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Wende Stellano

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NORTHERN ILLINOIS UNIVERSITY
CEO SALARY AND MANAGEMENT EFFICIENCY

A thesis submitted to the University Honors Program

In Partial Fulfillment of the Requirements of the Baccalaureate Degree

With University Honors

Department of Finance


BY:

Wende Stellano

DeKalb, Illinois

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Student Name: Wende Stellano

Approved By: 

Department of: Finance

Date: May 8, 1995

ABSTRACT

This paper aims to shed light on the relationship between CEO compensation and management efficiency. It reports the results of an empirical study of a sample of Fortune 500 firms. My hypothesis is that there is a positive relationship between CEO compensation and management efficiency. In order to try to prove my hypothesis, I conducted several tests. The tests were performed by dividing the sample in a number of ways and then performing a regression analysis on the data. The first test was conducted by taking the sample as a whole, the second by dividing the sample by industry, third by dividing the sample by market value (size), and finally by dividing the sample by salary-to-asset ratio. The results of the first test showed that, overall, no relationship exists between CEO compensation and the efficiency of management. The second test showed that a relationship does exist between CEO compensation and management efficiency in some industries. The next test showed that a positive relationship exists between the two variables for small firms, and a negative relationship exists for large firms. The final test also provides support for the idea that CEO compensation is related to the efficiency of management. Although my hypothesis was not entirely correct, it did prove to be accurate in several cases.

Key Words: CEO Compensation; Firm Performance.

Introduction

Is CEO compensation tied to performance? This study was conducted to shed light on this question. The relationship of firm performance to CEO compensation is a matter of concern to both the public and academics. Concern over the topic is reflected in the April 12 issue of *The Wall Street Journal*. For my study, a proxy for Tobin's q, defined as the sum of the book value of debt and the market value of equity divided by the sum of the book value of debt and equity, will be used to measure the efficiency of management performance. Tobin's q was chosen as the proxy for management efficiency since it takes into account both market and book values, thereby providing an accurate measure of company performance.

Literature Review

The question of whether CEO compensation is tied to performance has been a controversial issue for quite some time now. Literature has been published supporting both sides of this issue. Hampson (1991) argues that CEO compensation must be related to his/her performance against previously agreed objectives and not anything else. He also does not believe in "annualities" - yearly increases, because he believes that executives will not rush off because they did not get an increase in a given year. Cox and Power (1991) share the same opinion as Hampson. They state that CEO pay has increased annually, surpassing inflation and profits for many years now (1991). A "truly ethical" CEO would focus on narrowing the divergence between his own goals and those of the shareholders. This would result in performance and pay being fairly closely linked.

Most theories of motivation argue in favor of strong performance-reward contingencies (Steers & Porter, 1983). The motivation assumptions underlying executive compensation is clear: tie rewards to desired performance in order to ensure maximum performance (Wilhelm, 1993). For CEOs, performance is typically viewed in terms of profitability (ROE or ROI) or market share. Research evidence is mixed concerning

whether executive compensation is closely related to company performance (Ungson & Steer, 1984). A sample of 1,414 firms over 15 years (1935-1950) showed that CEO compensation is related primarily to size or sales volume, not profits (Roberts, 1959). Ciscell and Carroll (1980), and Deckop (1988) found that sales were predominant in determining CEO compensation. Because CEO pay levels are often based on comparative pay surveys (Kraus, 1976), it is intuitively clear that pay would covary generally with size, regardless of performance. It is not surprising, therefore, that researchers have argued that CEOs are more often interested in empire building than in maximizing stock returns.

There are also those who believe that a CEO's compensation shouldn't be based on performance. Some researchers believe that only a small fraction of the stock awards plus bonuses for CEOs depend on meeting financial targets. Stock awards are granted as a way of retaining CEOs. Alan Johnson (1995), managing director of compensation consultants in New York, says of Anthony O'Reilly - long-time Chairman, President, and CEO of H.J. Heinz Co., "we won't pay him for performance, we will pay him 150% of what he's worth because somebody may pay him 200% of what he's worth and we don't want to lose him." This retention argument strikes some observers as a lame excuse to pay underperformers more. Critics see other evidence of overly generous CEO compensation nowadays. One sign: sizable bonus awards despite missed targets or lack luster results. This statement is supported by Mark Bieler (1995), Bankers Trust executive vice-president and its head of human resources, "slashing a chief executive's salary is virtually unheard of, even where (business) performance has flipped around." He also argues that if too much of a CEO's compensation is incentive based, the executive may start thinking too much like a short-term shareholder and be tempted to pursue misguided restructurings, lay-offs, and divestitures.

