclosure).

Because companies operate in competitive markets, some corporate information needs to remain confidential for the success of the company. Because of this need for confidential information, information asymmetry between insiders and the public will always exist. Many people with business careers will likely have access to insider information at some time in their careers and need to realize that trading on such information places them at considerable risk. The SEC web site identifies the following groups that it has brought insider trading cases against:

Corporate officers, directors, and employees who traded the corporation's securities after learning of significant, confidential corporate developments;

Friends, business associates, family members, and other "tippees" of such officers, directors, and employees, who traded the securities after receiving such information;

Employees of law, banking, brokerage, and printing firms who were given such information to provide services to the corporation whose securities they traded;

Government employees who learned of such information because of their employment by the government; and

Other persons who misappropriated, and took advantage of, confidential information from their employers.

([www.sec.gov/answers/insider.htm](http://www.sec.gov/answers/insider.htm))

Most insider trading cases brought by the SEC result from trading before earnings announcements or before takeovers (Seyhun 1992). These events often result in significant changes in stock price. The timing of the price reaction can be reasonably predicted. These same events have been studied throughout accounting and finance partially because of the predictability of the timing and the predictability of the price reaction. This also makes them tempting targets for insider trading.

In spite of the strengthening of laws against insider trading, it is still difficult to detect and prosecute. The SEC recently took steps to make prosecution of insider trading cases easier. On December 15, 1999 the SEC requested public comments on two proposed changes to the insider trading laws. Rule 10b5-1, which is now effective, states that if a person is in possession of material nonpublic information at the time he trades a stock, he is presumed to have traded based on the information. There are several defenses outlined under Rule 10b5-1 that provide an exception to the rule in certain situations. One of the exceptions is when the trade is part of a predefined plan or contract that was made prior to the knowledge of the insider information.

The second change is Rule 10b5-2. Rule 10b5-2, which also is now effective, clarifies what is meant by a “duty of trust or confidence” under the insider trading provisions. This rule identifies that any time a person agrees that the information will be kept confidential or has a history of keeping confidential information, then the person receiving the confidential information has a duty of trust and may not trade based on the information. The rule also defines certain family relationships as positions of trust.

In an insider trading case in 1989, a former stock *broker* was convicted of trading based on insider information. He received the insider information about a company “ ... after its president told his sister, who told her daughter, who told her husband,” who in turn told the defendant who traded on the information (Burns 12-14-99). This is an example of just how far removed insider information can get and why the SEC felt the need for Rule 10b5-2 to clarify how far reaching the position of trust extends. There is no way to determine how much illegal insider trading goes undetected. The lines between illegal and legal trading were not clearly drawn in the past. The new rules passed by the SEC have done a better job of clarifying just what is illegal.

The remainder of this paper is organized as follows. Chapter 2 identifies prior research and develops the hypotheses. Chapter 3 discusses two preliminary studies that were conducted to lead up to the current study. Chapter 4 describes the sample and the methodology that was used for the study. Chapter 5 discusses the results of the study and chapter 6 discusses the limitations and describes possible future research in the area.

## **CHAPTER 2**

### **LITERATURE REVIEW AND HYPOTHESES**

The causes of noncompliance with insider trading laws have not been specifically addressed in the literature. Several studies have looked at the ethics and social utility of insider trading. Other studies have addressed deterrence to other forms of illegal behavior, though none have addressed the motivations for and deterrence to insider trading. This literature review includes a review of the insider trading literature, a review of the theoretical literature on crime and punishment, and then examines some empirical studies related to crime and punishment. There are similarities between insider trading and tax noncompliance in that both are white-collar crimes with financial gain as the primary motivation. Therefore, this review also includes several studies from the tax compliance literature relevant to the current study.

#### **2.1 Insider Trading Studies**

Some financial studies have examined the informational content of legally disclosed insider trading. These studies look at market response to the news of insiders making trades. One study used archival data on legally reported insider trades to address whether or not insider trading should be permitted (Seyhun 1992). Another type of study on insider trading involves the use of experimental market methodologies to assess whether individuals with insider information can achieve abnormal gains (Marsden and Tung 1999). There is also a stream of research that looks at whether insider trading is

unethical, and whether it should be illegal. These papers address social utility and look at theoretical arguments of why insider trading should be legal or illegal. Some argue that insider trading is an economic issue rather than a moral issue and that it increases overall shareholder wealth and therefore benefits society (Ma and Sun 1998). A counter argument says that even if overall wealth is increased, it is still unethical if it is not fair to any individuals (Snoeyenbos and Smith 2000). The current study does not attempt to address whether insider trading should be illegal, but accepts the laws as they are and looks at the causes of noncompliance with those laws.

Abdolmohammadi and Sultan (2002) conducted an experiment to determine if students with lower ethical standards are more likely to take part in insider trading. The subjects were exposed to a simulated trading environment and an experimental group was given access to insider information while a control group was not given access to insider information. All subjects were told that trading based on insider information was illegal and generally viewed as unethical. All subjects took the Defining Issues Test (DIT) developed by James Rest. The DIT rates subjects ethical reasoning based on a P-score. Within the experimental group, 15 of the 24 subjects admitted to accessing the insider information. A t-test was used to determine whether the subjects who accessed the insider information had a significantly lower P-score and thereby lower ethical reasoning. The results, though marginally significant ( $p\text{-value} = .08$ ), suggest that individuals who accessed the insider information tended to have lower ethical reasoning.

Dunkelberg and Jessup (2001), looked at six individual cases of unethical behavior of successful professionals. One of the cases involved Dennis Levine who was convicted of felony charges for insider trading. Levine and his group worked for the mergers and acquisitions departments of major investment banking firms. The group would share insider information so that they could trade based on the information before the public had access to it. Levine eventually got caught and agreed to testify against the rest of the group. Levine had to pay restitution of \$11.6 million to the Securities and Exchange Commission and received a two year prison sentence. Before Levine started insider trading, he saw the price of stocks go up right before mergers and “was convinced that everybody was getting rich on insider information but him.” (Dunkelberg and Jessup

2001, 52) The case implies that cynicism influenced his decision to trade based on insider information.

In an empirical paper addressing the effectiveness of increased sanctions for insider trading, Seyhun (1992) found that increased sanctions did not decrease insider trading. The study examined three sample periods. The first period was from January 1975 to March 1980. This period was before the Chiarella decision in 1980. This court found the defendant not guilty of insider trading even though he used insider information, because the court ruled that he owed no fiduciary duty to the firms involved. The second period from April 1980 to August 1984 represents the period before significant insider trading laws were passed in 1984. The third period was from September 1984 to December 1989 and represents the effects of the new laws. He found that both the volume of insider trading and the profitability from it increased in the period after 1984 as compared to the period before 1980.

The study shows that both volume and abnormal profits for insiders increased during the period when the insider trading sanctions were being heavily increased. However, the number of insiders trading before earnings announcements and takeover announcements decreased over the three periods corresponding to the increased sanctions. It appears the increased sanctions may have made insiders more leery of trading before these events, though insiders' overall ability to make abnormal profits actually increased during the period.

Since the data collected were limited to insider trades that were reported to the SEC, it only includes those trades that the insiders believed to be legal. Since the insiders believed the trades to be legal, there would be no reason to believe that the sanctions would have an effect on these type of trades, with the exception of the fact that it codified the laws making it clearer as to what was legal and illegal. The Seyhun study does not address whether increased sanctions had an effect on illegal insider trading.

Seyhun also looked at codes of ethics for 37 firms and found that "25 percent of the firms warned specifically against insider trading, 25 percent cautioned against misuse of company confidential information, while 50 percent did not mention either insider trading or misuse of confidential information." (Seyhun 1992, 175)

Marsden and Tung (1999) used a laboratory experiment to test whether individuals with insider information could obtain abnormal returns. Student subjects were trained in the use of a simulated electronic trading market. Insider information was made available to the subjects. Subjects were told the likelihood of getting caught if they accessed the insider information and the financial penalty for getting caught.

The system randomly monitored access to the insider information. If the system detected a participant while he/she was viewing the insider information, then the penalty was automatically imposed. Various levels of monitoring rates and penalties were used in the tests. The results of the experiment suggest that individuals were able to obtain abnormal returns from insider trading if the monetary penalties were not imposed. Inconsistent results were found for the ability of insiders to make abnormal profits after taking into account different probabilities of getting caught and different penalty rates. The study made no attempt to address the effect that increased penalty rates or increased probabilities of getting caught had on insider trading. It looked at the effect imposing penalties had on abnormal profits rather than at the compliance aspect of the effect of penalties on insider trading.

The study proposed here differs from existing literature on insider trading in that it looks exclusively at the causes of illegal insider trading rather than addressing whether insider trading is ethical, profitable, or should be legal. The motivation for illegal insider trading may be quite different from legal insider trading.

## **2.2 Utility Theory of Crime and Punishment**

A central piece of the crime and punishment literature was Becker's 1968 theoretical paper, "Crime and Punishment: An Economic Approach". His paper addresses the levels of punishment, the social costs of upholding legislation, and the economics of crime. Becker uses an economic model to determine whether a person will commit a crime. This method "assumes that a person commits an offense if the expected utility to him exceeds the utility he could get by using his time and other resources at other activities"(Becker 1968, 176). Becker acknowledges that a willingness to commit a crime is also a potential variable affecting the decision to commit a crime.

There are three items in the basic economic model of crime. These include severity of penalty, likelihood of getting caught, and amount of gain expected from the action (Becker 1968). Expected gain provides motivation to commit an offense and includes both monetary and non-monetary rewards. Probability of getting caught simply tells us how much weight to place on the potential gain from the action and how much weight to place on the potential loss from the action if caught. Becker models the utility from a crime as follows:

$$EU_j = p_j U_j (Y_j - f_j) + (1 - p_j) U_j (Y_j)$$

where:

$EU_j$  = expected utility from the crime

$p_j$  = probability of conviction

$f_j$  = monetary equivalent of punishment from given offense

$Y_j$  = offenders income including monetary and “psychic”

$U_j$  = individuals utility function

(Becker 1968, 177)

From this equation, we see that the total expected utility is comprised of two parts. The first part is the probability of getting caught times the utility that will be received if caught. It includes the monetary and non-monetary income from the activity minus the cost of the punishment from the activity. The second part is the probability of not getting caught times the utility from the income from the activity.

