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The Effects of CEO Compensation Structure on Reported Earnings and Shareholder Wealth

Research Honors Paper
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I. Introduction

Corporate executives are paid at extremely high levels compared to lower-level employees, especially in the United States, and their level of compensation usually does not change based on company performance with respect to competitors, but rather with changes in their company's stock price. It is well known that executive compensation among U.S. corporations is comprised mostly of stock options, sometimes up to 90% of overall compensation (Edgar 2002). These stock options allow executives, namely chief executive officers (CEOs), to cash in big bucks during good times and risk zero losses during bad times.

In addition, a problem exists among publicly traded corporations, known as the principal-agent problem (Garen 1994). Executives, especially CEOs, control the company, and must use their own discretion in handling the capital supplied by owners, or shareholders. Recently, executives of some U.S. corporations have abused money supplied by shareholders for their own benefit, and have overseen the manipulation of financial statements to create false investor optimism and boost their company's stock price for their own short term gain (Gimein 2002).

In a *Fortune* magazine article entitled "You Bought, They Sold.", Mark Gimein (2002) explains that many corporate CEOs took advantage of a stock bubble to cash in hundreds of millions of dollars worth of risk-free stock options at vastly inflated prices. For instance, San Diego Padres chairman, John Mooress, sold \$646 million in Padres stock before announcing that the baseball team's revenues had been misstated. Also, Qwest Communication executives sold \$2.26 billion of company stock--\$1.6 billion was sold by former CEO Phil Anschutz—shortly before the corporation announced it had

inflated its revenues over the past 3 years (Gimein 2002). According to Gimein (2002), since the announcement Qwest's stock price has dropped from \$47.25/share to just over \$1/share at the time the article was published.

More evidence of executive malfeasance is seen in a study conducted by *Fortune* magazine, Thomson Financial, and the University of Chicago's Center for Research in Securities Pricing. The study analyzes 1,035 corporations having a market cap of at least \$400 million and experiencing at least a 75% decline in stock price from January 1999 to May 2002. Gimien (2002) reports that according to the study executives and directors sold roughly \$66 billion of their own company's stock. A reported \$23 billion went to 466 insiders at the 25 corporations where executives cashed out the most stock (Gimien 2002). Table 1 presents the "Top Ten" companies from the study with respect to the amount of money executives realized by selling their own shares of company stock.

These examples illustrate that there have been numerous instances where the actions of the agents (CEOs) have clearly been at odds with the interests of the principals (shareholders). This raises the question of whether the current structure of compensation, with emphasis on stock options, contributes to the principal-agent problem.

The purpose of this paper is two fold. First, I will test a set of hypotheses concerning how certain components of CEO compensation effects the percent changes in reported earnings and shareholder wealth from 1993-2001. Second, I will test the hypothesis that a major sell off of stock conducted by CEOs will trigger a significant decline in reported earnings or shareholder wealth.

Table 1: Top Ten List

Company	\$ Realized by Executives	\$ Realized by CEO
Qwest Communications	\$2.26 billion	\$1.57 billion
Broadcom	\$2.08 billion	\$799 million
AOL TimeWarner	\$1.79 billion	\$475 million
Gateway	\$1.27 billion	\$1.10 billion
ARIBA	\$1.24 billion	\$191 million
JDS Uniphase	\$1.15 billion	\$175 million
I2 Technologies	\$1.03 billion	\$447 million
Sun Microsystems	\$1.03 billion	\$103 million
Enron	\$994 million	\$102 million
Global Crossing	\$951 million	\$505 million

The rest of the paper will follow as such. Section II will review the literature on principal-agent theory and four basic components of executive compensation. Section III discusses the data set used to conduct the study. Section IV explains the empirical model. Section V presents the regression results. Section VI presents an alternative hypothesis and model. Finally, section VII discusses policy implications.

II. Theory and Literature Review

A. Principal-Agent Theory

Principal-agent theory refers to the separation of ownership and control among publicly traded corporations and has been widely used to analyze executive compensation. In reference to executive compensation, principal-agent theory states that the principals, or shareholders, of a corporation must effectively motivate the agent, or

CEO, to act in their best interests. Although the principals own the corporation, it is the CEO that has control over essentially all material business decisions. So how can shareholders make sure that the boss of their company is looking out for their interests? Can't shareholders simply observe the actions of the CEO and compensate, or discharge, the CEO accordingly? Unfortunately, things are not so simple.

