EVIDENCE ON BOARD SIZE AND ITS IMPACT ON CEO PAY-PERFORMANCE SENSITIVITY

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Abstract

Recent literature asserts that board size is one of the crucial determinants in board monitoring. We conjecture optimal board size leads to effective and efficient decision-making. Using a U.S. firm sample from year 1996 to 2005, we examine whether board size has any impact on one of the main tasks of board monitoring – appropriate compensation for CEOs. Specifically, we investigate if board size is associated with CEOs' pay-performance sensitivity. Agency theory suggests top managers' compensation be structured in alignment with shareholder wealth. If a board is vigilant, managers who create (destroy) wealth should be rewarded (penalized). By using value added models, we construct a new sensitivity measure of CEO compensation to wealth added per share. Our findings indicate that there is a non-linear relationship between board size and CEO pay-performance sensitivity. As the board size becomes bigger, the pay-performance sensitivity follows a pattern that first increases and then decreases.

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1. Introduction

One of the most important tasks of corporate boards is to select, evaluate, and approve appropriate compensation for the company's executive officers. The infamous compensation packages received by former NYSE chairman, Richard Grasso, and former CEO and Chairman of Fannie Mae, Franklin Raines, draw criticism on the insensitivity of the boards over CEO compensation. Under both cases, the compensation packages were approved by the board. While boards of directors are the designated monitor of shareholders, oftentimes they seem to be too slow to react if they act at all. Further, according to a recent survey conducted by the Corporate Library, the average annual pay of CEOs at S&P 500 companies increased from $8.1 million in 2003 to $13.5 million in 2005. In March 2007 the Congress was considering a bill to require U.S. public companies to give shareholders the ability to cast non-binding votes on executive pay.[1] While many argue that this proposed Shareholder Vote on Executive Compensation Act

(also known as "say-on-pay" bill) distracts boards and discourages top executives from serving on public companies, the attempt indicates some inclination of policy-makers to indirectly return some authority which is traditionally designated to the board of directors to shareholders. The goal of this proposed say-on-pay bill is similar to what has already been adopted in the United Kingdom, Australia, and Sweden. The change in legislation's attitude suggests policy-makers do not often believe boards can do an adequate task in aligning incentives of top managers with shareholders through compensation. Hence the proposal exerts pressure on boards to be more efficient and effective in aligning top management compensation packages with shareholder wealth. By September, many large U.S. companies, such as Blockbuster Inc. and Verizon, have voluntarily voted on and approved some forms of "say-on-pay" giving shareholders some power to determine top executive compensation.[2]

Nevertheless, with the departure of Stan O'Neal at Merrill Lynch and Charles Prince at Citigroup,

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[1] Hughes, Siobhan. "'Say on Pay' Bill Clears Panel." *Wall Street Journal* 29 March 2007. 30 March 2007 <http://online.wsj.com/article/SB117513141499752677.html>.

[2] Cheng, Roger and Amol Sharma. "Verizon Holders Pass 'Say-on-Pay' Plan". *Wall Street Journal* 19 May 2007. 20 May 2007 <http://online.wsj.com/article/SB117953537031608301.html>.

attention is brought back on the shrinking pool of top talents in the industry. Reich (2007) argues that CEOs are not overpaid because of the ever increasing challenge to operate in a highly competitive market place. Vigilant and well-functioning boards are now facing insurmountable pressure to identify and recruit talents while designing a competitive compensation that is sensitive to the market's supply and demand of talents. Coupled with the increasing external pressure, board monitoring is often challenged with top management's incentives. Agency theory suggests that there is an inherent problem when top managers are hired for their expertise to manage a company on behalf of shareholders. Jensen and Murphy (1990) argue that there is a conflict of interest between shareholders of a publicly owned corporation and the corporation's management. The separation of ownership and control gives top managers opportunity to accumulate private benefits at the expense of shareholder wealth. In theory and practice, compensation policy can be designed to provide managers incentive to select and implement actions that increase shareholder wealth. Jensen and Murphy further propose that compensation policy that ties top managers' welfare to shareholder wealth helps align the private and social costs and benefits of alternative actions; hence provide the right incentives for management to take appropriate actions. Based on this argument, it is appropriate to pay top managers on the basis of shareholder wealth. In their sample from 1974 to 1986, Jensen and Murphy find that CEO wealth changes $3.25 whenever the value of the firm changes by $1,000.

It has been widely accepted that board size affects firm performance. Lipton and Lorsch (1992) believe most corporate boards are dysfunctional and that this problem worsens as the number of directors increases. Thus they suggest limiting the number of directors to ten. Jensen (1993) proposes an optimal board size to be eight or nine arguing that a larger board tends to be less effective in making decision. Yermack (1996) echoes this assertion and provides empirical evidence to support that that smaller boards are associated with higher firm value. He also finds that companies with smaller boards exhibit favorable financial ratios, and provide stronger CEO performance incentives from compensation and the threat of dismissal. Mak and Kusnadi (2005) examine the impact of corporate governance mechanisms on the firm value (proxied by Tobin's Q) of Singapore and Malaysia firms. Consistent with Yermack's findings, they find that there is an inverse relationship between board size and firm value in both countries. Dalton, Daily, Johnson, and Ellstrand (1999), on the contrary, argue that one of the main functions of board is to provide counsel for management at critical corporate events. Their findings provide support that larger boards are better counsel for management. However, Raheja (2005) argues that optimal board size and composition are a function of directors' and

firm's characteristics. Raheja suggests that optimal board size is a result of a tradeoff between maximizing inside directors' incentive to reveal private information and outside directors' cost of coordination and ability to reject inferior projects.

While boards have the authority to decide on how top managers are compensated, little is known on what makes a board more efficient in coming up with the right compensation decision. This paper attempts to examine how size of board as one of the determinants in board imposes corrective actions on executive compensation relative to firm performance. Specifically, we investigate the relation between board size and CEO's pay-performance sensitivity to better our understanding on two aspects: incentive and monitoring. Board of directors is charged with the fiduciary duty to provide incentives for CEO to maximize shareholders' wealth and penalize those that fail to do so. Information flow and process could be a crucial key to understand how board size might affect decision-makings especially when it comes to one of the most important duties of boards. We conjecture that if a board is optimal in size, the cost of coordinating and sharing of information is low, leading to a high sensitivity in corrective actions on executive pay in response to firm performance. Our findings suggest that there is a non-linear relationship between board size and CEO pay-performance sensitivity, after controlling for board structure, CEO's attributes and firm characteristics. And the non-liner pattern between board size and CEO pay-performance sensitivity proves robust to a variety of robustness tests. However, we note that our study does not identify one "optimal size" for boards in evaluating CEO's pay based on firm performance.

We test the relation between board size and firm's CEO pay-performance sensitivity to understand the effectiveness and efficiency of incentive and monitoring provided by boards in reducing agency problem. We review literature in Section 1, present data and research methodology in Section 2, discuss our empirical findings in Section 3, offer some robustness tests in Section 4, and conclude in Section 5.

2. Data and Methodology
2.1 Data and Sample Selection

We examine U.S. public companies from the year 1996 to 2005. Based on this ten-year examination period, we identify CEO compensation data from *Standard & Poor's Compustat Executive Compensation* (ExecuComp) database and obtain 14,715 firm-year data. We then collect information on board features and director characteristics from the *Investor Responsibility Research Center* (IRRC) and obtain 15,717 firm-year data. Additional stock data are from *The Center for Research in Security Daily Prices* (CRSP) and financial data are from *Standard & Poor's Compustat* (Compustat). Our final sample

contains a total of 12,477 observations by merging all four data bases.[3]

We restrict our analysis to only CEO's compensation for two reasons. First, CEOs are the most important and influential decision makers in corporations, and often the highest paid manager in a public firm. Second, since compensation is reported for the five highest paid executives in ExecuComp, the identity of those individuals varies year-by-year (Dass, Massa and Peyer, 2005). Hence, we believe CEO compensation is a fair proxy for top executive pay.

2.2 Variables Description

Compensation data are classified into seven compensation categories identified in the Summary Compensation Tables of the proxy statements. They are salary, bonus, other annual compensation (including perquisites and amounts for reimbursed for payment of taxes), restricted stock awards, options or stocks appreciation rights (SARs), long-term incentive plan payouts (LTIP), and "all other compensation". Three measures of compensation are used in this study: current compensation including salary and bonus (TCC), total compensation including options granted (TDC1) and total compensation including options exercised (TDC2).

