

THE DYNAMICS OF CEO COMPENSATION AND FIRM PERFORMANCE: ARE EXECUTIVE COMPENSATIONS EXCESSIVE?

Ying Huang*, Carl R. Chen**

Abstract

We evaluate the dynamics of executive compensation and shareholder returns. In observing the level of compensation, we notice that CEOs' salaries, bonuses, annual stock options, and accumulation of stock options all showed strong or explosive growth. We postulate that the marginal productivity of CEO compensation diminishes over the sample period due to this substantial growth. Our empirical results support this hypothesis. Using both single equation and simultaneous equation models, we find the marginal effect of compensation on total shareholder returns declines substantially. The results support the concerns that the public has expressed about the levels of CEO compensation.

Keywords: executive compensation, CEO, shareholder returns

*Corresponding author: Ying Huang, Department of Economics and Finance, Northern Kentucky University
e-mail: yhuang616@gmail.com. Thomas Steiner is greatly acknowledged for the contribution to an earlier version of this manuscript.

**University of Dayton

I. Introduction

The corporate form of organization ties together various stakeholder groups including an executive team, stockholders, customers, and suppliers. The different stakeholder groups are related through various implicit and explicit contracts. The executive team is given the responsibility of utilizing the financial capital contribution of the stockholders. Indeed, the stockholders hold voting influence over the executive team through the board of directors. Nevertheless, the relationship has potential conflicts. Certainly the executive team may not hold the same objectives or rather embrace the same objectives with the same degree of intensity. The potential conflict is centered upon the stock value of the equity of the firm. A maximum stock value may be achieved through motivating executives to act as if they are stockholders. The compensation contract has the potential to achieve this alignment. At the same time, a bad compensation contract pays excessive rewards to an under-performing executive team. A common structure for an executive compensation contract includes salary, bonuses, and stock options. But, are these compensation methods designed to achieve wealth gains for shareholders?

This has been an increasingly interesting topic in the public arena. Furthermore, in the wake of recent corporate scandals such as Enron, Global Crossing, and WorldCom, corporate executives are equated with greed. Dennis Kozlowski, Tyco's ex-CEO, was one of the most well-paid corporate executives (his 1998 pay was \$24 million plus \$41 million in option gains), yet it was reported that Mr. Kozlowski regularly reached into the Tyco coffers to finance his extravagant

lifestyle including a \$19 million free loan for his Boca Raton estate.¹⁴² Moreover, critics argue that stock options create incentives for executives to artificially inflate earnings to run up the value of their holdings. More companies are, therefore, announcing plans to expense the stocks options offered to executives and employees. Proctor and Gamble is the latest to join this exercise. The explicit expensing of the stock options could be quite costly for certain companies. For example, Amazon's 2001 net loss could have been widened by \$396 million had the company expensed its stock options.¹⁴³ Financial institution, such as Fidelity Investments, says that it might withhold votes for directors favoring generous executive compensation. "We are concerned about grossly excessive CEO compensation," says Eric Roiter, a general counsel at Fidelity.¹⁴⁴ Whether executive compensation is excessive or not has thus received renewed attention and is hotly debated.

The debate has a deep and developing history in the academic executive compensation literature that includes an impressive collection of published works. For example, a substantial body of work has focused upon the pay-performance relationship.¹⁴⁵ Jensen and

¹⁴² Loan was forgiven by Tyco. See *Wall Street Journal*, August 7, 2002, p. A1.

¹⁴³ *Wall Street Journal*, August 6, 2002, pp. A4 and C1.

¹⁴⁴ *Wall Street Journal*, June 12, 2002, p. C1.

¹⁴⁵ These studies include Murphy (1985, 1986), Coughlan and Schmidt (1985), Brickley, Bhagat, and Lease (1985), Gibbons and Murphy (1990), Jensen and Murphy (1990), Houston and James (1995), Mehran (1995), Loderer and Martin (1997), Core, Holthausen, and Larcker (1999), and Palia (2001).

Murphy (1990) find that CEO pay changes \$3.25 for each \$1,000 adjustment in shareholder wealth. The small but positive relationship supports the notion that compensation contracts are designed to be sensitive to firm performance and therefore an alignment of interest is established through the contracts that diminishes the agency conflicts inherent in the relationship. Despite the evidence on pay-performance relationships, the question remains: even if managerial compensation contracts are structured to be sensitive to firm performance, are excessive amounts of compensation paid to the executives? Meulbroek (2001) raise the issue of whether compensation plans in high growth firms are weighted too heavily towards incentive-alignment to be cost effective.