One major problem, according to Jensen and Murphy (1990), is that shareholders do not have complete information regarding the CEO's activities and the company's investment opportunities. Ideally, shareholders could come together and form a contract that specifies their CEO's actions in every possible situation. Realistically, though, Jensen and Murphy (1990) state that shareholders almost always do not know what actions the CEO can take or which actions will increase shareholder wealth. And, while shareholder wealth is certainly affected by factors outside the CEO's influence, such as market conditions and public policy, it is in the best interests of the shareholders to compensate their CEO on the basis of shareholder wealth (Jensen and Murphy 1990).

Therefore, Jensen and Murphy (1990) analyze this relationship between CEO compensation and shareholder wealth across publicly traded corporations. They create a pay-performance sensitivity variable that is defined as the dollar change in the CEO's wealth associated with a dollar change in the wealth of the shareholders. From the results of their study, Jensen and Murphy (1990) find that while the CEO pay-performance relationship is positive and significant, the value of the relationship is too low. In other words, CEO's are not bearing enough risk and are not being effectively motivated through incentives. They found that through cash compensation, stock options, stockholdings, and threat of dismissal, CEO wealth changes \$3.25 for every \$1,000

change in shareholder wealth. Also, they show that CEO direct ownership levels—which do not include stock options—have declined over the past 50 years, and hypothesize that public and private political forces impose constraints that reduce the pay-performance sensitivity (Jensen and Murphy 1990). There is no doubt that this reduction in direct ownership levels has been an important factor in the reduction of the pay-performance variable. Reductions in the pay-performance relation and the level of CEO pay since the 1930s support their hypothesis.

In another attempt to solve the principal-agent problem as it applies to executive compensation, John Garen (1994) forms an equation that describes the composition of CEO pay: $Y_i = b_0 + b_1 R_i$, where Y_i is the CEO's compensation of corporation i and R_i is a measure of corporation i 's income. The coefficient b_0 represents salary and bonus, and b_1 indicates the sensitivity of CEO pay to firm performance, much like Jensen and Murphy's pay-performance sensitivity variable. One purpose of Garen's study is to determine why previous studies have shown that b_1 varies greatly across corporations.

Most of his findings are consistent with the principal-agent theory, in that compensation is structured to trade off incentives with insurance. As the CEO is required to engage in riskier activities, the insurance portion of pay is increased and the incentive portion is reduced. For example, those companies that spend more money in R&D—uncertain and sometimes risky investments—have compensation packages that provide more insurance for the CEO and are not as sensitive to firm performance. Overall, Garen (1994) finds that the statistical significance of his findings is low, but the magnitude of the effects is substantial. In addition, the explanatory power of the empirical model for pay-performance is quite low, similar to Jensen and Murphy's (1990) study.

Furthermore, he finds little evidence of the significance of relative performance pay as one might expect in a principal-agent setting. In sum, Garen (1994) shows that principal-agent considerations do have an important effect on executive compensation, but many issues in the determination of CEO pay are unresolved.

B. Building on Garen's Equation and Principal-Agent Theory

According to Garen (1994), executive compensation from the perspective of principal-agent theory can be broken down into the following formula: $Y_i = b_0 + b_1 R_i$ where Y is total compensation for the CEO of company i , b_0 is a fixed component of compensation, R is the reported income for company i , and b_1 is the component of CEO compensation that is sensitive to company i 's reported income (R_i). In trying to find an appropriate value for b_1 , or pay-performance sensitivity, it is first essential to breakdown the variable that it is attached to—something that Garen, and Jensen and Murphy, failed to do. If b_1 represents the component of compensation that is tied to reported income, (as it is in Garen's study--it is tied to shareholder wealth in Jensen and Murphy's study) it is necessary to determine what makes up this reported income component, R_i . Obviously, if the agent's pay is in anyway sensitive to the performance of the company, then once the components of performance (R_i) are established, we know exactly how the CEO is motivated. It is my contention that some forms of compensation motivate the CEO to act in his own best interests, which are not necessarily the same interests of the shareholders.

According to the following two equations, the reported income of company i , R_i can be broken down as follows:

$$R_i = \text{Actual income} + (\text{Reported income} - \text{Actual income}) \text{ or,}$$

$$R_i = \text{Real performance} + \text{Accounting Fraud}$$

Actual income of a company is also known as its real performance, and the difference between the income reported by company i and its actual income (real performance) can be viewed as accounting fraud.

