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**THE PAY TO PERFORMANCE RELATIONSHIP: IS CEO COMPENSATION  
LINKED TO PERFORMANCE?**

**A Thesis  
Presented to  
the Faculty of the Department of Psychology  
San Jose State University**

**In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science**

**by  
Craig Michael Coleman**

**August 2000**

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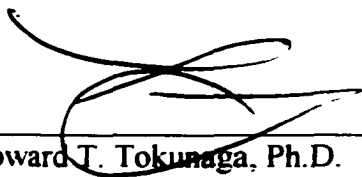
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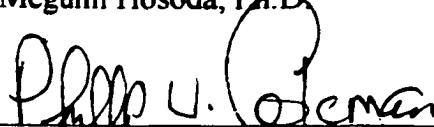
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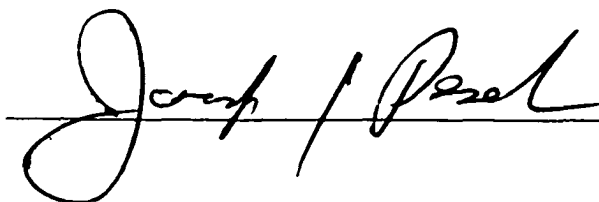


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## **ABSTRACT**

### **THE PAY TO PERFORMANCE RELATIONSHIP: IS CEO COMPENSATION LINKED TO PERFORMANCE?**

**by Craig M. Coleman**

**Recent popular literature has criticized the compensation awarded to the Chief Executive Officers (CEOs) of large companies, claiming that pay is excessive and is not adequately linked to performance. Compensation received by 349 CEOs of large companies for the three year period 1996-1998 was studied to determine if there is an observable relationship between compensation and firm performance. CEO compensation was also divided into short term and long term compensation to examine the impact of these sub components of total compensation. Results showed that short term compensation (i.e., annual salary and bonus) by itself was not significantly related to firm performance. Long term compensation (i.e., stock and stock options, long term bonuses), however, was significantly related to firm performance. Multiple regression analysis results revealed that firm performance predicted CEO compensation after the influence attributable to firm size was controlled.**

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**The pay to performance relationship: Is CEO compensation linked to performance?**

**The issue of Chief Executive Officer (CEO) compensation has received widespread attention, from both academic researchers and society at large. The publication of the pay awarded to several well known CEOs by various media entities has increased societal awareness and discussion of this issue. Common themes seen in much of the recent popular literature on CEO compensation are that CEOs are not only paid excessively, but also their pay has risen inordinately relative to other workers. A newspaper article by Jones and Strauss (1999) reports that in 1980 the average annual compensation for CEOs was slightly more than three times the pay of then President Jimmy Carter; however, in 1998 the same average rose to 53 times that of President Bill Clinton. An article from The Washington Times by Burn (1998) cites data showing that while CEO pay was 44 times that of factory workers in 1965, the figure increased to 209 times in 1998.**

**Business magazines such as Business Week, Forbes, and Industry Week have presented similar data criticizing the growing gap between pay for CEOs and average workers. To further publicize the issue of alleged excessive CEO pay, the American Federation of Labor and Congress of Industrial Nations (AFL-CIO) has set up an Internet website that specifically focuses on the topic of what it calls "Runaway CEO Pay." At [www.paywatch.org](http://www.paywatch.org), users are able to browse articles with information and pay figures similar to those listed above and are even invited to compare their own pay to that of hundreds of CEOs across the country.**

Also present in popular literature is the idea that CEOs are not necessarily paid in accordance with the success of the companies they manage. A Wall Street Journal article (Lublin, 1998) opines that CEOs are not only paid well when achieving high results, but paid well even when they fail to achieve. Highlighting the main point of the article is the example of a former CEO of Apple who was dismissed by the board of directors after the company lost \$2 billion during his tenure. With his salary and a guaranteed severance package, the CEO was paid over \$8.7 million for only 17 months of work despite the extreme losses in company assets.

Opponents of the “excessive CEO pay” movement claim that the pay rates for the modern CEO are justified when considering the wealth a competent CEO can bring to shareholders. The increased use of company stock and stock option awards to compensate and motivate CEOs are also cited as creating an effective link between pay and performance, and one can argue that large monetary gains from these awards are justly earned when a company’s value has increased (Crystal, 1995). If the CEO fails to produce results and the value of the company decreases, such as the above case with Apple, the CEO will not earn money from stock and stock options. Defenders of high compensation also claim that due to the extreme importance of good leadership a company must offer high compensation packages to attract and retain the best managerial talent for these highly responsible positions (Boschen & Smith, 1995).

### Research on the Pay to Performance Relationship

Given that popular literature has devoted considerable attention to CEO compensation, it is not surprising that academics have looked into this topic as well. Articles published in the 1980's (Loomis, 1982; Drucker, 1984; Ciscel & Carroll, 1980; Murphy, 1985; Coughlan and Schmidt, 1985) found little or no relationship between CEO compensation and company performance, as measured by economic results. These studies examined the relationship between compensation and the predictor variables firm size, return on equity, and profits. According to these articles, firm size (as measured by firm sales) is the only important determinant of executive compensation because the other economic based variables failed to show any significant relationship. These results would favor the idea that larger companies pay higher compensation, regardless of how well the company performs under the CEO's direction.

