

A CLOSER LOOK AT CEO COMPENSATION
LEVELS OF PUBLIC COMPANIES
IN THE UNITED STATES
THESIS

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by

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ABSTRACT
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Texas State University–San Marcos

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SUPERVISING PROFESSOR: BOB HILL

I analyze the relationships between CEO compensation and company size and performance, as well as the relationships between CEO compensation and executive attributes, using data on 150 public U.S. companies. This paper looks beyond firm size to various other measures of company performance to see if it is possible to explain more of the variance in CEO compensation. Measures include revenue, revenue growth, and market capitalization. Profit margin is used to measure profitability, and return on equity is used to measure managerial effectiveness. I find that firm size exhibits a strong correlation to CEO compensation; however, the low amount of variance in CEO

compensation explained by company performance variables other than firm size suggests that there is not a strong relationship between CEO compensation and company performance

INTRODUCTION

Agarwal (1981) describes executive compensation as the function of three factors: job complexity, employer ability to pay, and executive human capital. Job complexity refers to the magnitude of responsibility given to the executive. As a company grows and diversifies, the decisions and responsibilities an executive faces become increasingly complex, often requiring greater compensation. The employer's ability to pay its executive creates stability by decreasing turnover and increasing the number of CEO applicants. Finally, companies must determine the amount of human capital, or unique skills, required from an executive, to effectively run the company, and companies must be willing to compensate the executive for those skills.

In his study, Agarwal found these factors accounted for almost 80 percent of the variance in executive compensation. This paper will build on that work, with recent data, and look closer at the relationships between CEO compensation and executive attributes (or human capital), as well as the relationships between CEO compensation and company size and performance. Here, performance will be used to indicate an employer's ability to pay. Agarwal measured an employer's ability to pay using total profit (the net operating gain before taxes and dividends) and rate of return (the ratio of total profit to assets). A substantial body of research exists on the relationship between CEO compensation and company size, but this paper will look beyond size to various other measures of company performance to see if more of the variance in CEO compensation can be explained.

Measures will include revenue, revenue growth, and market capitalization. Profit margin will be used to measure profitability, and return on equity will be used to measure managerial effectiveness.

CHAPTER I

BACKGROUND

THE EVOLUTION OF CEO COMPENSATION

CEO compensation has gone through three distinct phases over the last 80 years: a sharp decline during World War II, a gradual increase from the mid-1940s to the 1970s, and a high and accelerated growth in the 1980s and 1990s (Frydman and Saks 2005). Frydman and Saks (2005) explain that government tax policy played a major role in executive compensation decisions until the 1940s. From there until the 1980s, corporate governance, social norms, the market for corporate control, and the labor market for executives contributed to overall shifts in executive pay (Frydman and Saks 2005).

From 1980 to 2003, CEO compensation increased by more the 600 percent (Gabaix and Landier 2006, Reingold and Jespersen, 2000). Gabaix and Landier's (2006) compensation model demonstrates that the rise in CEO compensation could be a leveling effect resulting from the increasing size of public companies. Gabaix and Landier (2006) measure total compensation as the sum of salaries, bonuses, long-term incentive payments, and the Black-Sholes value of options granted; they measure firm size as the mean of the largest 500 firm asset market values in Compustat (Gabaix and Landier 2006).

The researchers found that the six-fold increase in CEO compensation can be fully attributed to the six-fold increase in market capitalization of large U.S. companies during that time (Gabaix and Landier 2006).

CEO COMPENSATION AND COMPANY SIZE

Substantial research has been done to show that CEO compensation is higher for larger companies (Frydman and Saks 2005, Kostiuk 1990, Rose and Shepard 1997). It is reasonable to suggest that the added complexity of running a large public company deserves higher levels of compensation. Executives of large companies also often have the added pressure of their professional and personal lives being scrutinized by the public. Recently, Apple, Inc., stock price dropped after rumors that CEO Steve Jobs's health was deteriorating (Zeiler 2009). Stakeholders believe Jobs is the soul of the company and that, without his leadership and vision, the company could fall in to a slump like it did when Jobs was removed from Apple in 1985.

In an early study of executive compensation, Simon (1957) explained a firm as a pyramid of management levels. The authority relationships and the practice of paying lower-ranking managers less, with less dispersion of salaries among lower-ranking managers, create a pyramid dimension. Therefore, a larger firm will have more management levels and, thus, the opportunity for higher executive compensation. Although sensible, Simon's explanation assumes a close, linear relationship between the size of the company and the number of management levels that might not be realistic.

Tosi, Werner, Katz, and Gomez-Mejia (2000) found that financial performance accounts for only 5 percent of the variance in CEO compensation, with firm size accounting for a much larger portion. This paper will continue on this topic to find what, if any, other company performance variables have positive or negative relationships with CEO compensation.

CEO COMPENSATION AND EXECUTIVE ATTRIBUTES

Combs and Skill (2003) examined whether levels of executive compensation depend more heavily on unique managerial skills or the executive's ability to influence the compensation process. Interestingly, Combs and Skill (2003) performed their research by calculating the two-day cumulative abnormal stock price reaction to key executives' sudden deaths. The researchers believed this unique metric would reveal investor sentiment toward executive attributes. Their research found managerialism (the ability to influence compensation processes) to be more significant than the executives' human capital (unique skills).

If the unique skills and talents of a CEO were, in fact, related to compensation, it would be reasonable to assume that those skills would explain a portion of the variance in CEO compensation. In their research, Sung and Swan (2008) used decision-making ability, or the information gathering ability to identify better investment opportunities, to represent CEO talent. These measures were based on resumes and track records, then monitored over time by observing firm size and economies of scale changes. Sung and Swan (2008) found the average talent level of small-firm CEOs to be only slightly lower than that of

large firm CEOs. Going back to the company size factor, Sung and Swan argued that the compensation of a low-ability manager at a large firm will often be greater than the compensation of a high-ability manager at a small firm.

CEO COMPENSATION AND PERFORMANCE-BASED INCENTIVES

Other research attributes the increase in CEO compensation over the past twenty years to an upsurge in performance-based incentives. Inderst and Mueller (2005) suggest that the increased use of performance-based incentives is related to the increased volatility in business creating more opportunities for high bonuses. Companies benefit from this trend by tying executive compensation to the long-term performance of the firm, which in turn reduces unethical executive behavior to reach short-term performance-based objectives. With regard to the potential for unethical self-enrichment, Fama (1980) suggested that “separation of security ownership and control can be explained as an efficient form of organization within the ‘set of contracts’ perspective,” although his theory relied on the notion that managers will avoid misbehavior at the risk of damaging their reputation and future employment opportunities. The idea of “skimming” has also been attributed to the increase in CEO compensation (Bebchuk and Fried 2004). This theory suggests that executives will take advantage of any existing opportunity for self-enrichment.

In considering performance-based incentives, companies must weigh both the positive and the negative effects. Agency theory focuses on controlling the behavior of agents to ensure that it is consistent with the objectives of the principals (Jensen and Meckling, 1976). While tying CEO compensation to company performance can have a positive

effect on CEO behavior, CEOs will demand to be compensated for the higher risk associated with performance-based pay. Miller, Wiseman, and Gomez-Mejia (2002) found that a stronger relationship exists between performance-based pay and firms with moderate levels of risk. When a company has high levels of systematic (market) risk, more of those risks are out of the manager's control, so the manager will avoid performance-based incentives with that company. Conversely, firms with low risk and, therefore, predictable performance would gain little value from increasing the portion of a CEO's performance-based compensation.