Despite the above arguments, some feel that times are changing: CEOs' salaries will be tied to performance as a standard. Former Commerce Department Secretary

Barbara Hackman Franklin states, "It used to be that comparability was the big issue for compensation - by industry, by size. But now, pay for performance is going to be the standard bearer. There will be more and more of an emphasis on performance and results, and less on comparisons" (1993). Charles Schultz (1994), President of CFS Compensation Consulting agrees with Barbara by pointing to what he calls the 80/20 rule. Twenty percent of CEOs receive pay that might be classified as excessive. "That means 8 out of 10 companies do a diligent and thoughtful job putting their executive compensation packages together. But the media lumps all CEOs together and creates this image that CEO pay has gone through the roof." The 1990's are a decade of the executive compensation committee. The emphasis is on what is good performance? and the committees are finding that it is very, very complex.

Hypothesis

The hypothesis of this study is that there is a direct relationship between CEO/Pres. salaries and management efficiency for all firms regardless of size or industry. If a firm's management efficiency is summarized by Tobin's q, q can be used to determine if there is a relationship between management efficiency and salaries. All firms, regardless of size or industry, must compensate management appropriately in order to create maximum management efficiency. These implications provide the following research hypothesis:

H₀1: There will be a positive relationship between management efficiency, as measured by Tobin's q, and CEO/Pres. salaries as measured by the ratio of salaries to total assets.

Data and Methodology

To test the hypothesis that there is a positive relationship between management efficiency and CEO/Pres. salaries, I sampled from the Fortune 500. Using the 1994 version of COMPACT DISCLOSURE database, I developed a listing of all CEO and

Presidents' compensation, the firm's long-term debt, and book and market values of the equity. After screening for data availability, 412 firms remained in the sample.

Various tests were performed on the sample in order to determine if, and what kind of relationships exist between management efficiency and CEO/Pres. salaries. First a regression analysis was conducted in order to see if a positive linear relationship exists between the two variables. The market-to-book ratio was the dependent variable and the salary-to-asset ratio was the independent variable. Another test was conducted to identify any relationship between management efficiency and salaries by industry. The sample was separated by two-digit primary SIC codes and only those industries with ten or more companies in them were used in order to provide adequate and relevant analysis criteria. A third test was performed by splitting the sample into quintiles according to market value, with the smallest companies in the first quintile and the largest in the fifth quintile. Once the sample was split into quintiles, a regression analysis was performed on each quintile to test for the existence or nonexistence of a linear relationship between the variables. The results will show if a relationship exists between the efficiency of management and the size of the firm. The final test conducted resulted in ranking the firms in descending order on the basis of salary-to-asset ratios and then dividing them into quintiles. The first quintile thus comprises firms with the largest salary/asset ratio, the second with firms in the next highest range for the choice variable, and so on. Again, the highest and the lowest numbers were dropped in order to have an equal number of companies in each quintile. To see if the results of this test were significant, I used two hypotheses. The null hypothesis was: the mean of Tobin's q for the first quintile is be equal to the mean of the Tobin's q for the fifth quintile. The alternative hypothesis was: the mean of the Tobin's q for the first quintile is greater than the mean of the Tobin's q for the fifth quintile. A critical value of t was then found at the .05 level of significance in order to determine if the results were relevant.

Results

The results of the above tests proved to be quite interesting and supportive of some of the opinions cited earlier. When the first test results were analyzed, there was not a relationship found at any level of significance (See Tables 1 & 1A). When the sample was divided into industries, several industries showed a relationship between the variables either at the .05 or .10 level of significance (See Tables 2 & 2A). The Chemicals & Allied Products industry showed a negative relationship between CEO/Pres. compensation and management efficiency at the .05 level of significance. The Food & Kindred Products industry also showed a negative relationship but at the .10 level of significance. These results support researchers' views that CEOs are not paid on performance since the more efficient the CEO, the lower his pay for these two particular industries. The Electric & Other Electric Equipment industry showed a positive relationship between the variables at the .10 level of significance thus supporting the other side of this great controversy.

A rather interesting finding occurred when the sample was divided by market values (See Table 3). For the smaller firms, there was a positive relationship between the two variables being analyzed, and a negative relationship between the same two variables for the larger firms. The negative relationship for the larger firms was reinforced by the fact that the fourth and fifth quintiles showed this relationship, although at different levels of significance. This relationship shows that the executives of smaller firms tend to be paid more by performance, whereas the executives of large firms are compensated according to other variables not measured in this study. These results further exemplify the controversy and difference in opinions on the subject. Not all companies are paying their executives on performance.

