CORPORATE DIVERSIFICATION AND CEO COMPENSATION: EVIDENCE FROM THE MODERATING EFFECT OF STOCK OWNERSHIP

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Abstract

The article is an attempt to assess whether Stock Ownership moderates the relationship between corporate diversification and CEO compensation. Based on agency theory, we develop the hypothesis of whether when CEOs hold a large fraction of their firms' outstanding stock, the CEOs are acting more as owners or shareholders than employees. This reduces the principal and agency relationship of agency theory, since CEOs are acting as owners rather than employees; thus the demand for further stock-based compensation is likely to be reduced because the interests of CEOs and shareholders are relatively aligned. For the purposes of this study, a sample of 2,448 CEO compensations across 1,622 firms from 1997 to 2002 was used to test several hypotheses. Corporate diversification was divided into two categories; international diversification and industry diversification. To test the hypotheses, multiple regression analysis was employed to examine stock ownership as a moderator variable on the relationship between international diversification and industry diversification and CEO total compensation with tenure, age, duality, and gender as control variables. The results indicate that stock ownership negatively and significantly influences the relationship between International diversification and CEO compensation. Additionally, the findings also confirm that stock ownership negatively and significantly influences the relationship between industrial diversification and CEO compensation. Our results are consistent with our hypotheses and indicate that firms with lower Stock Ownership produce larger interaction effects to increase international diversification and total compensation pay to CEOs, and firms with lower Stock Ownership, produce larger interaction effects to increase industry diversification and total compensation pay to CEOs.

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INTRODUCTION

Ryan and Wiggins (2002) explored a negative relationship between CEO fractional ownership and equity-based incentives. The result suggested that stock ownership reduces the need for additional incentive aligning mechanisms. Lambert et al. (1987) found that CEO compensation was lower when the CEO's ownership was higher and when there was an internal member on the board other than the CEO who owned at least 5% of the shares.

CEO stock ownership is strongly related to compensation (Cyert, Kang & Kumar, 2002; Sanders & Carpenter, 1998). When CEOs hold a large fraction of their firms' outstanding stock, the CEOs are acting more as owners or shareholders than employees. This reduces the principal and agency relationship of agency theory, since CEOs are acting as owners rather than employees; thus the demand for further stock-based compensation is likely to be reduced because the interests of CEOs and shareholders are relatively aligned (Bryan, Hwang & Lilien, 2000; Jensen & Meckling, 1976). Moreover, internationally diversified firms involve more complex work than domestic firms and industrially diversified firms also involve multi-segmented business; which increases the complex work over single-segment firms. In order to incentivize the CEO's work for shareholders' interests, higher international diversified firms and multi-segment business firms offer higher proportions of company stock making the CEO act as shareholder; in the process reducing agency costs and the requirement of CEO compensation. Thus, CEO stock ownership is negatively associated with CEO compensation.

Considering the research results suggesting that stock ownership may moderate corporate diversification and CEO compensation, this study employs stock ownership as a moderator to explore their influence on the relationship between international diversification and industrial diversification and total compensation. A sample of 2,448 CEO compensations across 1,622 firms from 1997 to 2002 was used to test several hypotheses. Corporate diversification was divided into two categories; international diversification and industry diversification. To test the hypotheses, multiple regression analysis was employed to examine stock ownership as a moderator variable on the relationship between international diversification and industry diversification and CEO total

compensation with tenure, age, duality, and gender as control variables.

The result shows that stock ownership negatively and significantly influences the relationship between international diversification and CEO compensation. Additionally, the finding also shows that stock ownership negatively and significantly influences the relationship between industrial diversification and CEO compensation.

The rest of the paper is organized as follows. Section 2-literature review and hypotheses development, section 3-outline of the research design, data and methodology, section 4-results and discussion of findings, section 5-reports and discussion of the empirical results, and section 6-conclusions from our findings.

EMPIRICAL LITERATURE AND HYPOTHESES DEVELOPMENT

CEO stock ownership is strongly related to compensation (Cyert, Kang & Kumar, 2002; Sanders & Carpenter, 1998). When CEOs hold a large fraction of their firms' outstanding stock, the CEOs are acting more as owners or shareholders than employees. This reduces the principal and agency relationship of agency theory, since CEOs are acting as owners rather than employees; thus the demand for further stock-based compensation is likely to be reduced because the interests of CEOs and shareholders are relatively aligned (Bryan, Hwang & Lilien, 2000; Jensen & Meckling, 1976).