Jensen and Murphy (1990a) analyzed executive pay and performance data for the years 1969-1983, using methods similar to the above studies although focusing on yearly pay increases rather than total pay. The authors concluded that pay for CEOs was not significantly linked to the economic performance of their companies, and that CEOs receive only \$3.25 for every \$1,000 gain in shareholder wealth for a given year. Jensen and Murphy's results, especially the numerical association known as 'pay elasticity,' became a benchmark for future researchers including Hall and Liebman (1998) and Sibling and Haley (1995). Pay elasticity measures the percentage increase in a CEO's compensation for a specified percentage increase in the value of the firm. For example,

the rather low elasticity of .10 implies that a CEO who increases a company's stock rate of return by 20 percent would be compensated only one percent more than a CEO who increases the rate of return by ten percent (Hall and Liebman, 1998).

To examine the pay to performance relationship in more detail, McKnight (1996) divided CEO compensation into two components; annual salary and annual bonus. McKnight studied these two types of compensation to ascertain whether either type is individually related to a company's economic performance. McKnight's results for annual salary were similar to the previous studies showing firm size, not firm performance, was the significant predictor of salary. For annual bonus, however, he did find a modest relationship for both firm size and firm performance. These results still did not show convincing evidence for a pay to performance relationship, but the study was valuable nonetheless. McKnight introduced the idea that various forms of compensation may relate differently to company performance, a method utilized in the present study.

### The Role of Stock and Stock Options

Although the studies mentioned so far have not shown much evidence supporting the existence of a pay to performance relationship, there is one key factor common to these studies that could help explain their collective results. These studies only considered annual salary and bonus as CEO compensation, and did not consider compensation in the form of stock and stock options. More recent studies emphasized

the importance of including stock and stock option awards in analyzing the pay to performance relationship, and found different results than their predecessors.

Lewellen, Loderer, Martin, and Blum (1992) was one of the first studies to incorporate stock and stock option compensation when considering the pay to performance relationship. The authors found evidence that a significant relationship exists between total compensation and company performance (as measured by stock price), thus differing from previous studies that had only considered salary and bonuses for total compensation.

Hall and Liebman (1998) closely followed the research methods utilized by Jensen and Murphy's (1990a) study, with one important difference. Hall and Liebman expanded the data set and analysis to include, not only salary and bonus, but also compensation earned in the form of stock and stock options. This revised method was chosen due to its ability to more precisely measure the total compensation earned by CEOs. Hall and Liebman also reported results in terms of the same pay to performance elasticity ratio that was used previously by Jensen and Murphy. The Hall and Liebman elasticity figure was thirty times larger, however, which the authors attributed to the influence of stock and stock options. The authors discuss the key implication of these results, stating that the pay sensitivity with regard to salary and bonus is very small in comparison to the sensitivity associated with stock and stock option compensation. These studies show rather important evidence that inclusion of stock and stock options in a compensation package tends to increase pay to performance sensitivity.

### The Importance of Long Term Analysis

Literature of the 1980's not only failed to include stock and stock option compensation, but often only sampled just one year of compensation and performance data. Inclusion of just one year of data can create sampling problems that jeopardize the studies' ability to generalize results. For example, companies will often award a large salary increase or pay a large bonus during one year that reflects strong company and or CEO performance for the previous year. The year that the CEO actually receives the pay increase(s) could turn out to be a subsequent year with poor performance, and a researcher attempting to correlate these values could conclude that pay and performance are not related. In reality, however, the good performance in this example was properly rewarded but the limited sampling time frame may not relate these values properly.

This limitation is discussed in more detail by Boschen and Smith (1995) who examined the importance of studying the pay to performance relationship over time periods of at least three years. The authors reported that the long term implications of a CEO's performance (what they called the "cumulative response") on their pay was about ten times greater than the short term implications, or "contemporaneous response." Furthermore, Boschen and Smith conclude that a onetime innovation in firm performance made by a CEO typically alters his/her pay over about the next four years, meaning that studies with a one year research design may not be sensitive enough to accurately relate CEO pay and performance.

From both the popular and academic literature it appears that the link between CEO pay and performance has received considerable attention, although further research is needed to gain a more complete understanding. Surveys and empirical studies that limit their data to short term forms of compensation (i.e., annual salary and bonus) rather consistently fail to show a significant relationship with CEO performance, while those that include both short term and long term compensation consistently reveal significant positive relationships. From these results it appears that a researcher's data collection methods are possibly as much a determinant of the results as are the variables under examination. Previous studies have not attended to the distinct impacts of different types of compensation on CEO performance, an important omission which could otherwise potentially increase understanding of this topic.

### Purpose and Hypotheses

The purpose of the current study was to build upon the existing research to replicate previous studies with more recent data, and also to look specifically at the importance of the type of compensation awarded to CEOs. In particular, the impact of long term compensation on the pay to performance relationship was examined to determine if companies that utilize this form of compensation would profess a stronger pay to performance relationship.

Although previous studies have spent considerable energy exploring the relationship between total compensation and firm performance, the impact of different types of compensation on performance has not received much attention. The current



study will break down compensation into two components and examine their individual relationships with firm performance; hence the following hypotheses:

**H1a: Short term compensation is positively correlated with firm performance.**

**H1b: Long term compensation is positively correlated with firm performance.**

For the purposes of the present study, short term compensation is defined as the sum of annual salary and annual bonus awarded to the CEO. Long term compensation is defined as the sum of long term bonus payouts, the monetary value of stock grants on the day awarded, and monetary gains realized by exercising stock options. In order to calculate gains from stock options, one takes the difference between the actual market value of the exercised stock options and the purchase price that was determined at the time the options were granted.