In a clinical study, Campbell and Wasley (1999) demonstrate an example of a compensation package that extracted wealth from shareholders to the benefit of the executives. They report on a 1986 incentive contract for the managers at Ralston Purina Company. The contract was structured such that the managers would receive \$49.1 million in stock if within ten years the stock price closed above \$100 for ten consecutive days. While the hurdle was achieved with the managers receiving the remuneration and with shareholders receiving wealth increases through the stock price gain, the shareholders' return was insufficient over the ten year period to deliver returns in excess of market determined required rate of return. In effect, even though there was an alignment of shareholder wealth and managerial compensation, managers were paid excess compensation.

Empirically, two recent papers have examined the impact of executive compensation on firm performance. Mehran (1995) finds that firm performance measured by Tobin's Q and ROA is a function of the percentage of compensation that is equity based. These results are based upon single equation models using a sample of firms from 1979-1980. However, Palia (2001) using a two-stage-least-squares method finds that a combined measure of managerial ownership and equity based compensation structure has no effect upon Tobin's Q. The results suggest that the firms are in equilibrium with respect to the CEO's compensation contract. Our study extends this line of enquiry. We investigate the impact of various measures of executive compensation on a market-based measure of total shareholder returns. We hold constant the influence of managerial ownership and examine alternative estimation methods including single equation and simultaneous equation approaches. A primary contribution of our paper is to investigate these relationships over a time period from 1993 to 1998 during which equity based compensation was experiencing very strong growth. Our analysis offers three primary conclusions. First, we find a clear and substantial growth in total compensation and equity based compensation during these market boom years. The possibility existed in this environment for

executives to extract compensation in excess of the value of their labor. Second, we find a positive but marginally decreasing relationship between executive compensation and stock returns over these years. Indeed, our analysis shows that the positive effect is almost completely eliminated by the year 1998. Third, our results are robust across alternative executive compensation measures and alternative estimation methods. Our alternative compensation measures include total executive compensation, performance based compensation, yearly stock option compensation, and value of accumulated stock options. We further employ both single equation and simultaneous equation models to study the issue.

The remainder of our paper is structured as follows. In Section II we describe the data, form hypotheses, and discuss the methodology. In Section III we review empirical results. Section IV offers concluding remarks.

II. Hypotheses, Methodology, and Data

The first objective of our study is to test whether larger executive compensation is consistent with stronger shareholder returns. An alignment of interest hypothesis would argue that shareholder returns are enhanced when an executive's interest is aligned with that of the shareholders'. To align executives and shareholders' interest, executive pay is tied to their performance. This leads to Hypothesis 1.

Hypothesis 1: Executive compensation is designed to align managers and shareholders' interest; therefore, firms with larger executive compensation have higher gains in shareholders' wealth.

We test this hypothesis by examining the following equation:

$$R_{it} = \alpha + \beta_1 (\text{Compensation}_{ijt}) + \beta_2 \text{OWN}_{it} + \beta_3 \text{LTA}_{it} + \beta_4 \text{BETA}_{it} + \beta_5 \text{MKT}_{it} + u_{it} \quad (1)$$

The *Compensation* variable is defined in a number of ways including total compensation, performance based compensation, stock-option based compensation, and the total value of options accumulated. The variables used in the analysis are defined as follows:

R_{it} = the annual total shareholder return for firm i from 1993 to 1998.

TOT_YR = the total CEO compensation for each year from 1993 to 1998. Total compensation is the sum of the annual salary (SAL_YR), the annual bonus (BON_YR), and the annual options granted (OPT_YR).

PERF_YR = the total performance based compensation for each year from 1993 to 1998. Performance based compensation includes the annual value of stock options granted and the annual level of bonuses paid.

OPT_YR = the value of the stock options granted to each CEO during each year from 1993 to 1998. The value of stock options is estimated by the Execucomp using Black and Scholes equation.

OPT_ACCUM = the total value of accumulated in-the-money stock options paid up through each year with the year end being from 1993 to 1998.

OWN = the total value of managerial ownership for each CEO for each year from 1993 to 1998.

LTA = the log of the total assets of the firm for each year from 1993 through 1998.

BETA = the systematic risk of the firm for each year from 1993 through 1998. The measure is estimated using daily company and market returns that are taken from the CRSP database.

MKT = market returns for the relevant year of data, taken from the stock returns of large company stock reported in Ibbotson Associates.

