Corporate Performance, Stock Option Compensation, and Measurement Error In CEO Pay

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Abstract

Previous investigations of the association between executive pay and corporate performance have relied heavily on the sum of salary and bonus as a proxy for total compensation. This study shows that the sum of salary and bonus contains a substantial amount of unsystematic measurement error. The results underscore the need for future research in this area to use compensation proxies that incorporate executive stock options.

Introduction

Background

The nature of the relationship between executive compensation and corporate performance is a highly visible and contentious issue. This issue has been addressed in depth by regulations recently issued by the Financial Accounting Standards Boards (FASB), Securities and Exchange Commission (SEC), and U.S. Congress. Also, over the last few years a large body of academic literature dealing with the relation between pay and performance has emerged (Murphy 1985; Lambert and Larcker 1987; Abowd 1990; Gibbons and Murphy 1990; Jensen and Murphy 1990; Leonard 1990; Sloan 1993).

Research in this area has relied heavily on the use of the sum of salary and bonus as a proxy for total compensation. A potentially serious limitation of this proxy is that it does not incorporate stock option compensation. Executive stock options have received an increasing amount of attention from the business press (Forbes 1993; Serwer 1993; Mercer 1993; Wong 1993), Congress (Borlas 1992; Practical Accountant 1992; Cheney 1994), the SEC (Gottschalk 1993) and the FASB (Berton 1993; Berton and Lublin 1993; FASB 1993; Public Accounting Report 1993; Rouse and Barton 1993). Recently, the Economist (1994) reported that the exercise of stock options accounts for almost 23 percent of all CEO compensation. The growing importance of executive stock options casts doubts on the adequacy of the sum of salary and bonus as a proxy for total compensation.

Objective

The objective of this study is to assess the adequacy of the sum of salary and bonus as a compensation proxy in studies of compensation and corporate performance. Whittington (1979) specified the two criteria that a proxy must satisfy in order to be adequate as a dependent variable in a multiple regression. The proxy must be correlated with the variable which it is intended to measure, and the measurement error in the proxy must be uncorrelated with the independent variables in the model. This study applies Whittington's (1979) two criteria to the sum of salary and bonus.

Methods and Findings

The sample consists of 267 large, publicly-held, U.S.-based firms taken from the Mercer, Inc. Executive Pay Survey (Mercer 1993). The sample was limited to one year of U.S.-based firms because the proxy statement disclosure requirements that made the required data uniformly available came into effect for annual meetings held after December 31, 1992 (Gottschalk 1993). In order to apply Whittington's (1979) criteria, the empirical analysis proceeds in three steps. First, the study develops measures of compensation that incorporate the value of stock options exercised and the value of stock options granted. Second, each of these broader measures of compensation is regressed against the sum of salary and bonus to determine the level of correlation and to estimate the total measurement error. Finally, the total measurement error in

the sum of salary and bonus is regressed against several measures of corporate performance to determine whether or not an association exists, and to partition the total measurement error into systematic and unsystematic components.

The main finding of the study is that the sum of salary and bonus is inadequate as a proxy for total compensation. The correlation between the sum of salary and bonus and broader measures of compensation is low, and the total measurement error is large. Almost all of the measurement error is unsystematic. Thus, the sum of salary and bonus is an unbiased (but noisy) compensation proxy. One implication of this finding is that although reliance on the sum of salary and bonus has not systematically biased the findings of previous studies, it is likely that the large amount of unsystematic error is a source of the inconsistencies in results. A related implication is that in order for future studies to provide consistent and conclusive findings concerning the association between compensation and performance, researchers will need to use compensation proxies that incorporate executive stock options. Fortunately, stock option compensation data have been made more accessible by the SEC's new proxy statement disclosure requirements.

Organization of the Document

The following section develops the conceptual framework and states the research questions that motivate the empirical analysis. Later sections describe the empirical procedures, present and discuss the results of the analysis, summarize the study, and offer suggestions for future research.

