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Influence of shareholder concentration on Chief Executive Officer (CEO) compensation| Empirical evidence

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INFLUENCE OF SHAREHOLDER CONCENTRATION ON CHIEF

EXECUTIVE OFFICER (CEO) COMPENSATION:

EMPIRICAL EVIDENCE

By

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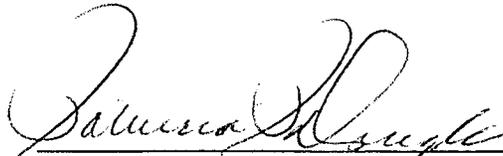
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Abstract

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Influence of Shareholder Concentration on Chief Executive
Officer (CEO) compensation: Empirical Evidence (16 pp.)

Director: Patricia P. Douglas ρ ρ $\mathcal{S}$

The purpose of this research is to replicate and confirm the work of Santerre and
Neun [1986] by utilizing more recent data in examining the relationship between
degree of stockholder control and Chief Executive Officers' (CEOs') compensation.
The Santerre-Neun study is a cross-sectional analysis of CEOs' cash salaries and
bonuses for 1980. However, the empirical results from this study support their
finding that an inverse relationship exists between the degree of stockholder
concentration and CEO compensation and further, offering stock ownership to
CEOs', contingent upon firm performance, is a valuable mechanism for firms to
consider. The authors also found that the level of executive compensation is partly
influenced by the degree of stock dispersion for firms which possess some degree
of momopoly power. This study consists of 89 firms in the Steel, Petroleum, Drug,
and Chemical industries for 1986.

Preface

There are a number of people whom I would like to acknowledge and thank for their contributions to this paper. First, my thanks go to James V. Koch, President - Old Dominion University and former President of The University of Montana, who has not only been a source of encouragement for many years, but whose guidance has fostered me to undertake this research paper.

I am also thankful to my committee: Patricia Douglas, Teresa Beed, and Dennis O'Donnell for their support, helpful comments, and guidance in getting this document perfected. I would also like to thank Roy Regel for helpful comments, Patricia Metz for her encouragement, support, and for proof reading the first draft of this paper, and finally, Kaim Samahon for inspiring me in pursuing a Masters degree in business - thank you very much for your input.

Table of Contents

List of Tables

INFLUENCE OF SHAREHOLDER CONCENTRATION ON CHIEF EXECUTIVE OFFICER (CEO) COMPENSATION: EMPIRICAL EVIDENCE

I. Introduction

Yearly publications of total remuneration packages earned by corporate Chief Executive Officers' (CEOs') and the degree of shares owned by them reported in the business press have become a matter of public concern and scrutiny. It is indeed plausible for some readers to look casually at CEO compensation totals and infer that the CEOs' are overpaid or underpaid, while others will be more analytical and take a closer look at these data. Consequently, shareholders may be even more concerned that CEOs' act in the shareholders' interest and that CEOs' remunerations reflect performance.

Stock ownership is an important means by which the managers are induced to act in the shareholders' interest [Benston, 1985]. One important base for measuring CEOs' competence is an assessment of the degree to which their decision-making has directly resulted in maximizing shareholders' wealth. Murphy [1985] posits that as measured by the rate of return on common stock, a strong, positive statistical relationship exists between executive pay and company performance. According to economic theory, managers (CEOs') are assumed to act in the best interest of shareholders by utilizing firm resources to maximize profits; hence, CEOs' are referred to as "profit maximizers." However, managers often tend to digress from the shareholder wealth maximization

1

criterion by focusing managerial decisions on attaining personal goals at the expense of shareholders. Consequently, a broader assessment base is needed.

Market performance provides a broad base because corporate decisions are constantly being analyzed by the market, particularly their effect on future cash flows which is reflected in a firm's current share price. Conversely, using share price movements as a basis for CEO compensation causes problems. Stock prices are often affected by factors beyond the control of the CEO, and thus will greatly increase CEOs' exposure to risk. For example, the stock price may well be influenced by the overall state of the economy and stock market. If a performance measure is utilized to assess an executive, he or she should have a reasonable degree of control over the results being measured.