Becker goes on to explain that the cost of a crime is viewed as both a cost to society and a cost to the offender. The offender suffers monetarily through fines as well as lost wages and the value of lost freedom when incarcerated. Society suffers from the loss caused by the crime itself and the costs associated with prevention, detection, conviction, and punishment. Becker points out that crimes could theoretically be almost eliminated by raising the probability of getting caught close to 100% and increasing punishments to exceed the gain from the crime. This, of course, would dramatically increase the social cost of detection and punishment. “There is a function relating the number of offenses by any person to his probability of conviction, to his punishment if convicted, and to other variables, such as the income available to him in legal and other illegal activities, the frequency of nuisance arrests, and his willingness to commit an

illegal act” (Becker p.177). As Becker points out, there are many variables that can potentially affect a person’s decision to commit a crime, but there should be a relationship between them. It is important to remember that it is the perceptions that individuals have about gains, penalties, and the likelihood of getting caught that people are acting on.

Becker also points out that a person’s income level may have an effect on how he/she views different penalties. Wealthier individuals are not as discouraged by small fines as less wealthy individuals. A \$100 fine to an individual who makes \$1000 a day does not have the same deterrence effect that a \$100 fine has to someone who makes \$50 a day. This effect is accounted for by the individual’s utility function.

### **2.3 Empirical Studies of Deterrence Variables – Certainty, Severity, Social Stigma, Guilt**

Deterrence research is the study of deterring criminal or deviant activities. The deterrence variables can be categorized into three main areas: (1) legal punishments, (2) peer imposed punishments – social stigma, and (3) self imposed punishments – guilt. Legal punishment is often divided into the probability of getting caught (certainty) and the severity of punishment (severity). This comprises the four main variables that have been tested in deterrence research: certainty, severity, social stigma, and guilt.

Tittle (1980) addresses the effect of sanctions in his book “Sanctions and Social Deviance”. Tittle’s study included approximately 2,000 individuals from three states based on self-reported deviant behavior. The respondents were asked questions concerning nine deviant acts including stealing, lying, and cheating on income taxes.

Tittle studied deterrence by looking at the effect of sanctions on social deviance. He defines social deviance as “behavior that is considered unacceptable, inappropriate, or morally wrong by the majority of people in a given social group.”(Tittle 1980, 42)

The degree of deviance associated with each act was determined by how the overall group felt about the act. Each respondent was asked to rate each act on a five point scale by how morally wrong they believed the act to be. The scale ranged from “not wrong at all” to “very wrong”. All of the behaviors were considered to be wrong by more than half of the respondents. The respondents were next asked to rank how serious

it would be for someone to do each of the activities. This allowed the author to rank the seriousness of the offenses. The respondents were also asked questions to determine if they believed the offenses should be illegal, since being morally wrong does not necessarily mean that one believes it should be illegal.

The respondents were asked whether they had committed each of the deviant behaviors in the past five years or expected there was some probability they would take part in the offense in the future. To test the effects of gender, the author compared the percentage of men admitting taking part in the offense to the percentage of women. A similar analysis was conducted based on their self-reported future probability of committing the nine acts. The author then used a chi-square test to determine if the difference in the groups was significant. Similar tests were conducted on race, age, social class, marital status, and labor force status. Age and gender were the most consistently significant of these variables across the nine offense types. Males showed a higher percentage of past deviant behavior than females and younger respondents generally showed a higher reported incidence of deviant behavior than older respondents. Using the same methodology, the author found “size of place of residence” had a significant effect. Generally people from less populated areas were less apt to have committed the offenses and perceived themselves as less likely to commit the offenses in the future.

Tittle concluded that current fear of sanctions should be associated with intentions to commit an act, not the past commission of an act, because a person’s fear of sanctions can change over time. Current fear of sanctions may have no association with past actions because the fear was not present at the time the action was committed.

To test the effect of the fear of sanctions, each respondent was asked questions concerning nine possible consequences to each of the nine deviant acts. The nine consequences included both formal sanctions such as legal penalties and informal sanctions like peers finding out and the loss of respect in society. The effects of the consequences were measured by their association with the respondent’s projections of taking part in the deviant act in the future. The respondents’ projections of future deviant behavior were found to be significantly associated with the fear of sanctions for all nine of the deviant acts. Informal sanctions from guilt and peers were found to be a much stronger deterrent than formal sanctions from legal penalties. Legal penalties were

measured as certainty and severity. Moral commitment (guilt) was found to be significant for all nine deviant acts.

Tittle stresses that it is important not to associate past activity with present fear of sanctions because the fear of sanctions can change over time. Therefore, if a survey is to ask respondents about their current fears of sanctions, it needs to associate these sanction fears with the intention to commit the acts in the future, not with past acts.

Grasmick and Green (1980) tested legal punishment, social disapproval (stigma), and moral commitment (guilt) by using individual subjective perspectives of the variables. Eight illegal acts were tested. Data on two dependent measures were gathered in the survey. One was obtained by asking respondents to identify if they had committed each of a list of illegal activities. The other dependent variable was obtained by asking respondents if they thought they would commit the acts in the future. The responses were then coded 1 for having committed the act in the past or expecting to commit the act in the future and 0 for not having committed the act or not expecting to commit it in the future. A composite of the responses was obtained from “summing the z-score transformations” for the eight illegal acts for the two dependent variables to provide variables similar to an interval scale that can be analyzed with regression. The two dependent variables were then regressed on the three independent variables, legal punishment, social disapproval, and moral commitment.

Perceived legal punishment was measured as the product of certainty of getting caught and severity of punishment. Since legal punishment is the product of certainty and severity, if either one is zero, there will be no deterrence effect from legal punishment. If there is no chance of getting caught, then the severity of penalty does not have an effect; and if the penalty is insignificant, then the chance of getting caught does not have an effect.

Probability of getting caught was measured as the chance “you would be arrested by the police if you did each of these things”. This question was asked subjectively since a respondent may not view his/her probability of getting caught the same as he/she views the probability of someone else getting caught. Severity of punishment was measured as “how big a problem that punishment would create for your life”. Social disapproval

(stigma) was measured as the number of acquaintances that had committed the crime and moral commitment (guilt) was measured as how often you think the offense is wrong.

The authors used multiple regression analysis and found that all three deterrence variables were significant. The independent variables explained over 40% of the variance in the criminal behavior for each of the two dependent variables.

The authors tested whether legal punishment had a greater effect when moral commitment was low and whether legal punishment had a greater effect when social disapproval was low. These two hypotheses test whether people who feel little guilt and are not concerned about losing the respect of their peers would be more deterred by legal punishments than people who have a strong deterrent from guilt and peers. To test these hypotheses, the study tested for an interaction effect between legal punishment and moral commitment and between legal punishment and social disapproval. Moral commitment was dichotomized into high and low values and a procedure similar to analysis of covariance was used to test the differences in the slopes. A similar procedure was used to test social disapproval. The results were not significant for either of these interaction hypotheses.

Probability of getting caught and severity of punishment need to be addressed subjectively. It is the individual's perception of the penalty that he/she will receive if he/she is caught that is the deterrent. Likewise, it is the individual's perception of how likely he/she is of getting caught that the individual is acting on (Grasmick and Green 1980).

Grasmick and Scott (1982) looked at threat of legal punishment, social stigma, and guilt on tax evasion, petty theft, and grand theft. Their study surveyed 401 adults selected from a Polk City Directory for a metropolitan area. The respondents were asked if they had omitted income or claimed excess deductions on their tax returns, committed petty theft, or committed grand theft in the past. The respondents were also asked if they thought they would commit the acts in the future.

Legal punishment was measured by asking respondents how likely they were of being caught if they committed the crime. In the Grasmick and Scott (1982) study, certainty alone was used as the measure of legal punishment, rather than the product of certainty and severity. Severity of punishment was not used in the study. Social stigma

was measured by asking respondents how many of their closest five acquaintances would commit the offense. Guilt was measured by asking respondents how often they felt the offense was wrong.

The Grasmick and Scott (1982) study divided each of the independent variables into high and low values. Threat of legal punishment was divided into those who believed they would be caught and those who did not believe they would get caught. Social stigma was divided into two groups based on whether more than half of their friends would commit the offense. Guilt was divided into two groups based on whether the respondent thought the offense was always wrong and those who did not think the offense was always wrong. A chi-square test was used to determine if there were significant deterrence effects for the three punishments tested: threat of legal punishment, social stigma, and guilt feelings. All three punishments had a significant relationship with the percentage of respondents who thought they would commit the act in the future for each of the three crimes. The study also used multiple regression to regress the intent to commit the act in the future on the three perceived threats. All three variables were also significant in the multiple regression. Threat of guilt feelings was found to have the strongest deterrence effect on tax evasion. Social stigma had the next strongest effect and legal punishment the least effect. All three deterrence variables were also significant for petty theft and grand theft.

Mason and Calvin (1984) used survey data on Oregon taxpayers to test changes in tax compliance attitudes between 1975 and 1980. The study addressed whether agreement with the tax laws is a factor contributing to tax evasion or whether the fear of getting caught (certainty and severity) was such a strong deterrent that agreement with the laws would not have an effect. Logit regression was used to test the effect of perceived fairness of tax law, fear of getting caught, year tested, and income level on the dichotomous dependent variable admitted past evasion. The study did not find a significant relationship between perceived fairness of laws and compliance although it did find that fear of getting caught had a significant relationship to compliance.

Certainty and severity have been tested more recently in the tax compliance literature with the use of experimental markets (Beck et al. 1991, Alm et al. 1992, and

Ghosh and Crain 1996). See Fischer et al. 1992, for a complete discussion of tax compliance studies related to certainty.

Beck et al. (1991) used an experimental methodology to test certainty and severity in tax compliance. The study used 112 student subjects who were asked to participate in a game type situation. The subjects were given fictitious money and asked to choose what taxable income they wished to report. The reported earnings were subject to a random chance of audit and a monetary penalty if the reported income was less than the actual taxable income. The results of the study indicated that both certainty in the form of audit probability and severity in the form of penalty rates had an effect on compliance.

Alm et al. (1992) also used an experiment with student subjects to test certainty (audit probability) and severity (penalty rates). Student subjects were given income and asked to report some amount or all of that income and pay tax on the amount reported. The subjects only paid tax on the reported income unless they were selected for a random audit in which case all income became taxable and any unreported income was subject to a penalty. The effect of certainty was tested by varying the probability of audit and the effect of severity was tested by varying the penalty rate. The study found certainty had a significant effect on subjects' compliance; however, the study did not find a significant effect of severity on compliance.

Ghosh and Crain (1996) conducted a laboratory experiment on a tax class to test the effects of individual ethics and certainty on tax compliance. Subjects were presented with a scenario and asked to calculate their taxes. Subjects were told that their likelihood of an audit (certainty) was similar to what the IRS would use. This made certainty subject to the individuals' perceptions. Subjects were compensated a percentage of the money that they had left after paying taxes, tax advice, and penalties. This gave the subjects an incentive to try to reduce the cost of taxes and maximize their wealth. The experiment found certainty and ethics had a significant effect on noncompliance.