Conceptual Framework and Research Questions

Findings of Previous Research

Several studies have investigated the association between compensation (measured as the sum of salary and bonus) and corporate performance (Murphy 1985; Lambert and Larcker 1987; Abowd 1990; Gibbons and Murphy 1990; Leonard 1990; Jensen and Murphy 1990; Sloan 1993). The findings have not been entirely consistent. Murphy's (1985) time series analysis led to the conclusion that "firm performance, as measured by shareholders' realized return, is strongly and positively related to managerial remuneration" (Murphy 1985, p. 40). The cross-sectional results that did not support this conclusion were dismissed as "anomalous and counter-intuitive" (Murphy 1985, p. 31). Gibbons and Murphy (1990) found that "the revision in a CEO's pay and the probability that a

CEO remains in his position for the following year are positively and significantly related to firm performance" (Gibbons and Murphy 1990, p. 49S). In contrast, Leonard (1990) found that "accounting measures of corporate success are not significantly related to the level of, or degree of equity in, executive pay" (Leonard 1990, p. 28S). Leonard (1990) concluded that the findings were "not compatible with the usual description of pay as an incentive device that rewards superior corporate performance" (Leonard 1990, p. 28S). Abowd (1990) found that accounting-based measures of performance yielded "only weak evidence" of a positive association between compensation and corporate performance, but that "economic and market measures yielded stronger evidence" (Abowd 1990, p. 52S). Lambert and Larcker (1987) and Sloan (1993) showed that the strength of the association between compensation and specific measures of performance depends upon the signal-to-noise ratio of the performance measures.

Stock Option Compensation

Of the studies cited above, only Murphy (1985) and Jensen and Murphy (1990) extended the sum of salary and bonus to incorporate executive stock options. Bizjak et al. (1993) used Jensen and Murphy's (1990) results to examine the association between investment choices made by managers and the structure of their compensation packages. None of these three studies attempted to investigate the measurement error in salary and bonus. Recent studies have found a positive association between growth opportunities available to firms and the use of stock option compensation plans (Smith and Watts 1992; Gaver and Gaver 1993). However, these studies have continued to rely upon salary and bonus as a proxy for total compensation.

The reluctance of researchers to consider stock option compensation has been a response to three conditions (1) obtaining the data would have been very costly (Sloan 1993) (2) there have been unresolved theoretical issues concerning the nature and measurement of stock option compensation (Antle and Smith 1985; Lambert and Larcker 1987) (3) the sum of salary and bonus typically accounts for a large percentage of total compensation (Murphy 1985). Recent regulatory pronouncements have addressed the first two conditions. Specifically, the Financial Accounting Standards Board (FASB) and the Securities and Exchange Commission (SEC) have issued pronouncements requiring the disclosure of stock option compensation data and giving guidance as to how stock option compensation should be measured. Attention now can be turned to the third condition.

Measurement Error in the Sum of Salary and Bonus

Murphy's (1985) observation that salary and bonus accounts for about 80 percent of total compensation has been used to justify the use of salary and bonus as a proxy for total compensation (Lambert and Larcker 1987; Sloan 1993). The problem with this argument is that as companies have increased their reliance on long-term incentives, the proportion of total pay attributable to salary and bonus has declined dramatically. The Economist (1994) reports that salary and bonus now account for less than 63 percent of total compensation, whereas the sum of salary, bonus, and stock options accounts for about 86 percent of the total (1994 p. 71). The decline in the relative magnitude of salary and bonus, coupled with the corresponding increase in the importance of executive stock options, strongly suggests that the sum of salary and bonus is no longer an adequate proxy for total compensation.

If the sum of salary and bonus is no longer adequate, researchers need to be aware of its limitations and the probable effects on statistical results. On the other hand, if salary and bonus is still an adequate proxy, there is little or no need for researchers to incur the costs necessary to incorporate stock options into measures of compensation. In any case, there is a need for a formal assessment of the magnitude and nature of the measurement error in the sum of salary and bonus.