Researchers claim that the increase in performance-based incentives has led to an increase in earnings manipulation. As defined by Davidson, Jiraporn, and Nemec, (2004), earnings manipulation is the intentional misapplication of accounting rules and misreporting of financial results that causes reported income to be larger or smaller than it would otherwise be. When performance-based incentives are a substantial portion of the CEO's compensation package, poor financial performance will not only reflect the manager's inability to run the company, but also lead to lower personal wealth of the CEO. Zhang, Bartol, Pfarrer, and Khanin (2008) found that CEOs with out-of-the-money stock options—those with a price lower than the strike price—were more likely to engage in earnings manipulation than those with stock options in-the-money—those with a price higher than the strike price.

Although popular theories of corrupt executives point to financial reporting manipulation, when compensation is tied to firm size, CEO's may also abuse their control over

acquisition activity to increase the firm size (Kroll, Simmons, and Wright 1990). Combs and Skill (2003) suggested that self-entrenchment could be present when a CEO's pay rises above what is predicted by firm size, job complexity, and pay that can be linked to performance.

Setting aside questionable behavior, a CEO's goal is, ultimately, to increase shareholder value. CEOs that deliver sufficiently high returns are less scrutinized because they accomplish this goal. Coombs and Gilley (2003) described "stakeholder management" as the degree to which organizations move beyond their own needs and legal requirements to satisfy the needs of their non-shareholding stakeholders (i.e., employees, suppliers, customers, and communities) whose primary benefit from the company is not from equity ownership (McWilliams and Siegel, 2001). They hypothesized that stakeholder management would have a positive effect on CEO compensation levels but found that, although boards of directors considered both financial and stakeholder performance, stakeholder performance had a negative effect on CEO compensation (Coombs and Gilly 2003). Therefore, their findings indicated that CEOs might be discouraged from pursuing stakeholder objectives (Coombs and Gilly 2003).

Although CEO compensation has been studied (and reported on) extensively, no research was found examining the relationships between compensation levels and company performance variables—return on equity, revenue, revenue growth, and profit margin. Research close to this topic primarily focuses on compensation related to firm size and stock price.

CEO COMPENSATION COMPONENTS

BASE SALARY

CEO compensation packages typically consist of base salaries, annual bonus plans, and stock options (Murphy 1998). Base salaries are determined based on industry surveys, which take into account company size, revenues, and market capitalization. Murphy (1998) suggested that, although the surveys adjust for size and industry, they do not take into account person-specific criteria such as age, experience, and education. This paper will incorporate these criteria into regression analyses to explore their relationships to compensation levels. These relationships could explain variations in CEO pay. As I will discuss, in the last two decades, compensation emphasis has moved from base salary to stock options. However, despite this decreasing focus on base salaries, they still serve as benchmarks for bonuses and other option grants (Murphy 1998).

BONUS PLANS

Bonus plans typically follow similar formats. A bonus is defined as a percentage of base salary paid when a performance threshold is met. A performance threshold, or milestone, is usually expressed as a percentage of the performance standard and typically based on one or two performance measures (Murphy 1998). Across the industrial, finance and accounting, and utilities industries, the most widely used performance standards were budget and prior-year performance (Murphy 1998). The most widely used performance measures across the same industries were earnings, EBIT, sales, and costs (Murphy 1998). A portion of the full bonus is paid at each threshold. Most bonus measures are

based on company performance. If the bonus includes any personal achievement, it normally does not exceed 25 percent of the full bonus (Murphy 1998). The methods used by companies to pay bonuses vary, but most follow a few common methods. The most common method is the 80/120 plan, (Murphy 1998), which pays no bonus unless performance exceeds 80 percent of a performance standard and caps bonuses once performance exceeds 120 percent of the performance standard. Other iterations of this approach exist, such as 90/110, 95/100, 50/150, and 80/110.

Murphy (1998) notes two fundamental flaws in making accounting profits the primary determinant of executive bonuses. First, accounting profits are history based, attributing nothing to decisions made to increase future profits at the behest of current profits. Second, accounting profits can be manipulated. Healy (1995) suggests that accrual policies of managers are related to income-reporting incentives in their bonus contracts and changes managers make to accounting procedures are associated with adoption or modification of their bonus plans. This means it is possible for executives to manipulate financial reporting in a way that ensures bonus pay out. A common way managers accomplish this is through the misuse of discretionary accruals to manipulate earnings and expenses over different time periods (Healy 1995).

STOCK OPTIONS

Stock options first became an attractive compensation alternative earlier in the 20th century due to exceedingly high personal income tax rates (Frydman and Saks 2005). Stock options have increased as a percentage of executive compensation in every decade

from the 1950s to present, (Frydman and Saks 2005), growing dramatically since the 1980s. Stock options give the recipient the right to buy or sell a stock at a specified “strike” price within a stated period of time and usually become exercisable, or “vested”, over a period of time. Typically, an executive forfeits his or her stock options by leaving the company before becoming fully vested (Murphy 1998). Most options expire in ten years and are granted with exercise prices equal to the “fair market value” on the date of the grant. Murphy (1998) reported on the option-grant practices of 1,000 large companies in 1992, and showed that fewer than two thirds of the CEOs in the sample received options in that year. However, many of these CEOs received multiple grants in that year, and 26 of the companies issued new grants to repay shares sold to pay the exercise price of exercised options.

If the underlying goal in business is to increase shareholder value, then stock options appear misaligned with that goal. The values of stock options are directly correlated with stock prices, making executives more likely to make business decisions with the goal of increasing stock price. Murphy (1998) demonstrated that stock options come at a high cost to shareholders, and a company should only grant them if the increased performance created by improved stock-based incentives exceeds the difference between the company’s cost and the executive’s value.

In 2000, Consec paid former GE Capital Chief Gary Wendt a signing bonus of \$45 million to forfeit his GE options and become CEO of Consec (Colvin, Harrington, and Hjelt 2001). This shows how stock option practices, even the stock options practices of

other companies, can have unfavorable consequences to shareholders. In addition, this massive signing bonus presumably affected the averages of CEO compensation during that time, leading to higher baselines for new CEO compensation packages. The Fortune article goes on to suggest that the leading cause for executive compensation excess is that the managers of these companies are not the owners. The owners (shareholders) are not able to functionally affect these practices, so the managers are largely able to set their own prices, either in the beginning during compensation negotiations, often employing consultants to assist in negotiations, or later through options grants, or worse, earnings manipulation. A recent article from The Human Resource Planning Society, suggests that better pay-for-performance alignment would ease the minds of shareholders (Reuters 2008).

From 1992 to 1996, the percentage of CEO compensation comprised of stock options in Mining and Manufacturing Firms, Financial Services, Utilities, and Other Industries increased by 33, 27, 54, and 64 percent respectively. The increase can be attributed to 1) favorable tax treatment of options (executives pay no taxes until the stocks are sold), and 2) increased CEO wealth attributed to exercising stock options during two decades of a bull market (Murphy 1998).

CEO ATTRIBUTES

Based on the theory of human capital, the unique skills and experiences that incumbent CEOs bring to their work affect their compensation (Agarwal, 1981). Agarwal (1981) measured the degree of human capital by education, field of study, and work experience,

and found that work experience—not education—was significantly related to executive compensation. From his work, Agarwal (1981) suggested that, while education and experience are major factors in achieving executive status, experience becomes a more powerful determinant of compensation. Finkelstein (1992) suggested that attributes including position, charisma, and knowledge characterize executive power. This paper will attempt to identify relationships between CEO compensation and CEO education, experience and tenure. I recognize that certain attributes, such as vision and charisma cannot be quantitatively measured, and I will not attempt to do so.