The final test resulted in the rejection of the null hypothesis, therefore showing that a significant relationship is present between the two variables at the .05 level of

significance (See Tables 4 & 4A). The results of this test provide support for the idea that CEO compensation is related to performance.

Conclusion

The results of this study illustrate the reason that the controversy exists. Since both sides of the controversy at hand are supported by different tests I conducted, it can not be determined which counterpart is correct. Although several tests showed that a relationship exists between CEO compensation and management efficiency, not all the tests provided this result. The results could have turned out this way for several reasons. The first being that the executive compensation committee is still having problems deciding on what is "satisfactory performance", thus causing the salaries to be based on variables other than performance. Another discrepancy could have occurred because firms with executive compensation committee were taken in the same sample as those without, thus causing the results to be different due to the inconsistencies in the sample.

TABLE 1
DESCRIPTIVE STATISTICS
OVERALL SAMPLE
N = 412

VARIABLE	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	2.276	1.851	2.429	11.863	.339
Salary/Asset Ratio	.901	.575	1.310	14.211	.007

TABLE 1A
REGRESSION RESULTS WITH MARKET-TO-BOOK RATIO
AS DEPENDANT VARIABLE AND SALARY/ASSET
RATIO AS INDEPENDENT VARIABLE
N = 412

	R ²	ALPHA	BETA	T-STAT
OVERALL	.044	2.200	.084	1.253

TABLE 2
DESCRIPTIVE STATISTICS ON
SAMPLE DIVIDED BY 2 DIGIT SIC CODES

Chemicals & Allied Products N = 54	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	3.142	2.512	3.687	9.365	1.159
Salary/Asset Ratio	.781	.522	.470	2.683	.067
Printing and Publishing N = 17	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	2.380	2.039	1.508	6.813	1.084
Salary/Asset Ratio	.867	.552	.421	2.664	.256
Paper and Allied Products N = 25	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	1.587	1.395	.333	3.122	.927
Salary/Asset Ratio	.354	.217	.085	1.316	.050
Textile Mill Products N = 11	MEAN	MEDIAN	VARIANCE	HIGH	LOW

Market -to- Book Ratio	1.667	1.262	.691	3.625	.813
Salary/Asset Ratio	1.034	.951	.297	2.231	.153
Food and Kindred Products N = 37	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	2.368	1.898	2.332	8.971	.676
Salary/Asset Ratio	1.146	.775	1.166	5.395	.029
Instruments & Related Products N = 28	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	2.309	2.038	1.024	6.371	1.143
Salary/Asset Ratio	.758	.695	.270	2.356	.035
Transportation Equip. N = 36	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	1.722	1.461	.885	6.399	.704
Salary/Asset Ratio	.864	.453	1.226	6.189	.007

Electric & Other Electric Equipment N = 33	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	2.643	2.372	1.301	5.482	.553
Salary/Asset Ratio	1.358	.854	2.569	6.671	.081
Fabricated Metal Products N = 11	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	2.520	1.907	2.934	7.698	1.327
Salary/Asset Ratio	.770	.374	.391	2.051	.194
Primary Metal Industries N = 21	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	1.907	1.603	.836	3.855	.845
Salary/Asset Ratio	.673	.533	.242	2.016	.090
Petroleum & Coal Products N = 24	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	1.474	1.379	.257	2.857	.544

Salary/Asset Ratio	.670	.360	.499	3.002	.034
Industrial Machinery & Equipment N = 49	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	2.640	1.949	5.401	10.728	.375
Salary/Asset Ratio	.781	.485	.847	6.121	.057

TABLE 2A
REGRESSION RESULTS ON SAMPLE DIVIDED
BY 2 DIGIT PRIMARY SIC CODES WITH
MARKET - TO- BOOK VALUE AS DEPENDANT
VARIABLE AND SALARY/ASSET RATIO AS
INDEPENDENT VARIABLE