During the 1950s and 1960s stock options, which was a major component of executive compensation packages, was a reliable mechanism in aligning the interest of shareholders and management [Rappaport, 1986]. But due to poor stock market performances in the 1970s, stock option plans proved to be substantially less valuable and many executives opted not to exercise their options. However, in the 1980s stock options have been a visible component of CEO compensation packages. The re-emergence of stock options in the 1980s as a major component in CEO compensation may be partly due to the overall performance of the stock market and the economy. Whether stock price provide a good basis of compensation is unclear from empirical research. **Coughlan & Schmidt [1985]** found that a strong, positive correlation exits between changes in executive compensation and stock price performance (adjusted for

marketwide price changes), while **Ciscel & Carrol [1980]** posit that the base salary received by management is determined through the interaction of supply and demand.

The ownership structure of a firm has a direct impact on the activities of CEOs and acts as a mechanism in aligning the activities of CEOs' [Benston, 1986]. The degree of corporate control has a direct influence on the level of compensation earned by CEOs [Santerre & Neun, 1986]. **Dyl [1988]** suggests the levels of management compensation are related to the degree to which a firm is closely held because major shareholders have a meaningful economic incentive to engage in monitoring activities of the manager. But, **Neun & Santerre [1986]** suggest that the ability of the dominant shareholder to exert increasing amounts of partial control over management gradually increases as the percentage of the stock owned by the dominant shareholder(s) rises.

The purpose of this study is to replicate **Santerre and Neun's** [1986] theoretical model and to examine its validity with more recent data. Therefore, this study tests the hypothesis that the level of executive compensation is partly influenced by the degree of stock dispersion for firms which possess some degree of monopoly power.

This study uses, similar to **Santerre and Neun's [1986]** study, a Herfindahl index of stock dispersion to indicate the degree to which a company is owned by a few powerful stockholders. The index can take a value between zero and ten thousand. When a firm's shareholdings are dispersed among many shareholders, with no single and/or group of shareholders owning a significant amount of shares, the index takes on a value towards the lower spectrum of the index. A dispersed ownership structure deprives any single owner of the ability to monitor and discipline the movements and the

strategic decision-making horizons of the CEO because it will be too costly to monitor. Recognizing the absence of shareholders with significant control over voting rights, CEOs' could deviate from shareholder wealth maximization goals and seek personal goals at the expense of shareholders which would be detrimental to the firm.

Consequently, when the shareholdings are owned by a powerful few, the index takes on a value towards the upper spectrum of the index indicating concentration of ownership. When the corporate stock ownership is owned by a few shareholders, the CEO will be cognizant of the power groups that control the voting rights of the firm and act accordingly; corporate power is likely to rise incrementally as the dominant fraction(s) of the outstanding stocks come(s) closer to owning 51% of the stock.[1] Furthermore, the CEO can be monitored better when the share ownership of a company is concentrated among a few shareholders. The Herfindahl index of stock dispersion captures the concentration of share ownership among a few powerful individuals or many owners at a given point in time.

II. The Empirical Model

This study investigates the relationship between CEO compensation and a firm's shareholder concentration identified by the Herfindahl index. The empirical model takes the following form:

$$R = Bo + B1 \text{ LASSETS} + B2 \text{ PRATE} + B3 \text{ LHERF} + e \quad (1)$$

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[1]. See [Neun & Santerre, 1986].

where

R = Cash salary and bonus for CEOs' in 1986.

LASSETS = Natural logarithm of the average of total assets for the period 1984-1986.

PRATE = Average of profit rate (accounting profits divided by sales) for the period 1984-1986.