It is possible for companies to gain a competitive advantage by employing CEO's with superior managerial skills, given how difficult it is to teach or imitate skills learned through experience (Castanias and Helfat 1991). Fisher and Govindarajan (1992) found both experience and education predicted executive compensation in profit centers.

Depending on the type of company and its current situation, varying managerial skills are valuable at varying times. For example, a start-up company may value organizational and team-building skills, while companies in a turnaround situation might look for stronger analytical and diagnostic skills (Gerstein and Reisman 1983). Castanias and Helfat (1991) grouped management skill into a hierarchy of three types: (a) generic skills, transferable across firms and industries; (b) type of business or industry-related skills; and (c) firm-specific skills. Here firm-specific skills refer to the knowledge of company history, culture, and internal strengths and weaknesses needed to manage a firm effectively (Castanias and Helfat 1991). Firm specific knowledge will be represented later in analysis as tenure.

Cherame, Sturman, and Walsh (2008) suggested that the unique skills a manager possesses only provide a company with a competitive advantage if the skills are (1) valuable, (2) rare, (3) imperfectly imitable, and (4) imperfectly substitutable. Their research compared the advantage of managerial skills that are specific versus transferable. They found that the unique skills of managers close to—but not at—the extreme end of the human capital continuum, although still specific in nature, take on some transferability (Cherame, Sturman, and Walsh 2008). This specific human capital remains rare and potentially valuable to a small number of competing firms, and thus can be considered the most valuable form of human capital in the executive labor market (Cherame, Sturman, and Walsh 2008).

Although we may gain insight into the ability of firm specific skills to dictate compensation levels by analyzing CEO tenure, analyzing how industry specific skills affect compensation is beyond the scope of the paper. In addition to tenure, this paper will include education in attribute analysis to indicate the strength of transferable skills in explaining variances in compensation. Lastly, CEO age will be analyzed and could provide insight to how the length of experience affects compensation levels.

CHAPTER II

RESEARCH OBJECTIVES

An article by Steven N. Kaplan (2008), based on his testimony before the U.S. House of Representatives Committee of Financial Services, posited that actual CEO compensation is highly related to firm stock performance. His research, based on three years of observation, showed that firms with CEOs in the top quintile of actual pay are the top performing quintile, while firms with CEOs in the bottom quintile of actual pay are the worst performing quintile relative to their industries in every size. Responding to Kaplan's article, John C. Bogle (2008) argued that the short-term stock price is not a fair indicator of firm performance and that CEO performance should be based on the long-term building of intrinsic value.

The goal of this paper is not to add to the numerous attempts to explain the variance in CEO compensation. Instead, it seeks to look through a narrower lens and analyze the relationships that certain factors have to CEO compensation at a given point of time in order to shed light on the variables affecting compensation under current market conditions.

Using a cross section of company performance and CEO compensation data, I will perform a regression analysis to measure the relationships between company performance

indicators and CEO compensation. From this data I will demonstrate how compensation levels vary with industry and firm size and evaluate links between pay and performance.

For the next step, I will use regression analyses to evaluate relationships between CEO compensation and CEO-specific attributes. Attribute data will include education, experience, and tenure. From these data, I will present findings that could further explain variations in CEO compensation.

CHAPTER III

RESEARCH QUESTION

This study explores the following question related to CEO compensation:

What are the current statistics of CEO compensation at U.S. public companies, and how do those compensations quantitatively relate to company performance and individual CEO attributes?

I will use multiple regression analyses and comparisons of mean values to assess mathematical relationships and numerical differences. The resulting datum will be used to make inferences regarding current compensation practices at United States public companies.

CHAPTER IV

HYPOTHESES

This study will examine three hypotheses:

1. *Among the observed company performance variables, market capitalization will exhibit the strongest correlation to CEO compensation.*

I will test this hypothesis through multiple regression analyses, using CEO compensation as the dependent variable and a number of company performance variables as independent variables.

2. *Among the observed companies, the companies with the highest market capitalization will also be the companies with the highest paid CEOs.*

I will test this hypothesis by collecting and comparing data on a sample of public companies taken from the S&P 500.

3. *Among the observed CEO attribute variables, tenure will exhibit the strongest correlation to CEO compensation.*

I will test this hypothesis using multiple regression analyses with CEO compensation as the dependent variable and a number of CEO attributes – representing age, education, and tenure – as independent variables.

CHAPTER V

DATA

To establish a list of public companies for analysis, I used Microsoft Excel Stat Tools to create a random sample of 150 public companies from the S&P 500. After creating the list, I gathered CEO information and compensation data from Businessweek.com and Reuters.com. Businessweek.com was the primary data source, and Reuters.com served as a secondary source when data was unavailable from Businessweek.com. Prior to gathering the data, I performed an analysis of both sites to confirm that they provided identical information. All data collected was current as of December 31, 2008.

Compensation data from these two sites match reported CEO compensations from the SEC. Capital IQ, a division of Standard & Poor, provides Businessweek.com's CEO compensation data. I removed thirteen companies from the data list, either because compensation data were unavailable or the compensation levels were extreme outliers. For example, I removed Apple, Inc., because CEO Steve Jobs is currently paid only \$1 per year.

Company information and performance data came from the finance section of Yahoo.com (Yahoo.com/Finance). Instead of searching for other data sources, I removed the few companies with missing data from the list to ensure consistency across sample data.

Company performance data were collected on multiple variables. The industry sector classification of each company is used to identify any variances due to industry. The broad sector categories include consumer discretionary, consumer staples, energy, financials, health care, industrials, information technology, materials, telecommunications services, and utilities. Although it varies among all, including similarly performing firms, stock price is analyzed to identify any relationship to CEO compensation at the time of analysis. Market capitalization is a common measure of firm size and is calculated as the company's current stock price multiplied by the number of shares outstanding. Return on equity measures the rate of return on the ownership interest, or shareholders equity, of the common stock owners. This variable measures a firm's efficiency in generating profits from assets, and represents how well a company uses investment dollars to generate earnings growth.

Revenue represents money received by the company for goods sold or services provided during a certain time period, and quarterly revenue growth represents how those earnings have changed over time. Revenue growth is an important factor in determining the potential future stock price of a company.

In addition to compensation, data on several person-specific attributes were collected. Age of each CEO at the time of analysis was collected to aid in explaining compensation variance. Levels of education were collected and grouped by completion of a MBA, Masters Degree, JD, or PHD. Lastly, tenure of each CEO with their current company was collected and used only when at or above 10 years.

CHAPTER VI

METHODS

After all data were collected, I performed multiple analyses. First, I performed one-variable summaries on compensation amounts to identify the average, highest, and lowest values as well as the range of compensation levels. I created box plots and histogram graphs to identify how compensation levels were distributed. In addition, I compiled a correlation and covariance table to explore relationships between compensation and performance variables, as well as a scatter plot graph to explore relationships among the performance variables.

Regression analysis was performed to reveal which performance variables accounted for the largest share of the variance in CEO compensation levels. A number of performance variables, representing company size, performance, and management effectiveness, were entered into the multiple regression analysis. A full listing of these variables appears in Table 1. The regression analyses results appear in Table 5.

