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AN EMPIRICAL STUDY OF CHIEF EXECUTIVE OFFICERS (CEOs) COMPENSATION

William G. Browne
and
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There is a considerable body of literature on the topic of executive compensation (22). A newly emerging interest seems to be directed toward the understanding of the system by which top executives of large, publicly owned United States corporations are compensated (1:51). However, only a small fraction of the literature, if any, is concerned with the variables that relate to the compensation level of chief executive officers (CEOs). The purpose of this research study is to explore the organizational variables that may be associated with CEO compensation.

There are a few private consulting firms that provide services to corporate compensation officers in the design of compensation packages for CEOs. These firms normally do not publish or publicly identify the set of variables that they use for CEO compensation recommendations. This study complements the consultant's work and provides compensation officers, CEO, upper management, and compensation researchers with information on the relationship between certain measurable organizational variables and CEO compensation. The study attempts to relate number of employees, assets, sales, net profit, CEO experience with the company, and two financial ratios (return on assets and profit margin) with the level of CEO compensation above \$100,000 across publicly owned U.S. companies. The data are later classified into 14 basic industries to investigate the relevant characteristics of each industry. Stepwise regression is used to analyze and identify the major factors that relate to the total compensation of CEOs in over 700 large companies in 14 industries. The data for two years, 1974 and 1976, are used. The 1974 data represent a period of economic slowdown (the height of stagflation) and 1976 represents a recovery period. Similarities and differences between the two periods provide an opportunity to study the dynamics that may have effects on compensation under two contrasting economic conditions. Both periods were void of the excessive inflation that has been dominant in the past four years (1977-1980); thus the effects of both inflation and the 1978 Revenue Tax Act on compensation packages can be discounted. This eliminates the aberrations caused by the impact of abnormal economic conditions on the measured organizational variables and their relations with CEO compensation.

The paper consists of five sections. The first contains the survey of background literature, outlines selected variables that may relate to executive compensation, and sets the stage for the theme of the current work. The second section deals with the research data and methodology. The overall survey results are presented in the third section. The findings and their implications are discussed in the fourth section, and the last section contains the conclusion.

BACKGROUND

The *Business Periodicals Index* was reviewed for five years to obtain literature sources that contained information on executive compensation. Compensation appears to be a popular topic, and over fifty publications were identified for each of the five years. Most of the articles consisted of discussions of current trends in compensation packaging and administration. For instance, in 1973-74 many of the papers focused on the wage and price guidelines and how they might influence the level and mix of a compensation package. A topic of recent interest is the adjusting of compensation packages to the conditions of the recent retirement and pension legislation. Even more recently there have been many discussions on the effects of inflation on taxable incomes and the benefits of the 1978 Tax Revenue Act. Other issues that gain in popularity on a cyclical basis relate to various bonus programs, stock options, insurance and benefit packages.

Many of the articles attempt to translate the national (or macro) conditions and trends for one particular industry or special interest group. For example, *Iron Age* (3) contains compensation articles that would be of interest to executives in the steel industry while *Financial Executive* (7.15) contains articles for those executives with positions in finance. There are also general periodic articles that are totally descriptive in nature and appear in business journals such as *Business Week* (9) and *Fortune* (5). A good example would be the May 1976 article appearing in *Fortune* titled, "A Group Profile of the Fortune 500 Chief Executives" (5). The author, Charles Burck, conducted a survey and generated information concerning the earnings, background, and working styles of CEOs. There are also a few articles that deal with the changing patterns in backgrounds of top executives. Typical headline or titles would be, "Management Compensation: Rising Slower Than the Cost of Living" (14), "It's Also a Good Year for Executive Pay" (8), or "Executive Compensation: Is Your Salary a Tax Liability" (10).

Our survey of published articles has uncovered little material on the possible factors that determine the differing levels of executive and CEO compensation among various companies. The Conference Board and the Financial Executives Institute both have prepared summaries on executive and CEO compensation that provide data on various practices by industry, region, location, and sales volume (16, 21, 22). These contributions provide some insight into the basis of the differences between the total compensation of corporate executives. They tend to be descriptive in nature but do not provide any statistically based inferences. However, limited materials attempting to statistically relate CEO compensation to various corporate factors are contained in studies of Roberts (19); Baumol (2); and McGuire (13); Lewellen and Huntsman (11); Masson (12); Prasad (18); and Smyth, Boyes and Peseau (20). The study by Prasad completed a statistical study of the compensation of executives in large corporations limiting the compensation related factors to assets, sales and profits. The assets variable was used to normalize the other three variables (pay, sales, and profits) used in previous publications. The main assumption underlying this and other studies has been based on Baumol's notion that CEOs compensation is directly related to the corporation's achievement of the economic goal of sales, subject to a

minimum profit constraint (2). These studies attempted to provide statistical support for Baumol's economic notion.

