

# An Experiment Testing the Determinants of Non-Compliance with Insider Trading Laws

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**ABSTRACT.** Recent stories of corporate insiders avoiding losses and, in some cases, generating enormous personal profits as their companies crumbled have led investors to question the integrity of American business and the fairness of the United States stock markets. The SEC tries to ensure the fairness of the stock markets by making and enforcing laws against unfair practices such as insider trading. In the United States, when insiders trade stock based on non-public information, they have broken the law and betrayed the trust that has been placed in them.

This study used student subjects to test the relationship between the likelihood of trading based on insider information and subjective probabilities of deterrents and motivations for insider trading. Expected gain, guilt, cynicism, and fairness of laws

were the determinants that had a significant relationship with the intent to trade based on insider information. This study also found support for prospect theory with regard to insider trading. The results indicate that subjects are more likely to trade based on insider information to avoid a loss than to achieve an abnormal gain. The study also finds evidence of social desirability response bias.

Additional findings of the study were that subjects did not view the determinants for themselves in a manner consistent with how they viewed those same deterrents and motivations for other people. Also, a test of the effects of gender found that certainty and social stigma were significantly higher for female respondents than for male respondents.

**KEY WORDS:** certainty, cynicism, deterrence, ethics, guilt, insider trading, prospect theory, severity, stigma

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## Introduction

When individuals in a position of trust take advantage of the public, investors lose trust in the marketplace. The recent Enron, WorldCom, Global Crossing, and Martha Stewart scandals provide examples of the devastating effects that this loss of trust can have on the marketplace. The Securities and Exchange Commission views insider trading as a serious problem in the United States and spends a great deal of time and money in the detection and prosecution of cases involving insider trading. Over the last two decades more attention has been given to insider trading in part because, "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).

Congress, policy makers, and the general public are concerned that investing in the United States stock markets may not be a fair game. The 2001 collapse of Enron Corporation, along with widespread allegations of insider trading at Enron, ImClone and Global Crossing have caused investors to lose confidence in the integrity of the United States capital markets. This perceived lack of fairness could lead to less investment in the stock market making it harder for companies to raise capital, which could affect economic growth.

The purpose of this study is to address the issues that affect compliance with the insider trading laws. The implications of this study are intended to help policy makers focus their efforts to increase compliance with insider trading laws.

## Background

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. An insider can buy stock as part of a regular buying and selling pattern. However, when an insider trades the stock to take advantage of private information, then he/she has broken the law.

The 1934 SEC Act made it illegal for company insiders to trade based on nonpublic information. After numerous scandals and questions about the integrity of our 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).

Prior to 1990, insider trading was a crime on only 43% of the world stock markets. By the end of the 1990s insider trading was illegal on 84% of the world stock markets. Insider trading became illegal in Britain in 1980 and in Germany

in 1994 (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, p. 150).

Some corporate information must 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 professionals 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 have been involved in insider trading:

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))

Although insider trading is difficult to detect and prosecute, the SEC has recently taken steps to make prosecution of insider trading cases easier. The first change, Rule 10b5-1 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. Several defenses are outlined in Rule 10b5-1 that provide an exception to the rule. One exception is when the trade is part of a prede-

financed plan or contract that was made prior to knowledge of the insider information.

The second change is Rule 10b5-2, which 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.

Insider trading extends far beyond officers of a company. In an insider trading case in 1989, a former stockbroker 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 12-15-99). This is an example of just how far removed the 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. Although differences between illegal and legal trading were not clearly drawn in the past, the new rules passed by the SEC have helped to clarify what is illegal.

There is no way to determine how much illegal insider trading goes undetected. In the past, most insider trading cases brought by the SEC resulted from trading before earnings announcements or before takeovers (Seyhun, 1992). Earnings announcements and takeovers often result in significant changes in stock prices, and 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 predictability also makes them tempting targets for insider trading.

### Literature review

Several studies have looked at the ethics and social utility of insider trading. Other studies have

addressed deterrence to similar forms of illegal behavior such as theft and tax non-compliance. This study attempts to provide a link between the existing ethics literature, the compliance literature, and insider trading.