We define CEO pay-performance sensitivity as the change in CEO compensation (as measured by the three compensation measures) divided by the change in firm's market value added (MVA) per share. While market value of a firm's common equity is calculated by multiplying the stock price by the number of shares outstanding[4], MVA is defined as the difference between the total market value of a firm and the book value as indicated on the balance sheet. From a value-based management perspective, the total value of any firm is the market value added (MVA) to common shareholders plus the book value of common stocks, preferred stock, and debts. With all things equal, the higher a firm's MVA, the better the job management is doing for the firm's shareholders. We use the value added model to examine shareholder wealth change is because boards of directors often look at MVA when deciding on the compensation a firm's managers deserve.[5] Also, by explicitly accounting for stock price and value, we are able to test both incentive and monitoring provided by the board to the top manager. For incentive, we examine the effectiveness of boards in aligning CEO compensation in response to the magnitude of shareholder wealth changes. For monitoring, we examine the efficiency of boards in refining CEO compensation in response to the timing of shareholder wealth changes (i.e. "elasticity" of

CEO pay in relation to firm performance). In addition, we factor into per share's MVA to provide a one-to-one comparison between individual CEO pay and the value change of a share. The following equation defines our CEO pay-performance sensitivity measure:

$$PPS = \Delta CEO(COMP) / \Delta(MVA) \qquad (1)$$

where $\Delta CEO(COMP)$ is defined as the change of CEO compensation from period t-1 to period t, while the $\Delta(MVA)$ is defined as the change of firm's market value added for each outstanding common share for the corresponding period.

Our main investigative variable is board size, which is measured as the number of directors on board as of the annual meeting date during each fiscal year. We also control other variables related to board structures, CEO attributes, and firm characteristics. Board structure includes outside director to total director ratio, whether the firm has a dual title for CEO/chairman, number of board meetings, and total director ownership. CEO attributes include CEO age, tenure, ownership and number of other directorships. Firm characteristics include firm sales, return on assets (ROA), long-term debt ratio, capital expenditure to asset ratio. Because the compensation committee is responsible for reviewing and approving, on behalf of the board of directors, the amounts and types of compensation to be paid to company's executive officers, we single out compensation committee and report it separately. The variables that we include are the ratio of outside to total director on compensation committee, and a dummy variable indicating whether CEO is also served on compensation committee.

[Insert Table 1 here]

Table 1 is the summary statistics table of our main dependent variables, main independent variables and other control variables. Panel A gives information on CEO compensation and pay-performance sensitivity measures while Panel B gives information on all other variables. The mean change in MVA per share for our 12,477 firm-year sample is around $1.31 while the median change is $0.37. The average changes (in thousands) in three measures of total compensation (TCC, TDC1 and TDC2) are $108.07, $354.94 and $500.78 while the median changes are $57.92, $135.56 and $101.63. CEO pay-performance sensitivity is measured by using a total compensation measure divided by the MVA per share. Based on the summary statistics, MVA dollar added per share in TCC we observe almost 6.67 times increase in CEO compensation in median but 743.17 times decrease in means. In terms of pay-performance sensitivity measure based on TDC1, our table indicates 15.91 times increase in CEO compensation in median and 879.57 times decrease in means. While in terms of pay-performance sensitivity measure based on TDC2, the evidence indicates 19.13 times increase in CEO compensation in median and 2,840.80 times decrease

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[3] Additional ownership information was collected from firms' SEC filings.
[4] Compustat annul data item 25 * data item 199.
[5] Brigham and Daves, Intermediate Financial Management, 9th Edition, Thomson South Western, 2007.

in means. Combining these statistics for the three sensitivity measures, we believe that at least half of our firm-year sample is rewarding CEO when value added to shareholder wealth however for the other half there could be over-rewarding or over-penalizing CEO in terms of compensation. The average board size is 9.70 members with an average number of 6.39 independent directors on the board. Eighty one percent of our firm-year sample has a dual title structure in which CEO is also the chairman of the board. On average, firms have 7.40 meetings during a fiscal year and directors own 14.75% of firms' shares. Average CEO in our sample is 56.01 years old, serves on board for more than ten years, owns 5.82% of company's shares and serves on no more than one outside board. Average sales are around $5,285.80 millions, with a ROA ratio of 0.13, a long-term debt ratio of 0.20 and a capital expenditure ratio of 0.06. The total number of directors on compensation committee is 3.62 members, with more than ninety percent on that committee being outside director. Finally over half of the time CEO serves on the compensation committee.

2.3 Research Methodologies

We estimate multivariate regressions to test the relation between board size and CEO pay-performance sensitivity. In our basic empirical model we employ ordinary-least-square (OLS) regression method to regress CEO pay-performance sensitivity on variables that measure the size of the board along with other control variables:

$$PPS = \alpha_0 + \alpha_1[BSize] + \alpha_2[BSize]^2 + \alpha_3[BoardStructure] \quad (2)$$
$$+ \alpha_4[CEOAttributes] + \alpha_5[FirmCharacteristics] + \varepsilon$$

where PPS is the CEO pay-performance sensitivity measure as defined in equation (1). $BSize$ is the investigative variable defined as the log of the board size; while the squared item of $BSize$ is included to test whether there is a non-linear relationship between CEO pay-performance sensitivity and board size. *BoardStructure* indicates outside director to total director ratio, CEO duality, log of number of board meetings and office director ownership. *CEOAttributes* includes log of CEO age, log of CEO tenure, CEO ownership and number of other directorship. *FirmCharacteristics* is a vector of performance control variables such as log of firm's sales, firm's return on assets, long-term debt to asset ratio, and capital expenditure to asset ratio. The coefficients α_1 and α_2 in equation (2) jointly measures the change in the CEO pay-performance sensitivity in corresponding to board size, controlling for other control variables.

Follow Boone et al. (2007), we use two strategies to control for the fact that board size and CEO pay-performance sensitivity can be endogenous in the board's decision making process. First, we include industry and year fixed effects in our

regressions. The rationale for industry and year fixed effects is that they control for the underlying economic environment that might jointly determine board size and CEO pay-performance sensitivity. For example, firms in the same industry face similar production technologies and market conditions – the very things that give rise to the endogeneity problem in the first place. In these tests, we classify all sample firms into nine industry groupings according to their standard industrial classification (SIC) codes and use dummy variables indicating whether each firm belongs to one of the nine industry groupings. We also use ten year dummy variables to test year fixed effects. And finally we use the two-way fixed effect model to control for both industry and year fixed effects. The basic OLS regression results are not substantially affected when we employ these fixed effect models on our panel data.

Our second strategy to control for endogeneity is to introduce instrumental variables for board size and the CEO pay-performance sensitivity. We pick these variables' lagged values as the instrumental variables. For example, for firm j's observation in year 2005, the instrumental variables for board size and CEO pay-performance sensitivity are firm j's board size and CEO pay-performance sensitivity in year 2004. We employ two-stage least squares (2SLS) regression method, including instrumental variables in the tests for the relation between CEO pay-performance sensitivity and board size. It turns out, however, that including these instruments, or additional instruments for other variables that plausibly could be endogenous, does not affect our main results substantially.

3. Empirical Results

We expect a significant relation between board size and CEO pay-performance sensitivity. That is, CEO pay-performance will be more sensitive in firms with more optimal board size compared to that of firms with a suboptimal board size. Table 2 provides results on simple OLS regressions using our main independent variables. In Panel A of Table 2 we regress the pay-performance sensitivity measures on log of board size. As indicated in the table, all the pay-performance sensitivity measures are significantly negatively related to board size, indicating that smaller boards are more efficient in forming good compensation plans for CEOs. While in Panel B we add a squared log board size measure into the regressions, the results have changed dramatically. The coefficients of log board size measures in all regressions have become positive, while the coefficients of the squared terms are all negative. The positive coefficients associated with log board size and the negative coefficients associated with the squared log board size terms clearly tell us that there exists a non-linear relationship between board size and CEO pay-performance sensitivity. For smaller boards, adding more board members will help the

board make more appropriate compensation decisions based on firm performance; while as the board size reaches beyond the optimal level, additional board members will be detrimental for boards to make efficient compensation decisions as related to firm performance.

[Insert Table 2 here]

While Yermack (1996) argues that board size is inversely related to firm performance, he also suggests that board size could be non-linearly related to firm performance. The findings in Table 2 indicate that board size has a non-linear relation with CEO's pay-performance sensitivity. Thus, we argue that boards will become more and more sensitive to CEO's compensation plan until they increase to a certain size. Once the optimal size is met, boards become less sensitive to CEO's pay-performance. This could be the case when boards grow beyond their optimal size, information is not executed as efficiently and effectively, thus leading to slow decision-making process. In Figure 1, we present a graphical depiction of the relation between board size and one of the measures of our CEO's pay-performance sensitivity (PPStcc) to illustrate our argument. As indicated in Figure 1, PPStcc peaks when board size is around eight or nine. This finding is consistent with the conventional wisdoms (see Jensen (1993), Lipton and Lorsch (1995), Monks and Minow (1995) and Yermack (1996)) about the optimal board size.