Whittington (1979) developed a statistical methodology that is well suited for this purpose. Whittington (1979) argued that the measurement error in a proxy consists of systematic and unsystematic components. Unsystematic measurement error introduces random noise into the proxy but does not bias the empirical results. Systematic measurement error leads to bias. Whittington (1979) also specified the two criteria that a measure must satisfy in order to be an adequate proxy for a dependent variable in a multiple regression. The first criterion is that the measure must be correlated with the variable for which it proxies. The second criterion is that the measurement error must be uncorrelated with the independent variables in the model. Violation of the first criterion indicates the presence of measurement error. Violation of the second criterion indicates that a significant portion of the total measurement error is systematic in nature.

Whittington's (1979) analysis was motivated by the desire to better understand the nature of the measurement error present in accounting rates of return. Consequently, applications of his theory have focused on proxies for corporate performance (Griner and Stark 1988; Griner and Stark 1991; Stark et al. 1992). Whittington (1979) noted that although measures of corporate performance served as

the context for the development of his theory of measurement error, "it is, in fact, a general statement about the use of proxy variables, which may be of some use in other accounting applications" (Whittington 1979, p. 202).

This study applies Whittington's (1979) criteria to the sum of salary and bonus as a proxy for total compensation. Whittington's (1979) approach offers insights concerning the magnitude and nature of the total measurement error, and also yields conclusions concerning the effects of reliance upon a proxy that contains measurement error. Empirical findings will be noisy (but not necessarily biased) to the extent that the sum of salary and bonus is less than perfectly correlated with total compensation. Of greater concern is the possibility that results will be systematically biased by correlations between measures of performance and the measurement error in the sum of salary and bonus.

Research Questions

The three research questions are (1) how large is the measurement error in the sum of salary and bonus? (2) how much of the measurement error is systematic? (3) what are the implications for research investigating the association between compensation and performance? The next section describes the empirical procedures that are used to address these questions.

Empirical Procedures

Sample Data

Sample Firms

The starting point for the sample is the Mercer, Inc. Executive Pay Survey for 1992 (Mercer 1993). This survey was selected because it reports salary, bonus, and the value of stock option grants for 350 large, publicly-held corporations in a broad range of industries. Firms were eliminated for the following reasons (1) salary and bonus were not disclosed separately in the Executive Pay Survey (2) the CEO reported on in the Executive Pay Survey was different from the CEO reported on in the Forbes (1993) survey (3) required performance data were not available (4) the company's 1992 fiscal year ended before June 1, 1992. Table 1 shows a reconciliation between the 350 firms in the Executive Pay Survey and the 267 firms in the sample.

The first condition was imposed to ensure that all firms in the sample comply with SEC disclosure regulations. The second condition ensures that the value of stock options granted and the value of stock options exercised

Table 1
Reconciliation Of The 350 Firms In The Executive Pay Survey
And The 267 Firms In The Sample

Description	Number Of Firms
In the Executive Pay Survey	350
Excluded because:	
(1) Salary and bonus were not disclosed separately	(22)
(2) CEO reported on was different from CEO in the Forbes Survey	(23)
(3) Corporate performance data were incomplete	(32)
(4) Fiscal year ended before June 1	(6)
Sample Size	267

are for the same individuals. The third condition was imposed to facilitate calculation of the measure of corporate performance. The fourth condition was necessary to ensure consistency among the time periods used by the Executive Pay Survey, Forbes, and Compustat.

Measuring Stock Option Compensation

In order to incorporate stock options into a proxy for total compensation, it is necessary to establish how stock option compensation will be defined and measured. The three alternative approaches are (1) stock options granted (2) stock options exercised (3) the change in stock option wealth experienced by the CEO during the period under investigation.