TABLE 1: COMPANY PERFORMANCE VARIABLES

Variable	Represents
Industry Sector	Groups of companies that operate in the same segment of the economy or share a similar business type.
Stock Price	Price of one share of company stock.
Market Cap	Measure of corporate or economic size equal to the stock price times the number of shares outstanding.
Return on Equity	Measure of the rate of return on the ownership interest (shareholders' equity) of the common stock owners. Measures a firm's efficiency at generating profits from every dollar of net assets. Return on Equity represents how well a company uses investment dollars to generate earnings growth.
Revenue	Total amount of money received by the company for goods sold or services provided during a certain time period.
Quarterly Revenue Growth	Measure of the increase in company revenue compared to a previous quarter's revenue performance.
Profit Margin	Ratio of profitability calculated as net income divided by revenues, or net profits divided by sales. Measure of how much of every dollar of sales a company actually keeps in earnings.

Regression analyses were also performed to reveal which CEO attribute variables accounted for the largest share of the variance in compensation levels. Attribute variables representing age, education and tenure with current firm were entered into the multiple regression analyses. A full listing of these variables appears in Table 2. Two regression analyses were completed; the results of these models appear in Table 6.

TABLE 2: CEO ATTRIBUTE VARIABLES

Variable	Represents
CEO Compensation	Total compensation calculated as the sum of total annual compensation, total short-term compensation, and other long-term compensation.
Age	Age of each CEO at the time of analysis.
Education	MBA - (1) for yes, (0) for no Masters Degree - (1) for yes, (0) for no JD/PHD - (1) for yes, (0) for no
Tenure +10	CEO's with tenure of more than ten years with current employer (1).

CHAPTER VII

RESULTS & DISCUSSION

COMPENSATION SUMMARY

A one variable summary analysis, appearing in Figure 1, was performed on the sample CEO Compensations. The output revealed that, out of the final list of 124 CEOs observed, the highest compensation was over \$36 million dollars, and the lowest was just over \$1 million dollars. The mean, or average, compensation was \$9.4 million. As shown in the box plot graph in Figure 2, although the maximum value is more than \$36 million, the range of the first three quartiles is only \$11.6 million, meaning three quarters of the CEOs observed make less than \$11.6 million—less than half as much as the highest paid CEO. Although I assumed the compensation data would be normally distributed; the data is clearly positively skewed, as shown in Figure 3. This skewing indicates that most CEO compensation levels range from \$1 million to \$8 million dollars. Out of the 124 CEOs observed, 83 (67 percent) receive compensation in this range.

The data support my second hypothesis, which predicted that, among the observed companies, the companies with the highest market capitalization would also be the companies with the highest paid CEOs. After data collection, the companies were organized from largest to smallest market capitalization. The companies with the 15 highest market capitalizations are listed below in Table 3. The mean CEO compensation

of this list is \$15.8 million, which is \$6.4 million more than the mean and in the fourth quartile of total CEO compensation levels in this study.

TABLE 3: MARKET CAPITALIZATION RANKING

Company	Market Cap (Billion)	CEO Compensation
Coca Cola Co.	95.41	13,990,171
Intel Corp.	81.76	11,542,000
Verizon Communications	80.67	26,553,576
Wells Fargo	59.07	12,568,917
Amgen	52.99	19,912,686
United Parcel Service	42.89	2,646,150
CVS Caremark Corp.	38.61	26,097,790
Comcast Corp.	37.53	20,802,728
Bank of America Corp.	36.87	24,844,040
Home Depot	34.81	8,282,868
3M Company	33.30	17,359,336
Colgate-Palmolive	28.89	11,446,320
Bank of New York Mellon Corp.	27.20	20,117,780
Apache Corp.	20.40	7,725,955
Devon Energy Corp.	20.05	12,660,499

CORRELATION AND COVARIANCE

As seen in Figure 4, correlation and covariance analysis was performed to observe the relationships between the dependent variable, CEO compensation, and the independent variables. Correlation relationships represent the simultaneous change in value of two numerically valued random variables. They are expressed as numbers between 0 and 1. A positive number closer to 1 than 0 represents a strong positive relationship. Stated more simply, a positive correlation indicates that one variable increases when the other increases. Most company performance variables show little correlation with the CEO compensation data. Of the variables observed, all but one correlation ranged from – 0.168 to 0.114. Negative correlations suggest that, as one variable increases in value, the

other decreases. The strongest positive correlation to CEO compensation was market capitalization, a finding supported by most research on the topic of CEO compensation. These findings suggest that, other than market capitalization, there is no linear relationship between CEO compensation and company performance.

The correlation output findings support my first hypothesis. Among the observed company performance variables, market capitalization exhibits the strongest correlation to CEO compensation. The correlation between CEO compensation and market capitalization is a positive correlation of .408, indicating that CEO compensation increases when market capitalization increases.

The correlation and covariance analysis also examines the relationships between independent variables, searching for any multicollinearity issues. Multicollinearity issues exist when two or more independent variables are correlated to each other. A multicollinearity issue may not affect the prediction of Y from a set of X variables; however, the issue could create difficulties in understanding how the various X variables impact Y. As shown in Figure 4, most of the independent variables are not highly correlated with each other. The highest correlation between variables is the .607 correlation between return on equity and profit margin. This high positive correlation could result in multicollinearity issues during regression analyses.

INDUSTRY SECTOR ANALYSIS

Each of the companies used in this study is assigned to one of ten industry sectors, as shown in Table 4 below.

TABLE 4: INDUSTRY SECTORS

Sector #	Sector Name	Examples
1	Consumer Discretionary	▪ 3M ▪ Home Depot ▪ Starbucks Corp.
2	Consumer Staples	▪ Estee Lauder Cosmetics ▪ General Mills ▪ Pepsi Bottling Group
3	Energy	▪ Murphy Oil ▪ Valero Energy
4	Financials	▪ Bank of America Corp. ▪ Discover Financial Services ▪ Wells Fargo
5	Health Care	▪ Humana Inc. ▪ St Jude Medical
6	Industrials	▪ Northrop Grumman Corp. ▪ Southwest Airlines ▪ United Parcel Service
7	Information Technology	▪ Adobe Systems ▪ Intel Corp. ▪ Motorola Inc.
8	Materials	▪ Dow Chemical ▪ Du Pont (E.I.)
9	Telecommunications Services	▪ Century Telephone ▪ Verizon Communications
10	Utilities	▪ CenterPoint Energy ▪ Dominion Resources ▪ TECO Energy

Looking at the scatter plot analysis in Figure 5, the range of compensations does not vary significantly across industry sectors. There appears to be no implication that one or more sectors could skew the analysis as a whole. Although the highest compensation level was

in the consumer discretionary sector, some of the lowest levels also fell in that sector.

There is the least amount of dispersion in the information technology sector, suggesting that the CEOs in this sector are compensated at similar levels and that compensation in this sector is inelastic.

REGRESSION ANALYSIS OF PERFORMANCE VARIABLES

Knowing that only market capitalization held a strong correlation to the dependent variable, compensation, it was not reasonable to expect a good model “fit” from a regression analyses incorporating all performance variables. The first regression analysis shown in Figure 6 includes all independent performance variables. The analysis uses dummy variables for industry sectors. The regression produced an Adjusted R squared value of 0.15 and a Standard Error of Estimate of \$5.8 million, meaning this model explains approximately 15 percent of the variance in CEO compensation. Next, a reduced regression excluding the industry sector dummy variables was performed, shown in Figure 7. A partial F-test, seen in Figure 6, looked at the explanatory value of the sector dummy variables. The high P-value of .99, with respect to a significance level of .05, indicates that the dummy variables for industry sector add little to the model or to the explanation of the variance in CEO compensation. Furthermore, excluding the dummy variables increases the Adjusted R squared value to 0.19 and decreases the Standard Error of Estimate to \$5.7 million.

