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GOVERNANCE STRUCTURE AND THE WEIGHTING OF PERFORMANCE MEASURES IN CEO COMPENSATION

Antonio Dávila*
Fernando Peñalva**

* Professor of Accounting and Control, IESE and Graduate School of Business, Stanford University
** Professor of Accounting and Control, IESE

IESE Business School – University of Navarra
Avda. Pearson, 21 – 08034 Barcelona, Spain. Tel.: (+34) 93 253 42 00 Fax: (+34) 93 253 43 43
Camino del Cerro del Águila, 3 (Ctra. de Castilla, km. 5,180) – 28023 Madrid, Spain. Tel.: (+34) 91 357 08 09 Fax: (+34) 91 357 29 13

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Abstract

We empirically examine how governance structure affects the design of executive compensation contracts and, in particular, the implicit weights of firm performance measures in CEO compensation. We find that compensation contracts in firms with higher takeover protection and where the CEO has more influence on governance decisions put more weight on accounting-based measures of performance (return on assets) than on stock-based performance measures (market returns). In additional tests, we further find that CEO compensation in these firms has lower variance and a higher proportion of cash (versus stock-based) compensation. We further find that CEOs' incentives (measured as changes in CEO annual wealth, which includes changes in the value of CEOs' equity holdings, in addition to yearly compensation) do not vary across governance structures. These findings are consistent with CEOs in firms with high takeover protection and where they have more influence on governance being able to influence the contracting.

Keywords: CEO compensation, executive compensation, performance measures, compensation contracts

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GOVERNANCE STRUCTURE AND THE WEIGHTING OF PERFORMANCE MEASURES IN CEO COMPENSATION*

1. Introduction

Governance structures have a strong influence on CEO compensation.They determine the company's exposure to the market for corporate control through their policy decisions (Jensen, 1993; Hermalin and Weisbach, 2003) and therefore how contracts influence CEO behavior. Internal governance bodies are also directly responsible for the design of CEO compensation contracts and this contracting process is one of company directors' main tasks. Core et al. (1999), using survey-based compensation data, provide initial evidence on the relationship between governance and CEO compensation. Their findings indicate that governance structures subject to more influence from the CEO are correlated with higher levels of CEO compensation. They also find that these governance structures are correlated with worse stock returns and worse operating performance. The authors argue that this evidence is consistent with the presence of agency costs associated with weaker governance, where the CEO exerts his bargaining power to extract rents at the expense of shareholders.

While existing evidence indicates that certain governance structures allow CEOs to extract excess rents, it remains unknown how these rents might be extracted. The objective of this study is to examine whether the design of CEO compensation contracts varies across governance structures. We focus on one aspect of contract design: the implicit weight on various performance measures. CEOs may want to increase the weight that the contract puts on more controllable measures, thus reducing variability in actual compensation, raising the likelihood of achieving target objectives, and increasing the rents that the CEO is able to capture. From the CEO's point of view, controllable measures have a better signal-to-noise ratio, which reduces the uncertainty about outcomes, and a more transparent association between certain types of effort and measured outcome, thus making it easier for the agent to exert the type and level of effort required to achieve the objectives. From the shareholders' point of view, these measures are incomplete—leaving out certain types of effort relevant to the value of the firm—and incongruent—weighting the various types of effort differently from what shareholders would otherwise choose. Thus, these contracts favor controllable measures at the expense of noisier measures that enhance the completeness and congruency of the contract.

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We focus on two main classes of performance measures: accounting-based measures of performance (return on assets) and stock-based measures (stock returns); and we examine whether accounting-based measures—arguably more controllable on average—have higher implicit weights and / or, conversely, whether stock-based measures—less controllable—receive lower weights as governance favors CEO influence.

Previous accounting literature has studied the implicit weights of performance measures on the design of CEO compensation contracts (Lambert, 2001), such as the relevance of accounting numbers (Lambert and Larcker, 1987; Sloan, 1993) and non-financial performance measures (Bushman et al., 1996; Ittner et al., 1997; Dávila and Venkatachalam, 2004) beyond stock returns. The evidence indicates that the implicit weights vary with the ability of the various measures to congruently reflect a CEO's multi-dimensional effort while minimizing the risk imposed upon him. Accordingly, the weight on a particular measure increases as its relative noise decreases (Banker and Datar, 1989) and its ability to reflect CEO effort increases (Baber et al., 1996). The findings are grounded on agency theory (Holmstrom, 1979), which predicts the relevance to contracting of measures other than stock returns based on noisiness (Banker et al., 1989), congruency (Feltham and Xie, 1994), efficiency (Bushman and Indjejikian, 1993), and trading (Baiman and Verrecchia, 1995) arguments. These studies typically focus on cash compensation and, in some cases, stock-based compensation; but they ignore changes in the value of the CEO's portfolio of equity-based holdings. When the change in the value of the portfolio is added to the annual pay to obtain the CEO annual wealth—a necessary step to be consistent with theory predictions that examine managers' incentive structure—some of these findings lose much of their significance (Core et al., 2003).

These studies aim at understanding CEOs' incentives; therefore, the change in value of a CEO's portfolio is a relevant piece of information to fully reflect the incentive structure that managers face. In contrast, the effect of governance on the design of CEO contracts is grounded on the CEO's ability to exercise power. This favorable bargaining position can be leveraged through the design of the compensation contract for the period, but does not influence the change in value of the beginning-of-the-year portfolio over the period. Even if changes in the value of the portfolio dominate the manager's incentive structure, he can only exercise his bargaining power in negotiating the structure of his annual pay and, in particular, the implicit weights of the various performance measures.

In contrast to the bargaining power argument, governance structures where the CEO has more influence and is better protected against takeovers may improve long-term firm performance. Because these structures offer better protection from the market for corporate control (DeAngelo and DeAngelo, 1985) and reward long-term value maximization (Fuller & Jensen, 2002), they enhance managers' incentives to make firm-specific investments in their human capital and have a longer-term horizon for their investment decisions (Stein, 1988). Dimitrov and Jain (2003) give evidence consistent with this "positive entrenchment" argument. Also consistent with this argument, Smart and Zutter (2003) find that dual-class structures experience significantly less IPO underpricing. This argument relies on the incentive structure facing the CEO (rather than on his bargaining power) and, following Core et al. (2003), we also examine the variation of the implicit weights of accounting-based and market-based performance measures across governance structures on changes in CEO annual wealth (rather than on CEO pay).

We use 6,536 observations of changes in CEO pay—cash and non-cash components—and CEO annual wealth for 1,879 CEOs during the years from 1993 through 2002, and a proxy of governance structure that combines various aspects associated with it—including anti-takeover protection and characteristics of the Board of Directors such as number of meetings, percentage of executives on the board, and whether the CEO is also the

chairman. We find that the implicit weight on accounting performance measures when changes in CEO pay are examined increases as the firm has more protection against takeovers and the CEO has more influence on internal governance. The results are robust to using change in return on assets (ROA), return on equity (ROE), and earnings per share (EPS) as the accounting performance measure. Furthermore, we also find that not only is the level of governance associated with the weighting of performance measures in CEO compensation, but also that changes in governance are associated with changes in the weight of the accounting-based performance measures. We find no difference in the implicit weight of accounting and stock based measures across governance structures when looking at changes in CEO annual wealth.

The higher weight that accounting measures receive within certain types of governance structures suggests that the variance in compensation may also vary across these different structures (Core et al., 1999). Because accounting performance measures are on average more controllable and less noisy than stock based measures, increasing their weight may reduce the overall variability of the compensation package. Consistent with this conjecture, we find that firms with more protection against takeovers and where the CEO has more influence on internal governance also have lower variance in CEO compensation. Finally, we also find that these governance structures are associated with a lower proportion of the equity-based component in CEO compensation. These results are also broadly consistent with the agency costs associated with CEO bargaining power.

The rest of the paper is structured as follows. The next section discusses related research on governance and develops our main hypothesis. Section 3 describes the research design, variable measurement, and sample selection. Section 4 presents the results related to our main hypothesis and additional results on the effect of governance structures upon the design of CEO compensation contracts. Section 5 concludes the paper.

2. Governance Structure and the design of CEO Contracts

Corporate governance is a combination of external and internal mechanisms. Takeover provisions and the market for corporate control belong to the first group, whereas the Board of Directors and the presence of blockholders are part of the second group. The two types of mechanisms are complementary as both are needed to achieve the desired effects (Cremers and Nair, 2005).