Moreover, internationally diversified firms involve more complex work than domestic firms and industrially diversified firms also involve multi-segment business; which increases the complex work over single-segment firms. In order to incentivize the CEOs work for shareholders' interests, higher international diversified firms and multi-segments business firms offer higher proportions of company stock making the CEOs act as shareholders; in the process reducing agency costs and the requirement of CEOs compensation. Thus, CEO stock ownership is negatively associated with CEO compensation.

Ryan and Wiggins (2002) explored a negative relationship between the CEO's fractional ownership and equity-based incentives. The result suggested that stock ownership reduces the need for additional incentive aligning mechanisms. Lambert et al. (1987) found that CEO compensation was lower when the CEO's ownership

was higher and when there was an internal member on the board other than the CEO who owned at least 5% of the shares.

Stock ownership affects CEO compensation (Grace, 2004; Bryan, Hwang & Lilien, 2000; Cyert, Kang & Kumar, 2002). Moreover, stock ownership also effects firm diversification (Kim, Kim & Pantzalis, 2001). Internationally diversified firms involve more complex work than domestic firms and industrially diversified firms involved multi-segmented business; which increases the complex work more than for single-segment firms. In order to incentivize the CEO's work for shareholders' interests, more highly internationally diversified firms and multi-segmented business firms offer a higher proportion of company stock making CEOs act as shareholders, in the process reducing agency cost and the requirement of CEO compensation. If stock ownership is negatively associated with a firm's international diversification, then it should have similar implications for total compensation due to agency cost reduction. For example, research suggests that stock ownership is negatively associated with total compensation. (Cyert, Kang & Kumar, 2002); Lewellen et al. (1987); Yermack (1995); and Kole (1997) found that managerial stock ownership is unrelated to stock option compensation. Moreover, international diversification is positively associated with total compensation (Duru & Reeb, 2002).

Taking into account the research results suggesting that stock ownership may be the primary reason for the level and structure of CEO compensation, stock ownership may affect other relationships to CEO compensation. Specifically, the relationship between international diversification, industrial diversification and total compensation may change as stock ownership increases. The influence of international diversification, industrial diversification and total compensation may increase as stock ownership increases. Higher international diversification is associated with work that is more complex for CEOs than for domestic firm CEOs.

In contrast, CEOs who work in firms with a high international diversification and industrial diversification should be compensated with higher stock ownership for the increased work burden they carry. Therefore, stock ownership may moderate the relationship between international diversification and industrial diversification. The higher international and industrial diversification may relate to a lower total compensation pay.

This interaction effect will be tested as follows:

Hypothesis H_{1aN} (null): Stock ownership will not moderate the relationship between international diversification and total compensation.

Hypothesis H_{1aA} (alternative): Stock ownership will moderate the relationship between international diversification and total compensation.

Hypothesis H_{1bN} (null): Stock ownership will not moderate the relationship between industrial diversification and total compensation.

Hypothesis H_{1bA} (alternative): Stock ownership will moderate the relationship between industrial diversification and total compensation.

DATA AND METHODOLOGY

RESEARCH MODEL

To test the hypotheses, multiple regression analysis was employed to examine stock ownership as a moderator variable on the relationship between international diversification and industry diversification and CEO total compensation with tenure, age, duality, and gender as control variables:

$$TC_{t,i} = y_0 + y_1 INTD + y_2 INDD + y_3 OWN + \\ + y_4 INTD*OWN + y_5 INDD*OWN + y_6 Tenure + \quad (1) \\ + y_7 Age + y_8 Duality + y_9 Gender + E_{t,i}$$

y_0 = the constant of regression equation

The dependent variable is total compensation (TC) measured as the sum of salary, bonus, value of restricted stocks granted, stock appreciation rights, value of stock options granted (Black-Scholes model), long-term incentive payouts, and other total compensation using Standard & Poor's Compustat ExecuComp database. Table 1 summarizes the dependent, independent and control variables included in the model as well as the measure and source for each variable. In total, the model includes dependent variable (TC), three independent variables (INTD, INDD, OWN), two moderating variables (INTD*OWN, INTD*OWN), and four control variables (tenure, age, duality, gender).