After excluding the dummy variables, I looked more closely at the independent variables in the reduced regression. Except for market capitalization, all of the variables have

much higher P-values and much lower t-values than would be ideal for a good explanatory regression. Based on the “Guidelines for Including/Excluding Variables in a Regression Equation”, all variables other than market capitalization are candidates for exclusion because market capitalization is the only variable with a p-value below the .05 significance level (Albright, Winston, and Zappe 2009). The guidelines also advocate excluding variables with t-values less than 1. In this case, only the market capitalization would remain. Therefore, according to economic theory, market capitalization should be a strong indicator of CEO compensation

Based on this conclusion, I performed a regression analysis of CEO compensation using only market capitalization, as shown in Figure 8. The output appeared to be less effective than the prior regressions. The Adjusted R squared decreased to 0.16, however, the Standard Error of Estimate decreased by \$5.8 million. This analysis suggests that, although this model explains less of the variance in CEO compensation, it may explain it a bit more precisely.

After testing several model variations, the model with the highest Adjusted R squared and lowest relative Standard Error of Estimate utilized market capitalization and profit margin as the only independent variables, as shown in Figure 9. The model produced an Adjusted R squared of 0.2179 and a Standard Error of Estimate of \$5.6 million. Although profit margin alone does not appear to be correlated to CEO compensation, when combined with market capitalization, it helps explain almost 22 percent of the variance in CEO compensation.

TABLE 5: COMPANY PERFORMANCE REGRESSION SUMMARIES*(dollar amounts in millions)*

Model	R-Square	Adjusted R-Square	Std. Error of the Estimate	Adjusted R-Squared Change	p-Value
1	0.2541	0.1505	5.85		.0040
2	0.2338	0.1945	5.69	0.0440	<.0001
3	0.1668	0.1600	5.81	0.0345	<.0001
4	0.2306	0.2179	5.61	0.0579	<.0001
A	Equation: Compensation = 10.8 + .015 (Price) + .176 (Market Cap) – .401 (Return of Equity) – .0003 (Revenue) – .334 (Quarterly Rev Growth) – 7.25 (Profit Margin) – 2.36 (Sector 1) – 3.17 (Sector 10) – 4.41 (Sector 2) – 2.99 (Sector 3) – 3.02 (Sector 4) – 4.18 (Sector 5) – 3.28 (Sector 6) – 4.90 (Sector 7) – 3.56 (Sector 8)				
B	Equation: Compensation = 7.30 + .015 (Price) + .178 (Market Cap) – .194 (Return of Equity) – .001 (Revenue) – .933 (Quarterly Rev Growth) – 8.38 (Profit Margin)				
C	Equation: Compensation = 7.53 + .163 (Market Cap)				
D	Equation: Compensation = 7.69 + .183 (Market Cap) – 8.49 (Profit Margin)				

The low amount of variance in CEO compensation explained by company performance variables other than market capitalization or firm size suggests that there is not a strong relationship between CEO compensation and company performance.

To test if the collected data could be labeled a statistically random sample, I ran a Lilliefors test the residuals versus fit data from the last regression, shown in Figure 10.

The Lilliefors test tests the null hypothesis that the data collected comes from a normally distributed population, thus supporting the assertion of a random sample. The test statistic identified in the test is higher than all the comparison values, indicating that the model is not normally distributed. Even though the random sample was created using the

Random Sample function of Microsoft Excel Stat Tools, the evidence indicates that the data are not a random sample. This result could be attributed to the compensation outliers.

REGRESSION ANALYSIS OF CEO ATTRIBUTES

As a parallel study to analyzing the relationships between CEO compensation and company performance variables, person-specific data were collected on each CEO in the sample of companies to investigate the relationships between CEO compensation and person-specific CEO attributes. Once the data were collected, regression analysis was performed using all CEO attribute variables, shown in Figure 11. The Adjusted R squared of 0.1092 and \$9.5 million Standard Error of Estimate suggest that such attributes explain only 11 percent of the variance in CEO compensation. Observing the independent variables, age and education (JD/PHD) show the strongest potential to explain the variance in compensation. I performed a second regression analysis using only age and education (JD/PHD) as independent variables, shown in Figure 12. This regression explains a slightly larger amount—12 percent—of the variance in CEO compensation.

TABLE 6: CEO ATTRIBUTE REGRESSION SUMMARIES*(dollar amounts in millions)*

Model	R-Square	Adjusted R-Square	Std. Error of the Estimate	Adjusted R-Squared Change	p-Value
1	0.1420	0.1092	9.46		.0011
2	0.1373	0.1244	9.38	0.0152	<.0001
A	Equation: Compensation = -10.7 + .366 (Age) + .062 (MBA) – 1.47 (Masters) + 8.99 (JD/PHD) + .302 (Tenure +10)				
B	Equation: Compensation = -11.03 + .369 (Age) + 8.72 (JD/PHD)				

The regression analysis of CEO attributes shows that the experience variable tenure is not highly correlated to CEO compensation in this sample, thus undermining my third hypothesis. Among the observed CEO attribute variables, experience does not exhibit the strongest correlation to CEO compensation. According to the research cited earlier in this paper, CEO experience has been shown to correlate to CEO compensation. This suggests either that the sample of companies observed in this study differs from that of previously cited studies, or that unknown factors have shifted the determinants of CEO compensation.

CHAPTER VIII

STUDY LIMITATIONS

While this paper provides some insight into the variance of CEO compensation, a full understanding of the results of the study requires knowledge of several inherent limitations of the analysis. These limitations are listed below.

1. *Current United States Economy* The United States economy is currently in a recession, possibly leading to a depression. Over a year ago, the failing subprime mortgage industry sparked a downturn that spread to other areas of the economy. According to the United States Department of Labor, the U.S. unemployment rate hit 8.1 percent in February 2009. The effects of the economy on company performance and compensation levels must be considered when evaluating the results of this study.
2. *Cross Sectional Data* This study uses a cross-sectional set of data observing compensation and performance data at a single point in time. From the data collected, it is unclear whether the relationships among pay and performance and pay and personal attributes are strengthening or weakening.
3. *Sample Data* The companies observed in this study are a random sample of the companies in the Standard and Poor's 500. The S&P 500 is a weighted index of the prices of 500 large cap common stocks actively traded in the United States. The companies in the S&P 500 are among the 500 American stocks with the

largest market capitalizations. Therefore, the companies used in this study may not be a reliable representation of all public companies in traded in the United States.

CHAPTER IX

FUTURE RESEARCH

The results of this study show that, in the aggregate, CEO compensation is tied to firm size but not to company performance. The independent variables used here reflect the key performance indicators of public companies in the United States. Future studies of compensation should attempt to gather a more representative sample of all public companies traded in the United States. In addition, qualitative variables should be combined with quantitative variables to present a more complete representation of CEO influence on public companies.

Lastly, while cross sectional analysis provides essential relationship data at a given point in time, time series data would provide information on when shifts occur in these relationships. For example, in the context of this study, time series data could show when CEO experience became less of a determinant of CEO compensation.