[Insert Figure 1 here]

Table 3 gives results on our full regression model for the pay-performance sensitivity measures. The results are fairly similar to our simple regressions in Table 2 in that board size is a non-linear function related to CEO's pay-performance sensitivity. We find that board size is significantly positively related to while the squared term of board size is significantly negatively related to all measures of CEO pay-performance sensitivity. We also find that the CEO pay-performance sensitivity measures are significantly positively related to CEO stock ownership. The finding indicates that boards can better align CEOs' pay with their performance when CEOs' own interest is more aligned with shareholder's wealth.

[Insert Table 3 here]

Raheja (2005) conjectures that board size could be dictated by the industry that the company is in. In our first strategy to control for endogeneity, we test both industry and year fixed effects. We add SIC dummies in our regressions and the results are reported in Tables 4, we add year dummies in our regressions and the results are reported in Table 5, and then we include both groups of dummies and test

fixed two-way effects and report results in Table 6. In Table 4, we run the model by including all the SIC dummies except dummy SIC6 (financial industry). Our main results hold, i.e. the non-linear relationship between board size and CEO pay-performance sensitivity still exists. And the positive relationship between CEO stock ownership and pay-performance sensitivity holds in two out of the three specifications. The insignificant coefficients on all the SIC dummies indicate that when comparing to financial firms, other industries is no more or less "responsive" to CEO pay-performance sensitivity.

[Insert Tables 4 here]

We also incorporate the year dummies into our model to capture the time specific effect that is invariant. The results of the estimations of a fixed effect model with year dummy variables are reported in Table 5. Year 2005 is the based year, therefore the other year dummy variables show the difference from year 2005. Again, our main results hold with the inclusion of year dummy variables. There is no consistent pattern for the year dummies. Finally in Table 6, both SIC dummies and year dummies are included in all the regressions to verify that the non-linear relationship between CEO pay-performance sensitivity and board size holds, controlling for invariant industry and year factors. And again the non-linear relation holds after considering two-way fixed effects.

[Insert Table 5 & 6 here]

Our second strategy to control for endogeneity is to introduce instrumental variables for board size and the CEO pay-performance sensitivity. Specifically two-stage least squares regressions are used to control for possible endogeneity between board size and CEO pay-performance sensitivity. In Table 7, the results from the second-stage regressions are reported. The independent variables listed in this table include the fitted variables for Log(Board Size)(f) and [log(Board Size)]^2 (f). To find each of the fitted variables, the non-fitted variable is regressed against its instrumental variables and the common control variables in the first-stage regressions. Among all the other common explanatory variables include Lag(PPS): one-year lagged measure of the three pay-performance sensitivity measures. The results from the two-stage least squares regressions suggest that the non-linear relation between CEO pay-performance sensitivity and board size holds.

[Insert Table 7 here]

4. Robustness Tests

Board size can be positively related to firm size, and large firms usually have bigger boards. In order to

verify that the relationship between CEO pay-performance sensitivity and board size is not just capturing the relationship between the sensitivity measures and firm size, we stratify our sample into ten size deciles according to market value of equity and run the basic OLS regressions. Each year the firms in the sample are ranked into 10 different size deciles according to firms' market value of equity. For example, decile one includes the smallest firms and decile ten includes the biggest firms. Every year the rank is re-balanced according to that year firm's market value of equity so that decile one always contains the smallest firms and decile ten always contains the biggest firms. The regression results are reported in Table 8. In Panel A of Table 8 we regress the pay-performance sensitivity measures on log of board size, while in Panel B we regress the pay-performance sensitivity measures on log of board size and the squared log board size measure. Only the result in decile 8 shows that there is a non-linear relationship between pay sensitivity measures and board size, while this relationship is not significant in any of the rest groups. Had the non-linear relationship between CEO pay-performance sensitivity and board size is just a misrepresentation of firm size effect, we would have seen significant positive coefficients for small deciles and significant negative coefficients for big deciles. The results in Table 8 clearly indicate that the non-linear relationship between CEO pay-performance sensitivity and board size is not just representing the firm size effect.

[Insert Table 8 here]

In Table 9, compensation committee variables are included in the regressions. The purpose is to test what difference it makes for the relation between CEO pay-performance sensitivity and board size when we control for the compensation committee composition. The coefficients of independent director ratio on compensation committee are both positive and significant in all three regressions, suggesting that CEO pay-performance sensitivity is positively related to outside directors serving on compensation committee. The non-linear relationship between pay-performance sensitivity and board size still holds after controlling for compensation committee variables.

[Insert Table 9 here]

Compensation is not going to be set and paid on the last day of the year. However, we are measuring the stock price change from beginning of year to end of year as part of our MVA calculation. It is likely that compensation is going to be set during the year, well before the end of the year. For the above reason, another robustness test is performed. We re-calculate CEO pay-performance sensitivity measures so that CEO compensation is associated with the firm's previous year's stock performance. Basically our

main results hold when we regress the recalculated sensitivity measures on board size.[6]

5. Conclusion

We examine a model of organization in which all the dimensions of the firm's governance structure, CEO attributes, board structure and firm characteristics, etc., act jointly as a value maximizing package. We identify board size as the main feature to better our understanding on how size affects the effectiveness and efficiency of corporate boards in decision-making process. On one hand, while the firm sometimes holds all other organizational features fixed, it occasionally alters one particular structure of board in which agency conflicts prevail and firm value decreases. On the other hand, the firm might well have anticipated this possibility by creating a complete package of incentive mechanisms that address deficiencies in other areas. For example, the firm will choose CEO pay-performance sensitivity or other monitoring mechanisms to offset problems that might arise from the suboptimal size of board. The firm will choose such monitoring mechanisms if the benefits of doing so exceed the costs. Furthermore, the firm may find that the costs of suboptimal board size are worth bearing if the benefits are great enough. In this firm, exogenous or predetermined variables, such as regulatory status, growth opportunities, nature of the product markets, etc., determine the optimal combination of governance features.

Similar to Keys and Li (2005) argument, we believe performance is endogenously related to organizational structure. Thus, one might not expect to observe a relation between performance and a governance device. However, it is reasonable to justify our experiment, given that board has the designated authority to decide and monitor CEO pay. If certain sizes of board are more often associated with better CEO pay-performance sensitivity, we argue that firms that move fast and persuasively will alter their board sizes leading to shareholder expectations of better future performance.

In this study, our findings provide insight on why some firms' CEO compensations are more in alignment with shareholder wealth compared to those of others. While current literature is inconclusive on board size and its impact on corporate governance, we keep board size static and examine its "usage" in determining CEO's compensation.[7] Our empirical finding indicates a non-linear relation between board size and CEO's pay-performance sensitivity. Smaller boards are often exhibited more sensitivity toward CEO's compensation until board size reaches to a certain number. Our graphic presentation of such relation indicates CEO's pay-performance sensitivity

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[6] The results are not reported to save space.

[7] See Conyon and Peck (1998), Dalton, Daily, Johnson, Ellstrand (1999), Mak and Roush (2000), Mak and Kusnadi (2005) Raheja (2005), and Yermack (1996)

peaks when a board has eight to nine members. The finding is consistent with what is proposed by Jensen (1993), suggested by Monks and Minow (1995) and Yermack (1996).

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Appendices

Table 1. Descriptive Statistics on Pay-Performance Sensitivity, Board Size and Other Attributes

Panel A: CEO compensation and pay-performance sensitivity measures
This panel includes mean, median, first quarter, third quarter, standard deviation and the number of observations for each CEO compensation variable and pay-performance sensitivity measure. *MVA per share* is the difference in market value added per share between time periods t-1 and t. *TCC* (in thousands) is the difference in compensation including salary and bonus between time periods t-1 and t, *TDC1* (in thousands) is the difference in compensation including salary, bonus and options granted between time periods t-1 and t, and *TDC2* (in thousands) is the difference in compensation including salary, bonus and options exercised between time periods t-1 and t. *PPStcc* (in thousands) represents pay-performance sensitivity using current compensation including salary and bonus to represent CEO compensation divided by *MVA per share*, *PPStdc1* (in thousands) represents pay-performance sensitivity using total compensation including options granted to represent CEO compensation divided by *MVA per share,* and *PPStdc2* (in thousands) represents pay-performance sensitivity using total compensation including options exercised to represent CEO compensation divided by *MVA per share*.