The appropriate level of governance is a function of firm characteristics as different types of firms need different levels of governance. For instance, Alchian and Demsetz (1972) argue that some entrenchment may deter outsiders from incorrectly replacing a competent incumbent manager. Entrenchment also enhances managers' incentives to make firm-specific human capital investments (DeAngelo and DeAngelo, 1985) and focuses managers' attention on long-term value maximization rather than short-term stock price movements (Knoeber, 1986; Fuller & Jensen, 2002). Consistent with these arguments, Brickley et al. (1994) find a positive stock price reaction to the adoption of poison pills when the board has a majority of outside directors.

However, empirical evidence also highlights problems associated with entrenchment. Core et al. (1999) find that Board of Director characteristics associated with CEO influence—including the CEO's holding the chairman position, board size, directors appointed by the CEO, gray outside directors, old directors, and busy directors—are correlated with higher levels of CEO compensation after controlling for economic determinants of compensation. Moreover, they further find that predicted excess

compensation, based on the governance structure of the firm, is negatively correlated with stock returns one year, three years and five years ahead. Yermack (1996) finds that firm value decreases with board size. Rosentein and Wyatt (1990) find a positive stock price reaction to the announcement of the appointment of a new external board member. Cyert et al. (2002) report a negative association between stock ownership by a large shareholder and the compensation committee, on the one hand, and the level of salary, equity, and discretionary compensation, on the other. Similarly, companies that adopt particular provisions such as various types of anti-takeover charter amendments also report higher CEO compensation in the year of adoption and the subsequent three years compared to companies that do not adopt such provisions (Borokhovich et al., 1997). Cremers and Nair (2005) find that firms with a high level of takeover vulnerability and less CEO influence on governance outperform firms lacking either of these two mechanisms.

While this latter evidence suggests that CEOs in firms with higher anti-takeover protection and CEO influence on governance receive higher compensation, it is unclear how their contracts are designed to capture these rents. From a contracting perspective, the most efficient solution to extract rents is to increase the CEO's salary, which does not impose additional risk on the manager. If bargaining power is exercised through salary increase, then we do not expect to observe any difference in the implicit weight of performance measures across governance structures. But simply increasing salary or bonus without a link to firm performance may draw attention from outsiders and expose managers to reputation costs that may damage their human capital. Pay for performance appears as an effective way of capturing these rents without drawing attention. Whether this is the case remains an empirical question. Another possibility to leverage pay for performance as a way to extract additional rents is to tie managers' compensation to observable luck, where CEOs are rewarded for positive performance due to events beyond their control, but are spared from being punished for negative events. Bertrand and Mullainathan (2001) examine this argument and find that weaker boards reward but do not punish CEOs for observable changes in firm performance that are beyond the control of the CEO (luck) to a larger extent. Having a large shareholder on the board reduces this "pay for luck" by between 23 and 33 percent; shorter CEO tenure, smaller boards, and a smaller fraction of insiders also reduce "pay for luck."

An alternative to exercising this bargaining power is for CEOs to influence the design of favorable contracts that put more weight on performance measures with lower variance that they can control more readily; that is, measures with better signal to noise ratio (Banker and Datar, 1989). Putting more weight on controllable measures reduces variability in actual compensation, eases the likelihood of achieving target objectives, and increases the rents that the CEO is able to capture. Empirical evidence indicates that stock returns are noisier (have higher variance) and receive higher weight in compensation contracts than accounting returns (Core et al., 2003). Because exposure to risk increases with the variance of the performance measure and its weight, managers are better off increasing the weight of accounting based measures rather than stock based measures. Because the bargaining power is exercised over the contract, the prediction is not informative about the CEO's incentives, which include annual pay as well as changes in the value of his beginning-of-the-year equity portfolio.

3. Research Design

3.1. Empirical Specification

Previous empirical work indicates that CEO compensation is associated with market (stock returns) and accounting (i.e., return on assets) measures of performance (Core et al., 2003; Bushman and Smith, 2001; Bushman et al., 1998, 2001; Kaplan, 1994; Sloan, 1993; Jensen and Murphy, 1990; Lambert et al., 1987). The null hypothesis in this study is that observed governance structures do not affect the weights of these performance measures. Therefore, only economic determinants of contract design identified in this stream of research should explain cross-sectional differences in the weights of accounting and stock performance measures. In particular, governance structures should not be significant in explaining these weights.

Our model regresses the change in CEO compensation on our two performance measures: changes in stock price (stock returns) and changes in accounting returns. Empirically, the cross-sectional variation in the weights of the performance measures can be examined using a changes specification that suffers from fewer omitted correlated variables' problems—a common threat to levels' specifications in compensation studies (Murphy, 1998). A changes specification minimizes the effect of omitted variables that remain relatively constant over a period of time (one year) such as industry variables and firm-specific factors including firm strategy, CEO quality and level of governance.

We control for variables that have been found to affect the weights of these two performance measures. Baber et al. (1996) find that the association between CEO compensation and stock returns is larger for firms with a larger opportunity set. This is consistent with stock prices better capturing the intangible value of future opportunities compared to accounting returns that only reflect current value generated. Following Smith and Watts (1992), we use the book-to-market ratio at the beginning of the year as our proxy for the firm's investment opportunities. We also control for the relative noise of our two sets of performance measures. Because the relative weights on performance measures are a decreasing function of the relative noise in the performance measures (Banker and Datar, 1989), we expect relative noise to affect the cross-sectional weights on accounting and stock measures. We use the ratio of the accounting-based performance measure variance to the returns-based performance measure variance as the proxy for relative noise (Sloan, 1993). Finally, we control for CEO ownership because the CEO's exposure to stock returns through stock ownership may affect the weighting of performance measures.

Because governance (as well as growth opportunities, relative noise and CEO ownership) is hypothesized to affect CEO compensation through the differential weighting of performance measures in the CEO contract rather than CEO compensation directly, we model its effect through interaction terms between our governance proxy (growth opportunities, relative noise and CEO ownership) and our two measures of firm performance after controlling for these variables' direct effects. We estimate the following empirical model, where the symbol Δ denotes change:

$$\Delta\ compensation_t = \beta_1 * stock\ returns_t + \beta_2 * \Delta\ accounting\ measure_t + \beta_3 * governance$$

$$+ \beta_4 * \Delta\ accounting\ measure_t * governance + \beta_5 * stock\ returns_t * governance$$

$$+ \Sigma\, \beta_i * control\ variables_t + \Sigma\, \beta_j * stock\ returns_t * control\ variables_t$$

$$+ \Sigma\, \beta_k * \Delta\ accounting\ measure_t * control\ variables_t + \varepsilon_t$$

If any of the two coefficients, β_4 and β_5, on the interaction between governance and the two performance measures is significant, the null hypothesis is rejected in favor of governance having an effect on the design of compensation contracts. Moreover, if governance structure is associated with an increase in the weight of accounting measures at the expense of stock returns then the coefficient on the interaction term between governance and accounting measures (β_4) will be positive and / or the coefficient on stock returns times governance (β_5) will be negative. Following previous findings, we expect the interaction between accounting and growth opportunities to be negative and / or the interaction between stock returns and growth opportunities to be positive (that is, CEO contracts in firms with more growth opportunities put less weight on accounting numbers and / or more weight on stock returns). We also expect the coefficient for the interaction term between accounting (stock returns) and accounting noise relative to stock returns noise to be negative (positive). Contracts for CEOs with larger ownership are expected to put more weight on accounting measures because of their exposure through their stock holdings to stock returns.

The specification is subject to several caveats. Following prior empirical research in the field, we treat governance structure as exogenous to the design of CEO contracts. This assumption is consistent with CEO compensation having no effect on governance structure; thus, with the assumption that governance is defined prior to the decision on how to design CEO compensation. To the extent that this assumption deviates from practice, our results may be affected by a simultaneous equation bias. However, empirical evidence shows that there is little time-series variation in the level of governance within a firm (Gompers et al., 2003), therefore the likelihood of changes in compensation affecting the level of governance is very small. Accordingly, our specification uses changes in compensation. To further limit this potential effect, we also run the specification of changes in compensation on changes in governance that avoids the impact of any variable that may be correlated in the cross-section but uncorrelated over time. Finally, to reduce the potential impact of the correlation between governance and economic characteristics of the firm, we use a two-stage procedure where we replace the governance variable (to be defined below) with the residuals from a regression of governance on economic characteristics of the firm. We also complement our main findings with additional tests that extend the effect of governance on the design of compensation contracts beyond the weighting of performance measures. Specifically, we examine the variance of CEO compensation and its composition over different governance regimes.