Experimental game-type studies have the advantage of being able to imply causation for the effect of manipulated variables and being able to control extraneous variables; however, the effect of peer influence and guilt is difficult to measure in a game situation. Also, it is difficult to measure the effect of more severe punishments like going to jail in a game type situation. Reall et al. (1998) find that subject's moral reasoning in

competitive game situations is lower than their non-game moral reasoning. The subjects may respond in a game situation in order to win the game, however the respondents know that no one is being hurt in a game situation.

Recent tax compliance research has used archival data from the IRS to find effects of certainty (audit rate) and severity (penalty rate) on tax compliance (Ali et al. 2001). Previous studies have found that self imposed and peer imposed punishments have a greater deterrence effect than legal punishments (Tittle 1980, Grasmick and Scott 1982). However, these aspects have not been tested in the recent tax compliance research because much of this research uses archival data that does not permit access to guilt or peer effects.

#### **2.4 Motivational Variables - Gain**

The economic model of crime and punishment identifies that an individual will commit a crime only if his utility from the crime exceeds his costs (Becker 1968). However, much deterrence research does not include a motivational variable in the analysis. By omitting a potential reward or gain from an illegal act, the researcher can not determine if an individual has been deterred by punishment or lacks the motivation to commit the crime. There is an interaction effect between motivation and deterrence, and the omission of a motivational variable causes the effects of the deterrence variables to be underestimated (Scott and Grasmick 1981).

Scott and Grasmick (1981) included a motivational variable in their study of deterrence behavior. Their study looked at the interaction between a motivational variable and deterrence variables. They used survey data on income tax cheating to study the interaction between deterrence variables and reward for committing an illegal act. Perceived injustice of the tax law was used as their motivational or reward variable. It was measured by the response to six questions concerning agreement with the way the government spends the tax money it collects from the public. The assumption is that an individual who does not like the way his tax money is being spent will be motivated to cheat on his taxes. Respondents were also asked questions to determine the degree they were deterred from cheating on their taxes by deterrence variables. The study used certainty of getting caught without a measure of penalty severity as a measure of legal

punishment. The deterrence variables were measured by the respondents' agreement with the following statements:

1. "I am afraid I would feel bad about doing it even if no one found out" (Guilt);
2. "I am afraid people I know would find out and lose respect for me" (Stigma)
3. "I am afraid I would be caught and punished" (Legal Punishment).

The analysis used regression with an interaction term between the motivational variable and the deterrence variables. All three deterrence variables were significantly related to cheating on taxes. The motivational variable was not found to be significant in an additive model that did not include the interaction term. However, when the interaction term was included in the model, the motivational variable and interaction term were significant. The deterrence effects were higher when motivation provided by the reward was higher.

Scott and Grasmick (1981) find that studies of deterrence should include a motivational variable and a term for the interaction between motivation and deterrence variables. Omitting these terms will cause the deterrence variables to be under specified. If there is no reward or motivation to break the law, then no one will commit the offence irrespective of the punishments.

Motivational variables can be difficult to measure. The motivation for tax noncompliance is the tax dollars saved, but only sophisticated taxpayers know how much gain to expect from their tax noncompliance. Also, a given dollar amount of gain does not provide the same incentive to all taxpayers. By contrast, individuals using insider information can easily determine the gain expected from insider trading, although the same dollar amount of gain may still provide different motivation to different individuals. Therefore, when testing, it is important to frame motivation in terms that will provide similar motivation across subjects.

## **2.5 Cynicism – Belief That Everyone Else Would Break the Law**

In addition to gain and the four deterrence variables, certainty, severity, social stigma, and guilt, a sixth variable called cynicism has also been found to have an effect on illegal activity. Cynicism has been tested in the ethics literature. "A cynic is one who

is distrustful of human nature and believes human conduct is motivated wholly by self-interests”(Salter et al, 2001, p40). This variable looks at whether believing that everyone else would break the law affects whether you will break the law.

Tittle (1980) tested a variable called “differential association” which is essentially the same as the variable called cynicism tested in the ethics literature. The theory of differential association states that if a person’s culture views a deviant behavior as acceptable, then the individual will be more apt to take part in the deviant behavior. Tittle measured the variable for differential association as the respondent’s perceptions of the proportion of people who take part in a deviant behavior and the number of people that the respondent knew who have taken part in the deviant behavior. Tittle found a significant relationship between the differential association variable and the intent to take part in deviant acts.

A study by Salter et al. (2001) looked at student attitudes toward cheating in the United States and the U.K. The dependent variable was self-reported past cheating. The study included the following independent variables: (1) Tolerance toward cheating, (2) Intent to cheat in the future, (3) Cynicism about cheating, (4) Seeing another student cheat, (5) Severe punishment, and (6) Gender. A seventh indicator variable was also used to identify the country where the student was in school.

Tolerance was measured by whether the respondents viewed 23 questionable situations as cheating. A higher overall score represented that the student was less tolerant to cheating. Intent was an indicator variable to identify whether or not the student expected to cheat in the future. Seeing another person cheat was a dummy variable for whether the subject had witnessed another student cheating. Severity of punishment was an indicator variable for whether the respondent expected a severe punishment if caught cheating.

Cynicism was measured by asking respondents how truthful they felt the following three statements were: (1) People who say they never cheated are hypocrites, (2) Everybody steals, cheats, or lies at least once in his/her lifetime, (3) People have to cheat in this “dog eat dog” world.

Separate logistic regressions were run to determine which variables were significant for the U.S and the U.K. All of the variables except gender were found

significantly related to past cheating for the sample of U.S. students. Cynicism was found to be significantly associated with the dependent variable for past cheating, implying that students who felt that everyone else was cheating were more likely to have cheated in the past.

## **2.6 Hypotheses**

The causes of tax noncompliance have been addressed in prior literature; however, the causes of insider trading have not been addressed. Based on similarities to tax noncompliance and other forms of illegal activities, the current study addresses the motivations and deterrents to insider trading. Based on the variables tested in the previous literature in crime and punishment and tax compliance, the following hypotheses are addressed in the current study:

**H1:** As expected gain from insider trading increases, the intent to take part in insider trading will increase.

**H2:** As perceptions of certainty (the likelihood of getting caught) increase, the intent to take part in insider trading will decrease.

**H3:** As perceptions of severity of penalties increase, the intent to take part in insider trading will decrease.

**H4:** As expected guilt from insider trading increases, the intent to take part in insider trading will decrease.

**H5:** As perceived social stigma from insider trading increases, the intent to take part in insider trading will decrease.

**H6:** As the perception of cynicism toward insider trading increases, the intent to take part in insider trading will increase.

## **CHAPTER 3**

### **PRELIMINARY STUDIES**

Six of the following seven variables were identified in the literature review as potentially having an effect on individuals' decisions to trade based on insider information. The seventh variable "perceived fairness of laws" has been tested in the tax compliance literature and was included in the preliminary studies. The variables have been referred to by different names in the literature but they can be summarized as:

- 1 Expected Gain – Perceived gain expected from the activity
- 2 Certainty - Perception of the likelihood of getting caught
- 3 Severity - Perception of the severity of punishment
- 4 Cynicism – Perception that everyone else would take part in the illegal act
- 5 Guilt – Personal anguish for doing something wrong
- 6 Social Stigma – Fear of loss of respect from peers
- 7 Perceived fairness of laws

#### **3.1 Study 1 – Importance Ratings**

##### *3.1.1 Sample*

The first preliminary study, which used a survey instrument was completed by 119 business students in a large southeastern university. Seven of the respondents were removed because they had not heard of insider trading. Four respondents were removed because they did not correctly respond to at least three of four questions designed to test

their understanding of insider trading. Two respondents were removed because they misinterpreted the instructions on the instrument. A final sample of 106 usable respondents was obtained.

Undergraduate business students are not expected to have experience with securities trading but should possess the necessary understanding of the stock market environment to respond to the survey. College students are in a social and economic class that could lead to management and thus have access to nonpublic information. The respondents to the survey were students from six sections of undergraduate managerial accounting classes. The students are primarily upper division business majors. Forty-one percent of the students had some past trading experience.(See Table 3.1)

**TABLE 3.1**  
**Study 1 - Demographic Variables**

<b>Gender</b>	Frequency	Percent
Male	71	67
Female	35	33
Total	106	100
<b>Past Trading Experience</b>		
Past Trading Experience	43	40.6
No Past Trading Experience	63	59.4
Total	106	100
<b>Academic Year</b>		
Freshman	0	0
Sophomore	18	17.0
Junior	70	66.0
Senior	15	14.2
Graduate Student	3	2.8
Total	106	100

### *3.1.2 Methodology*

All students were given a five-page excerpt on insider trading taken from the Security and Exchange Commission web site several days before the survey. The students were asked to write a short summary explaining their understanding of insider

trading and the difference between legal and illegal insider trading. The purpose of the assignment was to ensure that the students had a sufficient understanding of insider trading to be able to answer the survey.

Increasing the respondents' knowledge of insider trading laws should not change their opinions unless they were unaware of the laws prior to reading the material. The purpose of the study was to determine what variables affect an individual's decision to trade based on insider information. It was not designed to assess the public's knowledge or lack of knowledge of insider trading laws.

Insider trading cases document that insiders knowingly broke the law and made an effort to cover up their crime. If this is representative of insider trading, then making subjects aware of the law should not bias the study since people breaking the law apparently knew what the law was.

The survey instrument asked respondents to rate the degree of importance of certain variables to their decision to trade or not trade based on insider information. There were two versions of the survey instrument. The two versions reversed the order of seven repeated measure questions to test for order bias.

The surveys took approximately 10 minutes at the beginning of a class. They were given during regular class time, and the subjects received extra credit for taking part in the survey. The surveys were completely anonymous.

The instrument asked respondents: "If you were in a situation where you had access to corporate insider information that could be used to gain significant advantages in trading stock, how important is each of the following items to your decision to trade or not trade based on this information." Respondents were asked to rate each of the following items on a scale from 0 to 100 with 0 representing no effect and 100 representing an extremely strong effect.