Intuitively, CEOs who have compensation packages that are tied directly to reported earnings of their company, R_i , will have incentive to increase R_i either through real performance (actual income) or through accounting fraud. My model is based on the belief that accounting fraud overseen by corporate CEOs is induced by certain components of executive compensation, as represented by the following equation:

$$\text{Accounting fraud} = f(\text{component(s) of compensation})$$

Therefore it would be ideal to form a model that will a.) capture this accounting fraud variable, and b.) explain which components of compensation cause CEOs to engage in accounting fraud. While it is impossible to quantify the accounting fraud component of R_i , it may be possible to distinguish those companies whose CEOs have cheated if we can assume that cheating occurs in companies whose reported income (R_i) experience a steep incline in early years, followed by a sharp decline in later years. In other words, we must assume that firms who “cook the books” will experience false short term prosperity, but, without a strong foundation of real performance, the “bottom will fall out”—the accounting fraud will surface, and income will tumble, as well as the stock price.

Take the case of Qwest Communications. Its executives sold \$2.26 billion of company stock--\$1.6 billion sold by former CEO Phil Anschutz alone—shortly before the corporation announced it had inflated its revenues over the past 3 years (Gimein 2002). According to Gimein (2002), since the announcement, Qwest’s stock price has dropped from \$47.25/share to just over \$1/share at the time the *Business Week* article was

published. In addition, Enron executives orchestrated years of hiding debt from their financial statements in order to inflate earnings. Once the accounting fraud was discovered a fearful stock market responded and billions of dollars were lost by shareholders (Powers 2000).

There are other ways that fraudulent accounting leads to a decline in real long-run performance, other than by damaging investor confidence. For instance, fraudulent accounting could lead to excess capacity of resources in one industry. If the majority of the companies in an industry significantly, and falsely, inflate their reported earnings, those companies may attract more capital than they would have if they reported their real earnings. The resulting excess capacity of resources will eventually lead to inefficiencies in that industry. The industry may also attract more debt than it can really finance, as well as extra equity from investors, which leads to bankruptcy for the firms and negative returns for investors. According to bankruptcydata.com, such corporate bankruptcies have increased significantly over the last three years.

On the firm level, inflated earnings via accounting fraud may lead to an increase in production costs. For instance, labor may push for an increase in wages if it believes that their firm is experiencing solid profits. Also, lower level managers may increase production if they also believe that the company is in good condition (this would be less likely since most production decisions come from upper management, and since internal decisions are based on managerial accounting rather than financial accounting). These extra costs apply unwanted pressure on what would be already meager earnings. In theory, costs will exceed earnings to the extent that either a.) executives will no longer be able to hide their real financial standing and must release it to the public, or b.) the firm

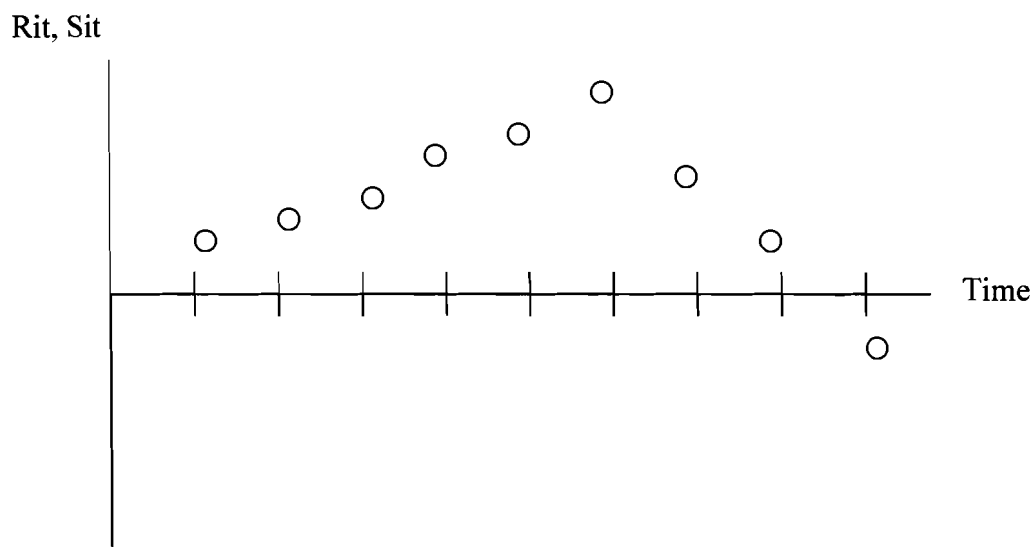
goes bankrupt—both scenarios causing an obvious slide in investor confidence, and stock price.