Variables	Mean	Median	Q1	Q3	S.D.	N
MVA per share	1.31	0.37	-5.39	5.87	142.29	12477
TCC	108.07	57.92	-97.50	299.46	1,163.82	12477
TDC1	354.94	135.56	-532.57	1,186.75	12,762.07	12477
TDC2	500.78	101.63	-436.22	1,126.96	15,989.45	12477
PPStcc	-743.17	6.67	-19.23	54.50	86,729.37	12477
PPStdc1	-879.57	15.91	-119.66	204.95	114,081.80	12477
PPStdc2	-2,840.80	19.13	-84.37	225.43	241,714.12	12477

Panel B: Board structure, CEO attributes, firm characteristics and compensation committee structure
This panel includes mean, median, first quarter, third quarter, standard deviation and the number of observations for variables under board structure, CEO attributes, firm characteristics and compensation committee structure. For board structure, *Board Size* is the number of directors on board, *Outsiders* is the number of outside directors on board, *Outsider ratio* is *Outsiders* divided by *Board Size*, *CEO Duality* takes the value of one when the CEO is also the chairman of the board and zero otherwise, *Meetings* is the number of meetings the board has during the year, and *Directors Ownership* (in percentage) is the percentage of directors' stock ownership. For CEO attributes, *CEO Age* is the age of the Chief Executive Officer, *CEO Tenure* is the number of years CEO serves the company, *CEO Ownership* (in percentage) is the percentage of CEO's stock ownership, and *CEO outside Directorships* is the number of directorships CEO holds in addition to his own company's board. For firm characteristics, *Sales* (in millions) is the total sales of the company, *ROA* is the return on assets of the firm, *Long-term Debt* is the company's long-term debt divided by total assets, and *Capital Expenditure* is the company's capital expenditure divided by total assets. For compensation committee, *No. of Members* is the number of directors, *No. of Independent directors* is the number of independent directors, Independent directors ratio is *No. of Independent Directors* divided by the *No. of Members*, and *CEO on Committee* takes a value of one if CEO serves on compensation committee and zero otherwise.

Variables	Mean	Median	Q1	Q3	S.D.	N
Board structure						
Board Size	9.70	9.00	8.00	11.00	2.96	12477
Outsiders	6.39	6.00	4.00	8.00	2.68	12477
Outsider Ratio	0.65	0.67	0.56	0.79	0.17	12477
CEO Duality	0.81	1.00	1.00	1.00	0.40	12477
Meetings	7.40	7.00	5.00	9.00	3.17	12065
Directors Ownership	14.75	6.20	2.40	17.90	23.75	9443
CEO attributes						
CEO Age	56.01	56.00	52.25	59.67	6.28	12477
CEO Tenure	10.11	8.00	5.00	13.00	7.68	11895
CEO ownership	5.82	1.90	0.90	5.33	10.97	9706
CEO outside directorships	0.85	0.67	0.00	1.36	0.85	10267
Firm characteristics						
Sales	5,285.80	1,443.29	580.76	4247.50	14,272.65	12476
ROA	0.13	0.13	0.08	0.18	0.11	12356
Long-term Debt	0.20	0.18	0.05	0.30	0.16	12451
Capital Expenditure	0.06	0.04	0.02	0.07	0.05	11632
Compensation committee						
No. of Members	3.62	3.00	3.00	4.00	1.20	10156
No. of Independent directors	3.28	3.00	2.00	4.00	1.28	10156
Independent directors ratio	0.91	1.00	0.83	1.00	0.19	10156
CEO on committee	0.52	1.00	0.00	1.00	0.50	10156

Table 2. Simple Regressions on the Relation between Board Size and CEO Pay-Performance Sensitivity

Panel A: Univariate regression of CEO pay-performance sensitivity on board size
This table provides coefficient estimates and p-values from regressions of CEO pay performance sensitivity on board size with one independent variable, *Log(Board Size)*. *PPStcc* (in thousands) represents pay-performance sensitivity using current compensation including salary and bonus to represent CEO compensation divided by *MVA per share*, *PPStdc1* (in thousands) represents pay-performance sensitivity using total compensation including options granted to represent CEO compensation divided by *MVA per share,* and *PPStdc2* (in thousands) represents pay-performance sensitivity using total compensation including options exercised to represent CEO compensation divided by *MVA per share*. *Log(Board Size)* is the log of the number of directors on board. P-values are provided in parentheses.

Variables	PPStcc	PPStdc1	PPStdc2
Intercept	12,456.1456	16,388.2204	41,022.2381
	(0.03)**	(0.03)**	(0.01)***
Log(Board Size)	-13,638.3333	-17,842.1282	-45,321.9526
	(0.02)**	(0.02)**	(0.01)***
Adjusted R^2	0.0003	0.0006	0.0005
N	12477	12477	12477

Panel B: Bivariate regression of CEO pay-performance sensitivity on board size and square of board size

This table provides coefficient estimates and p-values from regressions of CEO pay performance sensitivity on board size with two independent variables, *Log(Board Size)* and *[Log(Board Size)]^2*. *PPStcc* (in thousands) represents pay-performance sensitivity using current compensation including salary and bonus to represent CEO compensation divided by *MVA per share*, *PPStdc1* (in thousands) represents pay-performance sensitivity using total compensation including options granted to represent CEO compensation divided by *MVA per share,* and *PPStdc2* (in thousands) represents pay-performance sensitivity using total compensation including options exercised to represent CEO compensation divided by *MVA per share. Log(Board Size)* is the log of the number of directors on board. *[Log(Board Size)]^2* is the square of the log of the number of directors on board. P-values are provided in parentheses.

Variables	PPStcc	PPStdc1	PPStdc2
Intercept	-67,081.1732	-87,269.3035	-187,329.7868
	(0.02)**	(0.03)**	(0.02)**
Log(Board Size)	153,462.7096	199,933.3841	434,425.9453
	(0.01)***	(0.01)***	(0.01)***
[Log(Board Size)]^2	-86,223.3661	-112,371.1582	-247,547.6988
	(0.01)***	(0.01)***	(0.01)***
Adjusted R^2	0.0008	0.0008	0.0011
N	12477	12477	12477

* significant at the 10% level
** significant at the 5% level
*** significant at the 1% level

Figure 1. Graphic Representation of the Relation between Board Size and CEO's Pay-Performance Sensitivity Based on 12477 Firm-Year Sample
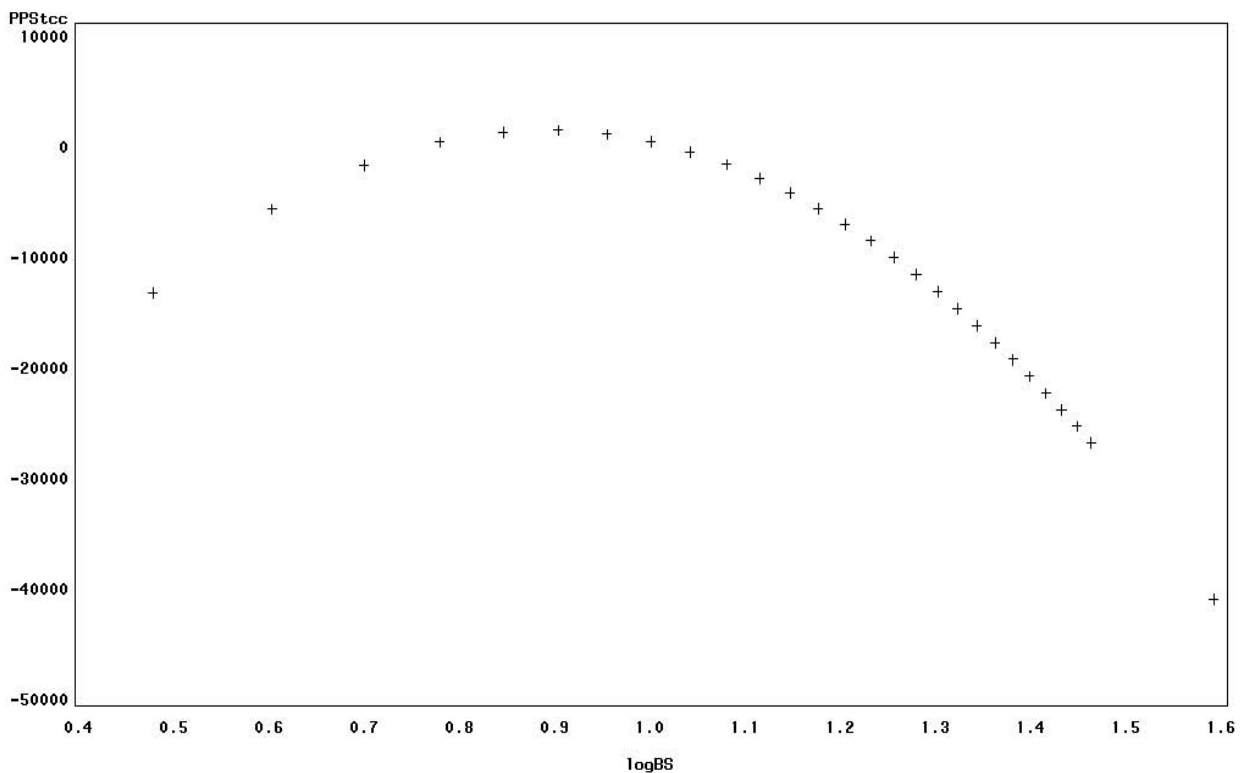
Table 3. Multivariate Regressions on the Relation between Board Size and CEO Pay-Performance Sensitivity