SAMPLE AND DATA COLLECTION

The sample consisted of secondary data collected from three databases and supplemented with additional data from the Securities and Exchange Commission (SEC).

Table 1: Dependent, Independent and Control Variables in Regression Model

Variable	Measure (Source)
Total Compensation (TC)	Total compensation for the individual year is comprised of the following: salary, bonus, other annual, total value of restricted stocks granted, total value of stock options granted (using Black-Scholes), long-term incentive payouts, and all other total compensation, then normalized total compensation.
INTD = International Diversification	Firm classified as multinational if it has foreign sales reported; otherwise, classified as domestic. (Compustat Geographic Segment File)
INDD = Industry Diversification	Firm classified as multi-segment if it has more than one business segment; otherwise, classified as single-segment. (Compustat Industry Segment File)
Stock Ownership (OWN)	The percentage of the company's shares owned by the named CEO officer.
Tenure	Years current CEO has held current position at the end of the fiscal year (ExecuComp).
Age	Age of CEO at the end of the fiscal year. (ExecuComp).
Duality	Considered 1 if the CEO is also the chairman; otherwise, 0. (ExecuComp)
Gender	Considered 1 if CEO is male; otherwise, 0 if female. (ExecuComp)

Company stock return data from the Center for Research in Security Prices (CRSP) along with financial statement data made available from Standard & Poor's Research Insight was included. For CEO data, Standard & Poor's (S&P) Compustat ExecuComp (hereafter, ExecuComp) database, based on the S&P 400, S&P 500, and S&P 600 indices composed of large, mid, and small-cap firms, was selected to alleviate the difficulty of extracting specific information from proxy statement and individual company reports. However, there is often missing data in ExecuComp, particularly relating to age and employment starting dates for CEOs. Thus, it was sometimes necessary to find that information using LexisNexis.

CEO compensation data was collected from ExecuComp from 1997-2002 and covers both total compensation and current compensation such as salary and bonuses. The data also contains long-term compensation such as long-term incentive plans, restricted stocks, stock appreciation rights, and stock options granted. Most studies of CEO compensation rely upon secondary data from filings with the Securities and Exchange Commission (Miller, 1995). Two Compustat files were used as databases to classify firms based on international diversification and industry diversification. Compustat's Geographic Segment File was used to classify a firm as multinational if it had any foreign sales reported; otherwise, it was classified as a domestic firm. Similarly, Compustat's Industry Segment File was used to classify a firm as multi-segment if it had more than one business segment; otherwise, it was classified as a single-segment firm.

DESCRIPTIVE STATISTICS

Each sample firm was classified into its primary Standard Industrial Classification (SIC) Code according to the 10-K product breakdown and then classified each firm according to the industry classification scheme suggested by Lippert & Moore (1995) and further modified in this study. To identify CEOs, we implemented a similar sample selection criterion as Murphy (1985). A CEO was included only if that individual was listed on the firm's financial statement during 1997-2002 and remained with the same firm for at least five years. This sample selection method is also consistent with Miller (1995). For this study 2,448 CEOs across 1,622 firms during the period 1997-2002 were identified. Frequency statistics for sample firms are presented in Tables 2 and 3.

RESULTS AND DISCUSSION OF FINDINGS

STATISTICAL TESTS

The current study makes use of several statistical tests provided by SPSS as follows:

1) Descriptive Statistics: means and standard deviations.

2) Pearson correlation coefficients were calculated to determine whether multicollinearity among the dependent variables is severe or not.