3.2. Variable Measurement

Research in CEO compensation typically focuses on two measures of CEO compensation that are also the variables in this paper. The first one is "cash pay", defined as the sum of annual salary plus bonus. The second measure adds non-cash items—including stock options, restricted stock, long-term incentive plans, and all other annual compensation—to "cash pay." We label this latter variable as "total pay." We use the log transformation of compensation to mitigate the influence of outliers and define the dependent variable in changes. Thus, the variable Δlog(compensation) is, alternatively, log(cash pay_t/cash pay_{t-1}) or log(total pay_t/total pay_{t-1}). It is more appropriate to use the second variable but we also report the results for the first one to make it comparable to earlier research. In our first set of tests we do not include the change in the CEO's equity portfolio value in our measure of compensation because, as argued above, the CEO's favorable bargaining position is exercised through the design of the compensation contract for the period, but his bargaining position does not influence the change in the value of the beginning-of-the-year portfolio.

We obtain compensation information directly from the ExecuComp database. ExecuComp values stock option grants using Black and Scholes. While this valuation has been used as best reflecting the value that executives put on these instruments, alternative valuations have been proposed. We also estimate stock option grants' value using a modified valuation formula. Specifically, we assume that the options are held 70% of the options' time to maturity (Huddart, 1994). The inputs required to estimate this alternative value—number of options granted, exercise price, dividend yield, and time to maturity—are obtained from ExecuComp. We estimate volatility as the standard deviation of daily stock returns during the 120 days before the end of the fiscal year multiplied by 254 trading days of a typical year. Our conclusions are unaltered by this alternative stock option valuation method.

We measure changes in stock price (*Returns*) as log(annual return$_t$ + 1) using CRSP data. There is no consensus on a particular accounting measure of performance. Murphy (1998), using survey data, reports that most firms use at least one measure of accounting profits, either as the dollar value of profits, on a per-share basis, as a margin, or as a return. Researchers have also used different accounting measures of performance: return on equity (Lambert and Larcker, 1987; Baber et al., 1996), return on assets (Core and Larcker, 2002; Sloan, 1993), and earnings per share (Core el al., 2003; Sloan, 1993). We use the change in return on assets (ΔROA_t)—where ROA is operating income divided by average total assets—as our main accounting performance measure. We use Compustat to obtain the accounting data.

We measure governance structure using an approach similar to the one used by Bertrand and Mullainathan (2001). Specifically, we develop a composite governance variable (*TotGov*) that incorporates the level of anti-takeover protection (external governance) and several characteristics of the board's structure (internal governance). This variable combines the following four governance proxies:

1) The first external governance proxy is the takeover protection index developed by Gompers et al. (2003). Even though these researchers interpret their index as a measure of shareholders' rights, we interpret it, following Cremers and Nair (2005), as a measure of takeover vulnerability. Using data compiled by the Investors Responsibility Research Center (IRRC) and state takeover law data, Gompers et al. construct an index for each firm in their sample by adding one point for every provision that reduces takeover vulnerability.[1] Higher values of this index are associated with more protection against takeovers.[2] Cremers and Nair (2005) also use a narrower alternative takeover index that only accounts for three components of the IRRC data shown to be critical to

[1] Gompers et al. (2003) examine 24 provisions: anti-greenmail, blank check preferred stock, business combination laws, bylaw and charter amendment limitations, classified board, compensation plans with change in control provisions, director indemnification contracts, control share cash-out laws, cumulative voting requirements, director's duties, fair price requirements, golden parachutes, director indemnification, limitations on director liability, pension parachutes, poison pills, secret ballot, executive severance agreements, silver parachutes, special meeting requirements, supermajority requirements, unequal voting rights and limitations on action by written consent.

[2] Our data covers the period 1993-2002. The IRRC data is only available for 1990, 1993, 1995, 1998, 2000, and 2002. Gompers et al. (2003) report that for the majority of firms there is little time-series variation in the index. Taking advantage of this fact, like Cremers and Nair (2005), we align the index for 1993 with CEO compensation data for 1993 and 1994, the governance index for 1995 with CEO compensation data for 1995, 1996 and 1997, the governance index for 1998 with CEO compensation data for 1998and 1999, the governance index for 2000 with CEO compensation data for 2000 and 2001, and the governance index for 2002 with CEO compensation data for 2002. In 7.65% of the cases some firms do not have a governance index value for all the years. In such instances, we interpolate the available index values to avoid losing those observations.

takeovers. They report that their results do not change and conclude that there are no systematic biases in the Gompers et al. index, and that it can be correctly interpreted as a measure of takeover protection.

2) However, this anti-takeover protection index does not capture information on internal governance, such as board characteristics. Hermalin and Weisbach (1998, 2003) argue that the main factor affecting a board's effectiveness is its independence from the CEO. Expanding their argument, we include an indicator variable that takes the value of one if the CEO is also the chairman of the board and zero otherwise. The CEO has more influence on governance when the same person holds the titles of CEO and chairman.

3) As a second proxy for internal governance, we include an additional variable that contains the proportion of top executives that serve on the board. A higher proportion of executives on the board is associated with higher CEO influence on governance.

4) Finally, Adams (2000) and Vafeas (1999) suggest that the number of board meetings is a good proxy for the directors' monitoring effort. We include this variable, where a higher value is associated with higher board influence.

Following Bertrand and Mullainathan (2001), we define the composite governance variable by taking the unweighted average of the standardized variables.[3]

Our proxy for investment opportunities is the book-to-market ratio (*B/M*). We follow Smith and Watts' (1992) definition and estimate this variable as the ratio of book value of assets to market value of assets measured at the beginning of the period. The market value of assets equals the market value of equity plus the book value of total liabilities. Like in Sloan (1993), the proxy to control for the relative noise in the performance measures is defined as the ratio of the variance of the accounting-based to the returns-based performance measures, *Var(ΔROA)/Var(Returns)*. To compute the variances we impose five consecutive annual observations spanning years t-4 to t. We define CEO ownership (*CEOshares*) as the percentage of shares owned by the CEO. Finally, we control for industry effects and for secular trends by adding two-digit SIC industry and year indicator variables. To mitigate the influence of outliers, we set the lower- and uppermost percentiles of all the variables, excluding the governance variables, equal to the 1st and 99th percentiles.

The final specification after controlling for industry and year is as follows:

$$\Delta log(compensation) =$$

$$\beta_0 + \beta_1 Returns + \beta_2 \Delta ROA + \beta_3 TotGov + \beta_4 \Delta ROA*TotGov + \beta_5 Returns*TotGov$$
$$+ \beta_6 B/M + \beta_7 \Delta ROA*B/M + \beta_8 Returns*B/M + \beta_9 Var(\Delta ROA)/Var(Returns)$$
$$+ \beta_{10} \Delta ROA*Var(\Delta ROA)/Var(Returns) + \beta_{11} Returns*Var(\Delta ROA)/Var(Returns)$$
$$+ \beta_{12} CEOshares + \beta_{13} \Delta ROA* CEOshares + \beta_{14} Returns* CEOshares$$
$$+ \beta_{15} Industry + \beta_{16} Year + \varepsilon$$

[3] The number of meetings is reverse coded to obtain *TotGov*. Like Bertrand and Mullainathan (2001), we use unit weights to construct *TotGov*, following the recommendations of Grice and Harris (1998), who find that unit-weighted composites exhibit better psychometric properties than alternative weighting schemes. Higher values of *Totgov* are expected to be associated with governance structures with higher takeover protection and CEO influence.

If CEOs exert their power to influence their compensation contracts so that more weight is given to accounting-based performance measures which they can better control, we predict that β_4 will be positive and / or β_5 will be negative or zero. If the presence of greater investment opportunities (low *B/M*) makes returns more sensitive to CEO actions, then we predict that β_7 will be positive and / or β_8 will be negative. If the relative weights on the performance measures are a decreasing function of the relative noise in the performance measures, we predict that β_{10} will be negative and / or β_{11} will be positive. Finally, if CEOs with a higher percentage of ownership are exposed to stock returns to a larger extent, we expect β_{13} to be positive and β_{14} to be negative.

3.3. Sample selection

Our initial sample is drawn from Compustat's Execucomp database. We select CEOs with compensation data to construct our regression variables and with at least three years in office to ensure that when we take changes, the compensation for year t-1 corresponds to an entire year.[4] This criterion also ensures that the CEO has had the opportunity to gain bargaining power and exert it, if he chose to do so. This criterion yields an initial sample of 8,073 CEO-year observations, covering fiscal years 1993 to 2002. Lack of returns data in CRSP eliminates 998 observations. We also eliminate 60 observations due to missing Compustat accounting data items. Missing governance index data in IRRC eliminates 287 observations, and lack of board data in Execucomp reduces the sample by 192 observations. The final sample consists of 6,536 CEO-year observations, corresponding to 1,879 CEOs for years 1993-2002.