LHERF = Natural logarithm of the Herfindahl index of stock dispersion for 1986.

e = Error term

The hypothesis is that a firm's total assets will be positive (B1 > 0). Prior studies have indicated that the assets of a firm are positively related to CEO compensation, **Abraham [1988]** and **Dyl [1988]**. **Finkelstein & Hambrick [1989]** postulates that bigger firms tend to pay more compensation because the CEO oversees substantial resources, rather than because of the firms' ability to pay more or because of their number of hierarchical pay levels. The accounting profit rate indicates the CEO's ability to direct the activities of the company profitably. **Lewellen & Huntsman [1970]** suggest that profitability is more important than sales in determining executive compensation. Therefore, the parameter estimate **PRATE**, the average of accounting profit rate, is expected to be positive (B2 > 0).

The Herfindahl index is computed as follows:

$$HERF = \sum_{i=10} (Si)^2 \quad (2)$$

where Si is the percentage of the firm's outstanding shares that are held by the ten largest

shareholders.[2] Although the construction of the Herfindahl index is slightly different from **Santerre and Neun's [1986]**, the index measures the degree to which the stockownership is concentrated. The construction of the Herfindahl index is followed according to **Koch [1980]**.

When each stockholder in the top ten owns a large percentage of the outstanding shares, each one has the incentive and the power to foster managerial decision making that will be in the shareholders' interest. The Herfindahl index enter the model in log-form, to comply with the Santerre/Neun theoretical model, and is hypothesized to have an inverse relationship with CEO compensation; hence, the parameter **LHERF** is expected to be negatively correlated with R, cash salaries and bonuses of CEOs, (B3 < 0).

Data for CEO total cash salaries and bonuses were derived from the Forbes Magazine.[3] Data regarding total assets and profit rate were derived from the Compustat PC-Plus data base. Lastly, data for the Herfindahl index were derived from the Disclosure data bank. The sample of firms includes 89 Fortune 500 firms: in the Steel industry (n=10), Petroleum industry (n=29), Chemical industry (n=26), and Drug

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[2]. **Santerre & Neun [1986]** used a different computation to construct the Herfindahl index. Their index was computed as follows: Σ (Pi/.51) ^{2}, where Pi is the percentage of the firm's outstanding shares that are held by the ith largest shareholders such that the sum of Pi's is equal to 51% (majority control). Based on their procedure, the index can take on a value between zero and one. The index is equal to one if a single shareholder has majority control of the firm and approaches zero as the number of shareholders increases and as shareholdings become more equally distributed among a given number of shareholders.

[3]. Forbes (1987: 162-205).

industry (n=24).[4] In 1986, the time of data collection, all the companies were held publicly and listed in the Fortune 500. Most firms had more than one SIC-Code due to their diversification strategies; hence, the companies were picked according to their industry-specific SIC-Code.

III. Empirical Results

The results of the regression model (1) described above are shown in Table 1. The ownership concentration variable (i.e. the natural logarithm of the Herfindahl index of stock dispersion) is significant at the .05 level and has the anticipated negative relationship to the level of cash salaries and bonuses earned by CEOs'. This result is consistent with the hypothesis that the level of executive compensation is partly influenced by the degree of stock dispersion for firms which possess some degree of monopoly power.

The other coefficients in the regression model, namely total assets and profit rate, have the anticipated positive relationship with the dependent variable, cash salaries and bonuses of CEOs', but only total assets is significant at the .01 level while profit rate, although positive, lacks statistical significance even at the .10 level. Thus, CEO compensation was based largely on the firm size and the degree of stockownership in

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[4].   These are the same industries **Santerre & Neun [1986]** investigated in their study and these industries were perceived as oligopolistic and having either "very high" or "substantial" barriers to entry.

1986.

Although earlier studies [Cooley & Edwards, 1982] have found that the profit rate was a determinant and a significant variable in assessing managerial compensation, results of this study suggest that it is insignificant in this model. Perhaps in 1986 compensation committees were advocating value and growth creation as parameters for CEO performance assessment and compensation, as opposed to the accounting profit rate that may have been one of the basis for assessing cash salaries and bonuses for CEOs' in 1980. On average the CEOs' in 1986 earned a cash salary and bonus of $775,438 and the Herfindahl index of stock dispersion on average had a value of 340 for the same year.