Figure 1 below shows the pattern that is expected in firms that have committed accounting fraud in early periods by overstating their earnings. Those firms will see a consistent and sharp increase in reported earnings early on, followed by a rapid decline. As previously stated, one purpose of my paper will be to determine the effects of certain forms of CEO compensation on the percent change in reported earnings and shareholder wealth, as well as determine the effects of exercisable stock options on the pattern of the percent change in reported earnings and shareholder wealth over time. With the growing popularity of stock options as a form of CEO compensation over the decade of the 1990s and into the 2000s many CEOs' pay are strongly linked to the stock price of their firms. Stock options and the other main components of executive compensation are discussed below.

C. Components of Executive Compensation

Because it is nearly impossible for shareholders to monitor CEOs directly, it is the responsibility of the shareholders' appointed board of directors to fulfill that role. One way that boards attempt to align their CEOs' interests with the shareholders' is in structuring the CEO's compensation package. This paper will focus on four basic components that made up approximately 87% of CEO pay for all companies in the S&P 500 in 1996 (Abowd and Kaplan 1999). They include salary, bonus, short term stock options (exercisable), and long term stock options (unexercisable).

Figure 1: Expected Pattern of the Annual Percent Change in Reported Earnings and Shareholder Wealth for Firms who Committed Significant Accounting Fraud



1. Salary

According to Abowd and Kaplan (1999), salary and bonuses comprised over 38% of CEO compensation of S&P 500 companies in 1996. Past studies combine salary and bonus when estimating the effects of compensation on shareholders. However, I believe it is necessary to separate salary and bonus, mainly because salary is fixed over time, and bonus varies usually with some level of company performance. Salary can be seen as a fixed amount of cash compensation that is determined at the beginning of an annual pay cycle (Abowd and Kaplan 1999).

The amount of salary a CEO receives is based on his or her time, in almost all cases, a year, and not his or her performance, at least not in the short run (Borjas 1999). However, in the long run, the firm can base decisions of retention or dismissal on performance (Borjas 1999). In terms of level of salary, firms should be willing to pay a high price to attract the best talent. However, from viewing data taken from annual proxy

statements, the value of salary compared to other components, especially stock options, is rather miniscule for almost all firms (Edgar 2002). Also, the annual increase in CEO salaries among the firms studied also seems insignificant compared to bonus and options (Edgar 2002). Finally, since the salary component is essentially independent of current effort, the CEO does not receive much incentive to perform.

Relating salary to R_i , which is actual income + accounting fraud, I do not believe that we will see a significant relationship. Although higher salary CEOs should be the most talented, and productive, in practice salaries are a very small component of compensation and do not impact the decisions made by the CEO relative to bonuses and stock options. *Therefore, I hypothesize that the salary component will have no significant effect on the percent change of reported income, or shareholder wealth over time.*

2. Bonus

Unlike salary, bonus is a component of compensation that is based on performance. According to Borjas (1999), bonuses “are payments awarded to workers above and beyond the base salary, and are typically linked to the worker’s (or to the firm’s) performance during a specified period of time”. It is not uncommon for bonus to significantly exceed the base salary for a corporate CEO (Edgar 2002). Most bonus programs reward the CEO and other top executives when certain financial ratios, such as return on assets (ROA), which is equal to net income divided by total assets, exceed a certain level (Edgar 2002).

However, Abowd and Kaplan (1999) remind us that economic theory does not predict that increases in incentives, by way of bonus, necessarily lead to increases in

profitability. For instance, if a CEO is currently receiving bonuses that are close to the firm's profit-maximizing level, then a slight increase in bonuses, or incentives, should lead to practically no change in profitability. However, economic theory also tells us that CEOs *will* work harder when given larger incentives to do so. The following has been found by previous studies.

Abowd and Kaplan (1999) explain that research shows mixed results in terms of the effect of bonuses on a firm's profitability. However, Kahn and Sherer (1990) found that managers whose bonus payments are contingent upon subjective evaluations tended to have higher subsequent evaluations, compared to other managers. Still, incentive plans may result in unintended effects as shown by Holthausen, Larcker and Sloan (1995). They discovered that when management is operating above the maximum of their bonus plan, that they tend to manipulate earnings downward. Little evidence of such manipulation was found when managers are below the minimum performance level that allows a bonus.

Overall, I hypothesize that firms who grant high bonuses to their CEOs will experience significantly higher percent changes in both reported earnings and stock price than those firms who grant their CEOs low bonuses.