Chemicals & Allied Products N = 54	R ²	Alpha	Beta	T-Stat
	.053	3.643	-.642	-1.699 ^a
Printing and Publishing N = 17	R ²	Alpha	Beta	T-Stat
	.018	2.600	-.254	-.524
Paper & Allied Products N = 25	R ²	Alpha	Beta	T-Stat
	.008	1.524	.177	.430
Textile Mill Products N = 11	R ²	Alpha	Beta	T-Stat
	.075	2.098	-.416	-.851
Food and Kindred Products N = 37	R ²	Alpha	Beta	T-Stat
	.053	1.528	-.324	-1.395 ^b
Instruments & Related Products N = 28	R ²	Alpha	Beta	T-Stat
	.006	2.195	.151	.397

Trans. Equipment N = 36	R ²	Alpha	Beta	T-Stat
	.042	.947	.174	1.222
Electric & Other Electric Equipment N = 33	R ²	Alpha	Beta	T-Stat
	.063	2.400	.179	1.446 ^b
Fabricated Metal Products N = 11	R ²	Alpha	Beta	T-Stat
	.0005	2.474	.061	.067
Primary Metal Industries N = 21	R ²	Alpha	Beta	T-Stat
	.078	1.558	.519	1.267
Petroleum & Coal Products N = 24	R ²	Alpha	Beta	T-Stat
	.045	1.372	.152	1.017
Industrial Machinery & Equipment N = 49	R ²	Alpha	Beta	T-Stat
	.024	2.332	.395	1.085

^a = Significant at the .05 level.

^b = Significant at the .10 level.

TABLE 3

**REGRESSION BY FIRM SIZE QUINTILES (FIRM SIZE DETERMINED BY MARKET VALUE - 82 FIRMS IN EACH QUINTILE)
REGRESSION PERFORMED WITH MARKET -TO- BOOK RATIO AS DEPENDANT VARIABLE AND SALARY/ASSET RATIO AS INDEPENDENT VARIABLE (SMALLEST FIRMS IN FIRST QUINTILE LARGEST FIRMS IN FIFTH QUINTILE)**

	R ²	Alpha	Beta	T-Stat
First Quintile	.049	1.247	.091	2.021 ^a
Second Quintile	.0004	1.801	-.017	-.170
Third Quintile	.016	2.390	-.119	-1.143
Fourth Quintile	.020	2.906	-.120	-1.283 ^b
Fifth Quintile	.040	3.648	-.214	-1.827 ^a

^a = Significant at the .05 level.

^b = Significant at the .10 level.

TABLE 4
DESCRIPTIVE STATISTICS OF
SAMPLE DIVIDED INTO QUINTILES OF 82 BY SALARY/ASSET RATIO
WITH THE HIGHEST SALARY/ASSET RATIO FIRMS IN THE FIRST QUINTILE

First Quintile	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	2.425	2.039	2.454	11.863	.704
Salary/Asset Ratio	2.276	1.870	1.483	6.671	1.287
Second Quintile	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	2.474	1.952	3.631	10.728	.544
Salary/Asset Ratio	1.001	.966	.018	1.283	.812
Third Quintile	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	2.208	1.922	1.646	8.971	.547
Salary/Asset Ratio	.604	.575	.012	.800	.439
Fourth Quintile	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	2.338	1.790	3.255	10.291	.375
Salary/Asset Ratio	.335	.331	.003	.436	.245

Fifth Quintile	MEAN	MEDIAN	VARIANCE	HIGH	LOW
Market -to- Book Ratio	1.951	1.720	1.031	5.586	.339
Salary/Asset Ratio	.137	.151	.004	.241	.010

TABLE 4A

REGRESSION RESULTS OF SAMPLE DIVIDED INTO QUINTILES, CONTAINING 82 FIRMS EACH, BY SALARY/ASSET RATIO WITH THE MARKET -TO- BOOK VALUE AS DEPENDANT VARIABLE AND SALARY/ASSET RATIO AS INDEPENDENT VARIABLE WITH THE LARGEST SALARY/ASSET FIRMS IN THE FIRST QUINTILE

	R ²	Alpha	Beta	T-Stat
First Quintile	.010	2.129	.130	.910
Second Quintile	.018	4.353	-1.522	-1.206
Third Quintile	.003	1.814	.654	.510
Fourth Quintile	.003	2.939	-1.793	-.449
Fifth Quintile	.001	2.022	-.519	-.287
T-Stat for Q ₁ & Q ₅	2.298 ^a			

^a = Significant at the .05 level.

T-Stat for Q₁ & Q₅ is for the hypothesis that the market-to-book ratio for high salary/asset firms is the same as the market-to-book for the low salary/asset firms.

This number is significant, thus proving the hypothesis wrong. This means that there is a relationship between CEO salaries and management efficiency.

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