4. Results

In this section we present the main results relating governance to the use of accounting and stock-related measures in the design of CEO compensation.

4.1. Descriptive statistics

Table 1 gives descriptive statistics on the various variables in the research. Panel A summarizes the various components of CEO compensation. For each component of compensation, Panel A provides the overall statistics as well as the statistics when the sample is partitioned into a "high takeover protection and high CEO influence" (HPI) governance group and a "low takeover protection and low CEO influence" (LPI) governance group at the median of the governance variable (*TotGov*). On average, LPI governance firms have lower cash pay and higher equity pay than HPI governance firms. The average cash pay in our sample is $1.337 million, the average equity pay is $2.416 million, and total pay is $4.240 million on average, although the distributions are skewed. These summary statistics are consistent with previous studies using a comparable time period (Core et al., 2003). Panel B presents descriptive statistics on the two definitions of our dependent variable.

Panel C summarizes governance related variables. Firms in the sample have adopted a median of 9 out of 24 provisions that increase anti-takeover protection as compiled by the IRRC, consistent with Gompers et al. (2003). The median number of board meetings is 7. The average percentage of executives on the board is 34%, consistent with

[4] We compute the number of years in office using the date the individual became chief executive officer.

previous evidence on a similar period (Harvey and Shrieves, 2001). The CEO is also chairperson in 79.9% of the observations.

Finally, Panel D summarizes other variables in the research design. The median change in ROA is 0, while the median return is 8.5%. The average of the standard deviation of ΔROA is 0.040 compared to 0.431 for returns, consistent with stock returns being noisier (Lambert and Larcker, 1987). The average book-to-market ratio and sales growth are 0.65 and 10.2%, respectively. The CEOs in our sample own 3% of the company on average, consistent with previous evidence (Yermack, 1995), and have been in office for an average of 10.6 years; and the mean (median) value of the stock options exercised annually is $1.90 (0) million.

Table 2 contains the Pearson correlations among variables of interest. Firms with higher book-to-market have larger changes in cash compensation and a higher (lower) proportion of cash (equity-based) pay to total pay, consistent with firms facing a constrained opportunity set (fewer investment opportunities), putting more weight on short-term incentives and relying to a smaller extent on equity compensation. Total governance (*TotGov*) is positively correlated with the percentage of cash pay over total pay, suggesting that governance structures with high takeover protection and CEO influence are associated with higher (lower) reliance on cash (equity-based) compensation. Untabulated results also show that this governance structure is also associated with CEO tenure and firm size. This latter correlation suggests that governance may deteriorate with firm size and, interestingly, it extends to all the components of our governance proxy.

Untabulated results also indicate that the level of fixed cash compensation (salary) on average is higher for the high anti-takeover, high CEO influence on governance firms ($0.651 vs. $0.647 million), although the difference is not statistically significant. The medians are also not significantly different. This result does not provide support for the hypothesis that the easiest way to extract rents is for the CEO to influence the contract to increase his salary.

4.2. Governance and the weighting of performance measures in CEO contracts

Table 3 presents the results testing the hypothesized association between governance and the structure of CEO compensation. We report results for our two measures of CEO compensation as dependent variables. The first column contains the change in cash pay and the second column reports change in total pay, which includes non-cash in addition to cash compensation. The coefficients for year and industry dummies are not reported. If governance affects the weighting of the various performance measures, then at least one of the coefficients on the interaction terms between governance and performance measures will be significant.

We find that the interaction between governance and performance (*ΔROA * TotGov*) is positive and significant for our two compensation variables. Companies with governance structures that have more anti-takeover protection and CEO influence (higher values of *TotGov*) put more weight on accounting performance measures. The sign for the interaction term between stock returns and governance (*Returns * TotGov*) is in the expected direction but not significant.

These findings are consistent with CEOs exercising their bargaining power through the design of the compensation contract and in particular by increasing the weight of accounting performance measures. Alternatively, these findings also suggest that CEOs in firms with higher levels of anti-takeover protection and more influence on governance may

be protected from market myopia, allowing them to concentrate on long-term value maximization. With optimal protection from takeovers, CEOs have lower incentives to manipulate earnings and, therefore, accounting measures contain less noise and become a better performance indicator on which to base compensation. Section 4.4 tests the robustness of this second argument.

As expected, we find that both accounting and stock-based performance measures are positively correlated with change in compensation in both specifications. We also find that a higher book-to-market ratio (i.e., firms with a smaller investment opportunity set) is positively associated with changes in cash pay and negatively with total pay, reflecting the increasing relevance of equity pay as the investment opportunity set increases. Consistent with prior research, we also find that firms with higher book-to-market ratio weight accounting measures more (Baber et al., 1996), but only for cash compensation. Also consistent with prior results, we find that accounting measures receive significantly more weight on cash compensation as their noisiness relative to stock returns decreases (Lambert et al., 1987; Sloan, 1993).[5]

We also test the robustness of our results to alternative measures of accounting performance; in particular to the change in return on equity (ΔROE_t)—where ROE is net income before extraordinary items and discontinued operations divided by average common equity—and the change in earnings per share scaled by beginning-of-the-period stock price ($\Delta EPS_t / P_{t-1}$)—where EPS is diluted earnings per share before extraordinary items and discontinued operations. We also examine the sensitivity of our conclusions to dropping those observations for which we interpolated the governance index (7.65% of the observations did not have a governance index for all the sample years).[6] We repeat our tests using lagged values of the governance proxies to allow for the CEO to exert his bargaining power the year before. Our inferences remain unaltered by each of these tests.

The previous results examine the impact of governance upon the weights of different performance measures. For different governance regimes, we find that these weights vary as hypothesized. As an additional robustness test, we modify the previous specification and replace *TotGov* with its change (*ΔTotGov*). The power of this test is much lower than our main regression. First, we do not have yearly measures for some of the variables that define *TotGov*; in particular, governance provisions captured in the anti-takeover protection index are only updated every two or more years. So our estimation of changes in governance is underestimated. Second, it relies on the assumption that changes in governance are rapidly translated into a change in the design of the CEO contract—within the same year in which governance changes take place. While such a rapid exercise of bargaining power may be true in certain companies, it may take longer to translate into contracting in other companies. In other words, while levels are informative about the on-going association between the two variables of interest, changes in governance also inform about (and assume) how quickly the expected association happens and how fast CEOs exert their newly gained power (as captured in the change in the governance proxy). On the other hand, a changes specification controls for potential omitted variables correlated with governance but with different time series properties. Table 4 reports the results. We find that contemporaneous changes in governance are associated with an increase in the weight given to accounting measures. The result is robust for the change in total pay.[7] This finding reinforces the evidence on the relevance of governance to the design of CEO compensation

[5] This result is consistent with previous research. However, as Core et al. (2003) point out, it should not be interpreted as a confirmation of theory predictions (Holstrom, 1979; Banker and Datar, 1989). For this to be a test of that theory, the dependent variable should be the change in wealth (total pay plus the change in the CEO's equity portfolio).

[6] As described in footnote 3.

[7] For the change in cash pay the result is robust in a one-tail test with a p-value of p=0.054.

contracts, but also indicates that the effect of a redistribution in the power structure between the CEO and shareholders is reflected (on average) in the design of the contract soon after governance changes.

We also use a two-stage procedure to control for the possibility that different firm characteristics require different levels of governance. In the first stage, we run a regression of *TotGov* on a vector of firm characteristics: size (measured as the logarithm of assets), growth opportunities (measured as book-to-market), CEO tenure (measured as the number of years in office), logarithm of the age of the firm (in years), and the presence of large free cash flows together with low growth opportunities (as defined in section 4.3 below). We also include two-digit industry and year dummies to control for industry and secular trends. All the variables load significantly in the regression.[8] Then, we replace *TotGov* in our main regression with the residuals from the first-stage regression and use it as our proxy for the quality of governance after controlling for firm characteristics. The residuals capture the variation in governance orthogonal to firm characteristics included in the first stage regression, that is, variation unaccounted for by these characteristics. The results from this two-stage model are consistent with the conclusions from Table 3.