1. What your family and friends would think if they found out (Social Stigma)
2. Likelihood of getting caught (Certainty)
3. Fairness of the laws prohibiting insider trading (Fairness of Laws)
4. Amount of gain expected from the insider trading (Expected Gain)
5. Feeling of guilt if you traded based on the insider information (Guilt)

6. Severity of penalties for getting caught (Severity)
7. Whether other people would trade based on the same information (Cynicism)

Multiple responses were obtained from each subject. Each response measures the item's effect on the decision to trade based on insider information. A one way repeated measure analysis of variance was run on the responses to determine if there was a significant difference between the seven groups. Repeated measures contrasts were then run on the responses to determine which groups were significantly different from the others.

### 3.1.3 Results of Study 1

The following table shows the mean responses to the survey question of how important each item is to the decision to trade based on insider information. (0 = no effect and 100 = very important)

**TABLE 3.2**  
**Importance Ratings – Mean Responses**

Level		Mean
Q6	Penalty Severity	81.48
Q2	Certainty	76.74
Q4	Expected Gain	73.77
Q3	Fairness of Laws	58.46
Q1	Social Stigma	58.01
Q5	Guilt	52.44
Q7	Cynicism	49.59

The one way repeated measure analysis of variance showed that there were significant differences ( $p < .001$ ) between the seven items. A summary of contrasts between the variables is presented in Table 3.3.<sup>1</sup>

<sup>1</sup> The contrasts are a “protected LSD” procedure because an F test has already determined there are significant differences between the groups. Thus, the experimentwise error rate is held approximately equal to that of the F test.

**TABLE 3.3**  
**Importance Ratings - Contrasts**

Contrasts		F	Sig.
Q6 vs Q2	Severity and Certainty	4.161	0.044
Q2 vs Q4	Certainty and Gain	0.944	0.334
Q4 vs Q3	Gain and Fairness of Laws	19.705	0.000

The tables show that the mean response to penalty severity was significantly higher than the second highest mean response, which was certainty. Certainty was not significantly different from expected gain, which had the third highest mean response. Penalty severity, certainty, and expected gain were significantly higher than the other four variables. The study did not conclude that the other four variables were not significant, only that they were viewed as having a significantly lower effect on insider trading than the first three variables. The study found that the respondents viewed penalty severity, likelihood of getting caught, and expected gain as having the greatest effect on their decisions to trade based on insider information. This study also found indications of a gender effect for the variable guilt.

A possible explanation of why severity, certainty, and gain were significantly higher than the other four items is that severity, certainty, and gain may be more case specific. The survey asked which of the items are going to be of greatest concern when making a decision to trade or not trade. The three items that are rated the highest are the items that would change the most depending on the particular case. These are case specific items because the situation will dictate the expected gain, the certainty of getting caught, and to some extent the severity of punishment. An individual has an impression of a range of penalties that may exist for a given crime but the specific crime may dictate where within that range he perceives the penalties to be. By contrast, social stigma, cynicism, guilt, and fairness of laws are more subject specific. These items are primarily beliefs that the subjects bring with them and will change much less depending on the particulars of the insider trading situation.

Independent sample t-tests were conducted to determine if gender had an effect on the seven variables. The results showed that guilt is significantly higher for female respondents than for male respondents. The mean response to the importance of guilt for

female respondents was 68 whereas the mean response to guilt by male respondents was 45. The difference was significant at a .001 significance level.

Independent sample t-tests were conducted to determine if past trading experience had an effect on the seven variables. The results showed that past trading experience had a significant effect on three of the seven variables. The variables for “social stigma”, “guilt”, and “cynicism” were all significantly different for individuals who had prior trading experience compared to individuals who did not have prior trading experience. For all three variables the individuals with prior trading experience reported that the items would have a significantly lower effect on their decision to take part in insider trading.

## **3.2 Study 2 – Subjective Probabilities**

### *3.2.1 Sample*

The second preliminary study was conducted on business students at the same university. The instrument was completed by 118 subjects. Five survey respondents were removed because the subjects had not heard of insider trading. Seven survey respondents were removed because they did not correctly answer at least three of four questions designed to test their understanding of insider trading. A final sample of 106 usable responses was obtained. Thirty-seven percent of the usable respondents had prior trading experience. Sixty-six percent of the respondents were male.

### *3.2.2 Methodology*

The respondents were given a five-page excerpt from the SEC several days prior to the survey. This was to ensure that the subjects knew what insider trading was and had an understanding of the insider trading laws.

The survey instrument asked respondents to give subjective probabilities to a series of questions concerning deterrence and motivation for taking part in insider trading. There were two versions of the survey instrument. One version reversed the order of the questions to test for order bias.

The instrument asked respondents to give the probability that they would take part in insider trading and to give their subjective opinions about the seven independent variables previously identified.

Since insider trading includes both buying stock based on insider information and selling stock based on insider information, two questions were averaged to make up the dependent variable. The first was presented in terms of a gain from buying a stock with insider knowledge that the stock price would go up. A second question was framed in terms of avoiding a loss by selling an existing stock based on insider knowledge that the stock price would go down. The two dependent measure questions were:

1. "What is the probability that you would consider buying a stock if you received insider information that the stock price would go up?"
2. "What is the probability that you would consider selling a stock that you own if you received insider information that the stock price was going to go down?"

Regression was used to test for a relationship between likelihood of taking part in insider trading and subjective assessments of seven deterrence and motivational variables. The same seven items used in the first preliminary study were used as independent variables in the regression.

Two questions were used to assess the certainty, severity, gain, social stigma, and cynicism variables. Variables were defined as the average of the two questions. The correlation for each pair of questions ranged from .577 to .675, which indicates that the questions did an acceptable job of measuring the same underlying construct. The variables for fairness of laws and guilt were each measured with one question.<sup>2</sup>

To measure likelihood of getting caught respondents were asked what they thought was the probability they would get caught and what proportion of people trading on insider information got caught. Similarly questions were asked for severity of punishment, expected gain, social stigma, fairness of laws, guilt, and cynicism.

### 3.2.2.1 *Prospect Theory*

One of the dependent measure questions involves buying a stock to achieve a gain and the other involves selling a stock to prevent a loss. Prospect theory suggests that a difference in the responses to the two dependent measure questions may exist because achieving a gain and avoiding a loss may not be viewed the same. (Kahneman and Tversky 1979) Based on prospect theory, the respondents should be more willing to trade to avoid a loss. To test for a difference between the responses, a paired t-test was used because each respondent answered both questions and therefore the responses to the two questions are not independent of each other.

### 3.2.2.2 *Social Desirability Response Bias*

The dependent measure questions concern illegal activities and therefore respondents may bias their responses. Social desirability response bias states that there is a tendency to bias one's response to make one's self look socially responsible. The theory suggests that a person will not give his true likelihood of trading based on insider information because this response makes the individual appear to possess a socially undesirable trait. Social desirability bias has been found to exist even in cases where the respondents are anonymous. To test for this bias, a third question similar to the two dependent measure questions asked respondents if their peers would trade based on insider information.

The bias should not be present in a question about one's peers since it does not directly reflect on the respondent. The difference between the responses to the following two questions tested for this bias:

1. "What is the probability that you would consider buying a stock if you received insider information that the stock price would go up?"
3. "What is the probability that your peers would consider buying a stock if they received insider information that the stock price would go up?"

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<sup>2</sup> One question on fairness had to be removed because it asked subjects for their opinions on the results of the application of the laws, which is not information that they would be expected to know. A second question measuring guilt asked respondents what percentage of the time insider trading hurts someone. This question was removed because there is no direct link between percentage of the time the offense hurts someone and the guilt that the offender would feel.

To test for the bias, a paired t-test was run on the differences between the responses to question 1 and question 3. A paired t-test is used because each respondent answered both questions and therefore questions 1 and 3 are not independent for each respondent.

There is no reason to believe that the respondents in the survey are actually more honest than their peers. Therefore, if the responses to Q3 are significantly higher than the responses to Q1, it would suggest that the responses are being biased by this social pressure.

### *3.2.3 Results of Study 2*

Table 3.4 shows the results of regressing the probability of trading variable (the average of the two dependent measure questions) on the seven independent variables. Guilt, expected gain, and cynicism were all significant. Guilt was significant at  $p < .001$  and gain was significant at  $p = .030$ . Cynicism was significant at  $p = .012$ . Fairness of laws was marginally significant at  $p = .056$ . All of the variables had the expected sign except for social stigma. The social stigma variable had a high correlation with the guilt variable. When the guilt variable was not included in the regression, the social stigma variable had the expected sign. The strength of the guilt variable along with the high collinearity of the two variables caused the sign of the social stigma variable to change when both variables were included in the equation. The model explained 33% of the variance of the dependent variable. The sign of the coefficients for guilt, expected gain, cynicism, and fairness of laws were all in the expected direction. Those who believed they would feel guilty were less likely to trade based on insider information. Those who expected higher gains from insider trading were more likely to trade, those who were more cynical about others trading were more likely to trade, and respondents who agreed with the laws were less likely to trade based on insider information.

**TABLE 3.4**  
**Subjective Probabilities - Regression**

Model:  $PT = b_0 + b_1*Stigma + b_2*Certainty + b_3*Fairness + b_4*Gain + b_5*Guilt + b_6*Severity + b_7*Cynicism$

<b>Variable</b>	<b>Expected Sign</b>	<b>Coefficient</b>	<b>t-stat</b>	<b>p-value</b>
Intercept		69.568	6.406	.000
Stigma	-	0.147	1.626	0.054 <sup>3</sup>
Certainty	-	-0.036	-0.312	0.378
Fairness	-	-0.154	-1.603	0.056
Gain	+	0.165	1.908	0.030
Guilt	-	-0.311	-4.110	0.000
Severity	-	-0.015	-0.189	0.425
Cynicism	+	0.223	2.310	0.012

$R^2 = .330$

Number of observations = 104<sup>4</sup>

Model F = 6.764, 7 degrees of freedom,  $p < .001$

Prospect theory was tested by examining the difference between the dependent measure questions concerning buying and selling a stock based on insider information. The mean response to the probability of buying a stock after receiving insider information was 64.74 while the mean response to the probability of selling a stock after receiving insider information was 76.38. The difference of 11.64 is in the expected direction and is statistically significant at a .001 level. These findings support that subjects were more inclined to use the insider information to prevent a loss than they were to achieve an abnormal gain.

<sup>3</sup> The sign of the stigma variable was in the wrong direction due to collinearity problems with the guilt variable. No implications are made from the results of the stigma variable.

<sup>4</sup> Two of the respondents omitted one or more questions and had to be removed from the regression.