The results of regression analyses based on the theoretical model (1) for the chemical, drug, petroleum, and steel industries are shown in Table 2. The model is significant in the drug industry and a relatively high proportion of the variance in CEO cash salary and bonus is explained by the right-side variables. Further, all the independent variables in the drug industry have their hypothesized values, but, only the average of total assets is significant at the .01 level. Compared to other industries included in this study, on average, the highest cash salary and bonus is earned in the Chemical industry ($845,269) while the lowest is in the Petroleum industry ($759,621). Further, on average, the Steel industry has the highest Herfindahl index, which means the ownership structure in the Steel industry is highly concentrated relative to the other industries. The Petroleum industry, on average, has the highest total assets and the Drug industry, on average, has the highest accounting profit rate.

The overall regression model (1) for the whole sample of firms representing four different industries is significant at the .01 level and has a coefficient of determination (R-Squared Adjusted) of .4459. Given that this study uses a cross-sectional analysis, collectively the model explains a significant proportion of variance in CEO cash salary and bonus, which is quite high for a study of this nature.

From Table 1, *ceteris paribus*, the partial relationship between a change in the Herfindahl index of stock dispersion (ΔLHERF) and a change in the cash salaries and bonuses earned by the CEOs (ΔR) may be expressed as follows:

$$\Delta R = -91.0437 \quad (\Delta LHERF) \qquad (4)$$

This same relationship can be expressed in percentage terms as follows:

$$\Delta R = -.11740 \quad (\Delta LHERF) \qquad (5)$$

simply by dividing equation (4) by the mean level of CEO cash salary and bonus for 1986, $775,438,[5] so that ΔR is the average percentage change in compensation associated with a change in the Herfindahl index. This implies that a 1% increase in the Herfindahl index is associated with a 11.74% reduction in CEO cash salary and bonus.

The most important point in this study is that the results of the model (1) demonstrates that the Herfindahl index of stock dispersion is inversely related to CEO salaries and bonuses as hypothesized in the **Santerre & Neun [1986]** study and is

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[5].	Mean	Min	Max
a) LHERF	2.557	1.64	3.99
b) LASSETS	3.480	2.40	4.83
c) SALARY & BONUS	775.438	200.00	1577.00

statistically significant.

IV. Summary and Conclusion

The influence of the structure of stockownership of a firm on the level of cash salary and bonus earned by CEOs' is an important conceptual linkage in the incentive argument which is common in accounting and economic research. **Neun & Santerre [1986]** contend that a minimum of 17% to 19% stockownership is required by the dominant stockholder before being able to exert a minimal amount of control over managers.

Most Fortune 500 firms offer incentives such as stock options (SO) and stock appreciation rights (SAR) contingent upon firm performance. When the firm reaches its corporate goals, the CEO is compensated according to their contractual agreement. When the CEOs' exercise the SOs and SARs, they become part owners of the firm. Rewarding CEOs by offering part ownership in the firm, contingent upon firm performance, is a valuable mechanism for corporate compensation committees to implement. Shareholders thereby secure CEOs' commitment to maximize shareholder wealth by offering stock ownership. Ownership also acts as a means of "bonding" executives to their firms **[Eaton & Rosen, 1983]**.

To test empirically if such incentives as stock ownership influenced CEO salaries and bonuses in 1986, a separate regression was performed. The regression used the following variables: average of total assets (1984-1986: LASSETS), Herfindahl index of

stock dispersion (1986: LHERF), and shareholdings by CEOs (1986:CEO-OWN) as independent variables. Results of the regression are presented in Table 3. The variable LHERF and variable CEO-OWN have negative relationships with the dependent variable, CEO Salaries and Bonuses, the former significant at the .05 level and the later significant at the .10 level. The results imply that when ownership is offered to the CEO in the company and when the share ownership structure is concentrated among a few powerful individuals, the CEOs' are paid less compensation. The total assets variable has a positive relationship with the dependent variable and is significant at the .01 level; indicating that the size of the firm contributes significantly towards CEOs' salaries and bonuses. The overall model is significant at the .01 level (F-Ratio= 25.126) and explains 45% of the variance in cash salaries and bonuses for 1986.