The first two approaches have been used by the FASB, SEC, Internal Revenue Code, and the business press. The FASB's exposure draft on "Accounting for Stock-Based Compensation" (FASB 1993) advocates a modified version of the first approach by requiring companies to value stock options at the time of grant and to amortize the value of the grant over the life of the options. The SEC's proxy statement regulations require disclosures under both of the first two approaches. For the company's five highest-paid executives, the SEC's proxy statement disclosure regulations require companies to report the number and value of options granted during the year, as well as the number and value of options exercised. The Internal Revenue Code also uses the first two approaches. The time period in which the executive recognizes taxable income depends upon the relationship between the market price and striking price (or exercise price) on the grant date. If the striking price is less than the market price of the stock on

the date of grant, the executive may be required to report taxable income in the year of the grant. If the striking price is greater than (or equal to) the market price of the stock on the date of grant, the executive does not report taxable income until the period in which the options are actually exercised. The business press has also used the first two approaches. The Mercer survey reports the present value of options granted during the year and includes option exercises as one component of long-term compensation (Mercer 1993). Forbes (1993) does not report option grants, but does report option exercises in the column "Stock Option Gains".

This study uses the first two approaches. The third approach is excluded for two reasons. First of all, it has not been adopted by the FASB, SEC, Internal Revenue Code, or the business press. Secondly, it does not represent an outflow of resources from the corporation to the executive. If a corporation grants options, a transfer of resources from existing shareholders to the executive has occurred. This is the premise for the FASB's Exposure Draft on "Accounting for Stock Based Compensation" (FASB 1993). If an executive exercises options, the corporation experiences an outflow in the form of an opportunity cost equal to the difference between the striking price and the market price of the stock on the exercise date. However, if an executive experiences an increase in wealth as a result of appreciation in the value of stock options, there has not been an outflow of resources from the corporation. On the contrary, shareholders have probably enjoyed an increase in the value of their stockholdings. This study focuses on stock option compensation that involves an outflow of resources from the corporation to the executive.

Definitions of Variables

Compensation Variables

The compensation variables are defined as follows:

SALBON is the sum of the 1992 salary and bonus amounts reported in the Mercer, Inc. Executive Pay Survey (Mercer 1993). (SALBON also is the sum of the salary and bonus amounts that are reported separately in the proxy statement).

COMPEXER is SALBON plus the value of options exercised during 1992. The option value is the amount reported in the column entitled 'Stock Gains' in the Forbes CEO compensation survey (Forbes 1993). (This amount also is the line item 'Value Realized' in the proxy statement schedule entitled 'Aggregated Option Exercises in 1992 and Year-end Option Values').

COMPGRANT is SALBON plus the value of options granted during 1992. The option value is the amount reported in the column 'Present Value of Option Grants' in the Mercer, Inc. Executive Pay Survey (Mercer 1993). Mercer calculated this amount by using a firm-specific cost of equity based on the capital asset pricing model, assuming a risk-free rate of seven percent and a risk premium of seven percent. The proxy statement discloses the number of options granted, but there are variations in the valuation methods that companies use. Reliance on the Mercer survey provides firm-specific valuations based on a single valuation methodology.

All three compensation variables are measured in thousands of dollars.

Corporate Performance

ROE (Return on Equity) is the 1992 return on average equity reported on Compustat. It is defined as income before extraordinary items divided by the average of beginning and ending stockholders' equity. **ROE** is expressed as a percentage.

Statistical Procedures

Compensation and Performance

The objective of the first set of statistical procedures is to compare the explanatory power of the model when compensation is defined as the sum of salary and bonus against the explanatory power when the sum of salary and bonus is extended to incorporate measures of executive

stock options exercised and granted. The objective is accomplished by regressing each of the compensation measures against the performance variables. The three regression equations are:

$$\text{SALBON} \qquad = B0 + B1(\text{ROE}) \qquad \text{(1A)}$$
$$\text{COMPEXER} \quad = B0 + B1(\text{ROE}) \qquad \text{(1B)}$$
$$\text{COMPGRANT} = B0 + B1(\text{ROE}) \qquad \text{(1C)}$$

The results are compared and contrasted in terms of overall explanatory power and associations between compensation and specific measures of performance. In each case, the null hypothesis is $B1 = 0$.