CHAPTER X

CONCLUSION

As long as publicly held companies remain a central player in the economy, the issue of CEO compensation will remain an important and popular topic of research. Each year, investors entrust trillions of dollars to the decisions of this country's CEOs, and now, more than ever, those investors are demanding a clearer picture of how CEOs are compensated and how that compensation is determined. The decisions CEOs make affect not only their own firms, but also have ripple effects throughout the U.S. and global economies. Analyzing the compensation practices of CEOs provides insight into their motivations and helps us predict what actions they will take. This information (we hope) makes us better investors and shareholders. The analyses in this paper attempt to quantify the relationships [certain variables] have to CEO compensation in order to explain the variance in compensation levels. However, until a model is created that can quantify attributes such as vision, leadership ability, and charisma, researchers will continue to struggle with this issue.

VITA

Jeremiah Joe Allen was born in Bowie, Texas, on April 16, 1977 to Larry Allen and Debra Walters. After graduating third in his class from Silo High School in 1995, he went on to earn a Bachelor of Arts in Communications from Southeastern Oklahoma State University in 1999. Upon graduation, he worked for several local broadcasting companies before moving into the restaurant industry. Currently, Jeremiah is a Finance Director for an Austin-based company specializing in innovative parenting products. Jeremiah began working toward his Masters of Business Administration at Texas State University-San Marco in 2006 and will receive his degree in May of 2009.

LIST OF FIGURES

<i>One Variable Summary</i>	<i>CEO Compensation</i>
Mean	9,345,606.13
Variance	40,234,428,372,180.50
Std. Dev.	6,343,061.44
Skewness	1.41
Median	7,725,955.00
Mean Abs. Dev.	4,876,190.94
Minimum	1,058,835.00
Maximum	36,816,827.00
Range	35,757,992.00
Count	124.00
Sum	1,158,855,160.00
1st Quartile	4,660,417.00
3rd Quartile	11,632,871.00
Interquartile Range	6,972,454.00

FIGURE 1: ONE VARIABLE SUMMARY – COMPENSATION

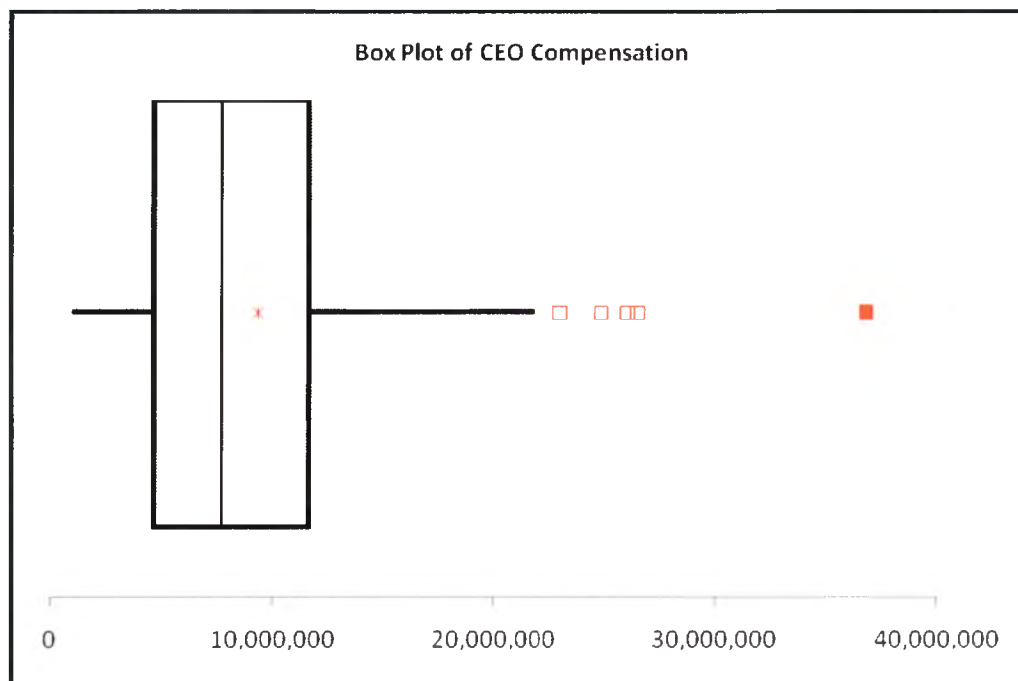


FIGURE 2: BOX PLOT GRAPH – COMPENSATION

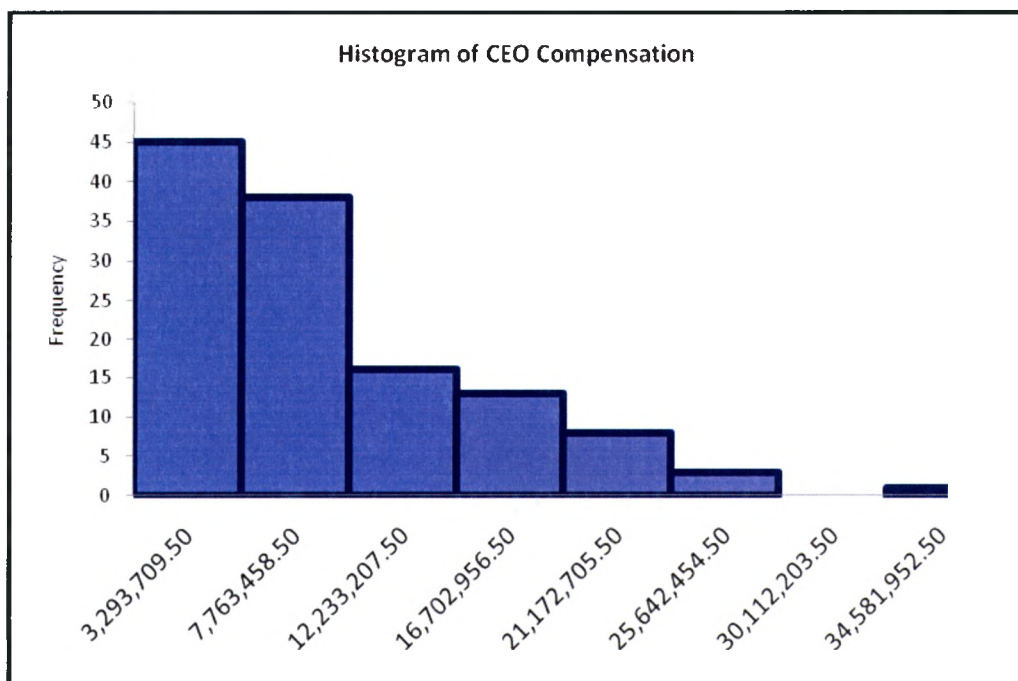


FIGURE 3: HISTOGRAM – COMPENSATION

<i>Correlation Table</i>	Price	Market Cap	Return on Equity	Revenue	Quarterly Rev Growth	Profit Margin	Sector 1	Sector 10	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 7	Sector 8
CEO Comp	0.06	0.41	-0.08	-0.06	-0.09	-0.17	0.11	-0.03	0.03	0.02	0.01	-0.04	0.00	-0.14	-0.04
Price		0.23	0.35	0.20	0.16	0.29	-0.20	-0.06	0.13	0.11	-0.05	0.24	0.12	-0.18	-0.04
Market Cap			0.17	0.00	-0.06	0.20	-0.05	-0.08	0.18	-0.02	-0.03	0.02	-0.04	0.00	-0.08
Return on Equity				0.05	0.19	0.61	-0.08	-0.01	0.03	-0.01	-0.07	0.09	0.00	0.03	0.03
Revenue					0.06	0.16	-0.07	-0.05	-0.03	-0.01	-0.10	0.11	-0.06	0.20	-0.03
Quarterly Rev Growth						0.11	-0.07	0.17	0.18	-0.15	-0.32	0.17	0.11	0.02	-0.04
Profit Margin							-0.30	0.01	0.03	0.01	0.05	0.06	-0.01	0.16	0.00
Sector 1								-0.11	-0.13	-0.10	-0.20	-0.15	-0.15	-0.18	-0.11
Sector 10									-0.08	-0.06	-0.12	-0.09	-0.09	-0.11	-0.07
Sector 2										-0.08	-0.14	-0.11	-0.11	-0.13	-0.08
Sector 3											-0.11	-0.09	-0.09	-0.10	-0.06
Sector 4												-0.17	-0.17	-0.20	-0.12
Sector 5													-0.13	-0.15	-0.09
Sector 6														-0.15	-0.09
Sector 7															-0.11
Sector 8															