4.3. Governance and the mix of pay in CEO compensation contracts

The evidence so far suggests that CEOs are able to exercise their bargaining power within certain governance structures and increase the weight of accounting measures. As argued in section 2, accounting measures are more controllable and this controllability has several attractive features from the CEO's perspective. One of them is that accounting measures are less volatile than stock returns, which reduces the risk imposed upon the agent. An additional implication of our results in Table 3 is that by increasing the weight of less volatile measures, CEOs may be able to reduce the volatility of their overall compensation. We examine the empirical implications of this argument in Table 5. Panel A provides descriptive statistics on the standard deviation of our two proxies of pay—cash pay and total pay—as well as on their changes (our dependent variables in Table 3). As in Table 1, we partition the sample at the median of *TotGov* and compare the mean of the high takeover protection and CEO influence (HPI) and low takeover protection and CEO influence (LPI) sub-samples. For the total sample and each sub-sample, we estimate the standard deviation of time series compensation for those CEOs for whom we have four or more consecutive observations. For total pay, the mean standard deviation for HPI governance firms is significantly lower than for LPI governance firms. This result is also significant when examining the standard deviation of the changes in total pay. These significant differences are robust to using the value of *TotGov* at points in time other than three years in the CEO position.

Panel B extends these descriptive statistics to a multivariate framework. In particular, it examines the relationship between the variation in change in compensation (rather than levels) and governance quality (*TotGov*) after controlling for variables that may affect this variation. In particular, we control for book-to-market because companies with larger investment opportunities may put more compensation at risk and thus increase its variation; we also control for size using the logarithm of assets, for CEO ownership, and for the variance of changes in accounting returns and stock returns. As in Panel A, we use the third year of a CEO's consecutive observations to select our independent variables; the third year corresponds approximately to the middle of the period used to compute the standard deviation of the changes in compensation. The results are robust to choosing other years to select the independent variables. The results indicate that high takeover protection and CEO

[8] We also included leverage but it was not significant and its exclusion did not change the nature of the inferences.

influence on governance is associated with lower variation in change in total pay (but not in cash pay), suggesting that CEOs leverage their bargaining power in this governance situation by reducing the variability of their compensation.

An alternative way in which CEOs may limit the variation in compensation is through the mix of types of pay. The descriptive statistics in Table 1 suggest that cash compensation is less volatile than equity compensation; in particular, the change in cash pay is smaller than the change in total pay. Thus, the variance in compensation may be reduced through a larger proportion of cash in the compensation mix. Table 6 examines this approach to designing CEO compensation contracts. Panel A provides descriptive statistics following the structure in Table 1; it includes overall statistics and statistics with the sample split at the median of *TotGov*. The proportion of cash pay in total pay is significantly larger for HPI governance firms, and conversely the proportion of equity pay is significantly larger for LPI governance firms.

Panel B presents the multivariate results. Our dependent variables are the proportion of cash pay, defined as log(cash pay / total pay), and the proportion of equity pay, defined as log(equity pay / total pay). Equity pay is the sum of annual grants of stock options and restricted stock. We use the log transformation to reduce the influence of outliers.

Because our dependent variables are levels rather than changes, in addition to the governance proxy (*TotGov*), we control for economic determinants that have been previously found to be associated with levels of pay. In particular, Smith and Watts (1992) suggest that a firm's investment opportunity set is positively associated with equity incentives, since the presence of growth opportunities makes it more difficult to monitor managerial actions. In addition, options' incentive and retention features are especially important for growth firms. Following Smith and Watts (1992), we control for the investment opportunity set using the book-to-market ratio (*B/M*) as previously defined. Firms with a smaller (larger) opportunity set are more likely to rely on short-term cash compensation (long-term equity-based compensation). We also include the growth in sales as an additional determinant of CEO pay in addition to being another proxy for the investment opportunity set (Baber et al., 1996).

High free cash flow poses a problem for firms with low growth opportunities, since managers may invest the excess cash in negative net present value projects or engage in empire-building acquisitions. Jensen (1986) suggests that using stock-based compensation can mitigate this agency problem. Following Lang et al. (1991) and Core and Guay (1999), our proxy to capture this determinant (*Free cash flow problem*) is the three-year average of [(operating cash flow minus preferred and common dividends)/total assets] if the book-to-market ratio is greater than or equal to one—that is, if firms expected to have low growth opportunities—and zero otherwise.

We control for the amount of options that the CEO exercised during the year using the fair value of the options exercised, because it is correlated with the amount of options granted and thus with equity pay (Core and Guay, 1999). The number of years the CEO has been in office (*CEO tenure*) is another hypothesized determinant of compensation. However, its relationship to the compensation mix may be non-linear. On the one hand, Harvey and Shrieves (2001) find that CEOs with longer tenure and approaching retirement receive more compensation in cash. On the other hand, the proportion of equity increases with tenure because the uncertainty about the CEO's ability is reduced, allowing firms to impose more risk on the CEO through equity compensation (Gibbons and Murphy, 1992). We model this potential non-linearity by including the squared term for tenure. Finally, we also control for size, which we measure as log (assets), and CEO ownership.

We run two different specifications for the two different dependent variables: proportion of cash pay to total pay and proportion of equity pay to total pay. For our first dependent variable we use a linear regression with robust standard errors. Because of the significant number of zeros in our second dependent variable (21%), ordinary least squares' regression may lead to biased results due to the self-selection problem associated with firms not choosing the level of equity pay at random. To mitigate this problem, we use a Heckman procedure (Heckman, 1979), a two-stage procedure that first estimates a selection model with the determinants of a firm's decision to grant options and then estimates the regression model.[9]

The first column reports the results for proportion of cash compensation. These results indicate that the governance proxy (*TotGov*) is positive and highly significant, indicating that firms with high takeover protection and CEO influence on governance are associated with a higher proportion of cash compensation. For CEOs that have exercised more options during the year, the proportion of cash is lower. This is consistent with these firms using more equity-based compensation to rebalance the CEO's incentive structure. While tenure is not significant, the squared term is positive, suggesting that the proportion of cash compensation increases with tenure. This result is consistent with the Harvey and Shrieves (2001) findings. Firms with more investment opportunities (low B/M, high sales growth) use less cash in the CEO pay package. As expected, the proxy for size, log (assets), is negatively associated with the proportion of cash pay. Finally, CEOs with higher stock ownership receive a higher proportion of cash pay.

When we use proportion of equity pay as our dependent variable, the results are also consistent with expectations. We find that the coefficient on total governance (*TotGov*) is significantly negative, implying that firms with lower takeover protection and lower CEO influence in governance are positively associated with more equity-based pay in the CEO compensation package. We also find that more investment opportunities (lower B/M and higher sales growth) result in more equity-based pay; more option exercises imply more option grants to restore the optimal level of CEO option incentives, which increase the proportion of equity pay in CEO compensation; firms with excess cash flows tend to remunerate their CEO with more equity and less cash, to reduce the free cash flow problem; and larger firms grant more equity to the CEO. This is consistent with previous research. Demsetz and Lehn (1985) argue that the optimal level of managerial ownership is positively related to firm size. Finally, CEO tenure is positively associated with more equity-based pay, but at a decreasing rate.

4.4. Alternative specification with the change in CEO annual wealth

So far, our tests have used total pay as the dependent variable. This is most consistent with CEOs exercising their bargaining power to write more favorable contracts when the governance structure provides more protection against the market for corporate control and gives the CEO more leverage over governance decisions. However, the results are also consistent with these governance structures protecting CEOs from market myopia and allowing them to focus on long-term value creation. While the bargaining power argument makes predictions about the design of the compensation contract, the protection argument makes predictions about CEOs' incentive structure (including the compensation contract as well as changes to their portfolio).

[9] The variables used in the selection model, in addition to the ones already included in the main regression, are the log of the market value of equity, the log of total sales, and the ratio of research and development expenditures to sales (Core and Guay, 1999).

To separate these two potential explanations, we use a specification similar to our main test (Table 3). However, the dependent variable is change in CEO annual wealth, which we define as total pay plus changes in the value of the beginning-of-the-year equity portfolio. This dependent variable is consistent with the protection argument but unrelated to the bargaining power argument. We measure changes in portfolio value as in Core et al. (2003). To capture the non-linearity associated with the changes in value of the stock options portfolio, we also include returns squared (*Returns2*) as an additional performance measure. Tests of incentive structure, which underlies the positive entrenchment argument, demands using the change in annual wealth as the appropriate dependent variable in the research design (Core et al., 2003).

Table 7 presents the results. Panel A provides descriptive statistics on changes in CEO wealth and the new dependent variable. On average, change in annual wealth is $21.95 million, and governance structures where the CEO is better protected against takeovers and where he has more influence over the governance process have higher change in annual wealth.

Panel B presents the multivariate model. As expected, *Return* and *Return2* are highly significant, while accounting returns are insignificant. Book-to-market, relative noisiness of the performance measures, and CEO ownership are all associated with the weights that performance measures receive; however, governance is unrelated.[10] This evidence suggests that positive entrenchment firms (as proxied by *TotGov*) do not appear to use the weightings of these two measures to align CEO incentives with long-term value creation. However, the evidence is not informative about whether these firms use other types of incentive design to achieve this objective.