Total Measurement Error

The second set of statistical procedures has two objectives (1) to test Whittington's (1979) first criterion by determining the extent to which the sum of salary and bonus is correlated with the more comprehensive measures of compensation (2) to produce residuals that serve as estimates of the total measurement error in the sum of salary and bonus. The objectives are accomplished by regressing each of the two comprehensive compensation measures against the sum of salary and bonus as follows:

$$\text{COMPEXER} \quad = B0 + B1(\text{SALBON}) \qquad \text{(2A)}$$
$$\text{COMPGRANT} = B0 + B1(\text{SALBON}) \qquad \text{(2B)}$$

In each case, the null hypothesis is $B1 = 0$. SALBON is deemed to contain measurement error to the extent that the correlation coefficient differs from unity. The residuals from Equations 2A and 2B represent the total measurement error in the sum of salary and bonus.

Systematic Measurement Error

The objective of the third set of statistical procedures is to determine whether or not Whittington's (1979) second criterion is satisfied. The analysis partitions the total measurement error into systematic and unsystematic components. A statistically significant association between the residuals from Equations 2A and 2B and corporate performance indicates the presence of systematic measurement error. The two regression equations are:

$$\text{RESIDA} = B0 + B1(\text{ROE}) \qquad \text{(3A)}$$
$$\text{RESIDB} = B0 + B1(\text{ROE}) \qquad \text{(3B)}$$

RESIDA is the residual from Equation 2A, and RESIDB is the residual from Equation 2B. In each case, the null hypothesis is $B1 = 0$.

Systematic and Unsystematic Components of Measurement Error

The objective of the fourth set of procedures is to further explore the extent to which Whittington's (1979) second criterion is satisfied. The objective is accomplished by estimating the percentage of total measurement error attributable to the systematic and unsystematic components. Total measurement error is defined as the error sum of squares from Equations 2A and 2B. The systematic (unsystematic) component of measurement error is defined as the regression (error) sum of squares from Equations 3A and 3B.

Results and Discussion

Results

Compensation and Corporate Performance

The three panels of Table 2 report the results of regressing each measure of compensation against corporate performance, as specified in Equations 1A, 1B, and 1C. As reported in Panels A, B, and C of Table 2, there is a positive and statistically significant association between performance and compensation for each of the three definitions of compensation. The associations are relatively weak, with adjusted R-Squares ranging from .029 to .054. These findings are consistent with previous studies.

However, the primary focus of this study is not on the association between compensation and performance per se, but rather on the effects of using the sum of salary and bonus as a proxy for total compensation. Table 2 suggests that using the sum of salary and bonus as a proxy leads to results that are at least broadly consistent with the results obtained when the compensation proxy incorporates measures of stock option compensation. The analyses below investigate this notion more rigorously.

Total Measurement Error

The two panels of Table 3 report the results of regressing each of the comprehensive measures of compensation against the sum of salary and bonus, as specified in Equations 2A and 2B. As reported in Table 3, the correlations with the sum of salary and bonus are statistically significant, but they do not approach the perfect correlation that would be necessary to perfectly satisfy Whittington's (1979) first criterion. When total compensation is defined to include the value of stock options exercised, the sum of salary and bonus accounts for only about twelve percent of the variance in total compensation. When total compensation is defined as the

sum of salary, bonus, and options granted, the sum of salary and bonus accounts for about twenty-five percent of the variance in total compensation. Although the sum of salary and bonus is correlated with more comprehensive measures of total compensation, the correlation is not large enough to allay concerns about the presence of measurement error.

Systematic Measurement Error

The two panels of Table 4 report the results of regressing the residuals from the analysis in Table 3 against corporate performance, as specified in Equations 3A and 3B. As reported in Panel A of Table 4, when compensation is defined as the sum of salary and bonus plus the cash value realized from the exercise of stock options, there is a marginally significant association between total measurement error and corporate performance. Corporate performance accounts for less than one percent of the variance in the measurement error. As reported in Panel B of Table 4, when compensation is defined as the sum of salary and bonus plus the value of options granted during the year, the association is somewhat stronger, but again corporate performance accounts for only about one percent of the variance in the measurement error. These results indicate that most of the measurement error is unsystematic.