The author hypothesized that both forms of compensation would relate with firm performance, supporting the theory that CEOs are paid in accordance with how well the companies they manage perform during their tenure. However, since most forms of long term compensation are granted according to measurable performance goals, the author anticipated long term compensation showing a stronger relationship with firm performance than short term compensation.

To further explore the impact of the two types of compensation the following hypothesis were also tested:

**H2: Companies who compensate their CEOs with long term compensation as opposed to short term compensation tend to have higher firm performance.**

Since long term compensation attempts to align the goals of shareholders with those of management, it follows that CEOs with a greater amount of long term compensation are motivated to improve their firm's performance to benefit both themselves and the shareholders.

To further explore the theory that CEOs are paid according to how well their firms perform, the following hypothesis was given:

**H3: Firm performance predicts total CEO compensation, even after the variance attributable to firm size and firm size change is controlled.**

This hypothesis is related to H1a and H1b; however, the potential influence of the size of the company is factored into the analysis. As mentioned earlier in the research of Loomis (1982), Drucker (1984), and Ciscel and Carroll (1980), the size of the company (as measured by total sales) was once believed to be the most important factor in determining CEO compensation, and H3 proposes that firm performance significantly influences CEO compensation even after the variance attributable to firm size is weighed. This test would either support or refute the idea that CEOs are paid in accordance with how well their firms perform.

## Method

### Sample

Sales, performance, and CEO compensation data were selected for 349 companies from 36 different industries for the data sample. A complete list of the

companies included in the sample is included in Appendix A. All companies in the sample are public companies operating in the United States. The sample is comprised mainly of large companies that collectively have significant influence on the United States economy. For example, at the time of writing 72% of the sample were on the Fortune 500 list, with half of the Fortune 500 being represented in the sample. Eighty-three percent of the sample were in the Standard and Poor's (S&P) 500 index, with 58% of the S&P 500 being represented. The sample also included 81% of the companies which comprised the Dow Jones Averages (Industrial, Transportation, Utilities).

Of the 349 companies in the sample, a complete data set was available for 293. Five companies were eliminated from the sample due to extremely high compensation figures that would cause a high positive skew and damage the ability to accurately determine the relationships between the important variables (America Online, Coca-Cola, General Electric, H. J. Heinz, and Walt Disney). Fifty-one companies had incomplete data sets but remained in the sample because one or more useable correlations could be calculated with the available data. Forty-eight of the 51 incomplete data sets were attributable to compensation figures having been reported as a total figure rather than being divided into short and long term compensation figures. Due to these missing data and the elimination of the five companies, a total of 296 pay sensitivity ratios were calculated from the original sample of 349 companies. Sales figures were not available for five companies.

In accordance with Boschen and Smith's (1995) recommendations, this study examined data for the three year period 1996-1998 (inclusive). The author recognized

that a three year sampling might result in a slight decrease in sample size due to CEO turnover and company closures over three years compared to one year. However, it was also believed that the benefits of a three year study would outweigh concerns over diminished sample size.

### Definition of Variables

CEO compensation was classified in three ways: short term compensation, long term compensation, and total compensation. Short term compensation was limited to the total salary plus annual bonuses for the three year period studied. Long term compensation was defined as the total monetary gains from stock awards (valued at award date), long term incentive plan payouts, and the exercising of stock options during the same time period. Total compensation was the sum of short term and long term compensation.

The pay sensitivity variable is a ratio calculated by dividing long term compensation by total compensation. A zero value indicates that the CEO received no compensation other than salary and bonuses, a value of 1.0 means that all compensation earned is classified as long term according to the above definition. This variable serves to measure the type of compensation received by the CEO in a numerical format and can be mathematically compared with other variables.

Firm performance is the 1998 value (at fiscal year end) of a \$100 investment in a company's common stock made at the start of the company's 1996 fiscal year, with any dividends being reinvested. Values for this variable are rounded to the nearest dollar. A

value over \$100 indicates that shareholders of that company would have gained money with the three year investment. Change in stock value is assumed to be an indicator of both the firm's performance and the CEO's performance for the three year period.

Firm size is measured by total firm sales for the three year period. A firm growth variable is also calculated as the percentage increase or decrease in sales from 1996 to 1998. A positive value indicates that sales (and size) increased during the 1996-1998 period.

### Procedure

All data were gathered from company annual statements submitted to the Securities and Exchange Commission (SEC). Public companies are required to make sales and executive compensation figures available to shareholders and the public according to SEC guidelines set in 1992. On the statement's required "Executive Compensation Summary Table" are monetary figures for the annual salary plus bonus of the five highest paid people in the reporting company for the current fiscal year and the two previous fiscal years. The proxy statement also includes the value of stock awards, long term incentive plan payouts, and the value realized from exercising stock options.

## Results

### Descriptive Statistics

Descriptive statistics for the seven variables tested are presented in Table 1. The mean sales total (firm size) for the three year period was \$26 billion, supporting the

assertion that the sample is comprised of rather large companies. The mean sales growth (size change) was 39%, confirming that these companies as a group experienced considerable growth during the 1996-1998 period. Both firm size and size change show positive skews, with values of 3.11 and 5.36, respectively. This skew reveals that the distribution is impacted by a minority of companies having very high values for these measures.

The pay sensitivity measure had a minimum value of zero, indicating that some CEOs (n=27) did not receive any long term compensation, and the maximum value (.98) verifies that at least one CEO was paid almost entirely by long term compensation during the three year period. The mean value for this variable was .49 and there was very little skew (-.38), revealing that this variable has a very close to normal distribution.