We have found no study that deals solely with the level of CEO compensation and its determinants. The above studies considered compensation as a surrogate indicator for the type of goals that are strived for in the firm. The authors were interested not in isolating variables that relate to compensation but only in the link between the economic results desired by the firm and compensation. Their research points to conflicting results and provides support for compensation relating either with profit maximization or sales maximization objectives. Our intent in this paper is to study an expanded selection of variables that might influence the CEO compensation across publicly owned firms.

METHOD

Forbes data (24) relating to compensation was gathered for two dissimilar years, 1974 and 1976 (as reported in May 1975 and 1977 issues). It contained information on over 700 firms with CEO compensations exceeding \$100,000 that are listed with the Security Exchange Commission (SEC). The data included seven variables for each company. Variables reflecting size were number of employees, assets, sales and net profit. Other variables consisted of industry, experience (years the CEO had been with the company) and total CEO compensation (salary, bonus, director's fee and deferred compensation). Two additional variables were extracted and computed from three of the variables to provide performance indicators for each company. The two variables were ROI (net profit/assets) and profit margin (net profit/sales).

Total compensation was used as the dependent variable, and the remaining seven variables (disregarding industry) were used as independent variables. To identify differences between relationships in each industry the data were classified into 14 industries. Industry classifications were based on the *Forbes* (24) criteria. In their 1975 and 1977 May issues, for comparative purposes, the journal editors list each company in one of the 14 industries. These are energy, industrial equipment, forest products, information processing, utilities, multi-companies, finance, aerospace-defense, metals, consumer goods, electronics, leisure, distribution, and transportation. A few (25-30) of the companies were listed in two or more industries.

The total data and individual industry data were separately analyzed and subjected to stepwise regression for each of the two years.

RESULTS

Summaries of the total data and individual industry's are contained in Table 1. The table provides a profile of relevant characteristics of each industry and the total survey data. The concentration within the industry can be noted by the number of firms included in each industry. The aggregate or "total" results of the two year period tend to be stable.

TABLE 1: INDUSTRY AND TOTAL MEANS FOR COMPANIES WITH CEOs WHOSE COMPENSATION IS \$100,000 OR MORE*

Year	TOTAL		ENERGY		INDUSTRIAL EQUIPMENT		FOREST PRODUCTS		INFORMATION PROCESSING		UTILITIES		MULTI CO'S		FINANCE	
	1974	1976	1974	1976	1974	1976	1974	1976	1974	1976	1974	1976	1974	1976	1974	1976
Cases	737	759	52	49	28	37	29	32	10	10	71	80	73	88	167	196
Number of Employees (E) x 10 ³	28	26	20	24	29	21	24	23	83	77	26	22	60	57	10	9
Assets (A) x 10 ⁶	235	272	323	394	91	95	108	121	341	391	335	359	204	254	481	493
Sales (S) x 10 ⁶	154	176	406	505	112	112	127	141	286	346	120	144	241	238	72	70
Net Profit (P) x 10 ⁶	8.4	10.4	29.2	36.5	5.5	6.2	8.0	8.1	27.2	35.1	12.5	14.8	8.5	15.0	3.7	4.3
ROI (R)	.056	.055	.095	.089	.066	.080	.081	.076	.063	.076	.039	.045	.045	.057	.017	.012
Profit per Sale (M)	.069	.071	.095	.083	.055	.067	.075	.069	.065	.075	.118	.113	.039	.046	.077	.037
Years in Company (Y)	24	24	24	25	23	27	25	27	24	28	26	27	21	24	23	23
Total Pay (T) x 10 ³	233	277	295	358	269	301	264	328	296	385	163	165	306	391	173	195