3) Multiple regression analysis was employed to examine firm performance to influence

and moderate the relationship between corporate diversification (both international and industrial) and

Table 2: Frequency Statistics for Sample Firms (n = 1,622)

Panel A: Filing Year		Observations	%
1997		113	7.0
1998		145	8.9
1999		1067	65.9
2000		193	11.9
2001		100	6.3
2002		4	0.0
Total firms		1622	100.0
Panel B: Type of Industry	**SIC Codes**	**Observations**	**%**
Aerospace and shipbuilding	3720-3829	65	4.0
Agriculture and metal	0000-1099, 1400-1499	18	1.1
Cars	3711-3716	26	1.6
Chemical, tire and leather	2800-2821, 3011-3199	42	2.6
Commodity	4812-4899	36	2.2
Computer and software	3570-3579, 7370-7389	180	11.1
Construction, wood, furniture and house	1500-1799, 2400-2599, 2840-2844, 3200-3299	58	3.6
Electric	3661-3699	115	7.1
Entertainment	7000-7369, 7400-7999	62	3.8
Finance	6000-6799	141	8.7
Food and tobacco	2000-2199	42	2.6
Health, education and law	8000-9999	64	3.9
Machinery	3510-3569, 3580-3652	88	5.4
Medical, photo and other	3841-3999	54	3.3
Paper and publishing	2600-2673, 2711-2780	54	3.3
Petroleum and refinery	1220-1389, 2911-2999	64	3.9
Retail and wholesale	5000-5999	201	12.4
Steel	3300-3496	62	3.8
Textile	2200-2399	25	1.5
Transportation	4011-4799	42	2.6
Utility	4911-4991	106	6.5
Other	2833-2836, 2851-2891	77	4.7
Total firms		1622	100.0

Table 3: Frequency Statistics for Sample CEOs (n=2,448)

Panel A: Filing Year		Observations	%
1997		335	13.8
1998		414	16.9
1999		828	33.8
2000		438	17.9
2001		362	14.9
2002		71	2.9
Total CEOs		2,448	100.0
Panel B: Type of Industry	**SIC Codes**	**Observations**	**%**
Aerospace and shipbuilding	3720-3829	96	3.9

Agriculture and metal	0000-1099, 1400-1499	34	1.4
Cars	3711-3716	42	1.7
Chemical, tire and leather	2800-2821, 3011-3199	73	3.0
Commodity	4812-4899	47	1.9
Computer and software	3570-3579, 7370-7389	299	12.2
Construction, wood, furniture and house	1500-1799, 2400-2599, 2840-2844, 3200-3299	86	3.5
Electric	3661-3699	161	6.6
Entertainment	7000-7369, 7400-7999	93	3.8
Finance	6000-6799	190	7.8
Food and tobacco	2000-2199	69	2.8
Health, education and law	8000-9999	93	3.8
Machinery	3510-3569, 3580-3652	138	5.6
Medical, photo and other	3841-3999	81	3.3
Paper and publishing	2600-2673, 2711-2780	81	3.3
Petroleum and refinery	1220-1389, 2911-2999	87	3.6
Retail and wholesale	5000-5999	306	12.5
Steel	3300-3496	102	4.2
Textile	2200-2399	34	1.4
Transportation	4011-4799	61	2.5
Utility	4911-4991	160	6.5
Other	2833-2836, 2851-2891	115	4.7
Total firms		2,448	100.0

total compensation.

Descriptive Statistics

Table 4 presents the following statistics for the variables in our regression model:

mean, median, standard deviation, and minimum and maximum. The sample statistics are divided into the dependent variable and three independent variables (Panel A), control variables (Panel B) and firm characteristics (Panel C) for the period 1997-2002. The average CEO in the sample was approximately 57 years, had been in the CEO position approximately 14 years, and had total compensation of approximately $2.35 million. A vast majority were male and about two-thirds of sample CEOs also held the Chairman position.

Test for Multicollinearity

Because multicollinearity between independent variables can cause large variances and covariances for the estimators of the regression coefficients, it becomes difficult to distinguish their relative influences. This problem is addressed by deriving the correlation coefficient matrix shown in Table 5 using the Pearson correlation coefficients test.

The correlation matrix in Table 5 shows that the strongest correlation coefficient among the independent variables was 0.369 between age and tenure. The second highest correlation coefficient was 0.341 between tenure and industry diversification. Gujarati (1988) suggests that simple correlations between independent variables should not be considered "harmful" unless they exceed 0.80 or 0.90. The Pearson correlations coefficient suggests that multicollinearity is not severe for the independent variables in this study.