3.) Stock Options

The growing popularity of stock options in executive compensation over the last 10 years has attracted much literature and controversy. Stock options comprised 49% of CEO compensation for S&P 500 companies in 1996 (Abowd and Kaplan 1999). Many studies have been performed to determine the effects of stock option compensation on company performance and shareholder wealth, resulting in mixed views. Yet, because

shareholder expectations are embedded in the returns that stock options provide, it is very difficult to gain guidance on this subject from economic theory (Abowd and Kaplan 1999). In addition, as seen through bonuses, economic theory does not predict that increases in incentives, even stock options, necessarily lead to an increase in reported earnings (Abowd and Kaplan 1999). Before jumping to what past studies have found, the following is meant to provide a basic understanding of the fundamentals of stock options.

a.) Stock Options--Explained

Stock option grants allow CEOs to purchase a specified number of shares of stock at some point in the future at a fixed exercise price, known as the strike price (Abowd and Kaplan 1999). Therefore, recipients of stock options will want the stock price to rise above the strike price, which is established at the grant date, by the time the option is exercisable (available to purchase). Usually, options have maturity dates of 5-10 years, meaning that the CEO's right to exercise, or purchase, their options expires anywhere from 5-10 years (Abowd and Kaplan 1999). Also, most companies do not allow its CEOs to exercise their options within the first few years of the grant date. Thus, stock options granted today can be thought of as a long term form of compensation. If the CEO can increase profitability, which in theory increases the stock price, over the long run, then the CEO will be rewarded once the options become exercisable. However, most veteran executives already have exercisable options in their compensation packages, which provide short-term incentives to boost the firm's stock price. In sum, almost all executives hold a mix of unexercisable and exercisable stock options (Edgar 2002).

b.) Stock Options—Past Studies

But, do stock options really work? That is, do stock options as a form of compensation help solve the principal-agent problem and align the interests of CEOs with shareholders? As we have seen, according to Jensen and Murphy (1990), options, along with other compensation, provide a weak alignment between shareholder and managerial interests. However, Haubrich (1994) believes that even low levels of alignment impose significant wealth risk on CEOs making it unclear whether performance would improve by increasing alignment. Also, by using both new stock option awards and the change in market value of options and stock already awarded, Hall and Liebman (1998) found that CEO wealth is significantly more sensitive to shareholder wealth than found by Jensen and Murphy (1990). Using data from 1994, they found that the median's CEO wealth changes at a rate of \$5.39 for every \$1,000 change in shareholder wealth. The changes in the value of held stock-options, which were not used in Jensen and Murphy's study, account for the \$2.14 difference. Jensen & Murphy found that CEO wealth changes only \$3.25 for every \$1,000 change in shareholder wealth.

Past research has shown that there is a definite empirical link between shareholder and CEO wealth by way of stock options. In addition, Bryan, Hwang, and Lilien (2000) find that stock options as a form of compensation are theoretically justified. In their study, Bryan et al. (2000) find that the use of stock options is shown to increase for companies with abundant investment opportunities (to protect against risk) and high volatility of earnings relative to stock returns. In other words stock options can be used to guard CEOs from bearing too much risk compared to direct stock ownership. When risk is present, stock options give the CEO the *option* for their compensation to be tied

directly to the stock price, whereas direct stock ownership forces such a direct relationship. Also, Bryan et al. (2000) find that the use of stock option awards also increases for firms with low liquidity and decreases for firms with high marginal tax rates (tax treatment on stock options is not attractive to corporations) (Bryan et al. 2002). So, besides attempting to link the interests of the principal and agent, stock options serve a practical purpose by allowing corporations to protect their executives against risk and avoid otherwise significant firm-wide financial difficulties, such as lack of cash for compensation purposes.

However, although certain characteristics of stock options make them attractive to both the corporation and recipient (CEO), they cause an even bigger incentive for CEO's to boost their company's stock price. It has already been shown by Albrecht (2003) that most financial statement (accounting) fraud occurs "because management is under pressure to report positive or high income to support stock prices." If management's compensation is tied directly to stock options, then the incentive to increase the stock price intensifies the motivation of management to commit accounting fraud. Therefore I believe that those CEOs who are compensated heavily through stock options will have a very high incentive to increase reported income and shareholder wealth through actual performance and/or accounting fraud. Here are my hypotheses for relating to stock options:

- 1.) *Firms whose CEO's possess a high value of unexercisable (long-term) stock options will experience a significantly higher percent change in reported income (R_{it}) and shareholder wealth (S_{it}) than firms whose CEO possesses low values of unexercisable options.*

2.) *Firms whose CEO's possess a high value of exercisable (short-term) stock options will experience an increase in annual reported income and shareholder wealth followed by a sharp decline in both (as shown in Figure 1).*

III. Data

I will test my hypotheses using data from the Edgar (2002) web site which serves as a database of the Securities and Exchange Commission filings for all publicly traded companies. From annual proxy statements, I have collected executive compensation data for twenty of the thirty companies that comprise the Dow Jones Industrial Average Index, chosen at random. Corporations who file with the SEC are required to report detailed information concerning their executive compensation packages starting in 1993. Thus, I will use annual data from 1993-2001 for each company. The final sample size is 180 (20 companies, 9 years). Table 2 identifies which companies will be tested, as well as the type of compensation those companies pay to their CEO.