### *Insider trading studies*

Various financial studies have looked at the information content of legally disclosed insider trading. These studies tend to focus on the market response to news that insiders are making trades. Seyhun (1992) used archival data on insider trades to address whether or not increased sanctions were an effective deterrent to insider trading. Seyhun found that increased sanctions did not decrease the incidence of insider trading. Experimental markets have been used to assess whether individuals with insider information can achieve abnormal gains (Marsden and Tung, 1999). Other studies have looked at the ethical issues of insider trading and whether it should be illegal. Some researchers contend that insider trading is an economic issue rather than a moral issue and that it increases shareholder wealth and therefore social utility (Ma and Sun, 1998). A counter argument says that even if overall wealth is increased it is still unethical if it is unfair to any individuals (Snoeyenbos and Smith, 2000). The current study does not attempt to address whether insider trading should be illegal, but rather accepts the laws as they are and looks at the causes of non-compliance with those laws.

Abdolmohammadi and Sultan (2002) conducted an experiment to determine if students with lower ethical standards were 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. 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 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 shared insider information so that they could trade based on the information before the public had access to it. Levine was charged and testified against the rest of the group. 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, p. 52). This cynicism may have influenced his decision to trade based on insider information.

Seyhun (1992) addressed the effect of increased sanctions on insider trading by looking at three sample periods representing significant changes in laws and enforcement. Results indicate that both volume and abnormal profits for insiders increased during the period when the insider trading sanctions were being increased. However, the number of insiders trading before earnings announcements and takeover announcements decreased over these same periods. It appears the increased sanctions may have made insiders more leery of trading before these events, even though insiders’ overall ability to make abnormal profits actually increased during the period. Thus, while the risk associated with insider trading was increasing, the potential reward from trading was also increasing. The data collected were limited to insider trades that were reported to the SEC, and therefore, only include those trades that the insiders believed to be legal. The Seyhun study does not address whether the increased sanctions had an effect on insiders who were intentionally breaking the law and trying to hide it.

Marsden and Tung (1999) used a simulated trading market to test whether individuals with insider information could obtain abnormal

returns under various monitoring rates and penalty rates. 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 results of the experiment suggest that individuals were able to obtain abnormal returns from insider trading if the monetary penalties were not imposed. The study did not address the effect that increased penalty rates or increased probabilities of getting caught had on the incidence of insider trading. The study looked at the effect of penalties on abnormal profits rather than their effect on compliance.

The current study looks at the motivations and deterrents to illegal insider trading. The motivation for illegal insider trading may be quite different from legal insider trading. While no such study has been conducted on insider trading, there is similar research in crime and punishment and tax compliance.

#### *Utility theory of crime and punishment*

The application of utility theory tells us that an individual will commit a crime if he/she expects the commission of the crime to increase his/her utility. Becker (1968) models the utility from a crime as follows:

$$E[U_j] = p_j * U_j (Y_j - f_j) + (1 - p_j) * U_j (Y_j)$$

where:

- $E[U_j]$  = 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, p. 177)

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. If the expected utility is positive then the individual would theoretically be willing to commit the crime.

*Deterrence variables – certainty, severity, social stigma, guilt*

Perceived probability of getting caught (certainty) has been found to have a significant effect on the intent to commit crimes (Grasmick and Green, 1980; Mason and Calvin, 1984; Tittle, 1980). Certainty has also been tested in tax compliance literature. Increasing the probability of getting caught increases compliance (Ali et al., 2001; Alm et al., 1992; Beck et al., 1991; Mason and Calvin, 1984) See Fischer et al., 1992, for a complete discussion of the tax compliance studies related to certainty.

The effect of various types of punishment to crimes has also been tested. Punishments are generally grouped into three categories – legal punishments, peer imposed punishments, and self imposed punishments (Grasmick and Green, 1980). In survey research, the severity of legal penalties (severity) has been found to have a significant effect on the intent to engage in criminal behavior (Tittle, 1980). Severity of penalties has been shown to be a significant deterrent in some experimental studies on tax compliance (Beck et al., 1991), while other studies failed to find significant effects to changes in penalties (Alm et al., 1992). The effect of more severe penalties like incarceration (which is generally the case with insider trading) cannot be measured in these experimental studies.

Peer imposed punishments (social stigma) include the effect of peers losing respect for the individual. Social stigma has been found to have a significant deterrence effect (Grasmick and Green, 1980; Grasmick and Scott, 1982; Scott and Grasmick, 1981; Tittle, 1980). Self imposed punishment (guilt) is the guilt that the individual

would feel for committing an illegal act. Guilt has been found to have a significant deterrence effect on illegal behavior (Grasmick and Green, 1980; Grasmick and Scott, 1982; Scott and Grasmick, 1981; Tittle, 1980). Some studies have found that self imposed and peer imposed punishments have a greater deterrence effect than legal punishments (Tittle, 1980; Grasmick and Scott, 1982). 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. Other recent tax compliance research uses experimental game-type studies. The effect of guilt and the effect of peer influence is difficult to measure in a game situation. Reall et al. (1998) find that subjects' 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.