Also of interest is the firm performance value, measured as \$100 investment in the company's stock over the 1996-1998 period. The mean value of \$229 shows that these companies were very successful during period studied. Compuware and EMC were particularly lucrative investments at \$1690 and \$1106, respectively, which helps explain the positive skew value of 4.09. At the end of 1998, only 17 companies were below the \$100 benchmark, while a remarkable 159 companies doubled their stock value during the same three year period.

The compensation variables each showed positive skews that were nearly identical. Short term, long term, and total compensation had skew figures of 2.49, 2.48, and 2.39, respectively. Long term compensation also shows a rather high variability, with a range of zero to nearly \$92 million; and a standard deviation of \$14.8 million

around a mean of \$11.3 million. These values, combined with a positive skew value, indicate that some CEOs earned very large sums of money over the three year period relative to other CEOs, with the majority of these earnings resulting from long term compensation.

### Correlations

Pearson correlation coefficients for all variables are presented in Table 2. Several correlations significant at the  $p < .001$  level are seen, including the notably strong correlation between long term compensation and total compensation ( $r = .97$ ). This correlation will be important when reviewing the regression results and analyzing the importance of long term compensation (rather than short term compensation) as it relates to the pay to performance relationship.

Firm size is significantly related with the compensation variables, showing that CEOs in larger companies are better compensated than CEOs in smaller companies. Interestingly, short term compensation showed a much stronger relationship ( $r = .37$ ,  $p < .001$ ) with firm size than long term compensation ( $r = .19$ ,  $p < .01$ ). This difference reveals that the compensation gap between larger and smaller companies is mostly comprised of differences in short term forms of compensation.

The sales growth of the companies in the sample (firm size change) related to only one variable as illustrated by the modest correlation ( $r = .15$ ,  $p < .01$ ) with firm performance. While this correlation relating company growth and stock gains makes intuitive sense, the author is surprised that stronger relationships were not seen between

company growth and compensation variables. Apparently the stock market is more impressed with company growth than compensation committees who determine the compensation given to CEOs.

### Tests of Hypotheses

The rather weak correlation ( $r = .09$ ,  $p = .13$ ) between short term compensation and firm performance did not support H1a, which predicted that short term compensation would be positively correlated with firm performance. When considering long term compensation, however, a strong correlation with firm performance existed ( $r = .22$ ,  $p < .001$ ), thus supporting H1b. Total compensation is also significantly correlated with firm performance ( $r = .18$ ,  $p < .001$ ), although the majority of this association is probably attributable to the very strong relationship between long term and total compensation.

When looking specifically at the dependent measure total compensation, five of the other six variables were significantly correlated with this measure, indicating that each of the variables appeared to be relevant with the exception of change in firm size. The lack of relationship with change in firm size ( $r = .05$ ,  $p = .38$ ) was somewhat surprising given the high correlation of total compensation to firm size ( $r = .26$ ,  $p < .001$ ). Apparently the overall size of the company is an important factor in determining compensation, but when the company's size changes there does not appear to be an associated change in compensation.

The correlation between pay sensitivity and firm performance ( $r = .15$ ,  $p < .01$ ) supported H2, which stated that companies who compensated their CEOs with long term



compensation as opposed to short term compensation tended to have higher firm performance.

### Multiple Regression

Hierarchical multiple regression analyses were performed to determine if firm performance predicts total CEO compensation after variance attributable to other variables is considered (H3). In the first regression (Table 3) firm size, change in firm size, and pay sensitivity are entered together in step 1 in order to determine the combined impact of these three predictor variables. These three variables showed a rather high combined correlation ( $R = .64$ ;  $R^2 = .41$ ,  $p < .001$ ) and thus account for a large amount of the variance in the total compensation variable. Despite this high combined correlation, the addition of firm performance by itself in step 2 significantly increased the  $R^2$  value ( $R^2_{CHA} = .02$ ,  $p < .01$ ) indicating that firm performance significantly predicted total compensation after variance attributable to the other predictor variables was considered.

Firm performance has a significant beta value ( $\beta = .13$ ,  $p < .01$ ) despite being entered into the regression in the second step. This result implies that this variable has significant influence on total compensation even when being isolated from other variables. The strong beta value for firm size ( $\beta = .24$ ,  $p < .001$ ) was anticipated; however, an even higher value for pay sensitivity ( $\beta = .54$ ,  $p < .001$ ) was an unexpected finding that shows the importance of the pay sensitivity ratio as a predictor variable. As expected, all beta values were positive indicating that total CEO compensation rose as each of the predictor variables rose.

In the second regression presented in Table 3, the steps are entered in reverse order to determine if any order effects were present in the analysis. Entering the firm performance variable before the three other predictor variables did not significantly change the results, thus H3 was supported regardless of the order the variables are entered into the regression equation.

Although the above regression results supported the idea that firm performance predicted total CEO compensation, there is no distinction between the two different types of compensation (i.e., short term and long term) and their separate influences on firm performance. To examine the individual roles of short term and long term compensation two additional sets of regression analyses were performed, with the results presented in Table 4 and Table 5.