The data for our study is from the time period starting in 1993 and ending in 1998. We use two databases to form various compensation, ownership, and financial measures. These are the CRSP tapes and the Standard and Poors' Execucomp database. In total, the sample contains 729 executives over a 6-year period. The number of CEO-firm-observations total 2,522.

Consistent with Hypothesis 1, that larger executive compensation creates more shareholders' wealth, parameter β_1 will be expected to have a positive sign and be statistically significant. Managerial ownership (OWN), total assets (LTA), systematic risk (BETA), and stock market return (MKT) are included in the model as control variables. OWN is expected to be positively related to R_i as Morck, Shleifer, and Vishny (1988), and McConnell and Servaes (1990) show that managerial ownership aligns the interest of managers and shareholders. The total asset variable is included in the equation to control for any firm size effect. The systematic risk is expected to be positively related to R_i as predicted by the capital asset pricing theory. Since six years of data are used in the pooled sample analysis, the MKT variable is included to control for variations across time in market conditions.

Because of the stock market boom in the decade of the 1990s, critics argued that executive compensation had exploded irrespective of the manager's ability to create shareholders' wealth. If this argument has merits, we would find the marginal productivity of executive compensation to decline over time as executive compensation becomes more excessive. This leads to Hypothesis 2.

Hypothesis 2: Since executive compensation grew rapidly during the period of the stock market boom, the marginal productivity of executive compensation has declined.

To test this hypothesis, β_1 in equation (1) is specified in a deterministic equation as:

$$\beta_1 = \gamma + \lambda t \quad (2)$$

Where t is a measurement of time trend which is defined as 1 for 1993, 2 for 1994, ... etc. We would observe a negative λ if the marginal productivity of executive compensation declines in the wake of the compensation explosion. Since equation (2) is not

directly observable, we substitute equation (2) into equation (1) and obtained:

$$R_{it} = \alpha + \gamma(\text{Compensation}_{it}) + \lambda(\text{Compensation}_{it} \bullet t) + \beta_2 \text{OWN}_{it} + \beta_3 \text{LTA}_{it} + \beta_4 \text{BETA}_{it} + \beta_5 \text{MKT}_{it} + u_{it} \quad (3)$$

Equation (3) can be estimated using an OLS method. A significant and negative λ would support Hypothesis 2. Otherwise, the results would favor the argument that executive compensation has not become less productive in more recent years.

Tables 1 offers descriptive statistics on the data used in the analysis. Table 1 shows R_i to have a mean value of 21.0105% with a standard deviation of 50.2055%. The minimum value is a negative 81%, while the maximum value is nearly 900%. Total yearly compensation, TOT_YR, has a mean value of \$2.092 million with a range from \$225 to \$82.622 million. The average yearly salary, SAL_YR, is \$300,517. The average yearly bonus, BON_YR, is \$250,019. The average yearly value of stock options granted, OPT_YR, is \$1.541 million. The range on this option variable is from \$0 to \$82.616 million. The performance based compensation, PERF_YR, which is simply the sum of the bonus and the value of stock options granted has a mean value of \$1.791 million with a range from \$0 to \$82.620 million. The accumulated value of in-the-money stock options over the entire time period has a mean value of \$8.8651 million.¹⁴⁶ The range on this variable is from \$0 to \$659,494 million. Managerial stock ownership has a mean value of \$90.5629 million. The average total assets of the sample firms is \$2,015.123 in millions. The mean value of BETA is 1.0462 and the mean value of the log of total risk, STD, is 0.69543. ROA has a mean value of 5.9564% and MVBV has a mean value of 1.8959. The LEV variable has a mean value of 54.2595% and the average sales growth, SALE3G, is 13.7564%.

Table 2 reports the compensation dynamics over the time period from 1993 to 1998. As shown in Panel A of Table 2, total compensation substantially rose over this time period with an average amount paid in 1993 of \$1.118 million and an average amount paid in 1998 of \$2.888 million. This is almost a tripling of the average compensation (158% increase). The sources of the gains are dominated by the stock options with more mild contributions from salaries and bonuses. Salaries grew most modestly from \$253,758 to \$324,001. A 27.68% increase. Bonus grew a bit stronger from \$150,708 to \$282,116. An 87.19% increase. Most striking is the growth in the value of stock options granted annually. These grew from \$705,862 in 1993 to \$2,282 million in 1998. A 223.39% increase. Equally dramatic is the growth in

¹⁴⁶ ExecuComp database provides only the accumulated value of in-the-money options. Since executive stock options are normally issued at-the-money and the sampling period was generally a bullish one, any bias of not including out-of-the-money options tends to be small.

the accumulated stock options. This averaged \$3.1978 million in 1993 and increased to \$14.6109 million by 1998. A 356.90% increase. The increases in various compensation components far exceed the increases in inflation, which experienced a 15.48% compounded growth during the 6 year period.