*Motivational variables – gain, cynicism, fairness of laws*

Gain has been tested in the tax compliance literature by using different marginal tax rates. A high tax rate means that the individual has more to gain by not reporting income since a higher dollar amount of tax will result from each dollar of income. Thus, compliance with the tax laws generally decreases with increasing tax rates (Alm et al., 1992; Ali et al., 2001).

Cynicism has been tested in 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, p. 40). Cynicism looks at whether believing that everyone else would break the rules affects whether you would break the rules.

Tittle (1980) tested a variable called "differential association" which measured the proportion and number of people that the respondents believed would take part in deviant acts. This variable is essentially the same as cynicism. Tittle found a significant relationship between differ-

ential association and the respondent's 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 United Kingdom. One of the independent variables in the study was cynicism. 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. 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.

Scott and Grasmick (1981) tested the effect of perceiving that the law is fair has on compliance with the law. They found that perceived fairness of laws did not have an additive effect on compliance in a model, which included legal punishments, peer imposed punishments, and self imposed punishments; however, it had a significant interaction effect with deterrence variables. Mason and Calvin (1984) tested the relationship between agreement with tax laws and tax compliance. Their study finds that there is an indirect relationship between tax compliance and agreement with the tax laws.

### *Hypotheses*

The following hypotheses are used to test the deterrence variables (certainty, severity, social stigma, and guilt), cynicism, the fairness of laws, and gain in the context of insider trading:

- 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 perceptions of cynicism toward insider trading increase, the intent to take part in insider trading will increase.

**H7:** As perceptions of the fairness of the laws increase, the intent to take part in insider trading will decrease.

In addition to these seven hypotheses, the study tests prospect theory and social desirability response bias. Prospect theory states that individuals view achieving a gain differently than avoiding a loss (Kahneman and Tversky, 1979). Based on this theory, individuals are more willing to take action to avoid a loss than to achieve a gain. This theory is tested by comparing whether respondents are more willing to trade based on insider information to avoid a loss on a stock they currently own than to trade based on insider information to achieve an abnormal gain.

Social desirability response bias is the tendency to respond in a manner that makes one look socially responsible. Since insider trading is an illegal activity, possessing the propensity to take part in insider trading may be viewed as socially undesirable. The bias to look socially desirable has been found to exist even when subjects are anonymous (Randall and Fernandes, 1991). This bias is tested by comparing whether subjects perceive that they are more likely to trade based on insider information than their peers.

### **Methodology**

#### *Sample*

The study was conducted using 118 students in six sections of a managerial accounting class at a major university. Three different instructors taught the six sections of the class. There were two versions of the instrument. The second version reversed the order of the questions from the first version. All students were given a five-

page excerpt on insider trading from the Securities 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. Insider trading cases document that insiders knowingly broke the law and made an effort to cover up their crime. Therefore, making subjects aware of the law should not bias the study. The purpose of the study was to measure the effect of the various determinants on 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.

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.

Business students are expected to have a good understanding of the business environment. Many will be candidates for management positions in the future, and as such, are likely to have access to insider information in the future. Although these subjects are not managers, they should represent a reasonable surrogate for the purposes of the study. In addition, these subjects are not at risk and, therefore, are more likely to answer the questions honestly.

Five respondents were removed because they had not heard of insider trading. Seven respondents were removed because they did not correctly answer at least three of four questions

designed to test their understanding of insider trading.<sup>1</sup> This resulted in 106 usable responses. Table I shows the demographic breakdown of the subjects.

#### *Instrument*

The Instrument was used to assess the effect of subjects' beliefs about deterrent and motivational variables on their intent to trade based on insider information by asking respondents to give their likelihood of taking part in insider trading. Subjects were also asked questions concerning deterrence and motivation for taking part in insider trading.