This table presents coefficient estimates and p-values from multivariate regression of CEO pay- performance sensitivity specifications. *PPStcc* (in thousands) represents pay-performance sensitivity using current compensation including salary and bonus to represent CEO compensation divided by *MVA per share*, *PPStdc1* (in thousands) represents pay-performance sensitivity using total compensation including options granted to represent CEO compensation divided by *MVA per share,* and *PPStdc2* (in thousands) represents pay-performance sensitivity using total compensation including options exercised to represent CEO compensation divided by *MVA per share*. *Board Size* is the number of directors on board. *Outsider ratio* is *Outsiders* divided by *Board Size*. *CEO Duality* takes the value of one when the CEO is also the chairman of the board and zero otherwise. *Meetings* is the number of meetings the board has during the year. *Directors Ownership* (in percentage) is the percentage of directors' stock ownership. For CEO attributes, *CEO Age* is the age of the Chief Executive Officer, *CEO Tenure* is the number of years CEO serves the company, *CEO Ownership* (in percentage) is the percentage of CEO's stock ownership, and *CEO outside Directorships* is the number of directorships CEO holds in addition to his own company's board. For firm specifics, *Sales* (in millions) is the total sales of the company, *ROA* is the return on assets of the firm, *Long-term Debt ratio* is the company's long-term debt divided by total assets, and *Capital Expenditure* is the company's capital expenditure divided by total assets. P-values are provided in parentheses.

Variables	PPStcc	PPStdc1	PPStdc2
Intercept	-2,910.9448	-36,841.1337	-92,945.8469
	(0.13)	(0.25)	(0.46)
Log(Board Size)	7,859.5888	47,602.9033	910,013.2052
	(0.03)**	(0.04)**	(0.02)**
[Log(Board Size)]^2	-8,785.8648	-25,237.8822	-510,505.9694
	(0.02)**	(0.02)**	(0.02)**
Outsider Ratio	-4,462.0560	-4,689.7779	1,858.5618
	(0.42)	(0.52)	(0.90)
CEO Duality	-80.2321	-871.4472	-394.0440
	(0.43)	(0.62)	(0.56)
Log(Meetings)	4,484.3972	4,343.0660	6,126.8814
	(0.44)	(0.57)	(0.70)
Directors Ownership	-2.7035	7.7931	-19.8671
	(0.17)	(0.82)	(0.13)
Log(CEO Age)	-1,610.5767	-14,395.0000	-3,565.8966
	(0.06)*	(0.23)	(0.43)
Log(CEO Tenure)	-105.0572	-10.7521	-784.9849
	(0.38)	(1.00)	(0.32)
CEO Ownership	8.5718	24.2972	60.5167
	(0.07)*	(0.06)*	(0.05)**
CEO outside directorships	5.6975	55.1451	-4.5976
	(0.90)	(0.95)	(0.98)
Log(Sales)	752.3391	1,584.9279	-2,367.1894
	(0.66)	(0.48)	(0.62)
ROA	23.5692	-18.7516	102.1155
	(0.72)	(0.83)	(0.57)
Long-term Debt	6,625.7180	9,293.5049	12,652.6043
	(0.24)	(0.21)	(0.43)
Capital Expenditures	11,522.5931	17,377.6845	-24,040.7550
	(0.50)	(0.44)	(0.62)
Adjusted R^2	0.0037	0.0028	0.0041
N	8906	8906	8906

* significant at the 10% level
** significant at the 5% level
*** significant at the 1% level

Table 4. Multivariate Regressions on the Relation between Board Size and CEO Pay-Performance Sensitivity
(One Way Fixed Industry Effect)

This table provides coefficient estimates and p-values from multivariate regression on CEO pay- performance sensitivity specifications. *PPStcc* (in thousands) represents pay-performance sensitivity using current compensation including salary and bonus to represent CEO compensation divided by *MVA per share*, *PPStdc1* (in thousands) represents pay-performance sensitivity using total compensation including options granted to represent CEO compensation divided by *MVA per share,* and *PPStdc2* (in thousands) represents pay-performance sensitivity using total compensation including options exercised to represent CEO compensation divided by *MVA per share*. *Board Size* is the number of directors on board. *Outsider ratio* is *Outsiders* divided by *Board Size*. *CEO Duality* takes the value of one when the CEO is also the chairman of the board and zero otherwise. *Meetings* is the number of meetings the board has during the year. *Directors Ownership* (in percentage) is the percentage of directors' stock ownership. For CEO attributes, *CEO Age* is the age of the Chief Executive Officer, *CEO Tenure* is the number of years CEO serves the company, *CEO Ownership* (in percentage) is the percentage of CEO's stock ownership, and *CEO outside Directorships* is the number of directorships CEO holds in addition to his own company's board. For firm specifics, *Sales* (in millions) is the total sales of the company, *ROA* is the return on assets of the firm, *Long-term Debt ratio* is the company's long-term debt divided by total assets, and *Capital Expenditure* is the company's capital expenditure divided by total assets. Eight out of nine SIC dummies are included in the regression to capture the fixed industry effect. P-values are provided in parentheses.

Variables	PPStcc	PPStdc1	PPStdc2
Intercept	-3,020.5903	-39,788.8048	-7,717.5557
	(0.12)	(0.24)	(0.54)
Log(Board Size)	4,778.9668	41,336.5177	885,458.6940
	(0.04)**	(0.03)**	(0.02)**
[Log(Board Size)]^2	-1,031.4202	-35,322.6513	-494,126.9541
	(0.05)**	(0.03)**	(0.04)**
Outsider Ratio	5,437.4077	6,150.1829	2,518.2467
	(0.33)	(0.40)	(0.87)
CEO Duality	-73.1039	-853.9791	8,635.8347
	(0.48)	(0.63)	(0.21)
Log(Meetings)	3,981.3881	3,640.0936	10,174.3212
	(0.50)	(0.64)	(0.53)
Directors Ownership	-2.5025	8.3691	-19.8205
	(0.21)	(0.81)	(0.13)
Log(CEO Age)	-37,922.1505	-13,753.5523	-67,923.8753
	(0.06)*	(0.26)	(0.22)
Log(CEO Tenure)	-101.2765	173.3445	3,772.1301
	(0.40)	(0.93)	(0.64)
CEO Ownership	8.6535	23.1694	59.8948
	(0.07)*	(0.78)	(0.06)*
CEO outside directorships	8.0895	17.2775	11.3951
	(0.87)	(0.98)	(0.57)
Log(Sales)	973.6191	1,926.5537	-2,617.0478
	(0.58)	(0.41)	(0.59)
ROA	19.4800	-23.4561	100.9323
	(0.77)	(0.78)	(0.58)
Long-term Debt	4,639.2403	6,988.8715	15,085.1323
	(0.43)	(0.37)	(0.36)
Capital Expenditures	1,322.5544	4,297.7790	-30,087.1043
	(0.94)	(0.86)	(0.57)
sic1	-71.2947	1,216.2870	714.8986
	(0.74)	(0.74)	(0.40)
sic2	-148.6791	-968.5912	353.0793
	(0.34)	(0.72)	(0.20)
sic3	30.8675	1,308.5749	-222.2414
	(0.83)	(0.61)	(0.25)

sic4	-140.7529	-2,465.0528	-332.8138
	(0.46)	(0.45)	(0.98)
sic5	48.5728	-924.3563	-668.7770
	(0.77)	(0.75)	(0.26)
sic7	-87.2994	93.3538	-325.8614
	(0.60)	(0.97)	(0.46)
sic8	-19.4782	-449.1470	395.5271
	(0.93)	(0.91)	(0.57)
sic9	-238.7156	-1,966.7710	-590.4173
	(0.75)	(0.88)	(0.56)
Adjusted R^2	0.0046	0.0042	0.0063
N	8906	8906	8906

* significant at the 10% level
** significant at the 5% level
*** significant at the 1% level

Table 5. Multivariate Regressions on the Relation between Board Size and CEO Pay-Performance Sensitivity
(One Way Fixed Year Effect)