While the regression results for long term compensation closely resembled those of total compensation, the results for short term compensation differed considerably from the initial regression analysis in Table 3. Although all the beta values are positive, short term compensation by itself does not predict firm performance ( $R^2_{CHA} = .00$ ) regardless of whether variance in the other predictor variables is considered or ignored. Interestingly, change in firm size accounted for a significant portion of variance in short term compensation ( $\beta = .13$ ,  $p < .01$ ), though long term compensation's relationship with this variable ( $\beta = .05$ ,  $p = .26$ ) was not significant. In a similar trend, short term compensation showed very little relation with pay sensitivity ( $\beta = .02$ ,  $p = .71$ ), even though long term compensation accounted for a very high amount of variance with this variable ( $\beta = .65$ ,

$p < .001$ ). Apparently the change in a company's size and the type of compensation awarded to the CEO influenced short term and long term compensation in different ways.

### Discussion

The results of this study provide convincing evidence of a pay to performance relationship for CEOs when companies emphasize long term forms of compensation, especially stock and stock options. While most of the hypotheses were supported by the data indicating that an overall relationship between CEO pay and performance exists, short term compensation, by itself, did not relate as well to CEO performance. While Hypotheses 1b, 2, and 3 were supported, the results do not show support for Hypothesis 1a regarding short term compensation's relationship with firm performance. The strong relationship between long term compensation and firm performance helps discredit the largely held view in popular literature that CEOs are paid haphazardly irrespective of how well they manage their company.

The method of analysis utilized by this study helps explain some of the discrepancy with previous research. The inclusion of long term compensation in analyzing the pay to performance relationship is not only important, but seems to determine whether or not one will find a significant relationship. When considering only annual salary and bonus, the current study's results correspond with earlier studies that find no significant pay to performance relationship. When considering long term compensation, however, the current study also agrees with findings of more recent studies that show a very robust relationship between pay and performance.

An unexpected finding, however, was the extent to which long term compensation influences the pay to performance relationship. In viewing the Pearson correlation between long term and total compensation ( $r = .97$ ,  $p < .001$ ) and the results of the various regression analyses, one can see how this study would have reached the same conclusions for H3 even if the short term compensation data had been excluded completely.

Another interesting finding of this study concerns the role of the size of the company and how this variable can impact CEO compensation. While the results of previous studies (e.g., Loomis, 1982; Ciscel and Carroll, 1980) show larger companies paying larger salaries were echoed in this study, the pay sensitivity measure was not significantly linked to company size. Smaller companies, therefore, appear to utilize long term compensation as much as the larger companies although their total pay tends to be lower.

One issue that has not been resolved by this study is excessive CEO pay. While the results discredited the popular idea that CEOs are not accountable to shareholders, the question of whether CEOs are paid more than they are worth is beyond the scope of this study. Although the above results suggested that executive compensation committees can increase the link between pay and performance by utilizing long term compensation, these committees must still use sound judgment in the amount of long term compensation awarded.

### Short term versus long term compensation

The separate impact of short term and long term compensation on company performance was larger than expected and raises the idea that these two forms of compensation are derived from different models. When viewing the individual beta values in the regression analysis predicting short term compensation, one sees that company size plays a major role in determining short term compensation, yet company performance does not. CEOs in larger companies tend to have larger base salaries, and their short term compensation also tends to increase if the company grows during the CEO's tenure.

Long term compensation, however, is influenced in a very different manner relative to short term compensation. Regression results for long term compensation revealed that firm size only modestly influences the amount of long term compensation received, and that CEOs are not rewarded via long term compensation for increasing the size of the company. Furthermore, the performance of the company had a very large impact on the amount of long term compensation received; a nearly opposite trend compared to short term compensation.

These differences highlight the importance of considering short term and long term compensation separately when examining the pay to performance relationship rather than combining them into one variable. Considering these two forms of compensation separately increases the researcher's ability to view the unique influences of the predictor

variables, rather than risk a false conclusion due to these two variables' tendency to cancel each other.

### The Role of the U.S. Economy

One factor that may help explain the finding of long term compensation's high predictive value relative to short term compensation is the unprecedented success of the U.S. economy during the studied time period. When attempting to generalize these results the influence of the overall economy should be recognized due to the economy's potential for impact on company stock values. During the 1996-1998 period the S&P 500 index nearly doubled, while the Dow Jones Industrial Average increased its value over 70%. Since more than half of the sample for this study is part of the S&P 500 index, it follows that CEOs in this sample who earned stock and stock option awards had a significant advantage over those who did not. While some of success of these companies (and the corresponding pay) can be attributed to the CEO's leadership, it is also possible that the success of the U.S. economy as a whole during this period is largely responsible for the rather impressive performance figures boasted by several companies in the sample.

Federal Reserve Chairman Alan Greenspan has emphasized the use of indexed stock options to minimize excessive compensation attributable to overall marketplace gains rather than a CEO's own contributions. Indexed options do not have a predetermined buying price as do the widely used traditional stock options. The indexed option buying price is a function of how well the company performs when compared to

other companies, often direct competitors. With this method, a company can increase sales and stock value dramatically, but the options may be worth little if the company's competitors had even better results. Conversely, if a company has a downturn during a period of economic difficulty but still outperforms its competitors, the buying price can still be favorable to the CEO. Indexed stock options may be a more favorable method to link pay to performance because of their ability to reward or not reward performance in a variety of economic conditions.

Given the economic theory that what goes up must also come down, this author is concerned with how long term compensation might be used in the future should the economy have a downturn. A cynical point of view would assert that companies will embrace the use of stock and stock option awards only as long as they allow CEOs to maintain their immense wealth, and then discard them in favor of another compensation method. Since the use of stock and stock option awards on a wide basis has only existed during the recent decade of economic prosperity, we can only hypothesize what would happen if the economic trends were to shift backward.