Subjects responded to each question by giving a percentage or probability from 0 to 100%. A response of 0 represented no chance while a response of 100% meant the item was an absolute certainty. A probability scale is used instead of a Likert scale to give greater accuracy in the responses. This gives the respondents the opportunity to select any probability from 0 to 100% rather than having only 5 or 7 options available

TABLE I  
Descriptive statistics of subjects

<b>Panel A: Gender</b>	Frequency	Percent
Male	70	66.0
Female	36	34.0
Total	106	100.0
<b>Panel B: Trading experience</b>		
Some prior trading experience	39	36.8
No prior trading experience	67	63.2
	106	100.0
<b>Panel C: Academic year</b>		
Freshman	0	0.0
Sophomore	27	25.5
Junior	66	62.3
Senior	12	11.3
Graduate	1	0.9
	106	100.0

as with a Likert scale. Since the responses from the survey questions are all probabilities from 0 to 100, the responses are comparable across different questions; however, the measures are still not truly continuous.

Two questions measured subjects' likelihood of trading based on insider information. The dependent variable was the average of the two questions. The first question was presented in terms of a gain from buying a stock with insider knowledge that the stock price would go up. The 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 are presented in appendix I.

The dependent variable (likelihood of insider trading) was regressed on the seven independent variables identified in the hypotheses. The respondents were asked to give their subjective opinions to questions measuring the following seven independent variables (see appendix I).

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

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 0.577 to 0.675, 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>

## Results

Table II 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  $p < 0.001$  and gain was significant at  $p = 0.030$ . Cynicism was significant at  $p = 0.012$ . Fairness of laws was marginally significant at  $p = 0.056$ . All of the variables had the expected sign except for social stigma. The social stigma variable had a high correlation with the guilt variable.<sup>3</sup> 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. The insignificance of certainty and severity are consistent with the findings from the archival study by Seyhun (1992) who found that insider trading did not decrease during the period of increasing sanctions during the 1980s. The results presented here also support the findings of Tittle (1980) and Grasmick and Scott (1982) who found that self-imposed punishments and peer-imposed punishments have a greater deterrence effect than legal punishments. However, it is also possible that the variables for certainty and severity of punishment are not significant since these variables would be greatly influenced by the facts of a given situation and no specific situation was presented in the experiment.



TABLE II  
Regression results for subjective probabilities

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

Variable	Expected sign	Coefficient	t-stat	p-value
Intercept		69.568	6.406	0.000
Stigma	-	0.147	1.626	0.054 <sup>a</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

$R^2 = 0.330$

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

Model F = 6.764, 7 degrees of freedom,  $p < 0.001$

Definition of variables:

PT = Probability of trading based on insider information

Stigma = Social stigma

Certainty = Likelihood of getting caught

Fairness = Fairness of laws

Gain = Expected gain

Guilt = Expected guilt

Severity = Severity of punishment

Cynicism = Belief others would trade

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

### Prospect theory

To test prospect theory, one of the dependent measure questions was presented in terms of buying a stock to achieve a gain and the other was presented in terms of selling a stock to prevent a loss. Prospect theory suggests that a difference in the responses to the two dependent measure questions may exist. Based on prospect theory, the respondents should be more willing to trade to avoid a loss. A paired t-test was used to test for a difference in the responses to the two questions. Table III, panel A presents the results. The mean response to the probability of buying a stock after receiving insider information (gain

situation) was 64.74 while the mean response to the probability of selling a stock after receiving insider information (loss situation) was 76.38. The difference of 11.64 is in the expected direction and is statistically significant at  $p < 0.001$ . These findings support prospect theory in that subjects were more inclined to use the insider information to prevent a loss than to achieve an abnormal gain.

### Social desirability response bias

Social desirability response bias states that there is a tendency to bias survey responses to make

TABLE III  
Test of prospect theory and social desirability bias

Panel A: Prospect theory	Mean response				
	Gain situation <sup>a</sup>	Loss situation <sup>b</sup>	Difference	T-stat	Significance
Mean probability of trading	64.74	76.38	11.64	4.650	0.000
Panel B: Social desirability bias	Mean response				
	Subject trading <sup>a</sup>	Peers trading <sup>c</sup>	Difference	T-stat	Significance
Mean probability of trading	64.74	71.29	6.55	2.315	0.011

<sup>a</sup> Average response for probability of subject buying a stock based on insider information to achieve an abnormal gain.

<sup>b</sup> Average response for probability of selling a stock based on insider information to prevent a loss.

<sup>c</sup> Average response for probability of one's peers buying a stock based on insider information to achieve an abnormal gain.

one's self look socially responsible. Since the dependent measure questions concern an illegal activity, there is a risk the responses may contain this bias. Therefore, respondents may not give their true likelihood of trading based on insider information because this response makes the individual appear to possess a socially undesirable trait. Social desirability bias can exist even in cases where respondents are anonymous (Randall and Fernandes, 1991). To test for this bias, a third question asked respondents if their peers would trade based on insider information.