This table provides coefficient estimates and p-values from multivariate regression on CEO pay- performance sensitivity specifications. *PPStcc* (in thousands) represents pay-performance sensitivity using current compensation including salary and bonus to represent CEO compensation divided by *MVA per share*, *PPStdc1* (in thousands) represents pay-performance sensitivity using total compensation including options granted to represent CEO compensation divided by *MVA per share,* and *PPStdc2* (in thousands) represents pay-performance sensitivity using total compensation including options exercised to represent CEO compensation divided by *MVA per share*. *Board Size* is the number of directors on board. *Outsider ratio* is *Outsiders* divided by *Board Size*. *CEO Duality* takes the value of one when the CEO is also the chairman of the board and zero otherwise. *Meetings* is the number of meetings the board has during the year. *Directors Ownership* (in percentage) is the percentage of directors' stock ownership. For CEO attributes, *CEO Age* is the age of the Chief Executive Officer, *CEO Tenure* is the number of years CEO serves the company, *CEO Ownership* (in percentage) is the percentage of CEO's stock ownership, and *CEO outside Directorships* is the number of directorships CEO holds in addition to his own company's board. For firm specifics, *Sales* (in millions) is the total sales of the company, *ROA* is the return on assets of the firm, *Long-term Debt ratio* is the company's long-term debt divided by total assets, and *Capital Expenditure* is the company's capital expenditure divided by total assets. Nine out of ten year dummies are included in the regression to capture the fixed year effect. P-values are provided in parentheses.

Variables	PPStcc	PPStdc1	PPStdc2
Intercept	-1,363.2810	-41,055.6431	-7,441.3616
	(0.16)	(0.22)	(0.55)
Log(Board Size)	7,197.1845	14,316.0764	900,350.1798
	(0.04)**	(0.03)**	(0.01)***
[Log(Board Size)]^2	-1,153.0427	-25,723.6444	-503,547.6728
	(0.05)**	(0.06)*	(0.02)**
Outsider Ratio	5,781.9931	6,261.6161	8.5145
	(0.30)	(0.40)	(1.00)
CEO Duality	-76.9789	-786.2557	8,644.6942
	(0.45)	(0.66)	(0.21)
Log(Meetings)	5,204.0611	5,059.2521	7,726.7748
	(0.37)	(0.51)	(0.63)
Directors Ownership	-2.9587	8.2098	-19.3513
	(0.15)	(0.81)	(0.14)
Log(CEO Age)	-3,043.2298	-14,044.9364	-67,916.3860
	(0.07)*	(0.24)	(0.22)
Log(CEO Tenure)	-99.1324	-507.8099	4,719.9050
	(0.41)	(0.81)	(0.57)
CEO Ownership	8.3231	19.5800	59.0230

	(0.08)*	(0.81)	(0.05)**
CEO outside directorships	6.3947	159.8618	21.6106
	(0.89)	(0.85)	(0.94)
Log(Sales)	621.1317	1,447.6284	-2,588.8227
	(0.72)	(0.52)	(0.59)
ROA	25.6960	-19.8075	121.4527
	(0.70)	(0.82)	(0.51)
Long-term Debt	6,612.9728	9,168.2056	13,474.1425
	(0.25)	(0.22)	(0.40)
Capital Expenditures	16,202.5091	23,451.7491	-21,137.6467
	(0.35)	(0.31)	(0.66)
y1996	-12,387.3465	-15,720.6479	-11,105.7009
	(0.07)*	(0.05)**	(0.39)
y1997	-1,779.0124	-2,082.2692	3,707.6578
	(0.68)	(0.72)	(0.76)
y1998	-2,346.3062	-3,187.2960	2,550.7927
	(0.59)	(0.57)	(0.83)
y1999	-2,468.8484	-886.1367	-20,380.8343
	(0.56)	(0.87)	(0.09)*
y2000	-2,103.9583	-2,420.9914	1,076.2956
	(0.62)	(0.66)	(0.93)
y2001	-1,853.1014	-3,123.8965	920.0961
	(0.66)	(0.57)	(0.94)
y2002	-1,394.9071	-1,559.1770	531.3936
	(0.74)	(0.77)	(0.96)
y2003	-1,036.4069	-1,365.1110	36.2234
	(0.80)	(0.80)	(1.00)
y2004	-743.1180	-270.3724	-447.2931
	(0.86)	(0.96)	(0.97)
Adjusted R^2	0.0047	0.0046	0.0075
N	8906	8906	8906

* significant at the 10% level
** significant at the 5% level
*** significant at the 1% level

Table 6. Multivariate Regressions on the Relation between Board Size and CEO Pay-Performance Sensitivity
(Two Way Fixed Effect)

This table provides coefficient estimates and p-values from multivariate regression on CEO pay- performance sensitivity specifications. *PPStcc* (in thousands) represents pay-performance sensitivity using current compensation including salary and bonus to represent CEO compensation divided by *MVA per share*, *PPStdc1* (in thousands) represents pay-performance sensitivity using total compensation including options granted to represent CEO compensation divided by *MVA per share,* and *PPStdc2* (in thousands) represents pay-performance sensitivity using total compensation including options exercised to represent CEO compensation divided by *MVA per share*. *Board Size* is the number of directors on board. *Outsider ratio* is *Outsiders* divided by *Board Size*. *CEO Duality* takes the value of one when the CEO is also the chairman of the board and zero otherwise. *Meetings* is the number of meetings the board has during the year. *Directors Ownership* (in percentage) is the percentage of directors' stock ownership. For CEO attributes, *CEO Age* is the age of the Chief Executive Officer, *CEO Tenure* is the number of years CEO serves the company, *CEO Ownership* (in percentage) is the percentage of CEO's stock ownership, and *CEO outside Directorships* is the number of directorships CEO holds in additional to his own company's board. For firm specifics, *Sales* (in millions) is the total sales of the company, *ROA* is the return on assets of the firm, *Long-term Debt ratio* is the company's long-term debt divided by total assets, and *Capital Expenditure* is the company's capital expenditure divided by total assets. Eight SIC dummies and nine year dummies are included in the regression to capture the two-way fixed effect. P-values are provided in parentheses.

Variables	PPStcc	PPStdc1	PPStdc2
Intercept	-2,453.6280	-4,827.4061	-6,830.3618
	(0.15)	(0.21)	(0.63)
Log(Board Size)	3,419.0451	47,137.2973	274,513.9883
	(0.04)**	(0.04)**	(0.02)**
[Log(Board Size)]^2	-2,928.0121	-25,196.5783	-486,280.9493
	(0.03)**	(0.03)**	(0.03)**
Outsider Ratio	-6,987.8632	-8,029.5563	402.0954
	(0.22)	(0.28)	(0.98)
CEO Duality	-69.7028	-769.0166	8,502.5370
	(0.50)	(0.66)	(0.22)
Log(Meetings)	4,709.6834	4,349.5474	11,943.2282
	(0.42)	(0.57)	(0.47)
Directors Ownership	-2.4039	8.7128	-19.3162
	(0.23)	(0.80)	(0.14)
Log(CEO Age)	-40,276.6751	-13,852.5536	-69,375.2091
	(0.14)	(0.27)	(0.21)
Log(CEO Tenure)	-96.0483	-316.6756	5,360.7972
	(0.43)	(0.88)	(0.52)
CEO Ownership	8.3986	18.2424	58.4365
	(0.08)*	(0.28)	(0.06)*
CEO outside directorships	8.9066	-231.2603	15.6341
	(0.85)	(0.78)	(0.96)
Log(Sales)	851.4866	1,803.0827	-2,863.7778
	(0.63)	(0.44)	(0.56)
ROA	21.6271	-24.5303	120.9291
	(0.74)	(0.78)	(0.51)
Long-term Debt	4,623.2775	6,845.4408	16,144.2082
	(0.44)	(0.38)	(0.33)
Capital Expenditures	6,894.2094	11,519.8951	-25,841.8965
	(0.72)	(0.65)	(0.63)
sic1	-86.0237	-989.9385	619.7614
	(0.69)	(0.79)	(0.66)
sic2	-151.1037	-954.7048	287.5710
	(0.33)	(0.72)	(0.78)
sic3	27.3807	1,372.2726	-250.2619
	(0.85)	(0.59)	(0.80)
sic4	-141.4747	-2,240.6396	-242.6051
	(0.45)	(0.49)	(0.84)
sic5	41.7546	-935.0690	-687.4352
	(0.80)	(0.74)	(0.53)
sic7	-90.4168	284.3377	-255.2206
	(0.59)	(0.92)	(0.82)
sic8	-26.7022	-251.9028	333.1757
	(0.90)	(0.95)	(0.57)
sic9	-237.4826	-2,313.0236	607.9958
	(0.45)	(0.86)	(0.56)
y1996	-13,008.4115	-16,570.9299	-11,677.2255
	(0.09)*	(0.15)	(0.36)
y1997	-2,252.8407	-2,722.5679	3,053.4809
	(0.61)	(0.64)	(0.80)
y1998	-2,695.7900	-3,662.4546	1,905.5421
	(0.53)	(0.52)	(0.87)
y1999	-2,742.2343	-1,265.3956	-21,128.8878
	(0.52)	(0.82)	(0.08)*

y2000	-2,369.9572	-2,783.5937	474.6521
	(0.58)	(0.62)	(0.97)
y2001	-2,024.0936	-3,369.6612	711.8845
	(0.63)	(0.54)	(0.95)
y2002	-1,613.2634	-1,873.8496	249.1280
	(0.70)	(0.73)	(0.98)
y2003	-1,191.3942	-1,588.2087	-202.8966
	(0.77)	(0.77)	(0.99)
y2004	-853.4963	-426.7209	-651.3604
	(0.84)	(0.94)	(0.95)
Adjusted R^2	0.0056	0.0049	0.0080
N	8906	8906	8906