5. Conclusions

CEO contracting is one of the most important tasks in corporate governance and, as such, it has been said to be a significant source of agency costs. Previous empirical evidence has documented the association between weak governance and higher levels of CEO compensation as well as with asymmetric rewards where CEOs are rewarded for favorable but uncontrollable events but are not penalized when events are unfavorable. In this paper we examine whether different governance structures are associated with different CEO contract designs. We run our tests using CEO pay and find that the weighting of accounting-based performance measures is higher for firms with better takeover protection and where the CEO has larger influence on internal governance decisions. This evidence is consistent with the argument that weak governance allows CEOs to exerts their bargaining power to write favorable contracts. It is also consistent with CEOs exerting their power through the design of the contract rather than by directly raising their salaries. Because simply raising the salary—the most efficient way of capturing rents—is easily recognized and subject to reputation costs as it is not related to performance, CEOs in weakly governed firms increase the weight of controllable performance measures at the expense of more complete but also noisier measures. The result is robust to various definitions of accounting returns and to levels as well as changes in governance. Because an attractive characteristic of controllable measures is their lower level of noise, we extend the empirical study and examine the variance of CEO compensation and the proportion of cash compensation across governance regimes. Consistent with CEOs using their bargaining power to decrease the variance in their compensation, we find that the variance in CEO pay decreases, and the proportion of cash compensation increases with weaker governance.

[10] For completeness we ran our main test (Table 3) including the variable *Return2*. As expected, this variable and its interactions were not significant and the inferences from Table 3 did not change.

This evidence indicates that one mechanism that CEOs use to exert the power that weak governance grants them is through the design of their compensation contract, favorable to them but sub-optimal (and a source of agency costs) from the shareholders' perspective. Thus, these results provide evidence that explains how CEOs achieve the previously documented association between the level of CEO compensation and governance variables, including governance provisions and Board of Director characteristics.

Finally, the paper examines the weights that these performance measures receive when contemplating the overall CEO incentive structure (including pay as well as changes in the value of the CEO's portfolio). We find that the weights of these measures do not vary significantly across governance regimes. Positive entrenchment predicts that firms with better takeover protection and where the CEO has more influence over the governance process will align CEO incentives with long-term value maximization. A potential way to accomplish this objective is through the weighting of performance measures. The evidence is not consistent with this prediction.

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Table 1.
Descriptive statistics

Panel A: CEO compensation

	Mean	Std. Dev.	Perc1	Perc25	Median	Perc75	Perc99
Cash pay	1.337	1.186	0.154	0.616	0.992	1.614	7.625
Cash pay (HPI governance)[+]	1.344	1.157	0.154	0.667	1.023	1.625	7.625
Cash pay[†] (LPI governance) [++]	1.330	1.215	0.167	0.578	0.963[***]	1.600	7.500
Equity-based pay	2.416	4.835	0.000	0.088	0.700	2.317	31.840
Equity-based pay (HPI governance) [+]	2.166[***]	4.274	0.000	0.123	0.711	2.141	22.659
Equity-based pay[†] (LPI governance) [++]	2.665	5.324	0.000	0.054	0.682	2.489	31.840
Rest of pay	0.487	1.821	-0.425	0.012	0.072	0.295	8.160
Rest of pay (HPI governance) [+]	0.530	1.843	-0.266	0.014	0.080	0.315	8.878
Rest of pay[†] (LPI governance) [++]	0.444[**]	1.797	-0.726	0.011	0.062[***]	0.285	7.966
Total pay	4.240	6.179	0.255	1.079	2.135	4.607	40.942
Total pay (HPI governance) [+]	4.041	5.644	0.255	1.124	2.168	4.452	33.229
Total pay[†] (LPI governance) [++]	4.439[**]	6.663	0.260	1.044	2.101	4.696	40.942

Panel B. Changes in CEO compensarion

	Mean	Std. Dev.	Perc1	Perc25	Median	Perc75	Perc99
Δ log (cash pay)	0.058	0.348	-1.120	-0.060	0.066	0.211	1.087
Δ log (total pay)	0.105	0.685	-2.165	-0.172	0.101	0.411	2.209

+ HPI governance indicates High anti-takeover Protection and High CEO Influence on governance.
++ LPI governance indicates Low anti-takeover Protection and Low CEO Influence on governance.
The sample consists of 6,536 CEO-year observations of Execucomp data (1,879 CEOs) for the years 1993-2002. All amounts in Panel A are in $ million. Cash pay is defined as the sum of annual salary and bonus. Equity-based pay is the sum of annual grants of stock options and restricted stock. Total pay includes cash pay, stock options, restricted stock, long-term incentive plan payouts, and all other annual compensation. Rest of pay is defined as total pay minus cash pay and equity-based pay. The sample is divided into two groups according to their corporate governance structure. We measure corporate governance using a summary measure of total governance (TotGov) that includes indicators of anti-takeover protection and characteristics of the Board of Directors, as defined in Section 3.2. HPI (LPI) governance indicates that the observation has a total governance score above (below) the median of TotGov. The variables have been winsorized at the 1 and 99 percentiles.
† The symbols [***, **, *] indicate that the means (medians) are different at the 1%, 5% and 10% level respectively.

Table 1 (continued)
Descriptive statistics

Panel C: Governance variables

	Mean	Std. Dev.	Perc1	Perc25	Median	Perc75	Perc99
Anti-takeover protection index	9.289	2.727	4	7	9	11	15
Number of meetings	7.203	2.953	3	5	7	9	16
Executives on the board (%)	34.29	18.60	11.11	20.00	33.33	42.86	100
CEO is also chair of board	0.799	0.400	0	1	1	1	1
TotGov	0.000	0.456	-1.072	-0.274	0.001	0.281	1.083

Panel D: Economic variables

	Mean	Std. Dev.	Perc1	Perc25	Median	Perc75	Perc99
ΔROA	-0.007	0.054	-0.242	-0.020	-0.001	0.013	0.169
Return	0.064	0.399	-1.264	-0.143	0.085	0.299	1.137
Std. Dev(ΔROA)	0.040	0.045	0.002	0.012	0.025	0.048	0.263
Std. Dev(Return)	0.431	0.356	0.073	0.219	0.326	0.503	2.196
B/M	0.650	0.261	0.104	0.451	0.671	0.861	1.215
Var(ΔROA) / Var(Return)	0.027	0.117	0.000	0.002	0.005	0.018	0.398
CEOshares	0.030	0.067	0.000	0.001	0.004	0.019	0.339
Fair value options exercised ($ million)	.1901	6.001	0.000	0.000	0.000	0.772	43.845
Free cash flow problem	0.003	0.015	0.000	0.000	0.000	0.000	0.092
CEO tenure (years)	10.6	7.3	3.1	5.2	8.4	13.4	38.0
Log (Assets)	7.665	1.708	4.284	6.404	7.488	8.813	12.201
Sales growth	0.102	0.214	-0.654	0.012	0.085	0.185	0.849

Governance Index is the governance index compiled by Gompers et al. (2003) to capture the level of anti-takeover protection. *TotGov* combines the four governance proxies into a summary measure of total governance by taking the average of the standardized variables, after controlling for firm characteristics as explained in Section 3.2. To perform this computation, number of meetings is reverse coded. *ΔROA* is the change in return on assets, where *ROA* is operating income divided by average total assets. Return is the log(annual return + 1), where annual return is the continuously compounded monthly CRSP return over the firm's fiscal year. *Std. Dev(ΔROA)* is the standard deviation of *ΔROA* measured with five consecutive annual observations spanning years t-4 to t. *Std. Dev(Return)* is the standard deviation of *Return* measured with five consecutive annual observations spanning years t-4 to t. *B/M* is the ratio of book value of assets to market value of assets measured at the beginning of the period. The market value of assets equals the market value of equity plus the book value of total liabilities. *Var(ΔROA) / Var(Return)* is the ratio of the variances of *ΔROA* and *Return*. *CEOshares* is the percentage CEO ownership. *Fair value options exercised* is the fair value of the stock options exercised by the CEO in the year. *Free cash flow problem* is the three-year average of [(operating cash flow minus preferred and common dividends)/total assets] if the book-to-market ratio is greater than or equal to one, and zero otherwise. *CEO tenure* is the number of years the CEO has been in office. *Log (Assets)* is the log of total assets (in millions) at fiscal year-end. *Sales growth* is defined as the change in the log of total annual sales. With the exception of the governance variables, all the variables have been winsorized at the 1 and 99 percentiles.