The bias should not be present in a question about one's peers because it does not directly reflect on the respondent. The difference between the responses to the dependent measure question concerning buying stock based on insider information and a question concerning one's peers buying a stock based on insider information was used to test for this bias (See appendix I). The following two questions tested for social desirability response 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?"

Since there is no reason to suspect that the respondents are more or less honest than their peers, if the responses to Q3 are significantly higher than the responses to Q1 it would suggest that this social pressure is biasing the responses. To test for the bias a paired t-test was run on the differences between the responses from question 1 and question 3. Table III panel B presents the results. 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 of 6.55 was in the expected direction and is significant at  $p = 0.011$ . The results suggest that responses to the questions concerning trading based on insider information are biased downward even though the respondents were anonymous. This result is consistent with the findings of Randall and Fernandes (1991) who find that ". . . social desirability bias persists even if a survey is administered in a non-threatening situation."

#### *Test of perceptions for self vs perceptions of others*

Individuals' perceptions of their own likelihood of getting caught can be different from their perceptions of others' likelihood of getting caught

(Jenson et al., 1978). The pairs of questions for the independent variables tested for this difference in perception. Respondents were asked the probability they would get caught and what proportion of people who take part in insider trading get caught. A difference between the two questions would indicate a difference in the perception of oneself getting caught as opposed to another person getting caught. Similar questions were asked for severity of punishment, expected gain, social stigma, and cynicism. Paired sample t-tests were used to compare the differences in perceptions for oneself and that for the population in general.

Table IV shows the results. The results indicate that there are significant differences between the perceptions for oneself and the perceptions for others. The results indicate that the respondents viewed themselves as more likely to get caught ( $p < 0.001$ ). Respondents viewed themselves as more likely to receive a severe punishment ( $p = 0.026$ ) and viewed themselves as more likely to increase their wealth ( $p = 0.007$ ). Respondents felt their relationships were less likely to change as a result of insider information than other individuals in the United States ( $p < 0.001$ ). There was no significant difference between the two questions for cynicism. These findings suggest that individuals do not view their personal risk

in the same manner that they view the risk to others.

#### Gender effects

Table V shows the mean responses to the seven independent variables by gender. Certainty and social stigma were significantly different between genders. Females perceived their likelihood of getting caught as significantly higher than males ( $p = 0.006$ ). Female respondents also indicated a significantly greater concern for the effect on their relationships with their peers if they traded based on insider information ( $p = 0.007$ ). Because there are seven possible comparisons being conducted, the probability of finding one significant result at random is increased seven times. By dividing the existing  $p$ -value by 7 it will protect the experimentwise error rate to 0.05. Certainty and social stigma are still significant after protecting the overall error rate to 0.05.

#### Limitations

Some variables tested in this study are case specific. These variables will change a great deal

TABLE IV  
Differences between responses to independent measure questions for self and for others

	Mean responses					
	Correlation <sup>a</sup>	Self question <sup>b</sup>	% of United States <sup>c</sup>	Difference	t-stat	P-value
Certainty	0.587	26.95	19.16	7.79	4.05	0.000
Penalty severity	0.675	39.07	33.73	5.34	2.26	0.026
Expected gain	0.591	63.87	57.01	6.86	2.74	0.007
Social stigma	0.577	31.16	45.81	-14.65	-5.11	0.000
Cynicism	0.661	64.65	67.10	-2.45	-1.20	0.234

<sup>a</sup> These are the correlations between the pairs of questions for each variable. Each pair of questions contained one question that referred to the likelihood for oneself and the other question asked for the probability for other people in the United States.

<sup>b</sup> These are the means of the responses to the questions that are framed in terms of affecting one's self (See Appendix I).

<sup>c</sup> These are the means of the responses to the questions that are framed in terms of the effect on others (See Appendix I).

TABLE V  
Differences in responses to independent variable questions by gender

	Mean Response			
	Male ( <i>n</i> = 70) <sup>a</sup>	Female ( <i>n</i> = 36) <sup>b</sup>	Difference	<i>P</i> -value
Certainty	19.48	30.01	-10.53	0.006
Penalty severity	35.39	38.36	-2.97	0.603
Expected gain	61.56	58.26	3.30	0.530
Social stigma	33.24	48.68	-15.44	0.007
Cynicism	67.61	62.56	5.05	0.291
Fairness of laws	61.32	61.57	-0.25	0.951
Guilt	51.51	59.46	-7.95	0.160

<sup>a</sup> One male respondent did not give a value for cynicism (*n* = 69 for this variable).