Cash compensation (i.e., salary plus bonus) was used as a measure of CEO compensation to comply with **Santerre and Neun's [1986]** study. Consequently, this measure excludes the consideration of the whole remuneration package usually presented to CEOs'; however, **Benston [1985]** and surveys by **Booz, Allen, and Hamilton [1983]** and **Hay Associates [1981]** report salaries and bonuses represent between 80% to 90% of total remuneration.[6] The findings of this study confirms **Santerre & Neun's [1986]** contention that an inverse relation exists between the degree of stockholder control and executive compensation and further, offering stock ownership to CEOs', contingent upon firm performance, is a valuable mechanism for firms to consider.

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[6]. **See Lambert & Larcker [1985].**

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Table 1

Regression Results: Cash Salary & Bonus for the CEOs in the Chemical, Drug, Petroleum, and Steel industries (1986).

Independent Variables	Estimated Coefficients (T-ratio)
INTERCEPT	-367.5705 (-1.460)
LASSETS	383.7520 (7.652)*
PRATE	450.2808 (1.546)
LHERF	-91.0437 (-1.809)**

R-Squared Adjusted = .4459
F-Ratio = 24.611 *
N = 89

Dependent Variable = CEO Cash Salary and Bonus for 1986

LASSETS = Natural logarithm of the average of total assets for the period 1984-1986.

PRATE = Average of profit rate (accounting profits divided by sales) for the period 1984-1986.

LHERF = Natural logarithm of the Herfindahl index of stock dispersion for 1986.

*Significant at the 1% level.

**Significant at the 5% level.

Table 2

MULTIPLE REGRESSION RESULTS AND CEO SALARY & BONUS VALUES
BY INDUSTRY

Regression Results: Cash Salary and Bonus for the CEOs in the Chemical (N=26), Drug (N=24), Petroleum (N=29), and Steel (N=10) industries.

Variables	Estimated Coefficients (T-Ratios)			
	Chemical Industry N=26 (Mean) [T-Ratio]	Drug Industry N=24 (Mean) [T-Ratio]	Petroleum Industry N=29 (Mean) [T-Ratio]	Steel Industry N=10 (Mean) [T-Ratio]
INTERCEPT	-210.743	-815.422	-913.828	271.422
LHERF	-148.847 (2.622) [-1.938]	-98.408 (2.436) [-.823]	-64.798 (2.569) [-.943]	109.156 (2.646) [.987]
LASSETS	432.000 (3.408) [5.037]*	556.682 (3.236) [4.268]*	492.353 (3.782) [6.725]*	7.535 (3.372) [.052]
PRATE	-315.338 (.0812) [-.681]	289.158 (.1592) [.617]	-480.371 (.0459) [-.672]	166.769 (.080) [.209]
F-Ratio	10.514	13.204	17.904	.362
R-Sq Adj	.5331	.6142	.6443	-.2704
Average Salary & Bonus	$845,269	$792,416	$759,621	$559,000
Maximum	1,488,000	1,269,000	1,577,000	825,000
Minimum	408,000	305,000	200,000	412,000

* Significant at the 1% level.

Table 3

Regression Results: Cash Salary & Bonus for the CEOs in the Chemical, Drug, Petroleum, and Steel industries (1986).

Independent Variables	Estimated Coefficients (T-ratio)
INTERCEPT	-167.2230*
LASSETS	353.6565 (7.187)*
CEO-OWN	-20.3690 (-1.844)***
LHERF	-105.6952 (-2.216)**

R-Squared Adjusted = .4513
F-Ratio = 25.126 *
N = 89

Dependent Variable = CEO Cash Salary and Bonus for 1986

LASSETS   = Natural logarithm of the average of total assets for the period 1984-1986.

CEO-OWN   = Stockownership of the CEO as a percentage of the total outstanding shares for 1986.

LHERF   = Natural logarithm of the Herfindahl index of stock dispersion for 1986.

*Significant at the 1% level.
**Significant at the 5% level.
***Significant at the 10% level.