Table 2.
Correlation Matrix

	Δ log (cash pay)	**Δ log (total pay)**	**Return**	**ΔROA**	**Antitakeover protection**	**Number of meetings**	**Execs on Board**	**CEO is chair**	**TotGov**	**B/M**	**Var(ΔROA)/ Var(Return)**	**CEOshares**	**Proportion of cash pay**
Δ log (total pay)	**0.347**												
Return	**0.348**	**0.224**											
ΔROA	**0.362**	**0.168**	**0.367**										
Antitakeover protection	0.012	0.007	0.014	**0.059**									
Number of meetings	-0.021	-0.006	**-0.060**	-0.027	**0.126**								
Execs on Board	0.007	-0.012	**0.037**	**0.042**	**-0.071**	**-0.102**							
CEO is chair	0.019	0.021	0.024	**0.033**	**0.109**	0.001	0.021						
TotGov	0.017	0.009	**0.036**	**0.049**	**0.449**	**-0.360**	**0.459**	**0.513**					
B/M	**0.055**	-0.020	**0.064**	**0.073**	**0.138**	**0.151**	-0.004	0.019	0.004				
Var(ΔROA)/Var(Return)	-0.011	-0.006	**-0.050**	**-0.048**	-0.031	-0.019	-0.023	0.000	-0.013	-0.026			
CEOshares	**-0.020**	**0.007**	**-0.000**	**-0.002**	**-0.203**	**-0.188**	**0.189**	**0.040**	**0.045**	**-0.067**	0.011		
Proportion of cash pay	**0.143**	**-0.438**	**0.035**	**0.105**	0.003	**-0.072**	**0.107**	-0.013	**0.057**	**0.247**	0.031	**0.138**	
Proportion of equity pay	**-0.109**	**0.212**	**-0.068**	**-0.101**	**-0.065**	-0.007	**-0.084**	-0.024	**-0.059**	**-0.280**	-0.007	**-0.054**	**-0.634**

Bold figures indicate significance at the 1% confidence level.

Δ log (cash pay) is the change in cash pay. *Cash pay* is defined as the sum of annual salary and bonus. *Δ log (total pay)* is the change in total pay. *Total pay* includes cash pay, stock options, restricted stock, long-term incentive plan payouts, and all other annual compensation. *Return* is the log(annual return + 1), where annual return is the continuously compounded monthly CRSP return over the firm's fiscal year. *ΔROA* is the change in return on assets, where *ROA* is defined as operating income divided by average total assets. *Antitakeover protection* is the index compiled by Gompers et al. (2003) to capture the level of shareholder rights. *TotGov* combines the four governance proxies into a summary measure of total governance by taking the average of the standardized variables, after controlling for firm characteristics as explained in Section 3.2. To perform this computation, number of meetings is reverse coded. *B/M* is the ratio of book value of assets to market value of assets measured at the beginning of the period. The market value of assets equals the market value of equity plus the book value of total liabilities. *Var(ΔROA) / Var(Return)* is the ratio of the variances of *ΔROA* and *Return*. The variances are computed with five consecutive annual observations spanning years t-4 to t. *CEOshares* is the percentage CEO ownership. *Proportion of cash pay* is defined as log(*cash pay* / *total pay*). *Proportion of equity pay to total pay* is defined as log(*equity pay* / *total pay*). With the exception of the governance variables, all the variables have been winsorized at the 1 and 99 percentiles.

Table 3.
Performance metrics, governance and compensation

		CEO compensation variable			
	Predicted sign	**Δ log (cash pay)**		**Δ log (total pay)**	
Δ ROA	+	1.118	***	0.811	*
		(0.193)		(0.434)	
Return	+	0.1957	***	0.346	***
		(0.028)		(0.064)	
TotGov	?	0.003		0.008	
		(0.009)		(0.019)	
Δ ROA * TotGov	+	0.520	***	1.031	***
		(0.204)		(0.405)	
Return * TotGov	–	-0.020		-0.036	
		(0.028)		(0.051)	
B/M	?	0.048	**	-0.113	***
		(0.019)		(0.042)	
Δ ROA * B/M	+	1.428	***	1.164	
		(0.340)		(0.712)	
Return * B/M	–	0.055		-0.025	
		(0.043)		(0.092)	
Var(Δ ROA)/Var(Return)	?	0.040		0.014	
		(0.0337)		(0.055)	
Δ ROA * Var(Δ ROA)/Var(Return)	–	-1.174	***	-0.691	*
		(0.240)		(0.390)	
Return * Var(Δ ROA)/Var(Return)	+	-0.188		-0.148	
		(0.151)		(0.212)	
CEOshares	?	-0.005		-0.014	
		(0.004)		(0.009)	
Δ ROA * CEOshares	+	-0.243	**	-0.121	
		(0.106)		(0.218)	
Return * CEOshares	–	-0.007		0.020	
		(0.014)		(0.027)	
Adjusted R^2		0.199		0.061	
N		6,536		6,536	

Δ log (cash pay) is the change in cash pay. *Δ log (total pay*) is the change in total pay. *Return* is the log(annual return + 1). *ΔROA* is the change in return on assets. *TotGov* combines the four governance proxies defined in Table 1. *B/M* is the ratio of book value of assets to market value of assets at the beginning of the period. *Var(ΔROA) / Var(Return)* is the ratio of the variances of *ΔROA* and *Return*. The variances are computed with five consecutive annual observations spanning years t-4 to t. *CEOshares* is the percentage CEO ownership. Intercept, two-digit SIC industry and year dummies included but not reported. The standard errors reported in parentheses are based on the Huber-White estimator, which is robust to both serial correlation and heteroscedasticity (Rogers, 1993). The symbols $^{***, **, *}$ indicate two-tail significance at the 1%, 5%, 10% level.

Table 4.
Performance metrics, change in governance and compensation

		CEO compensation variable			
	Predicted sign	**Δ log (cash pay)**		**Δ log (total pay)**	
Δ ROA	+	0.985	***	0.536	
		(0.186)		(0.444)	
Return	+	0.196	***	0.331	***
		(0.028)		(0.065)	
Δ TotGov	?	0.022		0.007	
		(0.021)		(0.036)	
Δ ROA * Δ TotGov	+	0.716		2.618	***
		(0.447)		(0.878)	
Return * Δ TotGov	–	-0.025		-0.075	
		(0.063)		(0.107)	
B/M	?	0.048	**	-0.120	***
		(0.019)		(0.042)	
Δ ROA * B/M	+	1.674	***	1.676	**
		(0.336)		(0.716)	
Return * B/M	–	0.043		-0.007	
		(0.043)		(0.093)	
Var(Δ ROA)/Var(Return)	?	0.041		0.021	
		(0.033)		(0.056)	
Δ ROA * Var(Δ ROA)/Var(Return)	–	-1.187	***	-0.740	*
		(0.252)		(0.408)	
Return * Var(Δ ROA)/Var(Return)	+	-0.1748		-0.122	
		(0.149)		(0.211)	
CEOshares	?	-0.004		-0.013	
		(0.005)		(0.010)	
Δ ROA * CEOshares	+	-0.162		-0.036	
		(0.102)		(0.231)	
Return * CEOshares	–	-0.017		0.014	
		(0.015)		(0.029)	
Adjusted R^2		0.200		0.062	
N		6,437		6,437	

Δ log (cash pay) is the change in cash pay. *Δ log (total pay*) is the change in total pay *Return* is the log(annual return + 1), where annual return is the continuously compounded monthly CRSP return over the firm's fiscal year. *ΔROA* is the change in return on assets. *ΔTotGov* is the change in *TotGov* from year to year. This variable is a proxy for total governance and combines the four governance indicators defined in Table 1. *B/M* is the ratio of book value of assets to market value of assets measured at the beginning of the period. *Var(ΔROA) / Var(Return)* is the ratio of the variances of *ΔROA* and *Return*. The variances are computed with five consecutive annual observations spanning years t-4 to t. *CEOshares* is the percentage CEO ownership. Intercept, two-digit SIC industry and year dummies included but not reported. The standard errors reported in parentheses are based on the Huber-White estimator, which is robust to both serial correlation and heteroscedasticity (Rogers, 1993). The symbols ***, **, * indicate two-tail significance at the 1%, 5%, 10% level.