The practice of repricing stock options allows companies to reward CEOs despite substandard performance. Stock options that are valued below the option price can be repriced so that the CEO will still gain money by exercising the options. Such practices seriously damage the link between pay and performance because underperformance is artificially compensated and CEOs are not punished. Though such repricings are seen on proxy statements they are difficult to track and often go unnoticed.

### Strengths of the Study

The results highlight the importance of analyzing the type of compensation received by the CEO. The calculation of a numeric value to describe the type of compensation has not been seen prior to this study, and this value proved to be an important tool in understanding the pay to performance relationship. This study is also helpful in explaining why some studies have found evidence supporting a pay to performance relationship while others have not.

The sample chosen for this study is both large and diversified; thus, the results can be generalized to the entire U.S. public company population with a reasonable degree of confidence. With more than half of the S&P 500 and more than 80% of the Dow Jones Averages companies being represented, one can anticipate similar results from other comparable samples. Over 36 industries are represented, allowing for a balancing of any industry specific tendencies.

### Suggestions for Future Research

Although this study examined data over a three year period, a future study could extend this period to five or more years. A longer time period is recommended because the stock option packages granted to CEOs often take several years to fully vest; thus, an analysis of only a few years might not account for a high number of stock options that either have not yet vested or the CEO has not exercised due to an anticipated stock price increase.



Future research might also sample smaller public companies, private companies, and/or foreign based companies to determine if any differences might increase knowledge about the pay to performance relationship. Samples could also include compensation data for other top executives to build upon the existing data for CEOs by themselves. Perhaps sampling to president, vice-president, and director levels would reveal important findings.

In order to test the possible impact of Alan Greenspan's ideas concerning indexed stock options, future research could evaluate each company relative to its competitors and determine mock indexed stock option gains. When comparing the difference between these mock compensation figures and the actual ones, the analysis could reveal that some companies are overly generous when setting stock option pricing.

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**Table 1****Descriptive Statistics for Firm Size, CEO Compensation, and Firm Performance Variables**

<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>S. D.</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Skew</b>
Firm Size (\$ millions)	339	26,018	30,148	160	236,122	3.11
Size Change (%)	342	39	79	-45	810	5.36
Pay Sensitivity	296	.49	.27	.00	.98	-.38
Firm Performance	344	229	150	49	1690	4.09
Short Term Compensation (\$ thousands)	297	6,233	4,622	300	32,446	2.49
Long Term Compensation (\$ thousands)	296	11,323	14,855	0	91,622	2.48
Total Compensation (\$ thousands)	341	17,113	17,225	842	118,115	2.39

**Table 2**

**Pearson Correlation Coefficients for All Variables**

	Firm Size	Firm Size Change	Pay Sensitivity	Firm Performance	Short Term Comp	Long Term Comp
Firm Size						
Firm Size Change	-.07					
Pay Sensitivity	.06	.05				
Firm Performance	-.04	.15*	.15*			
Short Term Comp	.37**	.13	.04	.09		
Long Term Comp	.19**	.07	.66**	.22**	.39**	
Total Comp	.26**	.05	.58**	.18**	.60**	.97**

\*p< .01 \*\* p< .001

(N's range: 293-341)

Table 3

**Hierarchical Regression Predicting Total CEO Compensation**

Step	Variables Entered	Beta Value	Multiple R	R <sup>2</sup>	Change in R <sup>2</sup>
1	Firm Size	.24**	.64**	.41	.41**
	Change in Firm Size	.08			
	Pay Sensitivity	.57**			
2	Firm Performance	.13*	.65**	.42	.02*

\* p< .01 \*\* p< .001

Step	Variables Entered	Beta Value	Multiple R	R <sup>2</sup>	Change in R <sup>2</sup>
1	Firm Performance	.22**	.22**	.05	.05**
2	Firm Size	.24**	.65**	.42	.38**
	Change in Firm Size	.06			
	Pay Sensitivity	.54 **			

\* p< .01 \*\* p< .001

Table 4

Hierarchical Regression Predicting Short Term CEO Compensation

Step	Variables Entered	Beta Value	Multiple R	R <sup>2</sup>	Change in R <sup>2</sup>
1	Firm Size Change in Firm Size Pay Sensitivity	.38** .15* .02	.40**	.16	.16**
2	Firm Performance	.08	.41**	.17	.01

\* p< .01 \*\* p< .001

Step	Variables Entered	Beta Value	Multiple R	R <sup>2</sup>	Change in R <sup>2</sup>
1	Firm Performance	.10	.10	.01	.01
2	Firm Size Change in Firm Size Pay Sensitivity	.38** .13* .01	.41**	.17	.16**

\* p< .05 \*\* p< .001

**Table 5**

**Hierarchical Regression Predicting Long Term CEO Compensation**

Step	Variables Entered	Beta Value	Multiple R	R <sup>2</sup>	Change in R <sup>2</sup>
1	Firm Size Change in Firm Size Pay Sensitivity	.16** .05 .65**	.68**	.47	.47**
2	Firm Performance	.22*	.70**	.49	.02*

\* p< .05 \*\* p< .001

Step	Variables Entered	Beta Value	Multiple R	R <sup>2</sup>	Change in R <sup>2</sup>
1	Firm Performance	.22**	.22**	.05	.05**
2	Firm Size Change in Firm Size Pay Sensitivity	.16** .02 .63**	.70**	.49	.44**

\*\* p< .001



## Appendix A

### Alphabetical Company List

(number corresponds to industry, legend provided at the end of Appendix A)