FIGURE 4: CORRELATION AND COVARIANCE – COMPENSATION

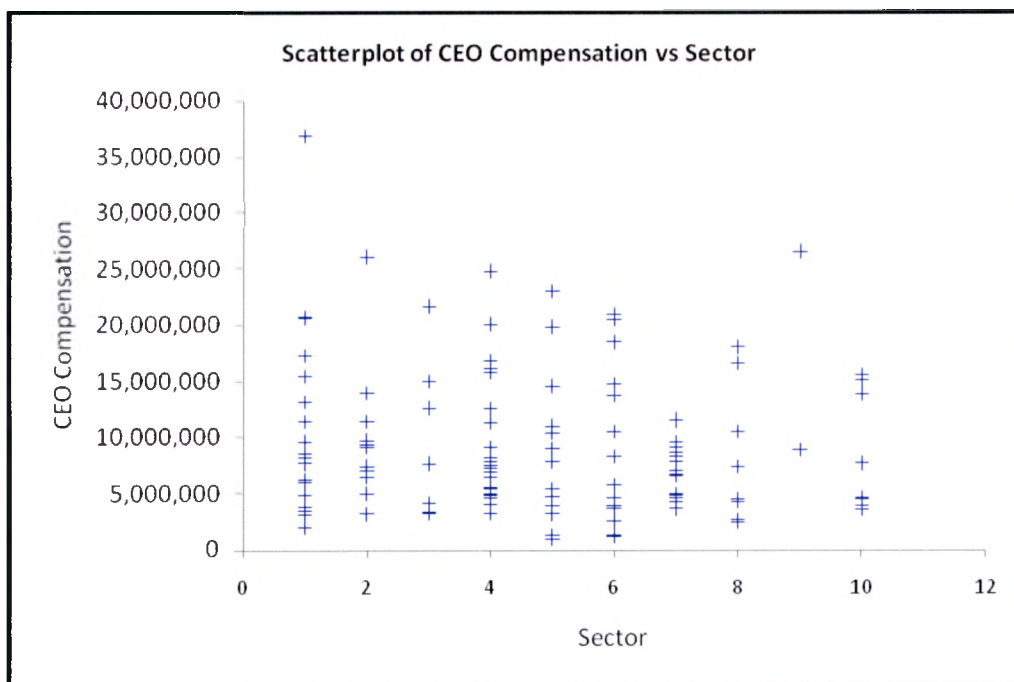


FIGURE 5: SCATTER PLOT OF CEO COMPENSATION VERSES INDUSTRY SECTOR

Summary	Multiple R	R-Square	Adjusted R-Square	StErr of Estimate		
	0.5040	0.2541	0.1505	5,846,459		
ANOVA Table	Degrees of Freedom	Sum of Squares	Mean of Squares	F-Ratio	p-Value	
Explained	15	1.25728E+15	8.38185E+13	2.4522	0.0040	
Unexplained	108	3.69156E+15	3.41811E+13			
Regression Table	Coefficient	Standard Error	t-Value	p-Value	Confidence Interval 95%	
					Lower	Upper
Constant	10,805,202.57	4,435,215.78	2.436	0.016	2,013,835.45	19,596,569.69
Price	14,624.95	33,030.28	0.443	0.659	-50,846.79	80,096.70
Market Cap Billion	176,256.51	37,098.77	4.751	0.000	102,720.32	249,792.70
Return on Equity	-401,130.09	2,017,020.14	-0.199	0.843	-4,399,213.92	3,596,953.74
Revenue Billion	-369.23	4,149.19	-0.089	0.929	-8,593.64	7,855.19
Quarterly Revenue Growth	-333,677.71	2,497,412.49	-0.134	0.894	-5,283,982.52	4,616,627.11
Profit Margin	-7,246,279.94	3,764,012.29	-1.925	0.057	-14,707,205.30	214,645.41
Sector (Dummy Variable) = 1	-2,359,500.88	4,538,106.23	-0.520	0.604	-11,354,814.71	6,635,812.95
Sector (Dummy Variable) = 10	-3,167,855.16	4,791,746.28	-0.661	0.510	-12,665,927.57	6,330,217.24
Sector (Dummy Variable) = 2	-4,410,644.65	4,579,025.57	-0.963	0.338	-13,487,067.72	4,665,778.42
Sector (Dummy Variable) = 3	-2,990,710.21	4,904,791.57	-0.610	0.543	-12,712,858.00	6,731,437.59
Sector (Dummy Variable) = 4	-3,020,652.06	4,533,229.37	-0.666	0.507	-12,006,299.12	5,964,995.00
Sector (Dummy Variable) = 5	-4,188,267.85	4,583,479.15	-0.914	0.363	-13,273,518.69	4,896,982.99
Sector (Dummy Variable) = 6	-3,283,909.70	4,594,511.34	-0.715	0.476	-12,391,028.25	5,823,208.84
Sector (Dummy Variable) = 7	-4,902,103.43	4,500,129.23	-1.089	0.278	-13,822,140.27	4,017,933.40
Sector (Dummy Variable) = 8	-3,562,431.55	4,818,465.17	-0.739	0.461	-13,113,465.45	5,988,602.35
Partial F test for including JobGrade dummies						
df numerator	9					
df denominator	108					
F ratio	0.027199752					
p-value	0.999998448					

FIGURE 6: COMPLETE REGRESSION – COMPENSATION

Summary	Multiple R	R-Square	Adjusted R-Square	StErr of Estimate	
	0.4835	0.2338	0.1945	5,692,976	
ANOVA Table	Degrees of Freedom	Sum of Squares	Mean of Squares	F-Ratio	p-Value
Explained	6	1.15687E+15	1.92811E+14	5.9491	< 0.0001
Unexplained	117	3.79197E+15	3.241E+13		
Regression Table	Coefficient	Standard Error	t-Value	p-Value	Confidence Interval 95% LowerUpper
Constant	7,301,769.55	986,699.69	7.400	0.000	5,347,662.529,255,876.57
Price	15,262.72	29,440.72	0.518	0.605	-43,043.0873,568.52
Market Cap Billion	178,940.78	33,950.50	5.271	0.000	111,703.60246,177.96
Return on Equity	-194,268.13	1,924,000.57	-0.101	0.920	-4,004,650.443,616,114.17
Revenue Billion	-1,336.96	3,893.88	-0.343	0.732	-9,048.586,374.66
Quarterly Revenue Growth	-933,075.60	2,169,296.60	-0.430	0.668	-5,229,253.853,363,102.65
Profit Margin	-8,383,728.52	3,438,377.95	-2.438	0.016	-15,193,255.89-1,574,201.16