The sample of 20 companies are split up into ten "high" and ten "low" companies in reference to the average annual dollar value of certain forms of compensation over the years of 1993-1996. The ten high dollar value companies for each form of compensation are presented below.

IV. Empirical Model

The previous section established 4 hypotheses concerning the effects of various components of CEO compensation on Rit and Sit. These hypotheses are:

1.) The salary component will have no significant effect a firm's reported earnings or shareholder wealth.

2.) Firms who grant higher bonuses to their CEOs will experience significantly higher percent changes in both reported earnings and stock price than firms who grant lower bonuses. I do not believe that high bonuses provide enough incentive to commit accounting fraud.

Table 2: Data List

High Salary	High Bonus	High ST Opt.	High LT Opt.
Citigroup	American Express	American Express	American Express
General Electric	Citigroup	DuPont	Citigroup
General Motors	DuPont	General Electric	General Electric
IBM	General Electric	IBM	IBM
Kodak	General Motors	Intel	Intel
McDonald's	Home Depot	Johnson & Johnson	Johnson & Johnson
Merck	IBM	McDonald's	Kodak
Philip Morris	Intel	Philip Morris	McDonald's
Procter & Gamble	Kodak	Procter & Gamble	Merck
United Technologies	Merck	United Technologies	United Technologies

3.) Firms whose CEO's possess a high value of unexercisable (long-term) stock options will experience a significantly higher percent change in reported income (Rit) and shareholder wealth (Sit) than firms whose CEO possesses low values of unexercisable options

4.) Firms whose CEO's possess a high value of exercisable (short-term) stock options will experience an increase in annual reported income and shareholder wealth followed by a sharp decline in both (as shown in Figure 1).

All of the variables used to test these hypotheses are defined in Table 3 below:

Table 3: Variable Definitions

Variable Name	Type	Definition
Reported Earnings (Rit)	Dependent	Annual percent change in net income for company i in year t
Shareholder Value (Sit)	Dependent	Annual percent change in stock price minus annual percent change in the S&P 500 for company i in year t
High Salary	Independent	Dummy variable, receives a value of one if the CEO receives a high salary
High Bonus	Independent	Dummy variable, receives a value of one if the CEO receives a high bonus
High LT Opt	Independent	Dummy variable, receives a value of one if the CEO receives a high value of unexercisable stock options
High ST Opt	Independent	Dummy variable, receives a value of one if the CEO receives a high value of exercisable stock options
Time	Independent	Receives a value of 1 for '93, 2 for '94, etc. up to 2001—used to estimate linear time pattern.
Time^2	Independent	Receives a value of 1 for '93, 4 for '94, etc. up to 2001—used to estimate a non-linear time pattern.

The first three hypotheses are tested by running the following 3 sets of simple regressions:

Hypothesis #1:

$$R_{it} = a_1 + a_2(\text{High Salary})$$

$$S_{it} = a_1 + a_2(\text{High Salary})$$

Hypothesis #2:

$$R_{it} = a_1 + a_2(\text{High Bonus})$$

$$S_{it} = a_1 + a_2(\text{High Bonus})$$

Hypothesis #3:

$$R_{it} = a_1 + a_2(\text{High LT Opt})$$

$$S_{it} = a_1 + a_2(\text{High LT Opt})$$

The above six regression equations simply estimate the effects of CEOs who receive high values of compensation components on percent changes in reported earnings and shareholder wealth compared to those who receive low values of compensation.