Panel B of Table 2 shows each compensation component as a percentage of total compensation over the 6-year period. The salary component of the total compensation decreases dramatically from 23% of the total compensation in 1993 to merely 11% in 1998. The bonus component of total compensation experiences similar, yet less dramatic, decreases (from 13.5% in 1993 to 9.6% in 1998). On the contrary, the stock option component of the compensation increases from 63% in 1993 to 79% in 1998. Clearly, the CEOs were demanding and receiving higher remuneration in terms of stock options in more recent years. Certainly an argument could be advanced that this compensation growth was excessive relative to the value of the services of the CEOs.

III. Empirical Results

A. Univariate Analysis

Table 3 shows some results of a univariate analysis on the relation between executive compensation and market based stock returns. The analysis compares two sub-samples of our database in which we divide the observations into HIGH and LOW return firms. High return firms have average stock returns that exceed the median, while low return firms have stock returns that are below the median. Each sub-sample thus has 1,261 observations. If executives with larger compensation create more value for shareholders, we expect high return firms to have larger compensations than low return firms. With the exception of the salary compensation, we find that yearly bonus, stock option grants, total compensation, and the accumulated option value are higher for the HIGH return sub-sample. The t-statistics show significance at the 99% level of confidence for each of these measures. These preliminary results are supportive of the contention that on average over the time period from 1993 to 1998 compensation is positively associated with firm performance. The analysis however lacks proper controlling of other factors and the potential for the simultaneity of the relation.

B. Multivariate Analysis – Single Equation Model

In Tables 4, we report regression results based upon Equation (1). We alternate different components of compensations in each model. In each model we also control for managerial ownership, firm size, systematic risk, aggregate stock market returns, and industry dummies using 2-digit SIC codes. In Model 1, compensation is defined as the sum of salary, bonus, and stock options (TOT_YR). TOT_YR is

positive and is significant at the 5% level suggesting that executives with higher total compensation do create more value for the shareholders. The parameter estimates on the control variables are consistent with expectations. OWN is positive and significant indicating that larger equity ownership enhances stock performance, consistent with the alignment of interest argument. LTA is negative although it is short of significance at the 10% level. The negative sign of LTA is consistent with the small firm effect. The parameter on BETA is 9.964 (percent), which seems to be a reasonable estimate of the market risk premium implied in the CAPM. MKT is positive and significant at the 1% level suggesting that part of the variations in R_t is due to the aggregate market performance. We include this variable in the analysis to control for the time-series effect in a pooled sample.

Models 2, 3, and 4 each use a different measurement of executive compensation (i.e., performance-based, stock options, and total value of accumulated options). In each case, executive compensation carries a positive sign and is significant at least at the 10% level. OPT_ACCUM has the largest parameter magnitude and the highest t-statistics. All control variables behave similarly as in Model 1. These results lend support to Hypothesis 1 that larger executive compensation creates more shareholders' wealth.

C. Declining Productivity of Executive Compensation

In Table 5, we report results based upon Equations (2) and (3) where we test the time-series dynamics of executive compensation productivity in the wake of surging executive compensation in more recent years. In Models 1, 2, 3, and 4, we use alternative compensation measures. Specifically, total compensation, performance-based compensation, annual option grant, and value of accumulated options are each employed. All compensation variables carry a positive sign and are statistically significant at least at the 10% level. Most interestingly, the coefficient of variable (COMP • t) is negative and significant except for the OPT_YR model. A negative parameter estimate on this interactive term would suggest that the positive association between compensation and stock returns diminishes from 1993 to 1998, suggesting a declining marginal productivity of executive compensation. Some numerical examples illustrate this point. For example, in Model 1 for 1993, the marginal effect of compensation on shareholders' return is 0.0020 (0.0024 – 0.0004). Similarly, the marginal effect for this variable in 1994 declines to 0.0016 (0.0024 – 0.0008). In 1995 it becomes 0.0012; in 1996, 0.0008; in 1997, 0.0004; and in 1998, 0.0000. The effect is completely retarded by the year 1998. Similar results are observed for the other compensation variables. For example, for the option accumulation variable in Model 4 for 1993, the

marginal effect is 0.7410 (0.8511 – 0.1101). The marginal effect for this variable in 1994 through 1998 is 0.7410, 0.6309, 0.5208, 0.4107, 0.3006, and 0.1905. Clearly, the effect diminishes during the 1990s but remains positive.