3Com 22	Avery Dennison 10
Abbott Laboratories 11	Avon Products 25
ADC Telecomm. 32	Baker Hughes 23
AES 36	Bank of New York 5
Aetna 21	Bank One 5
AFLAC 21	BankAmerica 5
Air Products & Chemicals 8	BankBoston 5
Alcoa 18	Bankers Trust 5
Allergan 11	BB&T 5
AlliedSignal 9	Bear Stearns 21
Allstate 21	Becton, Dickinson 11
Alltel 32	BellSouth 32
Ambac Financial 21	Berkshire Hathaway 21
Amerada Hess 20	Best Buy 3
Ameren 36	Bestfoods 13
America Online 22 (eliminated)	Biomet 11
American Electric 36	Black & Decker 15
American Express 21	Boeing 1
American General 21	Boston Scientific 11
American Home 11	Bristol-Myers Squibb 11
Ameritech 32	Browning-Ferris 30
Amgen 11	Burlington Northern Santa Fe 27
AMP 12	Burlington Resources 20
AMR 2	Campbell Soup 13
AmSouth Bancorporation 5	Capital One Financial 21
Anadarko Petroleum 20	Cardinal Health 29
Analog Devices 12	Carnival 17
Anheuser-Busch 6	Carolina Power 36
Aon 21	Caterpillar 15
Applied Materials 15	CBS 26
Archer Daniels 13	Cendant 30
Ascend Communications 22	Central & South West 36
AT&T 32	Century Telephone 32

**Atlantic Richfield 20**  
**Automatic Data 22**  
**AutoZone 29**  
**Chiron 11**  
**Chubb 21**  
**Cigna 21**  
**Cincinnati Financial 21**  
**CINergy 36**  
**Cintas 30**  
**Cisco Systems 22**  
**Citigroup 21**  
**Clear Channel Communications 26**  
**Clorox 25**  
**CMGI 30**  
**CNA Financial 21**  
**Coastal 20**  
**Coca-Cola 6 (eliminated)**  
**Coca-Cola Enterprises 6**  
**Colgate-Palmolive 25**  
**Compaq Computer 22**  
**Computer Associates 22**  
**Computer Sciences 22**  
**Compuware 22**  
**ConAgra 13**  
**Cons. Natural Gas 36**  
**Cooper Industries 12**  
**Corning 19**  
**Costco 29**  
**Cox Communications 26**  
**CSX 27**  
**CVS 29**  
**Dana 4**  
**Danaher 15**  
**Deere 15**  
**Delta Air Lines 2**  
**Diamond Offshore 23**  
**Disney (Walt) 17 (eliminated)**  
**Dominion Resources 36**  
**Donaldson, Lufkin & Jenrette 21**  
**Donnelley (R.R.) 30**  
**Dover 15**  
**Dow Chemical 8**  
**Dow Jones 26**  
**DTE Energy 36**  
**Ceridian 22**  
**Charter One Financial 21**  
**Chase Manhattan 5**  
**Chevron 20**  
**Ecolab 25**  
**Edison International 36**  
**El Paso Energy 36**  
**EMC 22**  
**Emerson Electric 16**  
**Enron 30**  
**Entergy 36**  
**Equifax 21**  
**Equitable 21**  
**Estée Lauder 25**  
**Family Dollar Stores 29**  
**FDX 30**  
**Fifth Third Bancorp 5**  
**First American 5**  
**First Data 22**  
**First Tennessee Natl. 5**  
**First Union 5**  
**Firststar 5**  
**FirstEnergy 36**  
**Fleet Financial Group 5**  
**Fort James 24**  
**Fortune Brands 19**  
**FPL Group 36**  
**Franklin Resources 21**  
**Frontier 32**  
**Gannett 26**  
**Gap 29**  
**Genentech 11**  
**General Dynamics 1**  
**General Electric 9 (eliminated)**  
**General Mills 13**  
**Genuine Parts 30**  
**Georgia-Pacific Group 24**  
**Gillette 25**  
**Golden West 21**  
**Goodyear Tire & Rubber 34**  
**GPU 36**  
**Grainger (W.W.) 30**  
**Guidant 11**  
**Halliburton 23**

Duke Energy 36  
Dun & Bradstreet 21  
DuPont 8  
Eastman Kodak 17  
Eaton 12  
Hewlett-Packard 22  
Honeywell 16  
Household Intl. 21  
Huntington Bancshares 5  
IBM 22  
Illinois Tool Works 19  
Immunex 11  
IMS Health 30  
Ingersoll-Rand 15  
International Flavors 8  
Interpublic Group 30  
Intuit 22  
ITT Industries 15  
Jefferson-Pilot 21  
Johnson Controls 19  
Kellogg 13  
KeyCorp 5  
Kimberly-Clark 24  
KLA-Tencor 16  
Knight-Ridder 26  
Kroger 28  
Leggett & Platt 3  
Lehman Brothers 21  
Lexmark International 22  
Lilly (Eli) 11  
Linear Technology 12  
Lockheed Martin 1  
Loews 21  
LSI Logic 12  
Lucent Technologies 32  
Marriott Intl. 14  
Marsh & McLennan 21  
Marshall & Ilsley 5  
Maxim Integrated Prods. 12  
May Department Stores 29  
Maytag 3  
MBIA 21  
MBNA 5  
McGraw-Hill 26  
Harley-Davidson 17  
Hartford Financial 21  
Hartford Life 21  
Hasbro 17  
Heinz (H.J.) 13 (eliminated)  
Hershey Foods 13  
Minnesota Mining 19  
Mirage Resorts 17  
Molex 12  
Monsanto 8  
Montana Power 36  
Morgan (J.P.) 5  
Morgan Stanley Dean Witter 21  
Morton International 8  
Motorola 12  
Nabisco Holdings 13  
National City 5  
Nationwide Financial 21  
NCR 22  
New Century Energies 36  
New York Times 26  
Newell Rubbermaid 19  
Nike 33  
Nordstrom 29  
Norfolk Southern 27  
Northern Trust 5  
Novell 22  
Nucor 31  
Occidental Pet. 20  
Office Depot 29  
Old Kent Financial 5  
Omnicom Group 30  
Oracle 22  
Owens-Illinois 10  
PaineWebber Group 21  
Parametric Technology 22  
Parker Hannifin 19  
Paychex 30  
PECO Energy 36  
PepsiCo 6  
Perkin-Elmer 16  
Pfizer 11  
PG&E 36  
Pharmacia & Upjohn 11