Systematic and Unsystematic Components of Measurement Error

Table 5 reports the results of partitioning the total measurement error into systematic and unsystematic components. As reported in Table 5, almost all of the measurement error in the sum of salary and bonus is unsystematic. Under each definition of total compensation, the unsystematic component of measurement error accounts for more than ninety-eight percent of the total. This is additional evidence that Whittington's (1979) second criterion is satisfied.

Discussion

The results in Table 2 indicate that the nature of the association between CEO compensation and corporate performance is sensitive to the measure of compensation that is employed. Specifically, there is a dependence between the definition of compensation and the strength of the association with corporate performance. In all cases, the association is relatively weak. The most plausible interpretation of this result is that the different definitions of total compensation serve as proxies for different compensation constructs. The implication is that researchers should identify the compensation construct that is most pertinent to their specific research objectives

Table 2
Regression Of Compensation Against Corporate Performance
For Three Compensation Proxies
(Equations 1A, 1B, and 1C)

Panel A (Equation 1A)

Dependent Variable = SALBON
N = 267
Adjusted R-Square = .054
Model F Statistic = 16.083
P-Value Of F Statistic = .0001

Independent Variable	Beta	Std. Error	T-Value	P-Value
Intercept	1159.32	82.77	14.01	.000
ROE	15.57	3.88	4.01	.000

Panel B (Equation 1B)

Dependent Variable = COMPEXER
N = 267
Adjusted R-Square = .029
Model F Statistic = 8.99
P-Value Of F Statistic = .0030

Independent Variable	Beta	Std. Error	T-Value	P-Value
Intercept	1837.67	417.90	4.40	.000
ROE	58.77	19.60	3.00	.003

Panel C (Equation 1C)

Dependent Variable = COMPGRANT
N = 267
Adjusted R-Square = .054
Model F Statistic = 16.147
P-Value Of F Statistic = .0001

Independent Variable	Beta	Std. Error	T-Value	P-Value
Intercept	2052.47	226.49	9.06	.000
ROE	42.69	10.62	4.02	.000

and should use the proxy corresponding to that construct. For example, if a researcher is examining the compensation **earned** during a year, the compensation proxy should incorporate the value of stock options **granted**. On the other hand, if a researcher is interested in the compensa tion **realized** during a year, the proxy should incorporate the value of stock options **exercised**. Additional theoretical research is needed to help researchers discriminate among compensation constructs, and to give researchers guidance in choosing the construct best suited to their objectives.

Table 3
Regression Of Each Comprehensive Compensation Proxy
Against The Sum Of Salary And Bonus
(Equations 2A And 2B)

Panel A (Equation 2A)

Dependent Variable = COMPEXER
N = 267
Adjusted R-Square = .117
Model F Statistic = 36.26
P-Value Of F Statistic = .0000

Independent Variable	Beta	Std. Error	T-Value	P-Value
Intercept	182.04	512.58	.36	.723
SALBON	1.73	.29	6.02	.000

Panel B (Equation 2B)

Dependent Variable = COMPGRANT
N = 267
Adjusted R-Square = .254
Model F Statistic = 91.80
P-Value Of F Statistic = .0000

Independent Variable	Beta	Std. Error	T-Value	P-Value
Intercept	674.23	258.58	2.61	.010
SALBON	1.38	.14	9.58	.000

The results in Tables 3,4, and 5 lead to the conclusion that the sum of salary and bonus is not adequate as a proxy for total compensation. Specifically, the results in Table 3 indicate that although the sum of salary and bonus is correlated with broader measures of compensation, the correlations are relatively low, and the total measurement error is large. Thus, although Whittington's (1979) first criterion is technically satisfied, the correlations differ from the ideal value of unity by a large enough margin to justify concerns about the magnitude of the total measurement error in the sum of salary and bonus. The results in Tables 4 and 5 indicate that the measurement error in the sum of salary and bonus is uncorrelated with corporate performance, thereby satisfying Whittington's (1979) second criterion.