To summarize, the results reported in Table 5 support Hypothesis 2 and suggest that β_1 in Equation (1) declines over more recent years due to the negative estimate of λ coefficient in Equations (2) and (3). This result implies that the recent surge in executive compensation is “excessive” and the justification provided by the alignment of interest argument is greatly weakened.

D. Robustness Test – Simultaneous Equations

Since some evidence suggests that compensation may be better treated as an endogenous variable, it follows that firm performance and executive compensation should be simultaneously determined. To reaffirm our results while avoiding this potential simultaneity bias, we estimate Equations (3), (4), and (5) within a simultaneous system using the two-stage-least-squares method. We include Equation (5) in the system because prior studies also argue that managerial ownership is endogenous. Similar to the single equation analysis, we alternate each compensation measurement in the system of equations. We select only a subset of compensation measures to report to save space. The compensation measurements that are not reported here basically yield similar results and reach the same conclusions as those reported.

In Table 6, we report results based upon a system in which OPT_YR, R_t , and OWN are jointly estimated. In Model (1), we see that the results based upon the system of equations are stronger than that reported in Table 5 where the estimation methodology is a single equation OLS model. Specifically, OPT_YR positively impacts stock returns, but the marginal productivity declines over time as suggested by the negative and significant parameter of (COMP•t). The marginal compensation effect in 1993 is 0.0162 (0.0201 – 0.0039), in 1994 is 0.0123, in 1995 is 0.0084, in 1996 is 0.0045, in 1997 is 0.0006, and in 1998 is –0.0033 (suggesting a negative marginal productivity). The endogenous variable OWN is positive and significant consistent with the alignment of interest hypothesis of managerial ownership. In Model (2) where OPT_YR is the dependent variable, OWN is positive and significant consistent with our reasoning that managers gain more power through their equity ownership to influence larger amount of option grants. Higher stock returns, however, do not result in a larger amount of option grants, as R_t is not statistically significant although it carries a positive sign. LTA is positive and significant consistent with the findings that large firms offer their executives more stock options.

Table 7 shows the results using the stock option accumulation variable (a measurement of the wealth in stock options). Both the compensation variable and the interactive term are again significant. The marginal impact of compensation on total returns again diminishes in the same fashion we have previously observed. The marginal compensation effect in 1993 is 2.7042, in 1994 is 2.1648, in 1995 is 1.6254, in 1996 is 1.0860, in 1997 is 0.5466, and in 1998 is 0.0072. R_t in Model (2) is positive and significant. This is expected since higher stock returns increase the value of stock options held.¹⁴⁷ To summarize, we find that our results of declining marginal productivity of executive compensations in recent years are robust to the different model specifications, including a simultaneous equation model. Finally, while we treat the compensation variables in equations (1) and (3) as exogenous, some evidence suggests that they may be better treated as endogenous variables (e.g., Palia, 2001). If compensation provides incentives for executives to maximize shareholders’ wealth, it is also reasonable to assume that a higher performing/quality firm offers more compensation incentives to the executives. Therefore, we form Hypothesis 3.

Hypothesis 3: Executive compensation and firm performance are endogenous and jointly determined.

To test this hypothesis, a three-equation system is formulated such that Equation (3) is jointly estimated together with Equations (4) and (5) that are defined below.

$$\text{Compensation}_{ijt} = \delta_0 + \delta_1 \text{OWN}_{it} + \delta_2 R_{it} + \delta_3 \text{LTA}_{it} + \delta_4 \text{STD}_{it} + \delta_5 \text{MKT}_{it} + v_{it} \quad (4)$$

$$\text{OWN}_{it} = \eta_0 + \eta_1 \text{LTA}_{it} + \eta_2 \text{MVBV}_{it} + \eta_3 \text{LEV}_{it} + \eta_4 \text{SALE3G}_{it} + \eta_5 \text{MKT}_{it} + e_{it} \quad (5)$$

The additional variables in Equations (4) and (5) are defined as:

STD = the total risk of the firm’s equity for each year from 1993 through 1998. This is calculated using daily stock returns.

MVBV = the market to book value ratio for each year from 1993 through 1998.

LEV = the leverage ratio for the firm for each year from 1993 through 1998. This is measured in percentage form as total liabilities divided by total assets.

SALE3G = the 3 year historical growth rate in sales for each year from 1993 through 1998.