Social desirability was tested by the difference between the probability of buying stock based on insider information and the probability one's peers would buy stock based on insider information. The difference in the responses was tested with a paired t-test. The mean response for buying a stock based on insider information was 64.74. The mean response to one's peers buying a stock based on insider information was 71.29. The difference was in the expected direction and is significant ( $p = .012$ ). The results suggest that responses to the questions concerning trading based on insider information are being biased downward even though the respondents were anonymous. This is consistent with social desirability bias since this type of insider trading is an illegal activity and therefore is viewed as socially undesirable.

This study also found a significant gender effect for some of the variables. Female respondents were found to perceive their likelihood of getting caught to be higher than male respondents. Female respondents were more concerned about the effect insider trading would have on their relationships with their peers. Female respondents felt they would feel more guilt if they traded based on the insider information.

### 3.3 Reconciliation of Studies

The following table compares the results of the preliminary studies.

**TABLE 3.5**  
**Reconciliation of Studies**

	Severity	Certainty	Expected Gain	Peer Influence	Fairness of Laws	Guilt	Cynicism
Study 1	81.48	76.74	73.77	58.01	58.46	52.44	49.59
Study 2	Not Sig.	Not Sig.	<u>Significant</u>	Not Sig.	Marginally Sig.	<u>Significant</u>	<u>Significant</u>
		Case Specific	Case Specific	Subject Specific	Subject Specific	Subject Specific	Subject Specific

While severity, certainty, and expected gain were significantly higher than the other four variables in study 1, of the three, only expected gain was significant in study 2. Guilt and cynicism were the least important to the respondents' decisions to trade in

study 1, but they were both significant in study 2. On the surface it may appear that the results are conflicting, however the studies are actually testing different things.

Study 1 specifically asked for causal relationships. Study 2 did not address causal relationships. Study 1 asked respondents “how important is each of the following items to your decision to trade or not trade based on this (insider) information”. This is asking the subjects for a causal relationship.

In study 2, subjects were asked for their probability of trading based on insider information. Then, in separate questions, respondents were asked for their perceptions of gain, certainty, severity, social stigma, fairness of laws, guilt, and cynicism. Respondents were not asked to relate the independent variables to the probability of trading; therefore, no causal relationship was implied. Rather, the regression equation tested whether there was a relationship between the respondents’ preexisting beliefs about the independent variables and their intent to trade based on insider information.

Study 1 suggests that severity, certainty, and expected gain are the three things that could most change an individual’s decision about trading based on insider information. Study 2 suggests that perceptions of guilt, cynicism, and expected gain were the preexisting beliefs that had the greatest association with the intent to trade based on insider information.

Another difference between the studies is that study 1 did not ask the respondents to give a value for the variables but rather to rate the importance of them. The values of the variables would be determined by the individual case. The three variables that were rated as the most important were gain, certainty, and severity. The variables for gain and certainty are case specific.

Seven possible variables affecting insider trading were tested in these preliminary studies. Fairness of laws is a preexisting belief of the subject. It is not specific to an individual case. However, it was not significant in study 2. In study 2, fairness of laws was highly correlated with guilt. A person who feels the laws are not fair will not feel as guilty about breaking them. Fairness of laws will be tested, although it is not included as a hypothesis.

The preliminary studies found varying degrees of support for the variables tested. Severity, certainty, and gain were rated as significantly more important than the other

variables in preliminary study 1. Gain, guilt, and cynicism were significant in preliminary study 2. Preliminary study 2 also found support for prospect theory and social desirability bias. Based on the results of these preliminary studies, the current study will test the six hypotheses and test for prospect theory and social desirability bias. The following section identifies the research design for the current study.

## **CHAPTER 4**

### **METHODOLOGY**

#### **4.1 Subjects**

The main experiment was conducted using MBA and Master of Accounting students. Masters level business students have a more sophisticated understanding of corporate culture than undergraduate students. Masters students are not at risk and therefore should be less apt to bias their responses than corporate executives. A portion of the student subjects had stock trading experience and many of them had full time work experience before entering graduate school. Demographic information on the subjects was collected, including past work experience, age, and past stock trading experience.

Due to the seriousness of the crime, a sample of subjects who have illegally used insider information could not be expected to answer honestly about having illegally traded in the past. Likewise a sample of executives of publicly held companies who have access to insider information could not be expected to answer honestly to questions concerning whether they would trade based on insider information due to the implications it could have on their positions. Therefore, a sample of individuals who have access to actual insider information is not feasible for the study.

Masters level business students have a relatively sophisticated understanding of the business environment. The masters level business students are the most likely candidates for management positions, and as such, they are likely to have access to insider information in the future. These subjects should have the required knowledge of

the business environment and they are not at risk. Therefore, they are more likely to answer the questions honestly.

The preliminary studies gave undergraduate students an assignment to read information from the SEC web site to ensure proper understanding of insider trading. Although, the information was intended to be only informative and not leading, there is always some risk that the information may bias the subjects' responses.

Graduate students are older, have a greater knowledge of the overall business environment, are more knowledgeable about events outside the classroom and have taken more advanced classes that may introduce insider trading. Therefore, the current study did not give the subjects any background information on insider trading. Instead, four questions were asked at the end of the instrument to make certain that the subjects had the required understanding of insider trading to respond knowledgeably to the instrument.

#### **4.2 Within-Subjects Experimental Design**

Hypothesis 1 and 2 were tested with a within-subject design. This removed the effects of the inherent differences between subjects that exist in between-subject designs. The risks of order bias associated with a within subjects design was mitigated in the experiment by systematically varying the order of the cases.

Each subject received five cases presenting various opportunities to take part in insider trading. The cases were given to the subjects one at a time. A new case was not given out until everyone in the group was finished with the previous case. The subjects were instructed to turn the cases over after completing them and not to look back at previous cases once they had turned them over. Each case varied two factors and did so by varying different cues for each factor. Adding time between cases and varying multiple items between cases makes it more difficult for subjects to discern the hypotheses (Schepanski et al. 1992). Due to these complexities, it is highly unlikely that the subjects were able to determine the hypotheses of the experiment.

The dependent measure is the response to the question, "What is the probability that you would consider trading based on the information in the case?" The subjects were asked to give a response from 0% to 100%. Certainty and gain were manipulated between the cases because these two variables are case specific. Four of the cases

manipulated gain from high to low and certainty from high to low. In this sense, the avoidance of a loss is referred to as a gain. Each of the cases involves a decision to sell a stock that is expected to decrease in value. The four cases contained one with a low gain and low certainty, one with low gain and high certainty, one with high gain and low certainty, and one with high gain and high certainty. This created a 2x2 within subject design.

	Low Gain	High Gain
Low Certainty	Low Gain Low Certainty	High Gain Low Certainty
High Certainty	Low Gain High Certainty	High Gain High Certainty

Preliminary study 1 suggests that the intention to trade based on insider information may be greater for cases that involve selling a stock to avoid a loss than for cases involving buying a stock to achieve an abnormal gain. Therefore, a fifth case was used to test this effect. The fifth case involves buying a stock that is substantially the same in terms of amount of gain and certainty as the high gain low certainty case that involves selling a stock. This was used to test prospect theory applied to insider trading- that achieving a gain is viewed differently than preventing a loss. The high gain low certainty case was chosen to test prospect theory because it is the most likely situation for actual insider trading to occur. Therefore, the following five cases were tested.

1. Low gain low certainty loss situation
2. Low gain high certainty loss situation
3. High gain high certainty loss situation
4. High gain low certainty loss situation
5. High gain low certainty gain situation

The cases manipulated gain by changing the amount of money invested and the magnitude of change expected in the stock price. A high gain is represented by a large expected change in stock price as well as a large amount of the individual's wealth invested. A low gain is represented by a smaller expected change in stock price and a smaller amount of the individual's wealth invested.

The same dollar amount of gain may affect individuals differently. Higher income individuals are less likely to be affected by a \$10,000 gain than lower income

individuals. Although the income levels of student subjects should be much more homogenous than a sample of individuals outside a university setting, a dollar amount of gain could still be problematic due to different backgrounds and future expectations of the subjects. To help alleviate the problem of different degrees of motivation caused by the same dollar amount of gain, gain is expressed as a percentage of salary and a percentage of wealth.

The high gain (loss avoidance) cases involve a stock price that is expected to lose a large percentage of its value and a large amount of the individual's wealth invested in the stock. The individual stands to lose 32% of his total accumulated wealth in the high gain cases. The small gain (loss avoidance) cases involve a stock that is expected to decrease by a smaller percentage and the individual has the equivalent of several months of salary invested in the stock. The individual stands to lose one month of salary in the small gain cases.

Certainty or likelihood of getting caught is manipulated by making the insider information traceable to the individual. In the low certainty case the individual receives the information from a friend about a company the friend works for. For the high certainty case, the subject obtains the insider information about the company that he/she works for. The subjects should perceive a greater likelihood of getting caught if he/she uses insider information about the company that he/she works for because it would be easier to detect. A manipulation check was given with each case that asks the subjects what they believe is the probability of getting caught if they traded based on the information in the case.

The subjects received the five cases one at a time. After each case, the subjects were asked the dependent measure question, "What is the probability that you would consider trading based on the information in the case?"

The first four cases were analyzed with a repeated measures analysis of variance. This tested for main effects to the different levels of gain and certainty. This also tested for an interaction effect between gain and certainty.

A paired t-test was run to test whether there is a significant difference between the buy situation and the sell situation when gain and certainty are the same. Cases four and five are used in the paired t-test. After testing hypothesis 1 and 2 with the analysis of

variance and testing prospect theory with the paired t-test, separate examinations of the other four hypotheses were conducted with regression equations on the other four variables.

Gain and certainty are the only variables that were manipulated, the other variables are believed to be primarily subject specific, and, therefore, were measured but were not manipulated since they were not expected to change significantly between cases. In addition to the dependent measure question, additional questions to measure severity, cynicism, guilt, and social stigma were asked with each case. These variables were analyzed with regression equations.

### **4.3 Regression and Mixed Model Designs**

The relationships between the dependent variable (probability of trading) and the variables for severity of punishment, cynicism, guilt, and social stigma were also analyzed. Separate regression equations were used for each of the five cases. The response to the dependent measure question, “What is the probability that you would consider trading based on the information in the case?” was regressed on the responses to the severity, cynicism, guilt, and social stigma questions. These regression equations were used to determine if the intent to trade based on insider information has a significant relationship to severity of punishment, cynicism, guilt, and social stigma.

A mixed model equation was used to analysis the first four cases. The mixed model includes the manipulated variables as dummy variables in the regression. By including the manipulated variables in this regression equation it was possible to test for an interaction between a manipulated variable and a measured variable. In addition this allowed the responses to the four cases to be considered in the model at the same time.