<sup>b</sup> One female respondent did not give a value for fairness of laws and guilt (*n* = 35 for these variables).

depending on the individual case or situation and not as much depending on the individual subject. The severity, certainty, and gain variables are case specific variables. They are primarily affected by the situation or case and not as much by the individual subject. The other four variables (social stigma, fairness of laws, guilt, and cynicism) are subject specific. Clearly, there is some overlap between the groups. Each variable will have some aspects of being case specific and some aspects of being subject specific.

The results indicate that perceptions of guilt, cynicism, expected gain, and fairness of laws were the beliefs that had the greatest association with the intent to trade based on insider information. Severity and certainty were the only two variables that were clearly not significant. The regression did not address causal relationships. Instead it tested what beliefs were associated with the intent to trade based on insider information. This may explain why most of the subject specific variables were significant in this regression and expected gain was the only case specific variable that was significant.

The likelihood of trading based on insider information was measured by the subjects' responses to two questions concerning their probability of trading if they had access to insider information. It is possible that the subjects' perceived probability of trading based on insider information would not correspond to their actual trading if they had access to insider information.

It is also possible that subjects' attitudes toward taking part in insider trading may change after they graduate college and enter the business world.

## Conclusions

The results of this study suggest that guilt had the greatest effect on intent to trade based on insider information. Expected gain, cynicism, and perceptions of the fairness of laws were also significantly associated with the intent to trade based on insider information. This suggests that it may be fruitful to center compliance efforts around public service methods designed to change perceptions and attitudes toward insider trading. This study did not find a significant relationship between perceptions of severity of punishment and intent to trade based on insider information. These findings suggest that increasing sanctions may not be a useful method of deterring insider trading.

Other findings of this study are that individuals are more likely to use insider information pertaining to a possible loss on stock that they currently own than they are to use insider information to achieve abnormal gains. This suggests that detection efforts should center around large stock price decreases since it appears that more individuals are willing to use insider information in these situations. Additional results support that

there is a social desirability bias associated with trading based on insider information. This confirms that at least part of the subjects believe that insider trading is not socially acceptable.

This study also found evidence that individuals view themselves in a biased manner. Specifically, subjects viewed themselves as more likely to get caught and more likely to receive a harsh punishment than other individuals. However, subjects thought they were more likely to profit heavily from insider trading than the average person. Subjects also believed that their peers would not be as concerned about insider trading as other people.

The results of the current study also suggest that there are differences between the way men and women perceive the deterrence variables. Specifically, women were found to believe their likelihood of getting caught was greater and were more concerned about their relationships with their peers than men.

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## Appendix I

### Dependent and Independent Measure Questions

Questions have been arranged and italicized descriptions have been added to aid in readability.

#### *Dependent Measure Questions*

What is the probability that you would consider buying a stock if you received insider information that the stock price would go up?

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?

#### *Test of Social Desirability Response Bias*

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

#### *Certainty*

If you chose to take part in insider trading what do you think is the probability that you would get caught?

What percentage of people insider trading in the United States do you think get caught?

#### *Severity of Punishment*

If you got caught taking part in insider trading what is the probability that you would get a very harsh punishment?

What percentage of people who get caught insider trading do you think get a very harsh punishment?

#### *Expected gain*

If you had access to insider information, what is the probability that you could significantly increase your wealth by trading based on the information?

What percentage of people who trade based on insider information do you think significantly increase their wealth?

#### *Social Stigma*

What is the probability that your relationship with your peers would change if they found out you traded based on insider information?

What percentage of people in the United States do you think would care if their friends traded based on insider information?

#### *Cynicism*

What percentage of your friends and colleagues do you think would trade based on insider information if they had access to it?

What percentage of people in the United States do you think would trade based on insider information if they had access to it?

#### *Fairness of the law*

To what degree do you agree with the laws against insider trading?

#### *Guilt*

What is the probability that you would feel guilty if you profited from insider trading?

## Notes

<sup>1</sup> Seventy-seven percent of the final sample answered correctly on all four questions designed to test their understanding of insider trading.

<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.

<sup>3</sup> There was some correlation between the independent variables. The correlation between guilt and social stigma was 0.538 and the correlation between guilt and fairness of laws was 0.400. The correlations between the other independent variables were all less than 0.30. The collinearity diagnostics did not indicate a severe collinearity problem, although including the guilt and stigma variables together resulted in the stigma variable changing to a negative sign.

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