In this three-equation system, we also treat managerial ownership as endogenous following the argument of Himmelberg, Hubbard, and Palia (1999). In equation (4), OWN is expected to positively impact compensation because higher equity ownership offers

¹⁴⁷ We also evaluated the other two measures of compensation, TOT_YR and PERF_YR, within a simultaneous equation system. We found the same qualitative results as reported in Table 6 and 7 for these two alternative measures. These results are available from the authors.

the executive more power in the board to persuade a higher compensation. R_1 should be positively related to compensation if compensation is designed to be performance sensitive. LTA, STD, and MKT are predetermined variables in the model. LTA is expected to carry a positive sign because large firms generally offer larger compensation due to the complexity of its operations. STD is included to control for the firm risk. Firm risk serves as a measurement of the firm's information environment and the risk of the firm's operating environment (Core, Holthausen, and Larcker, 1999). Theoretically, Banker and Datar (1989) suggest that the sign of STD is indeterminate. MKT is included to control for the impact of market conditions on executive compensation. Equation (5) specifies the determinants of OWN. We expect LTA to positively cause OWN as executives of larger firms own a larger amount of equity stake. MVBV is expected to be positively related to OWN because higher value firms inspire equity ownership. LEV is expected to be negatively associated with OWN because debt holders serve as external monitors which would reduce the need for internal monitoring function provided by the equity ownership. SALE3G and MKT proxy internal company strength and external equity market conditions respectively, and are expected to be positively associated with the value of equity ownership by executives.

IV. Conclusion

We study the impact of executive compensation on shareholders' wealth for a group of industrial firms from 1993 to 1998. Various forms of executive compensation, including total compensation, performance-based compensation, option-based compensation, and accumulated wealth in stock options, are separately examined. Our findings are: (1) All compensation measurements are positively related to stock returns meaning that executives with larger compensations do create more shareholders' wealth. (2) The marginal productivity of executive compensation declines rapidly over more recent years. The rapid declines in the marginal productivity of executive compensation weaken the argument of an alignment of interest hypothesis. This finding also implies that the dramatic increase in executive compensation in recent years may be "excessive" as the critics have argued. (3) Treating compensation, stock returns, and managerial ownership endogenously within a system of simultaneous equations does not alter our conclusions.

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Table 1. Descriptive Statistics

In this table, we report descriptive statistics for the variables used in this study. The number of observations is 2522. R_t is the one-year shareholder return, OPT_YR is the stock options granted during the year, BON_YR is the annual bonus, $PERF_YR$ is the performance based compensation, SAL_YR is the annual salary, TOT_YR is the total CEO annual compensation, OPT_ACCUM is the total value of accumulated in-the-money stock options, OWN is the managerial equity ownership, TA is the total assets, $BETA$ is the systematic risk of the firm, STD is the standard deviation each firm-year, $MVBV$ is the market to book value of equity, LEV is the leverage ratio, and $SALE3G$ is the 3-year historical growth rate in sales.

Variable	Mean	Standard Deviation	Minimum	Maximum
R_t	21.0105	50.2055	-81.081	896.154
OPT_YR	\$1,541.711	4,359.787	0.000	82,616.370
BON_YR	\$250.02	457.867	0.000	4,903.505
$PERF_YR$	1,791.729	4,396.586	0.000	82,620.870
SAL_YR	\$300.517	372.525	0.000	3,398.999
TOT_YR	2,092.246	4,474.759	0.225	82,622.370
OPT_ACCUM (Millions)	8.8651	29.8894	0.000	659.494
OWN	90.5629	1,001.063	0.000	24,942.04
TA	2,015.213	8,159.507	0.913	198,598.700
$BETA$	1.0462	0.5642	-3.716	3.8493
STD	0.6954	0.3663	-0.999	2.0167
$MVBV$	1.8959	2.4581	-1.3749	10.6700
LEV	54.2595	18.1217	3.2516	99.9851
$SALE3G$	13.7564	20.7707	-42.673	466.060

Table 2. Executive Compensation over the Period of 1993-1998

This table provides statistics on the executive compensation structure over the period of 1993 – 1998. OPT_YR is the stock options granted during the year, BON_YR is the annual bonus, $PERF_YR$ is the performance based compensation, SAL_YR is the annual salary, TOT_YR is the total CEO annual compensation, OPT_ACCUM is the total value of accumulated in-the-money stock options.