Year	TOTAL		AEROSPACE DEFENSE		METALS		CONSUMER GOODS		ELECTRONICS		LEISURE		DISTRIBUTION		TRANSPORT	
	1974	1976	1974	1976	1974	1976	1974	1976	1974	1976	1974	1976	1974	1976	1974	1976
Cases	737	759	9	10	36	28	112	104	33	33	27	23	127	103	40	29
Number of Employees (E) x 10 ³	28	26	55	62	22	30	38	35	86	76	26	29	31	34	51	30
Assets (A) x 10 ⁶	235	272	130	165	152	136	117	140	385	442	37	135	92	92	199	130
Sales (S) x 10 ⁶	154	176	260	300	180	200	164	185	262	294	103	144	147	189	220	149
Net Profit (P) x 10 ⁶	8.4	10.4	6.0	8.5	12.6	7.8	7.2	11.5	17.5	23.3	8.6	9.6	3.7	5.5	7.0	8.3
ROI (R)	.056	.055	.050	.053	.091	.052	.077	.090	.073	.087	.094	.084	.061	.063	.046	.052
Profit per Sale (M)	.069	.071	.027	.031	.034	.062	.050	.062	.062	.073	.086	.074	.041	.031	.049	.058
Years in Company (Y)	24	24	25	17	23	24	28	25	21	21	25	27	25	25	20	19
Total Pay (T) x 10 ³	233	277	271	377	311	317	282	341	267	309	267	377	215	254	258	321

*Data for developing this table was taken from the May 1975 and 1977 issues of Forbes.

The stepwise regression treatment of data for each industry resulted in the findings in Table 2. It contains the summary of the significant relationships between CEO compensation and the seven independent variables. Only the variables that enter at the .10 level of significance and greater are included. (The order of variable significance is identified by a number that represents the step at which the variable enters the industry equation.) The multiple R^2 values generated by the significant variables are in the right hand column.

Furthermore, four groupings of industries are exhibited in Table 2. These are large stable industries, small stable industries, volatile industries, and other industries. These groupings were based on the similarity of result among the 14 industries. The headings for each group reflect the environmental conditions of the industries within the given group. Among the selected independent variables, number of employees (E) appears in 10 of the 1974 industry equations and nine of the 1976 industry equations. In 1974, the R^2 values for 11 of the 14 industries exceed the total R^2 value of .300. In 1976, the R^2 values for nine of the 14 industries exceeds the total R^2 value of .376.

DISCUSSION

Evidence from both years provides a basis for supporting findings of previous studies (2, 11, 13, 18, 20). Both sales and profits explain a significant level of variations in the total equations for 1974 and 1976. Although there have been major differences in the economic conditions of the two years, there is a great deal of consistency across variables for the two divergent periods.

When the data are classified into industries and analyzed, the results unfold the unique characteristics of each industry. It is interesting to note that sales, as a primarily significant variable, appears to be a dominant variable for both years in only two industries: utilities and electronics-electrical.

In the first group of large stable industries category the number of employees variable is the strongest determinant of CEO compensation for both years. Experience, measured as the number of years of tenure with the company, emerges to be of secondary significance in the energy industry, and sales emerges as the second most important variable in the industrial equipment companies. No significant secondary variables consistently emerge for other industries in this category.

The second group of industries has number of employees appearing for both years at statistically significant levels, but not as the primary variable. The CEO compensation in the utilities industry tends to have a strong relationship with the size of the firm as indicated by sales, assets, and number of employees. Sales tends to be the most important contributing variable in the regression equation for this industry. This may reflect the federal and state regulatory commissions' policies that influence the compensation levels for CEOs. The regulatory nature of this industry could have retarded the effect of the performance variable, return on investment and profit margin, on the compensation of CEOs. Furthermore, it must also be pointed out that the utility industry has the lowest average compensation level of any industry. This again may be the result of regulatory and stable conditions of this industry.