* significant at the 10% level
** significant at the 5% level
*** significant at the 1% level

Table 7. Multivariate Regressions on the Relation between Board Size and CEO Pay-Performance Sensitivity (Two-Stage Least Squares Regressions)

This table provides coefficient estimates and p-values from the second stage of 2SLS regressions on CEO pay-performance sensitivity specifications. Three measures of dependent variables are: *PPStcc* (in thousands) represents pay-performance sensitivity using current compensation including salary and bonus to represent CEO compensation divided by *MVA per share*, *PPStdc1* (in thousands) represents pay-performance sensitivity using total compensation including options granted to represent CEO compensation divided by *MVA per share,* and *PPStdc2* (in thousands) represents pay-performance sensitivity using total compensation including options exercised to represent CEO compensation divided by *MVA per share*. The independent variables listed in this table include the fitted variables for *Log(Board Size)(f)* and *[log(Board Size)]^2 (f)*. The other explanatory variables include *Lag(PPS):* one-year lagged *PPStcc*, one-year lagged *PPStdc1* and one-year lagged *PPStdc2* for each column, respectively. *Board Size* is the number of directors on board. *Outsider ratio* is *Outsiders* divided by *Board Size*. *CEO Duality* takes the value of one when the CEO is also the chairman of the board and zero otherwise. *Meetings* is the number of meetings the board has during the year. *Directors Ownership* (in percentage) is the percentage of directors' stock ownership. For CEO attributes, *CEO Age* is the age of the Chief Executive Officer, *CEO Tenure* is the number of years CEO serves the company, *CEO Ownership* (in percentage) is the percentage of CEO's stock ownership, and *CEO outside Directorships* is the number of directorships CEO holds in additional to his own company's board. For firm specifics, *Sales* (in millions) is the total sales of the company, *ROA* is the return on assets of the firm, *Long-term Debt ratio* is the company's long-term debt divided by total assets, and *Capital Expenditure* is the company's capital expenditure divided by total assets. P-values are provided in parentheses.

Variables	PPStcc	PPStdc1	PPStdc2
Intercept	-1,6,549.2000	1,432,287.3000	1,249,345.1796
	(0.66)	(0.11)	(0.39)
Log(Board Size)(f)	2,590.6879	3,309,264.4346	3,032,229.8757
	(0.06)*	(0.07)*	(0.06)*
[Log(Board Size)]^2(f)	-17,341.7738	-1,720,663.8653	-1,598,890.6193
	(0.06)*	(0.08)*	(0.08)*
Lag(PPS)	0.0674	0.0902	0.0833
	(0.08)*	(0.09)*	(0.07)*
Outsider Ratio	-18.7541	5,373.3261	-10,911.8472
	(0.93)	(0.30)	(0.66)
CEO Duality	-81.7798	-892.9698	1,378.6794
	(0.54)	(0.72)	(0.15)
Log(Meetings)	9,414.9790	9,616.2900	9,961.8462
	(0.15)	(0.25)	(0.57)
Directors Ownership	-2.9131	72.0709	-9.5477
	(0.24)	(0.22)	(0.61)

Log(CEO Age)	-1,179.5788	-53,924.9907	-96,878.3690
	(0.25)	(0.05)**	(0.13)
Log(CEO Tenure)	-53.0671	-6,156.4874	8,430.5247
	(0.78)	(0.19)	(0.43)
CEO Ownership	9.8443	265.3180	14.6107
	(0.18)	(0.14)	(0.80)
CEO outside directorships	6.7879	743.6640	68.3827
	(0.89)	(0.53)	(0.86)
Log(Sales)	-1,268.4626	-1,127.5873	-4,727.7851
	(0.57)	(0.69)	(0.42)
ROA	-114.9842	-169.3455	-9.2868
	(0.21)	(0.15)	(0.97)
Long-term Debt	-11,932.5557	-11,245.3515	-2,787.0266
	(0.20)	(0.35)	(0.91)
Capital Expenditures	27,494.7430	34,745.7711	-11,113.2843
	(0.15)	(0.16)	(0.83)
Adjusted R^2	0.0052	0.0080	0.0096
N	8906	8906	8906

* significant at the 10% level
** significant at the 5% level
*** significant at the 1% level

Table 8. Simple Regressions on the Relation between Board Size and CEO Pay-Performance Sensitivity within Ten Different Size Groups

Panel A: Univariate regression of CEO pay-performance sensitivity on board size within ten size groups
The sample is stratified according to market value of equity. Each year the firms in the sample are ranked into 10 different size deciles according to firms' market value of equity. For example, decile one includes the smallest firms and decile ten includes the biggest firms. Every year the rank is re-balanced according to that year firm's market value of equity so that decile one always contains the smallest firms and decile ten always contains the biggest firms. This table provides coefficient estimates and p-values from regressions of CEO pay-performance sensitivity on board size within each size decile. *PPStcc* (in thousands) represents pay-performance sensitivity using current compensation including salary and bonus to represent CEO compensation divided by *MVA per share*, *PPStdc1* (in thousands) represents pay-performance sensitivity using total compensation including options granted to represent CEO compensation divided by *MVA per share* and *PPStdc2* (in thousands) represents pay-performance sensitivity using total compensation including options exercised to represent CEO compensation divided by *MVA per share*. *Log(Board Size)* is the log of the number of directors on board. P-values are provided in parentheses. Intercepts are suppressed.

	PPStcc	PPStdc1	PPStdc2
Decile 1 (N=1243)			
Log(Board Size)	3,155.1062	1,168.3892	4,705.6162
	(0.35)	(0.81)	(0.41)
Adjusted R^2	0.0007	0.0008	0.0006
Decile 2 (N=1248)			
Log(Board Size)	80.3829	-1,889.0357	-1,427.9262
	(0.58)	(0.52)	(0.60)
Adjusted R^2	0.0002	0.0003	0.0002
Decile 3 (N=1248)			
Log(Board Size)	379.2753	-7,932.2933	3,349.5567
	(0.27)	(0.59)	(0.23)
Adjusted R^2	0.0010	0.0002	0.0012
Decile 4 (N=1251)			

Log(Board Size)	-161.5676	-151.1647	-1,172.0786
	(0.83)	(0.92)	(0.70)
Adjusted R^2	0.0008	0.0008	0.0007
Decile 5 (N=1246)			
Log(Board Size)	-1,274.2827	400.5719	64.4040
	(0.30)	(0.86)	(0.98)
Adjusted R^2	0.0009	0.0008	0.0008
Decile 6 (N=1251)			
Log(Board Size)	-239.3119	3,624.3106	4,046.2523
	(0.55)	(0.56)	(0.06)*
Adjusted R^2	0.0003	0.0003	0.0028
Decile 7 (N=1249)			
Log(Board Size)	-11.0498	-190.3027	2,394.1133
	(0.97)	(0.90)	(0.42)
Adjusted R^2	0.0008	0.0008	0.0005
Decile 8 (N=1249)			
Log(Board Size)	-137,546.6280	-174,563.7693	-211,697.7850
	(0.04)**	(0.04)**	(0.03)**
Adjusted R^2	0.0035	0.0034	0.0037
Decile 9 (N=1248)			
Log(Board Size)	124.1887	351.0914	-767.8165
	(0.73)	(0.89)	(0.74)
Adjusted R^2	0.0007	0.0008	0.0007
Decile 10 (N=1244)			
Log(Board Size)	-1,532.6211	236.3772	-161,077.8848
	(0.32)	(0.93)	(0.31)
Adjusted R^2	0.0008	0.0008	0.0008

Panel B: Bivariate regression of CEO pay-performance sensitivity on board size and square of board size within ten size groups

The sample is stratified according to market value of equity. Each year the firms in the sample are ranked into 10 different size deciles according to firms' market value of equity. For example, decile one includes the smallest firms and decile ten includes the biggest firms. Every year the rank is re-balanced according to that year firm's market value of equity so that decile one always contains the smallest firms and decile ten always contains the biggest firms. This table provides coefficient estimates and p-values from regressions of CEO pay-performance sensitivity on two independent variables, *Log(Board Size)* and *[Log(Board Size)]*² within each size decile. *PPStcc* (in thousands) represents pay-performance sensitivity using current compensation including salary and bonus to represent CEO compensation divided by *MVA per share*, *PPStdc1* (in thousands) represents pay-performance sensitivity using total compensation including options granted to represent CEO compensation divided by *MVA per share*, and *PPStdc2* (in thousands) represents pay-performance sensitivity using total compensation including options exercised to represent CEO compensation divided by *MVA per share*. *Log(Board Size)* is the log of the number of directors on board. *[Log(Board Size)]*² is the square of the log of the number of directors on board. P-values are provided in parentheses. Intercepts are suppressed.