Panel A

	N	TOT_YR	SAL_YR	BON_YR	OPT_YR	OPT_ACCUM	Inflation
1993	299	1,118.329	253.758	150.708	705.862	3.1978	2.75%
1994	330	1,314.862	277.732	203.861	833.268	3.4647	2.67%
1995	366	1,601.749	289.855	246.442	1,065.451	6.3419	2.54%
1996	433	2,032.851	293.653	240.924	1,498.274	7.6323	3.32%
1997	528	2,669.018	329.082	310.636	2,029.300	12.051	1.7%
1998	566	2,888.775	324.001	282.116	2,282.658	14.611	1.6%

Panel B

	N	$SAL_YR\%$	$BON_YR\%$	$OPT_YR\%$
1993	299	0.2308	0.1349	0.6342
1994	330	0.2094	0.1533	0.6374
1995	366	0.1809	0.1538	0.6652
1996	433	0.1424	0.1176	0.7399
1997	528	0.1236	0.1164	0.7600
1998	566	0.1108	0.0969	0.7923

Table 3. R_i and Measures of Executive Compensation

This table compares two subsamples of the database. We compare a HIGH total return sample to a LOW total return sample in term of the level and structure of executive compensation. The HIGH sample is defined to be firms with an R_i that exceeds the median. The LOW sample is defined to be firms with an R_i that is less than or equal to the median. OPT_YR is the stock options granted during the year, BON_YR is the annual bonus, PERF_YR is the performance based compensation, SAL_YR is the annual salary, TOT_YR is the total CEO annual compensation, OPT_ACCUM is the total value of accumulated in-the-money stock options.

Total Return Sample	HIGH	LOW	t-statistic
Executive Compensation Measure			
SAL_YR	293.5639	307.4701	0.94
BON_YR	300.9146	199.1231	5.62 ***
OPT_YR	1,862.8487	1,220.5724	3.71 ***
TOT_YR	2,457.3271	1,727.1656	4.11 ***
OPT_ACCUM	13.8312	3.8991	8.46 ***

Table 4. Regression Results Explaining R_i as a Function of Executive Compensation Measures

In this table, we report the regression results of the impact of various compensation components on the market-based firm performance. R_t is the one-year shareholder return, OPT_YR is the stock options granted during the year, BON_YR is the annual bonus, PERF_YR is the performance based compensation, SAL_YR is the annual salary, TOT_YR is the total CEO annual compensation, OPT_ACCUM is the total value of accumulated in-the-money stock options, OWN is the managerial equity ownership, LTA is the logarithm of total assets, BETA is the systematic risk of the firm, BETA is the systematic risk of the firm, MKT is the annual return of large company stocks reported in Ibbotson, INDUSTRY is the industry dummy variables.

Models:	(1)	(2)	(3)	(4)
Variable				
Intercept	14.6843 (1.70)*	14.7628 (1.71)*	14.9656 (1.73)*	14.8179 (1.73)*
TOT_YR	0.00046 (2.00)**	-	-	-
PERF_YR	-	0.00050 (2.15)**	-	-
OPT_YR	-	-	0.00041 (1.73)*	-
OPT_ACCUM	-	-	-	0.2585 (7.43)***
OWN	0.0023 (2.25)**	0.0023 (2.23)**	0.0023 (2.30)**	0.0014 (1.36)
LTA	-0.8878 (1.59)	-0.8866 (1.59)	-0.8849 (1.58)	-0.8932 (1.61)
BETA	9.9640 (5.11)***	9.9406 (5.10)***	10.0434 (5.16)***	9.1455 (4.75)***
MKT	0.2843 (2.93)***	0.2838 (2.92)***	0.2887 (2.98)***	0.2411 (2.51)***
INDUSTRY	yes	yes	yes	yes
R^2	4.64 %	4.66 %	4.60 %	6.57 %

Table 5. Regression Results Explaining R_t as a Function of Executive Compensation Measures with Interactive Terms to Control for Compensation-Parameter Dynamics

In this table, we report the regression results of the impact of various compensation components on the market-based firm performance. R_t is the one-year shareholder return, COMP•Time is the product of compensation and time, OPT_YR is the stock options granted during the year, BON_YR is the annual bonus, PERF_YR is the performance based compensation, SAL_YR is the annual salary, TOT_YR is the total CEO annual compensation, OPT_ACCUM is the total value of accumulated in-the-money stock options, OWN is the managerial equity ownership, LTA is the logarithm of total assets, BETA is the systematic risk of the firm, BETA is the systematic risk of the firm, MKT is the annual return of large company stocks reported in Ibbotson, INDUSTRY is the industry dummy variables.