Gain was coded 0 for the low gain situation and 1 for the high gain situation. Certainty was coded 0 for the low certainty situation and 1 for the high certainty situation. Since each subject is responding to four questions in this regression, there is dependency between these responses that must be included in model. The cases were systematically ordered and there is no time dependence to the cases; however, a subject who responds high to one case is more likely to respond high to the other cases. This type of covariance structure is known as compound symmetry. Therefore, the compound

symmetry covariance structure was specified in the model to account for the fact that each subject was responding to multiple questions.

The perception of severity of punishment may have some aspects of being case specific and some aspects of being subject specific. Each individual has some notion of a range of penalties they would receive for insider trading though this perception may be subject to change depending on the specifics of the situation. Severity of punishment was measured separately with each case. The subjects were asked, “If you got caught trading based on the insider information in this case, how severe of a penalty do you think you would receive?”

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1	2	3	4	5	6	7	8	9	10	11
Just a		Small		Large		Large Fine			Large Fine	
Warning		Fine		Fine		& Probation			& Incarceration	

Cynicism or the belief that others would trade if they had the opportunity is primarily subject specific. It was asked after each case. It was expected that this variable would not change a great deal between cases but rather should have more variability between subjects. This variable was measured by asking respondents, “What portion of people in the US would trade if they were in this situation?”

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1	2	3	4	5	6	7	8	9	10	11
Very Few			Some			Most			Nearly	
Would			Would			Would			All Would	

Guilt is primarily a subject specific variable. This variable was measured after each case though it was also not expected to show much variability between cases but rather to show variability between subjects. Gender effects were of particular interest for this variable since guilt has been found to exhibit gender effects in the previous two studies. The respondents were asked, “If you traded based on this information, to what degree would you feel guilty?”

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1	2	3	4	5	6	7	8	9	10	11
Not at all			Slightly			Somewhat			Extremely	
Guilty			Guilty			Guilty			Guilty	

The effect of peers finding out was tested with the question, “How likely is it that your friends would lose respect for you if they found out you traded based on this information?”

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1	2	3	4	5	6	7	8	9	10	11
Extremely			Quite			Quite			Extremely	
Likely			Likely			Unlikely			Unlikely	

Since fairness of laws was not significant in preliminary study 2, it was not hypothesized to be significant in the current study. For completeness, however, the following question was asked to measure agreement with the laws, “To what extent do you agree that trading based on the information in the case should be illegal?”

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1	2	3	4	5	6	7	8	9	10	11
Strongly			Slightly			Slightly			Strongly	
Agree			Agree			Disagree			Disagree	

An additional question was asked with each case to measure social desirability response bias. It was hoped that most of this bias had been removed because the subjects were not in a threatening situation and their responses were anonymous. Social desirability bias can exist even in cases where respondents are anonymous (Randall and Fernandes 1991). To measure this bias, the following question was asked, “What is the probability that your best friend would trade based on the information in the case?” Since the respondents should be no more or less apt to trade than their closest friend, any significant difference between this question and the response to the dependent measure

question concerning the subjects themselves trading represents a bias. To test for the bias, a paired t-test was used to compare the responses to the two questions.

Questions were asked at the end of the survey concerning gender, prior trading experience, prior work experience, age, income level, and other demographic questions. Gender and past trading experience were of particular interest since they were found to have significant effects on some of the variables in the preliminary studies.

#### **4.4 Protocol of Experiment**

Subjects for the experiment were solicited from eight graduate level business classes. The experimenter was given permission by the instructors to appear before the classes for several minutes to explain the nature of the experiment. The explanation of the experiment did not mention insider trading, but rather described the experiment as a study of investor behavior. The students were told that they did not need any special background and that the knowledge they had made them qualified to participate in the study. This was done to prevent subjects from self-selecting based on whether they had background knowledge of insider trading and also to prevent subjects from reviewing any material before the experiment.

The subjects were told that the experiment would take approximately one hour and that they would be compensated \$10 for taking part in the study. In addition, the subjects were given a small amount of extra credit by their instructors for taking part in the study. A sign up sheet was passed around each class to allow subjects to sign up for a time that was convenient for them.

The experiment was conducted over a 3-day period approximately three weeks into the Fall 2002 Semester in a behavioral lab on the students' campus. The instrument was given out to subjects in groups of 6 or less. The subjects' names were checked off from the sign up sheets when they arrived at the testing site. This ensured that no subject took part in the experiment more than once. The subjects were read the instructions and given one case at a time. The subjects did not put their names on the instruments and were assured that their responses would remain anonymous. Upon completing each case the subjects turned the cases over. Subjects were instructed not to look back at the cases once they had turned them over. After completing all parts of the instrument, the subjects

stapled the instruments and placed them into a box of completed responses. The subjects were given a check when they completed the instrument and turned it in.

The following section includes the results of the main experiment. Demographic information on the subjects is also included in the section.

## **CHAPTER 5**

### **RESULTS**

#### **5.1 Overview**

The results of this study address the six hypotheses presented in the literature review as well as several additional issues raised in the preliminary studies and other places throughout the manuscript. The results first look at the sample and verify that the sample and methodology are suitable for the study. Hypotheses 1 and 2, which were tested with manipulations between cases, are analyzed with an analysis of variance. Next, hypotheses 1 through 6 and the effect of fairness of laws are analyzed with a mixed model and individual regression equations for the individual cases. Tests of prospect theory, social desirability response bias, and gender effects, all of which were found to be significant in the preliminary studies, follow the tests of the hypotheses.

#### **5.2 Demographics**

The subjects in the study were primarily graduate business students at a large eastern university. Participants were solicited from eight graduate business classes in the Fall Semester of 2002. There were 105 participants in the study. Table 1 shows the demographic profile of the participants. The ages of the participants ranged from 20 to 46 with an average age of 24.6 years. Sixty-seven (64%) of the participants were male and 38 (36%) were female. Forty-eight (46%) of the subjects had prior trading experience. The subjects were approximately evenly distributed across income levels.

Over half of the subjects had full time work experience. Seventy percent of the subjects had undergraduate business degrees.

### **5.3 Test of Understanding**

In order to establish that the subjects had the required understanding of insider trading to respond to the instrument, subjects were asked to identify four situations as insider trading or not insider trading. Table 2 shows the questions asked and the results of the test of understanding. Eighty-seven (83%) of the subjects responded correctly to all four of the questions and 104 (99%) responded correctly to all but one of the questions. This indicates that the subjects generally had an understanding of insider trading.

### **5.4 Ordering of Cases**

Because the subjects were responding to multiple cases it was necessary to vary the order of the cases to prevent an order bias. The cases were arranged in five different orders with one fifth of the subjects receiving the cases in each order. Case five was different from the other cases in that it was the only case that presented the information in terms of buying a stock to achieve an abnormal gain. The other four cases all presented the cases in terms of selling a stock to prevent a loss. Because of the inherent difference in case five, it was used as the middle case for all but order five so that the other cases could be systematically arranged around case five. The order of the five cases and how the variables were manipulated between the cases is presented in Table 3.

One way analysis of variance with order as the categorical independent variable was used to determine if order had an effect on the dependent variable for any of the five cases. The results of the analysis of variance to test for order effects are presented in Table 4. The results indicate no significant effects to the order of the cases.

### **5.5 Manipulated Variables - Gain and Certainty**

Hypothesis 1 states that as expected gain from insider trading increases, the intent to take part in insider trading would increase. Hypothesis 2 states that as perceptions of certainty (likelihood of getting caught) increases, the intent to take part in insider trading

would decrease. Gain and certainty were manipulated between high and low values in a 2 x 2 factorial design. In the low certainty cases, individuals receive insider information from a trusted friend. In the high certainty cases, individuals possess insider information about the company for which they work.

## **5.6 Certainty Manipulation Check**

To test whether the subjects responded to the cues for certainty, a manipulation check was used. The manipulation check asked the subjects what they believed was the probability of getting caught for each of the individual cases.

It was intended that subjects would respond that their likelihood of getting caught was greater for cases 2 and 3 since cases 2 and 3 presented situations where the insider information was about the company the subject worked for. The expected likelihood of getting caught for case 2 was rated as 49.25% and for case 3 the expected likelihood of getting caught was rated as 52.30%. Cases 1 and 4 presented situations where the insider information was received from a trusted friend and did not concern the company the subject worked for. The expected likelihood of getting caught for case 1 was rated as 26.75% and for case 4 the expected likelihood of getting caught was rated as 28.41%. Table 5 shows the mean responses to the question concerning subjects perceived probability of getting caught.

T-tests were used to test the significance of the differences between the perceived likelihood of getting caught for each case. Cases 1 and 2 had the same level of gain and only differed in the level of certainty. Cases 3 and 4 also had the same level of gain and only differed in the level of certainty. Table 6 shows the difference in the perceived certainty between cases 1 and 2 is in the intended direction and is significant at  $p < .001$  based on a T-test of the variables. Likewise, the difference in the perceived certainty between cases 3 and 4 is in the intended direction and is significant at  $p < .001$ . Table 7 shows that there was no significant difference in the likelihood of getting caught between cases 1 and 4 or between cases 2 and 3. These cases were intended to have similar levels of certainty and only be different based on gain. These results support that the certainty manipulation was successful.

## **5.7 Hypotheses 1 and 2 - Gain and Certainty**

A within subject design was used to test hypotheses 1 and 2. A two factor repeated measures analysis of variance was used to analyze the effect that the gain and certainty manipulations had on probability of trading. Table 8 shows the cell means for the 2 x 2 factorial design. The mean response for the probability of trading for case 1 was 61.26. The mean probability of trading for case 2 was 42.60. This difference is in the expected direction since the level of gain is the same for the two cases and the likelihood of getting caught is higher for case 2, thus making subjects less inclined to trade in this situation. The mean response for case 3 was 54.22. This was higher than case 2 since the level of certainty was the same between the two cases and case 3 had a higher expected gain. Therefore, individuals were more willing to take the risk of getting caught. Case 4 had the highest probability of trading of 71.28 since it had both a high gain and low certainty.

Table 9 shows the results of the multivariate tests. Gain is significant at  $p < .001$  and certainty is significant at  $p < .001$ . There was no significant interaction effect between the two variables.

## **5.8 Hypotheses 3, 4, 5, 6 - Severity, Guilt, Social Stigma, Cynicism**

After each case the subjects were asked a series of questions. One question was designed to measure each of the hypotheses 3, 4, 5, and 6. In addition one question was used to measure fairness of laws.