TABLE 2: VARIABLES THAT RELATE TO CEO COMPENSATION USING STEPWISE REGRESSION AT .10 LEVEL OF SIGNIFICANCE

		Size			Performance		Experience	Multiple R ²	
		No. of Employees (L)	Assets (A)	Sales (S)	Net Profit (P)	ROI (R)	Margin-Average Profit (M)		Tenure Years with Company (T)
Total	1974	--	--	(1)	(4)	(2)	(3)	--	.300
	1976	(4)	--	(1)	(5)	(2)	(3)	--	.376
<u>Large Stable Industries</u>									
1. Energy	1974	(1)	--	--	--	--	--	(2)	.691
	1976	(1)	--	--	--	--	--	(2)	.616
2. Industrial Equip.	1974	(1)	--	(2)	(3)	--	--	(4)	.556
	1976	(1)	--	(2)	--	--	--	--	.575
3. Forest Products	1974	(1)	--	--	(2)	--	--	--	.494
	1976	(1)	--	--	--	--	--	--	.365
4. Information Processing	1974	(1)	--	--	--	--	--	--	.381
	1976	(1)	--	--	--	--	--	--	.465
<u>Small Stable Industries</u>									
1. Utilities	1974	(2)	(3)	(1)	--	--	--	(4)	.627
	1976	(3)	(2)	(1)	--	--	--	--	.680
2. Multi-Co's.	1974	(5)	(3)	(4)	(1)	--	--	(2)	.465
	1976	(2)	(1)	--	--	--	--	(3)	.594
3. Finance	1974	(3)	--	(5)	(1)	(6)	(2)	(4)	.497
	1976	(2)	--	--	(1)	(3)	(4)	--	.490
<u>Volatile Industries</u>									
1. Aerospace/Defense	1974	--	--	(2)	--	--	--	(1)	.883
	1976	(1)	--	--	(3)	(2)	--	(4)	.957
2. Metals	1974	--	--	--	(1)	--	--	--	.189
	1976	(2)	--	(1)	--	--	--	--	.614
3. Consumer Goods	1974	(2)	(1)	--	--	--	--	--	.411
	1976	--	--	--	(1)	(2)	--	--	.131
4. Electronics Electrical	1974	(2)	--	(1)	--	--	--	--	.500
	1976	--	(2)	(1)	--	--	--	--	.480
5. Leisure	1974	(2)	--	(1)	--	--	--	--	.574
	1976	--	--	--	--	(1)	--	--	.223
<u>Others</u>									
1. Distribution	1974	--	--	--	(1)	(2)	--	--	.259
	1976	--	--	--	(1)	--	--	--	.280
2. Transportation	1974	--	--	--	--	--	--	--	.096
	1976	--	--	--	--	(1)	--	--	.122

*R² values reflect contributing variables at .10 level of significance and above

For the finance companies, however, net profit is the most significant variable in explaining the variation in CEO compensation. Other variables of importance include number of employees, profit margin and return on investment for both years. The most significantly consistent variables for the multi-companies are assets, experience (years of tenure) and number of employees. Similar to the energy companies, experience seems to have a significantly important relationship with CEO compensation for multi-companies.

In the third group of industries the number of employees appears as a significantly meaningful variable only during one of the two years (the multiple R^2 value for the year with employees in the equation is always higher than the other year). The aerospace/defense industry has the highest R^2 of any other industry for both years but there is little consistency between the list of significant variables from one year to the other. This perhaps can be attributed to the small number of companies in this industry and the apparent CEO changes within this industry. (The average CEO tenure dropped from 25 years in 1974 to 17 years in 1976). For four of the five industries in this volatile group there is no consistency between significant variables in 1974 and 1976 equations. In the electronics/electrical group there is evidently a significantly strong relationship between CEO compensation and sales. The other significant variables are number of employees in 1974 and assets in 1976.

The "Others" industries group has relatively weak properties. The lack of consistently significant relationships between the variables and CEO compensation may be associated with the fact that the industries in this group consist of many divergent groups of companies (e.g., airlines, railroads, trucking for transportation). In the distribution companies (which represent different types of wholesalers, agents, and retailers) there is a significant relationship between net profit and CEO compensation for both years. But the transportation industry has the weakest properties among all the 14 industries in this study. In this industry the CEO compensation is regulated by different local and federal agencies (i.e., Civil Aeronautics Board, Federal Aviation Administration, Maritime Commissions, etc.) which have different charters and public obligations.

CONCLUSIONS

The above findings and discussions lead to a number of interesting conclusions.

1. Size (number of employees, assets, sales and net profit) and performance variables (return on investment and profit per sales) are helpful constructs in assessing the CEOs compensation.
2. The CEO compensation in large stable industries tends to be primarily related to the number of employees.
3. The CEO compensation in stable small industries is most often related to profit and sales.
4. The CEO compensation in the volatile industries may not be consistently related to any of the above variables from year to year.
5. The CEO compensation in the "Other" industries is not consistently related to any of the above variables considered.
6. The CEO compensation relationship with size and performance variables tends to be highly idiosyncratic across industries.

These conclusions suggest that in spite of the common belief that the CEO compensation is based on sales and profits, the CEO compensation relates to different variables in different industries. The present study does not include the influence of organizational endogenous factors in CEO compensation. Baker (1) points to corporate power structure, board of directors responsibility and authority, motivational assumptions and the CEO's attitude toward pay as four possible factors. Within each company and industry there are norms and folklores relating to CEO compensation. Perhaps it is the effect of the endogenous factors that creates an idiosyncratic macrocompensation behavior across firms. The future research in CEO compensation would need to expand into the combined effects of endogenous and exogenous factors and processes on CEO compensation in different firms and industries.

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