Table 5.
Governance and variance in CEO compensation

Panel A: Descriptive statistics

	Standard deviation of Log (cash pay)	Standard deviation of Log (total pay)	Standard deviation of ΔLog (cash pay)	Standard deviation of ΔLog (total pay)
HPI governance	0.285	0.487	0.289	0.566
LPI governance	0.302	0.515*	0.300	0.614**

Each cell contains the mean of the standard deviation of CEO pay. To compute the standard deviation, we impose the restriction of having four or more consecutive observations (N=751). *Cash pay* includes annual salary and bonus. *Total pay* includes cash pay, stock options, restricted stock, long-term incentive plan payouts, and all other annual compensation. Then, we compute the mean of the standard deviations by governance group. HPI (LPI) governance indicates that the CEO's firm has a total governance score above (below) the median of *TotGov*. This variable is a proxy for total governance and combines the four governance indicators defined in Table 1 into a summary measure of total governance. Higher values of *TotGov* are associated with poorer governance. The symbols ***,**,* indicate that the means are different at the 1%, 5% and 10% level respectively.

Panel B: The effect of governance on the variance of CEO pay

	Standard deviation of ΔLog (cash pay)	Standard deviation of ΔLog (total pay)
TotGov	-0.003 (0.016)	-0. 076** (0.030)
CEOshares	-0.014* (0.08)	0.001 (0.018)
B/M	0.086** (0.035)	-0.149** (0.076)
Log (Assets)	0.017*** (0.006)	0.031*** (0.012)
Var(Δ ROA)	2.065* (1.100)	4.751*** (1.779)
Var(Return)	0.049*** (0.017)	0.101*** (0.032)
Adjusted R^2	0.123	0.135
N. observations	751	751

The sample consists of CEOs with four or more consecutive observations. *TotGov* combines the four governance proxies defined in Table 1. *B/M* is the ratio of book value of assets to market value of assets at the beginning of the period. *Var(ΔROA)* and *Var(Return)* are the variances of *ΔROA* and *Return*. *CEOshares* is the percentage CEO ownership. Intercept and two-digit SIC industry dummies included but not reported. The standard errors reported in parentheses are based on the Huber-White estimator, which is robust to both serial correlation and heteroscedasticity (Rogers, 1993). The symbols ***, **, * indicate two-tail significance at the 1%, 5%, 10% level.

Table 6.
Governance and structure of CEO compensation

Panel A: Descriptive statistics

	Mean	Std. Dev.	Perc1	Perc25	Median	Perc75	Perc99
Cash pay / Total pay	0.534	0.275	0.036	0.312	0.515	0.747	1.000
Cash pay / Total pay (HPI gov.)	0.539	0.268	0.042	0.329	0.521	0.744	1.000
Cash pay / Total pay † (LPI gov.)	0.529*	0.283	0.036	0.292	0.509	0.750	1.000
Equity pay/Total pay	0.374	0.291	0.000	0.090	0.362	0.607	0.973
Equity pay/Total pay (HPI gov.)	0.364	0.278	0.000	0.114	0.352	0.572	0.960
Equity pay/Total pay † (LPI gov.)	0.385***	0.303	0.000	0.068	0.374**	0.635	0.973

† The symbols $^{***, **, *}$ indicate that the means (medians) are different at the 1%, 5% and 10% level respectively.

Panel B: Governance and pay mix

				Heckman regression	
	Predicted sign	Proportion of cash pay to total pay		Proportion of equity pay to total pay	
TotGov	+ / –	0.066	***	-0.056	***
		(0.016)		(0.014)	
Fair value of options exercised	– / +	-0.017	***	0.005	***
		(0.002)		(0.001)	
Free cash flow problem	– / +	-1.082	**	2.842	***
		(0.552)		(0.802)	
Log (assets)	– / +	-0.107	***	0.0324	***
		(0.006)		(0.007)	
B/M	+ / –	0.624	***	-0.545	***
		(0.041)		(0.048)	
CEOshares	+ / –	0.036	***	0.021	**
		(0.011)		(0.010)	
Sales growth	– / +	0.010		0.076	*
		(0.042)		(0.043)	
CEO tenure	?	-0.001		0.013	***
		(0.004)		(0.003)	
CEO tenure-squared	+ / –	0.0003	***	-0.0002	**
		(0.0001)		(0.0001)	
Adjusted R^2		0.270			
N. observations		6,535		6,534	
N. uncensored observations				5,131	
Wald chi-square test of zero slopes				1017.40	
Wald test p-value				0.000	

Proportion of cash pay to total pay is defined as log(*cash pay* / *total pay*). *Proportion of equity pay to total pay* is defined as log(*equity pay* / *total pay*). *B/M* is the ratio of book value of assets to market value of assets at the beginning of the period. *Fair value options exercised* is the fair value of the stock options exercised by the CEO in the year. *Free cash flow problem* is the three-year average of [(operating cash flow minus preferred and common dividends)/total assets] if the book-to-market ratio is greater than or equal to one, and zero otherwise. *CEOshares* is the percentage CEO ownership. *CEO tenure* is the number of years the CEO has been in office. *Log (Assets)* is the log of total assets at fiscal year-end. Intercept, industry and year dummies included but not reported. The standard errors reported in parentheses are based on the Huber-White estimator, which is robust to both serial correlation and heteroscedasticity (Rogers, 1993). The symbols $^{***, **, *}$ indicate two-tail significance at the 1%, 5%, 10% level.

Table 7.
Performance metrics, governance and compensation

Panel A: Descriptive statistics

	Mean	**Std. Dev.**	**Perc1**	**Perc25**	**Median**	**Perc75**	**Perc99**
Change in annual wealth	21.953	98.448	-177.24	-0.135	3.046	13.077	606.902
Change in annual wealth (high entrenchment)	23.273	99.340	-119.67	0.095	3.170	12.724	606.902
Change in annual wealth (low entrenchment)	20.639	97.549	-177.67	-0.426	2.954	13.417	606.902

	Mean	**Std. Dev.**	**Perc1**	**Perc25**	**Median**	**Perc75**	**Perc99**
$(\Delta \text{ Wealth}_{t} / \Delta \text{ Wealth}_{t-1})-1$	0.482	2.943	-5.557	-1.054	0.060	1.426	14.20

Change in annual wealth is the change in total CEO wealth defined as total pay plus changes in the value of the beginning-of-the-year CEO's portfolio of company securities. High (low) entrenchment indicates that the CEO's firm has a total governance score above (below) the median of *TotGov*. This variable is a proxy for the level of governance and combines the four governance indicators defined in Table 1 into a summary measure of total governance, after controlling for firm characteristics. Higher values of *TotGov* are associated with poorer governance.

Table (continued)

Panel B: Multivariate results

	Dependent variable: (Δ Wealth$_t$ / Δ Wealth$_{t-1}$)-1	
Δ ROA	0.108	
	(0.748)	
Return	8.370	***
	(0.138)	
Return2	3.792	***
	(0.190)	
TotGov	-0.018	
	(0.038)	
Δ ROA * TotGov	0.138	
	(0.738)	
Return * TotGov	0.034	
	(0.126)	
Return2 * TotGov	0.116	
	(0.192)	
B/M	0.046	
	(0.082)	
Δ ROA * B/M	2.171	
	-1.359	
Return * B/M	-3.275	***
	(0.212)	
Return2 * B/M	-0.764	**
	(0.303)	
Var(Δ ROA)/Var(Return)	-0.088	
	(0.113)	
Δ ROA * Var(Δ ROA)/Var(Return)	-2.433	***
	(0.889)	
Return * Var(Δ ROA)/Var(Return)	-3.638	***
	-1.177	
Return2 * Var(Δ ROA)/Var(Return)	-2.679	***
	-1.047	
CEOshares	-0.132	***
	(0.018)	
Δ ROA * CEOshares	0.324	
	(0.339)	
Return * CEOshares	1.119	***
	(0.056)	
Return2 * CEOshares	0.494	***
	(0.098)	
Adjusted R^2	0.866	
N	6,478	

Δ Wealth is the change in total wealth (total pay plus changes in the value of company securities in the CEO portfolio). *Return* is the log(annual return + 1). *Return2* is returns squared. *ΔROA* is the change in return on assets. *TotGov* combines the four governance proxies defined in Table 1. *B/M* is the ratio of book value of assets to market value of assets at the beginning of the period. *Var(ΔROA) / Var(Return)* is the ratio of the variances of *ΔROA* and *Return*. The variances are computed with five consecutive annual observations spanning years t-4 to t. *CEOshares* is the percentage CEO ownership. Intercept, two-digit SIC industry and year dummies included but not reported. The standard errors reported in parentheses are based on the Huber-White estimator, which is robust to both serial correlation and heteroscedasticity (Rogers, 1993). The symbols ***, **, * indicate two-tail significance at the 1%, 5%, 10% level.