Medtronic 11  
Mellon Bank 5  
Mercantile Bancorp 5  
Merck 11  
Merrill Lynch 21  
Micron Technology 12  
Microsoft 22  
Price (T. Rowe) 21  
Procter & Gamble 25  
Progressive 21  
Providian Financial 5  
Public Service Ent. 36  
Qualcomm 12  
Ralston Purina 13  
Raytheon 12  
Regions Financial 5  
Reliant Energy 36  
ReliaStar Financial 21  
Republic New York 5  
RJR Nabisco 35  
Rockwell International 12  
SABRE Group Holdings 22  
Safeco 21  
Safeway 28  
Sara Lee 13  
SBC Communications 32  
Schering-Plough 11  
Schlumberger 23  
Schwab (Charles) 21  
Seagate Technology 22  
Sealed Air 19  
Sears, Roebuck 29  
Sempra Energy 36  
ServiceMaster 30  
Sherwin-Williams 7  
Siebel Systems 22  
SLM Holding 21  
Solectron 12  
SouthTrust 5  
Sprint (FON Group) 32  
St. Paul 21  
State Street 5  
Stryker 11  
Summit Bancorp. 5

Philip Morris 35  
Pioneer Hi-Bred 13  
Pitney Bowes 22  
PNC Bank 5  
Popular 5  
PP&L Resources 36  
PPG Industries 7  
Praxair 8  
Texaco 20  
Texas Instruments 12  
Texas Utilities 36  
Textron 9  
Time Warner 26  
Times Mirror 26  
Torchmark 21  
Transamerica 21  
Travelers Property Casualty 21  
Tribune 26  
TRW 9  
Tyco Intl. 15  
Tyson Foods 13  
U S West 32  
U.S. Bancorp 5  
UAL 2  
Union Carbide 8  
Union Pacific 27  
Union Planters 5  
Unisys 22  
United Technologies 1  
US Airways Group 2  
USA Networks 26  
UST 35  
USX-Marathon 20  
Vastar Resources 20  
VF 33  
Viacom 17  
Vulcan Materials 7  
Wachovia 5  
Walgreen 29  
Warner-Lambert 11  
Washington Mutual 21  
Washington Post 26  
Watson Pharmaceuticals 11  
WellPoint Health 30

**Sun Microsystems 22**  
**SunGard Data Systems 22**  
**SunTrust Banks 5**  
**Synopsys 22**  
**Synovus Financial 5**  
**Sysco 13**  
**Tellabs 32**  
**Tenet Healthcare 30**  
**Tenneco 9**

**Wells Fargo 5**  
**Weyerhaeuser 24**  
**Whirlpool 3**  
**Willamette Industries 24**  
**Williams 36**  
**Winn-Dixie Stores 28**  
**Wrigley (Wm.) Jr. 13**  
**Xerox 22**  
**Zions Bancorporation 5**

## **Legend of industry numbers:**

- 1 Aerospace
- 2 Airlines
- 3 Appliances
- 4 Automotive
- 5 Banks and Bank Holdings
- 6 Beverages
- 7 Building
- 8 Chemicals
- 9 Conglomerates
- 10 Containers
- 11 Drugs
- 12 Electrical And Electronics
- 13 Food Processing
- 14 Food and Lodging
- 15 Machinery
- 16 Instruments
- 17 Leisure Time Industries
- 18 Metals and Mining
- 19 Manufacturing
- 20 Natural Resources
- 21 Financial (non-bank)
- 22 Computers/Office Equipment
- 23 Oil Service and Supply
- 24 Paper and Forest Products
- 25 Personal Care
- 26 Publishing, Radio and TV Broadcast
- 27 Railroads
- 28 Retailing- food
- 29 Retailing- non food
- 30 Service industries
- 31 Steel
- 32 Telecommunications
- 33 Textiles and Apparel
- 34 Tire and Rubber
- 35 Tobacco
- 36 Utilities



**San José State**  
UNIVERSITY

Office of the Academic  
Vice President  
Associate Vice President  
Graduate Studies and Research

Appendix B

**TO:** Craig Coleman  
589 Lynxwood Court  
Sunnyvale, CA 94086

**FROM:** Nabil Ibrahim, *N. Ibrahim*  
AVP, Graduate Studies & Research

**DATE:** May 1, 2000

The Human Subjects-Institutional Review Board has approved your request to use human subjects in the study entitled:

**“The Pay to Performance Relationship: Is CEO Compensation Linked to Performance”**

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to any and all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Nabil Ibrahim, Ph.D., immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised that all subjects need to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate, or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted.

If you have any questions, please contact me at (408) 924-2480.

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