### 5.8.1 Mixed Model

Cases 1 through 4 were combined to analyze the other four hypotheses and the effect of fairness of laws with a mixed model procedure. Each of the 105 subjects responded to each of the four cases resulting in 420 observations. The observation from one subject for one case is not independent of the observation from that subject for another case. This dependence between observations from the same subject must be included in the model. There is no time ordering of the cases to suggest an autoregressive structure; however, an individual who responds high in one case is more likely

to respond high in another case. This type of structure is referred to as a compound symmetry covariance structure and was specified in the model.

The four cases manipulated gain from high to low and certainty from high to low. By combining the four cases it allows for a test of interactions between the manipulated variables (gain and certainty) and the measured variables (severity, cynicism, guilt, social stigma, and fairness of laws) and it allows for all the information to be used in the same model. No interaction was hypothesized although two were tested. Interactions between certainty and severity were tested and were not found to be significant in the model. Also, no interaction was found to be significant between the two manipulated variables gain and certainty. Since no interaction was hypothesized and neither interaction was significant, interactions were not included in the final model.

The final model tested all six hypothesized relationships as well as the effect of agreement with the laws against insider trading. Table 10 shows the results of the mixed model equation. The sign was in the expected direction for all seven variables tested.

Gain and certainty were manipulated between the cases. These two variables were also tested previously with an analysis of variance, but are included in the regression equation as well so that the variation from the manipulated factors within the cases can be separated from the variation due to the other five variables. Gain was significant with a p-value of  $<.001$  and certainty was significant with a p-value of  $<.001$ .

The five measured variables were severity, cynicism, guilt, social stigma, and agreement with the laws. These variables, with the possible exception of severity, were believed to be primarily subject specific and not greatly affected by the specifics of an individual case. As explained in chapter 3 under the reconciliation of the preliminary studies, severity was expected to have some aspects of being both case specific and some aspects of being subject specific. All of the five measured variables had the expected sign.

Cynicism or the belief that others would trade in the same situation had the expected sign and was significant at  $p<.001$ . This indicates that subjects who believe that others would trade based on the insider information are more likely to trade based on insider information.

Guilt was measured as the response to the question “If you traded based on this (insider) information, to what degree would you feel guilty?” The sign of this variable was expected to be negative. The sign of the variable for guilt was in the expected direction and significant at  $p < .001$ . This indicates that individuals who felt they would experience guilt over trading based on insider information were less likely to take part in insider trading.

Social stigma was measured as the likelihood that the subjects would lose the respect of their peers if their peers found out they had traded based on insider information. It was hypothesized that if one felt that they would lose the respect of their peers, they would be less apt to trade based on the insider information. The sign of the social stigma variable was in the expected direction and was significant at  $p = .029$ . This indicates that the perception of how one’s peers would react did have an effect on the individual’s intention to trade based on insider information.

Prior research in tax compliance suggested that individuals who agree with the laws are more inclined to comply with them. As presented in chapter 3, this variable was expected to be significant in preliminary study 2, but was only marginally significant. Based on the results for agreement with laws in preliminary study 2, it was not stated as a formal hypothesis in the current study. For completeness, however, it was tested by the response to the question “To what extent do you agree that trading based on the information in the case should be illegal?” The sign of the variable for agreement with the laws was in the expected direction and was significant at  $p = .030$ . This indicates that subjects who agreed with the laws were less inclined to break them by trading based on insider information. One possible explanation for the lack of significance in the preliminary studies for this variable is that the subjects were undergraduates with less understanding of insider trading. Another possible explanation is that the preliminary studies were both conducted before the collapse of Enron and numerous publicized cases of insider trading and corporate corruption. Knowledge of these events and the laws against them may have changed perceptions about whether or not insider trading is acceptable and whether it should be illegal.

Severity of penalties was hypothesized to have an effect on the intention to trade based on insider information. Severity of penalties was rated as the most important item

in the determination to trade or not trade based on insider information in preliminary study 1. It was hypothesized that an individual who believes that they will receive a more severe penalty if caught would be less apt to take part in insider trading. Subjects were asked, “If you got caught trading based on the insider information in the case, how severe of a penalty do you think you would receive?” The sign of the variable for severity of penalties was in the expected direction; however, the variable was not significant ( $p=.134$ ).

### **5.8.2 Regression Analysis of Individual Cases**

Separate regressions were also run for each of the five cases. The regressions for the individual cases were able to explain from 31 percent of the variability in probability of trading in case 1 to a high of 56 percent for case 5 as measured by the R square. (See Tables 11 - 15) Cases 1 through 4 all involved selling an existing stock based on insider knowledge that the price would go down. The explained variance for the first four cases ranged from 31 percent to 38.5 percent based on the R square. Case five involved buying a stock in order to achieve an abnormal gain. Surprisingly, the model was better able to explain the variability of the buy situation. Case 4 and case 5 both involve high gain and low certainty and the only material difference between the two cases is that case four is framed in terms of selling an existing stock while case five is framed in terms of buying a stock. The R square for case 4 was .355 while the R square for case 5 was .567. It is not clear why these five variables are better able to explain the behavior in the buy situation and further study is warranted.

Severity of penalties had the expected sign in the regression equations for four of the five cases; however, it was not significant in any of the equations. It was not clear from the preliminary studies whether this variable was more case specific or subject specific. It was included in the model as a measured variable.

If severity is primarily a subject specific variable, it should not change materially between cases. Table 16 shows that severity of penalty was similar for cases 2 and 3, where certainty was high. Also, severity was similar for cases 4 and 5 where certainty was low in both cases and gain was high. Surprisingly, case 1 had a mean value for certainty of 4.86 which was considerably lower than the other cases. The interaction

effect for certainty and severity of punishment on probability of trading was tested in the combined model and was not significant. However, the manipulated variable certainty does appear to have an effect on the subjects' perception of the severity of penalty they would receive.

Similar to tax compliance studies (Alm et al. 1992), the effect of severity of punishment in the current study is inconsistent. It is significant in some of the regression equations, but not significant in others. Also, it is significant in one of the preliminary studies, but not in the other. This suggests that the method of measuring severity may have an effect on its significance. A further study that involves manipulating severity seems warranted by the results of the current study.

Cynicism had the expected sign and was significant in all five individual regression equations. Guilt also had the expected sign and was significant in all five individual regression equations. Social stigma had the expected sign in all five individual regression equations; however, due to the loss of power compared to the mixed model, it was only marginally significant in one of the five regression equations. Agreement with the laws had the expected sign in three of the five individual regression equations.

Based on the results of the individual regressions, it appears that cynicism and the expected feeling of guilt had the strongest association with the probability of trading based on insider information.

## **5.9 Prospect Theory**

Prospect theory suggests that individuals are more willing to take action to avoid a loss than to achieve a gain. A fifth case was designed to test prospect theory. The fifth case was similar to the fourth case in terms of expected gain and likelihood of getting caught. The fourth case was framed in terms of selling a stock to prevent a loss whereas the fifth case was framed in terms of buying a stock to achieve an abnormal gain. As intended, the manipulation check for certainty did not indicate a significant difference between the likelihood of getting caught for cases 4 and 5.

To test prospect theory, a paired T-test was run on the difference between the probability of trading for case 4 and the probability of trading for case 5. Based on prospect theory, it was expected that the probability of trading for case four would be

greater than the probability of trading for case five. Table 17 shows that the mean probability of trading to achieve an abnormal gain was 53.80% (case 5) while the mean probability of trading to avoid a loss in the same amount with the same level of certainty was 71.27%. This difference is significant at  $p < .001$ .

### **5.10 Social Desirability Response Bias (Halo Effect)**

Paired T-tests on the difference between the probability of trading based on insider information and the probability that one's best friend would trade based on the same information measured social desirability response bias. Each subject answered both questions for each of the five cases, thus giving a separate test of this bias for each of the five cases.

Table 18 shows that the difference in the mean responses to the two questions was in the expected direction for all five cases. The difference was significant for three of the five cases and marginally significant for one of the five cases. Case 4 was the only case where there was not a significant difference in the responses to the two questions. There may have been some confusion in case 4 from the use of terms "very close friend" in the case and "best friend" described in the question. It was not intended to imply that this was the same individual, but possibly some respondents took it to mean the same individual. This could distort the social desirability response bias in case 4. Case 1 also used the term "friend" in the case which may have contributed to social desirability bias only being marginally detected in that case.

### 5.11 Gender Effects

The preliminary studies found significant differences for some of the variables based on gender. Preliminary study 1 found that female subjects responded significantly higher for the importance of guilt on their decisions to trade or not trade based on insider information. Preliminary study 2 found that female respondents expected to feel more guilt, were more concerned about social stigma and perceived their likelihood of getting caught as significantly higher than did male respondents. Based on the preliminary studies, gender effects were tested for all five cases for guilt, social stigma, and

perception of probability of getting caught. The current study had 67 male respondents and 38 female respondents.

An independent sample t-test was used to test whether female respondents expected they would experience more guilt than male respondents from insider trading as indicated in preliminary studies 1 and 2. Panel A of table 19 shows the results for the effect of gender on the variable guilt. In all five cases the mean response from female respondents was higher than that of male respondents. The difference was significant in case 3 ( $p=.018$ ) and case 4 ( $p=.024$ ) and marginally significant in case 1 ( $p=.056$ ).

An independent sample t-test was also used to test whether gender had an effect on subjects' perceptions of social stigma. Preliminary study 2 indicated that female respondents were more concerned about the loss of respect from their peers than were male respondents. Panel B of table 19 shows the results for the effect of gender on the variable social stigma. The scale on the question for social stigma was reversed from that of guilt, and therefore, it was expected that female respondents would respond lower than male respondents representing a more likely loss of respect from one's peers. As expected, the mean response for female subjects was lower than that of male subjects for all five cases. The difference is significant for case 4 ( $p=.021$ ) and marginally significant for case 1 ( $p=.076$ ) and case 3 ( $p=.058$ ).

The other variable that indicated a significant difference between male and female respondents in the preliminary studies was certainty. Preliminary study 2 indicated that female subjects felt they were significantly more likely to get caught if they traded based on insider information. Certainty was manipulated within the cases in the current study and the subjects' perceptions of certainty were also measured at the end of each case. A paired t-test was used to test for a difference in subjects' perceptions of certainty based on the response to the question: "If you chose to trade based on the information in the case, what is the likelihood that you would get caught?" Table 20 shows the effects of gender on certainty for all five cases. Consistent with the preliminary studies, the mean responses for females were higher for all five cases. The difference was significant in all five cases ( $p<.001$ ,  $p=.039$ ,  $p=.001$ ,  $p=.006$ ,  $p=.003$ , for cases 1 – 5 respectively). This indicates that female respondents felt their risk of getting caught was greater than that of male respondents.