I will test my final hypothesis, **Hypothesis #4**, by running the following regressions for the sample of ten firms that have a high level of short term stock options:

$$R_{it} = a_1 + a_2 \text{ TIME} + a_3 \text{ TIME}^2 + a_4 \text{Intel} + a_5 \text{GE} + a_6 \text{McDonalds} + a_7 \text{Dupont} + \\ a_8 \text{Philip} + a_9 \text{Johnson} + a_{10} \text{UT} + a_{11} \text{PG} + a_{12} \text{IBM}$$

$$S_{it} = a_1 + a_2 \text{ TIME} + a_3 \text{ TIME}^2 + a_4 \text{Intel} + a_5 \text{GE} + a_6 \text{McDonalds} + a_7 \text{Dupont} + \\ a_8 \text{Philip} + a_9 \text{Johnson} + a_{10} \text{UT} + a_{11} \text{PG} + a_{12} \text{IBM}$$

If a_2 is positive and significant, and a_3 is negative and significant then we may accept the hypothesis that CEOs who receive a high value of exercisable (short term) stock options will be more prone than CEOs who receive a low value of exercisable stock options to commit accounting fraud. The firms included in the model are used to control for firm specific effects.

V. Results

Tables 4, 5 and 6 present my results for all four hypotheses:

**Table 4: Results for Reported Earnings (Rit) for Tests 1-3
(N = 180) (t statistics are in parentheses)**

Variable	Constant	Coefficient	Adj. R ²
High Salary	1.184	2.043 (.639)	-.003
High Bonus	1.092	2.226 (.696)	.487
High LT Opt	1.202	2.006 (.627)	-.003

**Table 5: Results for Shareholder Wealth (Sit) for Tests 1-3
(N = 180) (t statistics are in parentheses)**

Variable	Constant	Coefficient	Adj. R ²
High Salary	.0787	-.0790 (-.177)	-.005
High Bonus	.0578	.0340 (.761)	-.002
High LT Opt	.0497	.0502 (.1125)	.001

Unfortunately, none of the coefficients were significant. Therefore, I found that none of the components of CEO compensation for the firms tested significantly effect percent change in reported earnings or shareholder wealth, or the timing pattern of those measures.

VI. "Year After" Analysis

There could be several explanations as to why the results were insignificant and in most cases did not support the hypothesis. First, due to data and time restrictions, only 10 companies were selected per regression for a sample size of 90. More successful studies on the topic of executive compensation test 500-1500 companies. The problem, and perhaps the reason for my poor results, is that with such a small sample size it only

takes one outlier to distort the results, whereas many outliers are needed to affect the results of a large sample.

Table 6: Results for Reported Earnings (Rit) and Shareholder Wealth (Sit) for Test #4 (t statistics are in parentheses)

Independent Variable	Rit Regression	Sit Regression
Constant	.851 (2.167)	.143 (.984)
Time	-.195 (-1.373)	-.0220 (-.419)
Time^2	.0122 (.879)	.00224 (.438)
Procter	.315 (.870)	-.0291 (-.218)
IBM	-.0282 (-.078)	.0770 (.575)
UT	-.394 (-1.089)	-.00296 (-.022)
Johnson	-.0381 (-.105)	-.0340 (-.253)
Philip	-.167 (-.462)	-.0443 (.351)
Dupont	.491 (1.358)	-.143 (-1.065)
McDonald	-.194 (-.537)	-.126 (-.943)
GeneralE	-.131 (-.363)	.00987 (.074)
Intel	-.0249 (-.069)	.138 (1.030)
N	180	180
Adj. R^2	.044	-.044

Secondly, I've concluded that even if compensation significantly affects reported earnings and shareholder return it is nearly impossible to capture one, definite pattern of these measures among multiple firms due to the timing of their compensation awards, as the test for hypothesis #4 attempted to do. Companies will grant options and bonuses during different years over a 9 year span. Some companies will experience peaks and

declines in Rit and Sit during different years. Therefore, with 10 firms, there may be at least one company peaking in each year of the study, which would distort results. This may be due to the fact that some companies award different levels of stock options in different years. I distinguished high option firms from low option firms by looking at the average of the value of options over the first 4 years of the observed time period. This was necessary to hypothesize long-term effects. However, some companies may be low options firms in the early '90s, but high option firms later in the decade due to timing differences of option grants. Consequently, if compensation structure does effect shareholder value and reported earnings, these timing differences make it nearly impossible to capture a similar time pattern across several firms.

Since timing is such an important factor in determining how CEO compensation affects reported earnings and shareholder wealth, it may be necessary to look at each firm on a case-by-case basis. More specifically, it would be interesting to see how companies perform in the year after their CEO exercises the largest dollar amount of options over the 9 year period from 1993-2001. In other words, the next step is to observe whether or not companies experience a decline in reported earnings and shareholder wealth, and the magnitude of such decline, in the year following their CEO's big sell off. If it is found that companies perform poorly immediately following a large CEO exercise of options, then it can be argued that fraud has occurred.