Multiple Regression Analysis and Hypotheses Testing

Hierarchical regression analysis was used to test the two hypotheses on the moderating effects of stock ownership on the relationship between international diversification, industry diversification, and CEO compensation. Three steps were taken to enter the variables into the regression equation model. In the first step 1 (Model 1), total compensation and the four control variables weere entered: tenure, age, duality

Table 4: Descriptive Statistics

Panel A: Variables	Number of observations [a]	Mean	Median	Std. Deviation	Minimum	Maximum
Total Compensation	2,434	5,198.95	2,354.79	11,795.97	0	273,415.47
International Diversification	2,448	3.29	3	1.11	0	5
Industrial Diversification	2,448	2.55	2.33	1.57	1	10
Stock Ownership	2,448	8984.05	0.28	444303.97	0.00	21982950.44
Panel B: Control Variable						
Tenure [b] (day)	1,069	2,947.66	2,192	2,774.43	13	19,935
Age	1,288	56.91	57	7.75	36	89
Duality [c]	2,448	0.56	0.67	0.45	0	1
Gender [d]	2,448	0.96	1	0.18	0	1
Panel C: Firm Characteristics (000s)						
Assets	2,448	7.994	1,199.97	35,813.94	8.66	692,789
Sales	2,448	4,346.94	1,102.44	11,799.42	0	180,041.33
Capital Exp	2,426	312.11	51.39	1,270.14	0	31,672.5
EBIT/Sales	2,445	89.7	0.51	796.75	-10,537	30,877
R&D/Sales	1,464	0.22	0.03	2.7	0	96.1
Capital Exp/Sales	2,423	0.13	0.05	1.75	0	85.68
Market Value/Capital Exp	2,364	64.27	24.1	264.19	0.05	10996.64

Notes: [a] Compustat's Georpraphic Segment file limits the number of global segments to five; [b] Compustat's Industry Segment file limits the number of global segments to ten; [c] 0 = CEO is not chairperson; 1 = CEO is also chairperson; [d] 0 = female, 1 = male; ee in $ thousands

Table 5: Pearson Correlation Coefficient Matrix

Variables [a]	1	2	3	4	5	6	7	8
1.Total Compensation	1							
2.International Diversification	.144**	1						
3.Industry Diversification	.073**	.146**	1					
4.Stock ownership	.029**	-.188**	-.089**	1				
5.Gender	-.008	-.017	.056**	-.025	1			
6. Age	.125**	-.007	.169**	.119**	.108**	1		
7. Duality	.251**	-.003	.105**	.267**	.023	.271**	1	
8. Tenure	.195**	-.120**	.341**	.089**	.127**	.369**	.297**	1

Notes: values [a] of n ranged from 1,069 to 2,448; [b] *p < 0.01; ** P <.05. This table shows the correlations between variables by using Pearson Correlation Coefficients

and gender. In the second step 2 (Model 2), the three predictor variables - international diversification (*INTD*), industry diversification (*INDD*), stock ownership (*OWN*), - were added to the previous regression. Finally, in step three (Model 3), the two moderating variables measured as cross products- (*INTD*OWN*) and (*INDD*OWN*)-were

added to obtain the full regression model used to test the hypotheses.

The results of the three regression models are presented in Table 6. In Model 1, all four control variables were significant. In Model 2, three control variables: gender, duality and tenure are significant and three of the

predictor variables were significant (INTD, INDD, OWN). In Model 3, the control and predictor variables retained their significance from Model 2 and all of the moderating variables were significant. Therefore, all of two hypotheses are supported by the results.

Table 6 provides the results of the regression analyses to test hypotheses H_{1aA} and H_{1bA}.

For the hypothesis H_{1aA}: Stock ownership will moderate the relationship between international diversification and total compensation.

The results of the interaction term, involving both stock ownership and international diversification (β = -.563, t = -4.580, p =.000), were found to be negatively significant. Thus, the results support hypothesis H_{1aA} that stock ownership negatively moderates the relationship between international diversification and total compensation.

For the hypothesis H_{1bA}: Stock ownership will moderate the relationship between industrial diversification and total compensation.