## 5.12 Analysis Using Probability of Trading and Friend Trading as Dependent Variable

The test for social desirability response bias indicates a significant bias in the subjects' responses. To help mitigate this bias, the subjects' responses to the probability that they would trade and the probability that their best friend would trade were averaged and used as the dependent variable in the following analysis. There is no reason that on average the subjects should be more or less willing to trade based on insider information than their best friends. Therefore, the question pertaining to the subjects' friend's likelihood of trading is another measure of the probability of trading. Having two measures for the same effect provide greater reliability for the measure.

The mixed model was run with average response to the two questions concerning trading and best friend trading as the dependent variable. Table 21 shows the results of this analysis. The two manipulated variables are both significant. Gain is significant at  $p < .001$  and certainty is significant at  $p < .001$ . All of the measured variables have the correct sign and the only variable that is not significant is the variable for severity of penalties ( $p = .261$ ). Cynicism and guilt are both significant at  $p < .001$ . Stigma is significant at  $p = .001$  and agreement with the laws is significant  $p = .012$ <sup>5</sup>.

Regressions for each individual case were also run using the average dependent variable. Tables 22 through 26 show the results of the individual regression equations for each of the five cases. The R square for all five cases increased as a result of using the average response as the dependent measure. The R square increased from .310 to .343 for case 1, from .380 to .447 for case 2, from .385 to .493 for case 3, from .355 to .389 for case 4, and from .567 to .586 for case 5.

Tables 22 through 26 show results similar for most of the variables to those in the regressions based on the single question measuring probability of trading (tables 11 through 15). However, by using the average response as the dependent variable, social stigma is significant in three of the five regression equations and marginally significant in the other two regression equations. Social stigma was only marginally significant in one of the five individual regression equations using probability of trading as the dependent

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<sup>5</sup> The mixed model also had similar results when it was run using probability of friend trading as the dependent variable. All the independent variables had the expected sign and all were significant except severity.

variable. The results suggest that the average response may be a better measure of the subjects' intent to trade based on insider information because the social desirability response bias has been partially mitigated and having a second question adds reliability to the measure.

## **5.13 DISCUSSION**

This study finds support for five of the six hypotheses tested. Hypothesis 1 tests whether intent to trade based on insider information increases as expected gain increases. Hypothesis 2 tests whether intent to trade based on insider information decreases as the perception of getting caught increases. Hypotheses 1 and 2 are tested with manipulations of the variables between cases. Support is found for hypotheses 1 and 2. As gain is manipulated from low to high values, the intent to take part in insider trading increases. Likewise, as certainty is manipulated from low to high, the intent to take part in insider trading decreases.

Hypotheses 3, 4, 5, and 6 are measured by the responses to questions after each case. Hypothesis 3 is not supported by the current study. In the main experiment and in preliminary study 2, no significant relationship is found between subjects' perceptions of the severity of penalties and their intentions to trade based on insider information. However, severity of penalties is rated highly important to the decision to trade based on insider information in preliminary study 1.

Hypothesis 4 tests whether subjects who expect to feel more guilt from insider trading are less inclined to trade based on insider information. Guilt is found to be significant in the mixed model combining the five cases and in the regression equations for all five cases. Guilt also has a significant relationship to intention to trade based on insider information in preliminary study 2.

Hypothesis 5 stated that as perceived social stigma increases, the intent to take part in insider trading would decrease. Social stigma is supported in the combined model and has the expected sign in the regression equations for all five cases; however, it is only marginally significant in one of the five cases. When the average of probability of trading and probability of one's best friend trading was used as the dependent variable,

social stigma was significant in the combined model and significant in three of the five regression equations and marginally significant in the other two regression equations.

Hypothesis 6 tests the effect that cynicism has on the intent to trade based on insider information. Cynicism is defined as the belief that others would trade based on the insider information. The combined model and individual regressions for all five cases found a significant relationship between cynicism and the intent to trade based on insider information. Cynicism is also significant in preliminary study 2.

Agreement with the laws against insider trading was tested in both preliminary studies and the main experiment, although it was not stated as a formal hypothesis. Subjects' agreement with the laws was significant in the mixed model and was marginally significant in one of the preliminary studies.

Prospect theory states that individuals are more likely to act to prevent a loss than to achieve a gain. Preliminary study 2 and the main experiment test prospect theory in the context of insider trading. The studies test whether individuals are more apt to use insider information to avoid a loss than to achieve a gain. Preliminary study 2 and the main experiment both find support for prospect theory.

## **CHAPTER 6**

### **IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH**

#### **6.1 Implications**

The contributions of this study are to identify what leads to insider trading and thereby identify what can be done to reduce it. From a policy perspective, some attitudes are much easier to change than others. Guilt or perception of gain may be very difficult or costly to alter. However, variables like severity of penalties, certainty, and public cynicism may be more practically changed.

Insider trading harms investors in multiple ways. In addition to the loss of trust in the capital markets, the public must bear the burden of the cost of detection and prosecution of insider trading cases. By identifying why some individuals in certain cases use insider information while others do not, we can identify the most effective prevention methods. This study tests whether expected gain, likelihood of getting caught, perceptions of the severity of penalties, perceptions of guilt, perceptions of social stigma, agreement with the laws, and the belief that others would take part in insider trading has an effect on subjects' intentions to take part in insider trading.

Identifying what situations are more likely to lead to insider trading allows policymakers to design more efficient detection efforts. This study finds that subjects' are more inclined to trade based on insider information in situations where they are faced with the possibility of avoiding a loss on stock they currently own than they are when faced with the possibility of achieving an abnormal gain by purchasing a stock that they

do not currently own. This suggests that insider trading is more likely to occur prior to a large stock price decrease where individuals are trying to prevent a loss, than prior to a large price increase where individuals are trying to obtain an abnormal gain. This information may be helpful in planning more cost effective compliance efforts.

This study finds that as expected gain increases, the intent to take part in insider trading increases. While this may seem intuitive, it was necessary to test to confirm this relationship. Having confirmed the relationship, future research can concentrate on cases where the expected gain is high, and, therefore, the likelihood of trading based on insider information is greater.

This study also finds that the intent to take part in insider trading increases as the perception of likelihood of getting caught decreases. This was tested in the study by having the subjects find out insider information about the company they work for or by receiving the insider information from a friend about the company that the friend works for. The results indicate that subjects are more willing to use the insider information when it is from a friend because they believed their likelihood of getting caught was lower. This is important for two reasons. If the incidence of insider trading is higher in situations that involve second hand knowledge, then detection efforts become more complicated, also, the presence of insider trading may be significantly higher than current detection efforts indicate because these cases are hard to detect. By knowing the importance of the perception of likelihood of getting caught to the decision to trade based on insider information, policy makers can concentrate efforts on increasing the public impression of the likelihood of getting caught. This can be accomplished by actually increasing detection efforts. Alternatively, this could be addressed by greater publicity of the number of cases prosecuted for insider trading.

The results found here do not provide conclusive support for severity of punishment. The main study did not find support for severity of punishment, although it was rated as the most important item in preliminary study 1. Since increasing the severity of punishment is a relatively easy and cost effective method of deterrent, future study in this area is warranted.

This study supports the premise that an individual's perception of guilt has a strong relationship to his/her intention to trade based on insider information. While the

results clearly indicate that a relationship exists, it is not as clear how this information can be used to curtail insider trading. One possible area of study would be to include discussions of insider trading and the harm that it causes in company professional development seminars and in college ethics courses. Further research is needed to determine if these efforts can change individuals' feelings of guilt.

The effect of social stigma was found to have a relationship to insider trading in the main study. Individuals who believe that their relationship with their peers would change if their peers found out they used insider information were less inclined to trade based on insider information. This variable is similar to the guilt variable in that it may be difficult to change perceptions of social stigma.

Based on the results presented here, cynicism (the belief that everyone else would trade based on insider information) seems to offer great promise for reform. Cynicism has a significant relationship to intent to trade based on insider information in all the analyses presented here. Subjects who believe everyone else would trade based on insider information are more likely to trade based on insider information. Cynicism possibly could be more easily changed than some of the other deterrents. Public relation efforts designed at increasing perceptions of the fairness of the United States stock markets could attempt to reduce cynicism about insider trading.

Agreement with the laws was found to have a significant relationship to the intent to trade based on insider information. Subjects who agree that insider trading should be illegal are less inclined to trade based on insider information. This relationship is not as consistent in the current study as some of the other variables and warrants further study.

Due to recent events in corporate America, including the recent Enron scandal and numerous cases of insider trading, the public's faith in the fairness of the stock markets has been shaken. The current study suggests that public relations efforts that are designed to increase the public's perception of the integrity of United States stock markets and lower public cynicism toward insider trading may be fruitful.

## **6.2 Limitations and Future Research**

This study was conducted on student subjects, many of whom did not actively trade stocks. Masters level business students are the most likely candidates for

management positions and, as such, they are likely candidates to have access to insider information in the future. The subjects possessed the necessary fundamental understanding of the stock market environment to answer the questions. However, there is still a concern as to whether their intentions to act will systematically change by the time they have access to insider information. To the extent that individuals become more or less willing to risk breaking the laws after they enter the work force, the generalizability of the results may be diminished.

Hypotheses 3, 4, 5, and 6 are analyzed with regression analysis and no cause and effect relationship can be inferred. For instance, individuals who perceive higher penalties may be less apt to trade based on insider information; however, perceiving higher penalties may not have caused them to be less apt to trade; and, therefore, raising the perceptions of penalties may not decrease the incidence of insider trading.

Severity of penalties remains somewhat of a mystery. It was designated as highly important in preliminary study 1; however, its non-significant results in the main study leaves the question of its importance unanswered. The previously mentioned cause and effect limitations of the measured independent variables also leaves questions about severity of penalty unanswered. Future research should manipulate the severity of penalty in order to further test its significance and to test for a cause and effect relationship for severity of penalties on the intent to trade based on insider information.

Due to the significance of cynicism (the belief that everyone else would trade based on insider information) in the current study, a follow up needs to address whether changing this cynicism could lower the incidence of insider trading. A follow up study could give one group of subjects information about the fairness of United States stock markets and have a control group that does not receive the information to test whether the intent to trade based on insider information is the same between the two groups. If this causal link can be provided, then the question turns to determining how to change the cynicism about insider trading.

Further studies may wish to address the effect of risk aversion on insider trading and the effect of a need for money. The differences found in the preliminary studies suggest that the methodology used has an effect on the results. Due to these differences, it is important that further studies use differing methodologies. This will lead to a greater

understanding of the variables affecting insider trading and help prevent any bias resulting from using only one methodology.