The following simple regression equations can be used to estimate those effects:

$$R_{it} = a_1 + a_2(\text{Exercise dummy})$$

$$S_{it} = a_1 + a_2(\text{Exercise dummy})$$

Simply put, these regressions are estimating the values of the percent change in reported earnings and shareholder returns the year after that company's CEO received more cash from selling stock options than in any other year observed. The dollar value of options exercised by the CEO will be used to determine the dummy. The dummy variable will have a value of one in the year after the company's CEO conducted the sell off. It will have the value of zero for the remaining eight years.

Tables 7 and 8 present the results of each regression:

Table 7: Results for Reported Earnings
Adj. R² = .023
N=180

Variable	Coefficient	Std. Error	Sig.
Constant	2.375	1.676	.158
Exercise Dummy	-1.907	5.623	.735

Table 8: Results for Shareholder Value
Adj. R² = .023
N=180

Variable Name	Coefficient	Std. Error	Sig.
Constant	.143	.023	.000
Exercise Dummy	-.171	.075	.024

The results for shareholder wealth are very significant and can tell us a lot about the consequences of large CEO sell offs. According to the results, shareholder wealth experiences a 17% decline in the year after the CEO sells an unusually large value of stock options. And these results are significant at the 95% confidence level.

This stresses the importance of studying the timing of option awards, and sales, of individual companies and CEOs rather than trying to find a common pattern over a fixed time period. Here, we looked at a particular year for each firm where the CEO sold the

most stock options instead of assuming that all CEOs conducted huge sell offs around the same time. The following describes a few individual cases of CEOs dumping their shares and the effects of shareholder wealth subsequent thereto.

In 1997 the CEO of Citigroup Inc. sold 14.7 million shares of options and received over \$220 million in cash. The following year, Citigroup stock suffered a 35% decline compared to the S&P 500. In 1998 Philip Morris' CEO dumped 573,000 shares to receive nearly \$19 million. One year later, that company's stock price had dropped 75% after controlling for market effects (Edgar 2002). Is this just good timing by the CEO, or evidence of insider trading and misalignment of shareholder and CEO interests? More research needs to be done, especially in the timing of specific events among firms and their CEO's within the scope of compensation.

VII. Policy Implications

It seems obvious that there is a need for strong executive compensation policies to restore the trust of potential shareholders. As tables 1 and 8 show, current executive compensation structures may entice CEOs and other executives to use inside information to determine if, and when, to sell their own stock and avoid heavy losses. Since my results suggest that shareholders suffer when CEOs sell off a high value of stock options, **policies should be implemented that limit the dollar value of stock options CEOs can sell within a certain period of time.** In addition, a recent article in *BusinessWeek*, written by Louis Lavelle (2002), offers some very interesting, and possibly effective, policy ideas.

According to Lavelle (2002), one possibility would be for a company's board of directors—who usually determine executive compensation structure—to handout fewer

stock options. Also, the government could discourage large option grants by creating tax penalties for companies that use them. In addition, companies could replace traditional stock options with options that increase in value only with an increase in stock price with respect to a peer group (Lavelle 2002). This would encourage CEOs to take measures that will help the company outperform their competition rather simply increase their stock price. Finally, Lavelle (2002) suggests that executives be required to wait 6 months from the day they exercise their options before they can actually sell their shares. This would prevent CEOs from cashing in on insider information (as seen in Table 1).

In a recent New York Times article, Gretchen Morgenson (2002) reports the findings of two professors of human resource management at Rutgers who examined stock option grants and shareholder returns at the 1,500 largest American companies from 1992-2001. According to the study, Morgenson (2002) explains that companies who give out “significantly larger-than-average” option grants to their top executives provided much lower shareholder returns than those that dispensed “far fewer options”. Professor Joseph Blassi (2002) concluded that his study, “strongly suggests that executive excess in stock options did not help total shareholder return over the entire decade”.

In short, it seems that CEOs need less incentive to boost short-term stock prices and more incentive to produce strong long-term company and share price performance. In other words, America’s executives need to be given less stock options and be required to take more direct ownership in the company for which they are held responsible. This would be the most effective way to align the interests of the CEO (agent) and the shareholders (principals). During Bill Gates tenure at the head of Microsoft, he owned 20-25% of his company’s stock—no other CEO in my study owned as much as .6% of

their company's stock (Edgar 2002). Bill Gates value of stock options--both exercisable and unexercisable: \$0 (Edgar 2002). Microsoft's average annual shareholder return above the S&P 500 from '93-'01: 27.2% (Edgar 2002). Microsoft's average annual increase in net earnings: 32.5% (Edgar 2002). In my opinion, all U.S. executives should follow suit.

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