FIGURE 7: REDUCED REGRESSION 1 – COMPENSATION

Summary		Multiple R	R-Square	Adjusted R-Square	StErr of Estimate	
		0.4085	0.1668	0.1600	5,813,469	
ANOVA Table		Degrees of Freedom	Sum of Squares	Mean of Squares	F-Ratio	p-Value
Explained		1	8.25671E+14	8.25671E+14	24.4307	< 0.0001
Unexplained		122	4.12316E+15	3.37964E+13		
Regression Table		Coefficient	Standard Error	t-Value	p-Value	Confidence Interval 95% LowerUpper
Constant		7,525,014.96	638,923.54	11.778	0.000	6,260,201.998,789,827.93
Market Cap Billion		163,563.28	33,091.59	4.943	0.000	98,055.16229,071.39

FIGURE 8: REDUCED REGRESSION 2 – COMPENSATION

<i>Summary</i>	Multiple R	R-Square	Adjusted R-Square	StErr of Estimate		
	0.4802	0.2306	0.2179	5,609,606		
<i>ANOVA Table</i>	Degrees of Freedom	Sum of Squares	Mean of Squares	F-Ratio	p-Value	
Explained	2	1.14124E+15	5.70622E+14	18.1336	< 0.0001	
Unexplained	121	3.80759E+15	3.14677E+13			
<i>Regression Table</i>	Coefficient	Standard Error	t-Value	p-Value	Confidence Interval 95%	
					Lower	Upper
Constant	7695188.82	618855.72	12.435	0.000	6470000.70	8920376.94
Market Cap. Billion	183786.74	32563.50	5.644	0.000	119318.71	248254.78
Profit Margin	-8496462.88	2682996.31	-3.167	0.002	-13808161.76	-3184764.01

FIGURE 9: REDUCED REGRESSION 3 – COMPENSATION

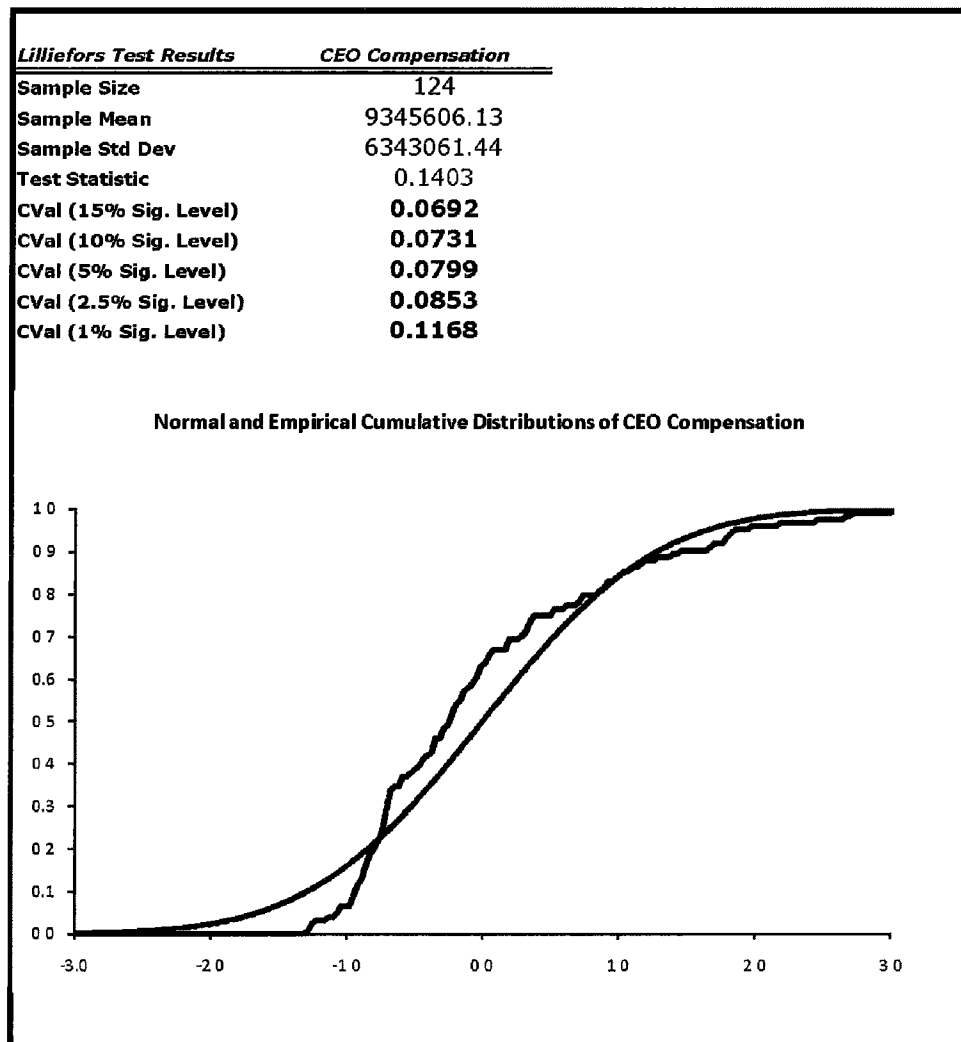


FIGURE 10: LILLIEFORS TEST – COMPENSATION

Summary	Multiple R	R-Square	Adjusted R-Square	StErr of Estimate		
	0.3768	0.1420	0.1092	9465302.703		
ANOVA Table	Degrees of Freedom	Sum of Squares	Mean of Squares	F-Ratio	p-Value	
Explained	5	1.94237E+15	3.88474E+14	4.3360	0.0011	
Unexplained	131	1.17365E+16	8.9592E+13			
Regression Table	Coefficient	Standard Error	t-Value	p-Value	Confidence Interval 95%	
					Lower	Upper
Constant	-10,749,062.75	7,156,360.21	-1.502	0.135	-24,906,050.31	3,407,924.82
AGE	366,947.56	133,015.87	2.759	0.007	103,810.43	630,084.68
MBA	62,428.01	1,715,959.60	0.036	0.971	-3,332,149.41	3,457,005.42
MASTERS	-1,466,199.15	1,898,852.85	-0.772	0.441	-5,222,583.05	2,290,184.74
JD/PHD	8,997,818.33	2,570,054.84	3.501	0.001	3,913,636.80	14,081,999.86
TENDOR +10	302,456.95	1,816,368.62	0.167	0.868	-3,290,753.45	3,895,667.35

FIGURE 11: COMPLETE REGRESSION – CEO ATTRIBUTES

Summary	Multiple R	R-Square	Adjusted R-Square	StErr of Estimate		
	0.3705	0.1373	0.1244	9384581.1		
ANOVA Table	Degrees of Freedom	Sum of Squares	Mean of Squares	F-Ratio	p-Value	
Explained	2	1.87749E+15	9.38743E+14	10.6590	< 0.0001	
Unexplained	134	1.18014E+16	8.80704E+13			
Regression Table	Coefficient	Standard Error	t-Value	p-Value	Confidence Interval 95%	
					Lower	Upper
Constant	-11,039,560.26	7,037,259.79	-1.569	0.119	-24,958,033.94	2,878,913.42
AGE	369,475.30	127,578.45	2.896	0.004	117,147.37	621,803.24
JD/PHD	8,718,109.15	2,431,998.61	3.585	0.000	3,908,039.65	13,528,178.64

FIGURE 12: REDUCED REGRESSION – CEO ATTRIBUTES

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