Summary and Conclusions

The primary objective of this study has been to assess the adequacy of the sum of salary and bonus as a proxy for total compensation in investigations of the relation between compensation and corporate performance. The objective was accomplished by applying Whittington's (1979) criteria for the adequacy of a proxy for a dependent variable in a multiple regression. In order to have more comprehensive measures of compensation to serve as benchmarks, the sum of salary and bonus was extended to incorporate the value of stock options exercised and stock options granted. An empirical analysis of the association between compensation and corporate performance for 267 firms led to the conclusion that a large amount of unsystematic measurement error is present in the sum of salary and bonus. One implication of this finding is that reliance on the sum of salary and bonus has not systematically biased the findings of previous studies. A second implication is that unsystematic measurement error in the sum of salary and bonus is a likely source of the inconsistencies in findings of previous studies. The final implication is that in order for future studies to produce consistent findings that permit definitive conclusions concerning the relation between compensation and corporate performance, researchers will need to use

Table 4
Analysis Of Residuals
From The Regression Of Each Comprehensive Compensation Proxy
Against The Sum Of Salary And Bonus
(Equations 3A And 3B)

Panel A (Equation 3A)

Dependent Variable = RESIDA (Residuals From Equation 2A)
N = 267
Adjusted R-Square = .007
Model F Statistic = 2.935
P-Value Of F Statistic= .0879

Independent Variable	Beta	Std. Error	T-Value	P-Value
Intercept	-349.09	396.35	-.881	.379
ROE	31.85	18.59	1.71	.088

Panel B (Equation 3B)

Dependent Variable = RESIDB (Residuals From Equation 2B)
N = 267
Adjusted R-Square = .015
Model F Statistic= 5.091
P-Value Of F Statistic = .0249

Independent Variable	Beta	Std. Error	T-Value	P-Value
Intercept	-231.02	199.15	-1.16	.247
ROE	21.07	9.34	2.26	.025

compensation proxies that incorporate executive stock options.

Suggestions For Future Research

This study suggests several avenues for future research. One possibility is to extend the definition of compensation to incorporate additional components of compensation. In addition to disclosing salary, bonus, and stock option data, annual proxy statements in 1993 and subsequent years also include information pertaining to grants of restricted stock, payments under long-term incentive plans, and awards made under long-term plans that are not explicitly tied to share prices. A related possibility is to desegregate broad measures of total compensation into individual components (such as the value of options granted) which then can be tested for associations with performance. Murphy

(1985) and Jensen and Murphy (1990) have made initial steps in this direction. Also, as U.S.-based companies continue to comply with the proxy statement disclosure requirements that became effective at the end of 1992, data will become available for time-series studies. To the extent that market regulators in other countries begin to require detailed disclosure of stock option compensation data, international studies will become possible. Finally, there is a pressing need for theoretical research that gives practical guidance to researchers who must choose the definition of compensation that most closely corresponds to the construct that is being modeled. ▢

Table 5
Systematic And Unsystematic Components Of Measurement Error
In The Sum Of Salary And Bonus

Measurement Error In The Sum Of Salary And Bonus

Compensation Proxy	Total	Systematic Amount	%	Unsystematic Amount	%
Compexer	8,267,692	90,562	1.1	8,177,130	98.9
Compgrant	2,104,037	39,660	1.9	2,064,377	98.1

Total measurement error is defined as the error sum of squares from Equations 2A and 2B reported on in Table 3. It is measured in thousands of dollars.

The systematic component of measurement error is defined as the regression sum of squares from Equations 3A and 3B, reported on in Table 4. It is measured in thousands of dollars.

The unsystematic component of measurement error is defined as the error sum of squares from Equations 3A and 3B, reported on in Table 4. It is measured in thousands of dollars.

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