The results of the interaction term, involving both

stock ownership and industrial diversification (β = -.739, t = -3.794, p = .000) were found to be negatively significant. Thus, the results support hypothesis H_{1bA} that stock ownership negatively moderates the relationship between industrial diversification and total compensation.

A test was performed to determine the moderating effect of CEO stock ownership on the relationship between corporate diversification and total compensation. The significance of interaction terms relating to hypotheses H_{1aA} (p < .001) and H_{1bA} (p < .001) indicates a strong interaction between CEO stock ownership and both international diversification and industrial diversification, respectively. Thus, the results provide support for both hypotheses H_{1aA} and H_{1bA}. Therefore, the findings show that CEO stock ownership strongly moderates international diversification and total compensation, and industrial diversification and total compensation respectively.

Table 6: Results of Regression Equations Model 1 Analysis for Testing Moderating Effect of Stock Ownership on the Relationship between Corporate Diversification and Total Compensation

Variabke	Model 1	Model 2	Model 3
y_1 **International Diversification (INTD)**		.121*** (6.293)	.223*** (7.611)
y_2 **Industry Diversification (INDD)**		.125*** (6.425)	.333*** (5.766)
y_3 **Stock Ownership (OWN)**		-.216*** (-10.908)	1.076*** (4.868)
y_4 **International Diversification * Stock Ownership (INTD*OWN)**			-.563*** (-4.580)
y_5 **Industry Diversification * Stock Ownership (INDD*OWN)**			-.739*** (-3.794)
y_6 **Tenure**	.068** (3.314)	.121*** (6.126)	.131*** (6.635)
y_7 **Age**	-.038† (-1.850)	-.021 (1.076)	-.015 (-.784)
y_8 **Duality**	.171*** (8.286)	.162*** (8.218)	.195*** (8.128)
y_9 **Gender**	-.067** (-3.353)	-.060** (-3.133)	-.060** (-3.199)
Adjusted R^2	.039	.130	.142
Change in adjusted R^2		.092***	.014***

*Notes: [a]n= 2436; [b]Beta weights and t-values reflect results for the full model † p < .10; *p < .05; ** p < .01; *** p < .001; When the predicted sign is either (+) or (-), then the p value is a one-tailed test; when the predicted sign is (?), then the p value is a two-tailed test*

Conclusions

This study explores whether stock ownership moderates corporate diversification and CEO compensation. To ensure better accuracy, this study divides corporate diversification international diversification and industrial diversification. This study looked at CEOs who held large fractions of their firms' outstanding stock making them act more as owners or shareholders than employees; in the process reducing the principal and agency relationship of agency theory.

The result supports the premise that stock ownership negatively influences and moderates the relationship between international diversification and total compensation. This is the first study to examine whether stock ownership negatively moderates the relationship between international diversification and total compensation. The fact that stock ownership interaction on international diversification is negatively associated with total compensation suggests that firms need to be particularly concerned when CEOs own more of the outstanding stock of firms. This situation produces interaction effects that decrease international diversification and lower pay to CEOs total compensation.

The result of the interaction term involving both stock ownership and industrial diversification was found to be negatively significant. Thus, the results show stock ownership negatively moderates the relationship between industrial diversification and total compensation. This is also the first study to examine whether stock ownership negatively moderates the relationship between industrial

diversification and total compensation. The fact that the stock ownership interaction on industrial diversification was found to be negatively related to total compensation suggests that firms need to be particularly concerned when CEOs owns more of the outstanding stock of firms. This situation produces interaction effects that decrease industrial diversification and total compensation pay to CEOs.

In conclusion, the results show that stock ownership negatively and significantly moderates the relationship between international diversification and CEO compensation. Additionally, the finding also shows that stock ownership negatively and significantly influences the relationship between industrial diversification and CEO compensation. These findings will help decision makers, such as boards of directors, investors, shareholders and CEOs construct optimal compensation contracts that reduce agency cost and maximize shareholder wealth in the future.

Limitations of this Study

This study only uses six sample years. Using data for a longer length of time would provide a better sample. The scope of the research is limited to corporate annual reports. Interim reports, monthly reports, and prospectuses, are not included in this study, which may provide important information for research. This study relied on public company data due to the difficulty in accessing private company information, such as annual reports. Therefore, the results may not be applicable to the market as a whole

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