Variables	PPStcc	PPStdc1	PPStdc2
Decile 1 (N=1243)			
Log(Board Size)	-19,259.1556	-42,996.7128	-43,632.3532
	(0.62)	(0.43)	(0.50)
[Log(Board Size)]²	12,833.9332	25,288.0053	27,677.3011
	(0.56)	(0.42)	(0.45)
Adjusted R^2	0.0010	0.0006	0.0010
Decile 2 (N=1248)			
Log(Board Size)	-120.4421	11,430.7179	5,836.3970
	(0.94)	(0.71)	(0.84)

[Log(Board Size)]^2	111.7219	-7,409.9780	-4,041.2516
	(0.90)	(0.67)	(0.80)
Adjusted R^2	0.0003	0.0005	0.0003
	Decile 3 (N=1248)		
Log(Board Size)	-4,671.7811	67,241.7708	-9,084.0656
	(0.20)	(0.67)	(0.76)
[Log(Board Size)]^2	2,757.2312	-41,035.4305	6,787.1686
	(0.17)	(0.63)	(0.67)
Adjusted R^2	0.0025	0.0004	0.0013
	Decile 4 (N=1251)		
Log(Board Size)	5,403.1753	17,004.2777	18,185.3174
	(0.52)	(0.30)	(0.59)
[Log(Board Size)]^2	-2,983.6003	-9,198.0859	-10,378.6884
	(0.51)	(0.29)	(0.56)
Adjusted R^2	0.0004	0.0009	0.0004
	Decile 5 (N=1246)		
Log(Board Size)	-11,086.0957	-15,677.7742	-19,915.3965
	(0.38)	(0.52)	(0.37)
[Log(Board Size)]^2	5,116.5914	8,384.4165	10,418.9180
	(0.44)	(0.50)	(0.36)
Adjusted R^2	0.0014	0.0004	0.0007
	Decile 6 (N=1251)		
Log(Board Size)	3,506.3896	6,243.9929	39,111.0946
	(0.40)	(0.92)	(0.08)*
[Log(Board Size)]^2	-1,917.2190	-1,340.8716	-17,947.7684
	(0.36)	(0.97)	(0.12)
Adjusted R^2	0.001	0.0003	0.0048
	Decile 7 (N=1249)		
Log(Board Size)	7,727.9664	-46.9308	-2,280.2221
	(0.01)***	(1.00)	(0.94)
[Log(Board Size)]^2	-3,997.6028	-74.0590	2,414.5364
	(0.01)***	(0.99)	(0.88)
Adjusted R^2	0.006	0.0016	0.0005
	Decile 8 (N=1249)		
Log(Board Size)	1,599,175.2788	2,115,990.4407	2,433,246.1951
	(0.03)**	(0.02)**	(0.03)**
[Log(Board Size)]^2	-869,312.8508	-1,146,532.5579	-1,323,921.6840
	(0.02)**	(0.01)***	(0.02)**
Adjusted R^2	0.0082	0.0082	0.0084
	Decile 9 (N=1248)		
Log(Board Size)	1,714.6748	35,187.1102	12,569.5930
	(0.67)	(0.23)	(0.62)
[Log(Board Size)]^2	-775.5066	-16,985.7267	-6,503.1999
	(0.69)	(0.23)	(0.60)
Adjusted R^2	0.0002	0.0012	0.0003
	Decile 10 (N=1244)		
Log(Board Size)	182.5464	10,082.5305	120,270.5992
	(0.99)	(0.75)	(0.95)
[Log(Board Size)]^2	-798.5328	-4,584.0864	-130,987.7777
	(0.92)	(0.75)	(0.88)
Adjusted R^2	0.0008	0.0015	0.0009

* significant at the 10% level
** significant at the 5% level
*** significant at the 1% level

Table 9. Multivariate Regressions on the Relation between Board Size and CEO Pay-Performance Sensitivity, Controlling for Compensation Committee

This table presents coefficient estimates and p-values from multivariate regression on CEO pay- performance sensitivity specifications. *PPStcc* (in thousands) represents pay-performance sensitivity using current compensation including salary and bonus to represent CEO compensation divided by *MVA per share*, *PPStdc1* (in thousands) represents pay-performance sensitivity using total compensation including options granted to represent CEO compensation divided by *MVA per share*, and *PPStdc2* (in thousands) represents pay-performance sensitivity using total compensation including options exercised to represent CEO compensation divided by *MVA per share*. *Board Size* is the number of directors on board. *Outsider ratio* is *Outsiders* divided by *Board Size*. *CEO Duality* takes the value of one when the CEO is also the chairman of the board and zero otherwise. *Meetings* is the number of meetings the board has during the year. *Directors Ownership* (in percentage) is the percentage of directors' stock ownership. For CEO attributes, *CEO Age* is the age of the Chief Executive Officer, *CEO Tenure* is the number of years CEO serves the company, *CEO Ownership* (in percentage) is the percentage of CEO's stock ownership, and *CEO outside Directorships* is the number of directorships CEO holds in additional to his own company's board. For firm specifics, *Sales* (in millions) is the total sales of the company, *ROA* is the return on assets of the firm, *Long-term Debt ratio* is the company's long-term debt divided by total assets, and *Capital Expenditure* is the company's capital expenditure divided by total assets. For compensation committee, independent directors ratio is *No. of Independent Directors* divided by the *No. of Members*; *CEO on Committee* takes a value of one if CEO serves on compensation committee and zero otherwise. P-values are provided in parentheses.

Variables	PPStcc	PPStdc1	PPStdc2
Intercept	-2,545.2423	-12,854.9366	-221,649.4658
	(0.30	0.45	0.16
Log(Board Size)	5,680.0119	25,253.4293	447,585.0353
	(0.05)**	(0.03)**	(0.02)**
[Log(Board Size)]^2	-3,429.3291	-21,464.3748	-25,6571.2958
	(0.04)**	(0.06)*	(0.02)**
Outsider Ratio	237.7413	1,702.4381	1,668.2900
	(0.44)	(0.42)	(0.93)
CEO Duality	-37.2100	-221.7168	-150.4316
	(0.75)	(0.78)	(0.98)
Log(Meetings)	200.2839	-1,432.9066	-662.4473
	(0.44)	(0.42)	(0.97)
Directors Ownership	-2.8674	4.2029	-21.5869
	(0.16)	(0.91)	(0.11)
Log(CEO Age)	-126.8410	-4,528.8142	-21,960.8119
	(0.89)	(0.48)	(0.71)
Log(CEO Tenure)	-103.6067	60.9344	-10,522.7352
	(0.43)	(0.95)	(0.21)
CEO Ownership	9.1496	4.8306	68.4304
	(0.07)*	(0.16)	(0.04)**
CEO outside directorships	67.2834	181.0511	7,709.5394
	(0.22)	(0.63)	(0.03)
Log(Sales)	-33.5275	536.7521	-5,832.6664
	(0.67)	(0.32)	(0.24)
ROA	3.2265	48.2840	85.4341
	(0.24)	(0.41)	(0.63)
Long-term Debt	84.3503	1,274.4322	4,529.1772
	(0.74)	(0.46)	(0.78)
Capital Expenditures	235.8018	3,871.5126	-57,291.7031
	(0.77)	(0.49)	(0.27)
Independent directors ratio on compensation committee	806.4752	604.0931	1,909.6615
	(0.00)***	(0.05)**	(0.06)*
CEO on compensation committee	-13.4334	241.6220	-5,622.9661
	(0.88)	(0.69)	(0.31)
Adjusted R^2	0.0080	0.0074	0.0096
N	8666	8666	8666

* significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level