Models:	(1)	(2)	(3)	(4)
Variable				
Intercept	12.3464 (1.42)	13.0112 (1.50)	13.9561 (1.61)	14.0699 (1.65)*
COMP•Time	-0.0004 (2.12)**	-0.0004 (1.91)*	-0.0003 (1.50)	-0.1101 (3.38)***
TOT_YR	0.0024 (2.53)***	-	-	-
PERF_YR	-	0.0024 (2.35)**	-	-
OPT_YR	-	-	0.0019 (1.84)*	-
OPT_ACCUM	-	-	-	0.8511 (4.76)***
OWN	0.0025 (2.43)**	0.0024 (2.39)**	0.0025 (2.41)**	0.0016 (1.59)
LTA	-0.8987 (1.61)	-0.8937 (1.60)	-0.8965 (1.60)	-0.8928 (1.62)
BETA	9.8630 (5.06)***	9.8526 (5.06)***	9.9649 (5.11)***	8.5989 (4.46)***
MKT	0.3357 (3.36)***	0.3221 (3.25)***	0.3147 (3.19)***	0.2696 (2.80)***
INDUSTRY	yes	yes	yes	yes
R^2	4.81 %	4.80 %	4.68 %	7.00 %

Table 6. Parameter Estimates for a Simultaneous Equation Model with OPT_YR Measuring Compensation

In this table, we report the regression results of a simultaneous equation model where both compensation and firm performance are treated as endogenous. R_t is the one-year shareholder return, OPT_YR is the stock options granted during the year, OWN is the managerial equity ownership, LTA is the logarithm of total assets, BETA is the systematic risk of the firm, STD is the standard deviation of stock return each firm-year, MVBV is the market to book value of equity, LEV is the leverage ratio, SALE3G is the 3-year historical growth rate in sales, MKT is the annual returns of large company stocks reported in Ibbotson, and INDUSTRY is industry dummy variables.

Models:	(1) R_t	(2) OPT_YR	(3) OWN
Intercept	-24.2778 (1.51)	-21,975 (5.39)***	932.2823 (4.73)***
COMP•Time	-0.0039 (3.33)***	-	-
OPT_YR	0.0201 (3.30)***	-	-
OWN	0.0222 (2.49)**	16.8138 (7.11)***	-
R_t	-	2.0009	-

LTA	-0.2667 (0.37)	(0.05)** 665.1540 (3.21)***	38.9325 (2.33)**
BETA	8.3055 (3.69)***	-	-
STD	-	-1,076.5921 (1.03)	-
MVBV	-	-	86.8934 (6.40)***
LEV	-	-	-4.9143 (3.62)***
SALES3G	-	-	-0.4972 (0.51)
MKT	0.5336 (3.75)***	-23.0111 (0.65)	2.6341 (1.37)
INDUSTRY	yes	yes	yes
R ²	4.15 %	3.01 %	5.93 %

Table 7. Parameter Estimates for a Simultaneous Equation Model with OPT_ACCUM Measuring Compensation

In this table, we report the regression results of a simultaneous equation model where both compensation and firm performance are treated as endogenous. R_t is the one-year shareholder return, OPT_ACCUM is the accumulated stock options wealth, OWN is the managerial equity ownership, LTA is the logarithm of total assets, BETA is the systematic risk of the firm, STD is the standard deviation of stock return each firm-year, MVBV is the market to book value of equity, LEV is the leverage ratio, SALE3G is the 3-year historical growth rate in sales, MKT is the annual returns of large company stocks reported in Ibbotson, and INDUSTRY is industry dummy variables.

Models:	(1) R_t	(2) OPT_ACCUM	(3) OWN
Intercept	8.9274 (0.57)	-142.8806 (6.10)***	932.2823 (4.73)***
COMP•Time	-0.5394 (3.36)***	-	-
OPT_ACCUM	3.2436 (3.58)***	-	-
OWN	0.0036 (0.38)**	0.0893 (6.13)***	-
R_t	-	0.9490 (3.56)***	-
LTA	-0.8334 (1.21)	4.4161 (3.62)***	38.9325 (2.33)**
BETA	6.0431 (2.73)***	-	-
STD	-	-3.9985 (0.64)	-
MVBV	-	-	86.8934 (6.40)***
LEV	-	-	-4.9143 (3.62)***
SALES3G	-	-	-0.4972 (0.51)
MKT	0.3561 (3.30)***	-0.3641 (1.76)*	2.6341 (1.37)
INDUSTRY	yes	yes	yes
R ²	6.24 %	6.41 %	5.93 %