Pay for the Right Performance*

David De Angelis
Johnson Graduate School of Management
Cornell University
Sage Hall, Ithaca, NY 14853
dd252@cornell.edu
(607) 342-8636

Yaniv Grinstein
Johnson Graduate School of Management
Cornell University
Sage Hall, Ithaca, NY 14853
yg33@cornell.edu
(607) 255-8686

July 13th, 2011

ABSTRACT

In December 2006, the Securities and Exchange Commission issued new rules that require enhanced disclosure on how firms tie CEO compensation to performance. We find that firms tie 52% of the CEO awards to pre-specified performance goals. Firms vary in their choice of performance measures and horizons, and in their reliance on pre-specified performance goals. Consistent with the optimal contracting theory, firms choose performance measures that are more informative of CEO actions, and rely less on pre-specified goals when there is more uncertainty regarding optimal CEO actions. However, firms also avoid relying on pre-specified goals when shareholder monitoring is weaker.

Keywords: CEO Compensation, Market-based Performance Measure, Accounting-based Performance Measure, Performance Horizon

JEL Classification: G34, G38, J33.

* An earlier version of this paper was circulated as "Measuring CEO Performance: Evidence from the New Compensation Disclosure Rules." We thank Lucian Bebchuk, Jan Bouwens, William Gerken, Dirk Jenter, Mark Leary, Roni Michaely, Gregory Nagel, Yixi Ning, Rik Sen, and participants at the 2010 Midwest Finance Association Meetings, 2010 Eastern Finance Association Meetings, 2010 Erasmus University Executive Compensation Conference, and 2010 Financial Intermediation Research Society Conference for valuable comments. All remaining errors are our own.

CEO compensation in U.S. public firms has attracted a great deal of empirical work. Yet our understanding of the contractual terms that govern CEO compensation and especially how the compensation committee ties CEO compensation to performance is still incomplete. The main reason is that CEO compensation contracts are, in general, not observable. For the most part, firms disclose only the realized amounts that their CEOs receive at the end of any given year. The terms by which the board determines these amounts are not fully disclosed.[1]

The fact that the contractual terms are not fully observable has led researchers to doubt that such contracts optimally tie CEO compensation to performance. For example, Bebchuk and Fried (2003) argue that companies have decoupled compensation from performance and camouflaged both the amount and performance-insensitivity of pay. Morse, Nanda, and Seru (2009) show both theoretically and empirically that, with lack of transparency of compensation contracts, powerful managers have the ability to rig their performance-pay for their own benefit.[2]

In December 2006, the Securities and Exchange Commission (SEC) issued new disclosure requirements on CEO compensation.[3] These requirements came as a response to investor concerns that in recent years CEO compensation packages have not been properly disclosed or well understood.[4] According to these new requirements, firms now must

[1] Regulation S-K of the Securities Exchange Act of 1934 items 402(b) and 402(c) requires the disclosure of some of the contractual terms regarding equity awards. However, no specific disclosure is required for the performance-based cash component of the executive contract.

[2] Other empirical studies such as Yermack (1997), Bertrand and Mullainathan (2000, 2001), Lie (2005), Bebchuk and Jackson (2005), Kuhnen and Zwiebel (2008), and Bebchuk, Grinstein, and Peyer (2010), all point to the positive relation between lack of transparency in contractual terms and questionable pay-performance practices.

[3] The final rule is available online at http://www.sec.gov/rules/final/2006/33-8732a.pdf

[4] For example, SEC Chairman Cox commented that: "Over the last decade and half, the compensation packages awarded to directors and top executives have changed substantially. Our disclosure rules haven't kept pace

provide additional information about the contractual terms of their compensation to the CEO. In particular, firms need to disclose the types of performance measures that they use to determine CEO rewards, the performance targets, and the performance horizon.

We use this newly available data to examine how firms tie CEO compensation to performance and the extent to which such practices support the predictions of optimal contracting theories. We focus on three aspects of the pay-performance terms: first, we examine firms' choice to pre-specify performance goals in their compensation contracts versus using their discretion in awarding the CEO. Second, we study firms' choice across the wide array of performance measures, and third, we examine firms' choice of performance horizon.

Our sample consists of firms in the Standard and Poor's (S&P) 500 index in fiscal 2007. We collect information from the proxy statements on the performance measures that are used in the CEO compensation contract in fiscal year 2007. We focus on identifying the different types of performance measures, their relative weights, and their horizons.

Across all firms in our sample, CEO compensation is given in the form of cash (e.g., bonuses and non-equity incentive plans), stocks, and option awards. The SEC distinguishes between *performance-based awards*, which are given for meeting pre-specified goals, and *other awards* (i.e., time-vesting awards and bonuses), which, for the most part, are given at the discretion of the board. We observe that 90% of our sample firms grant some type of

---

with changes in the marketplace, and in some cases disclosure obfuscates rather than illuminates the true picture of compensation. This has led to concern that some companies may not be disclosing all compensation as is currently required. We have concluded that executive compensation disclosure requirements should be modified." (Chairman's Opening Statement; Proposed Revisions to the Executive Compensation and Related Party Disclosure Rules, January 17, 2006).

performance-based award. The average value of these awards is 4.8 million dollars. On average, about half of the value of CEO total awards is performance-based.

We study the choice of the compensation committee between pre-specified performance-based awards and discretionary awards. In a complete-contracting framework, there is no reason for the compensation committee not to pre-specify its expectations of the CEO. However, in an incomplete contracting framework it might be optimal for some firms not to pre-specify performance goals. For example, if renegotiation is costly and there is large uncertainty regarding optimal CEO actions (which might get resolved only after the contract is signed), then the firm might be better-off not committing itself ex-ante to a specific performance target. We find evidence consistent with the optimal contracting prediction. Larger investment-intensive firms, which are likely to have larger uncertainty regarding optimal CEO actions, tend to assign a smaller fraction of the CEO awards to explicit measures.

On average, 79% of the value of performance-based awards is based on accounting-performance measures, 13% is based on stock-performance measures (i.e., market based), and 8% fis based on non-financial measures. Firms use a wide array of accounting measures. Firms reward CEOs based on income measures (e.g., earnings-per-share (EPS), net income growth, and earnings before interest and taxes (EBIT)), sales, accounting returns (e.g., return on equity, return on assets), cash flows, margins, cost-reduction measures, and EVA-type measures. On average, 56% of the value of performance-based awards assigned to accounting measures is tied to income measures. A significant portion of the awards is also assigned to sales measures (12%) and accounting returns measures (17%).

We find that more complex firms and firms with larger growth opportunities tend to rely more heavily on market-based measures, and firms that are more mature tend to rely more heavily on accounting-based measures. In addition, among accounting measures, sales are used by firms with larger growth opportunities, and accounting returns are used more heavily by more mature firms with fewer growth opportunities. We also find that firms in similar industries tend to adopt similar performance measures and that larger firms tend to have a longer-term performance horizon.

Overall, our findings support the optimal contracting theories. Consistent with the informativeness principle (Holmstrom 1979), firms tend to choose performance measures that are more informative of CEO actions. Consistent with the incomplete contract theory, firms tend to rely more on pre-specified measures when the contractual costs are smaller (Hart 1995).

Finally, we examine whether CEOs who have more ability to influence their compensation contract, will choose contractual terms that benefit them rather than increase shareholder value. We find some support to this argument: when shareholder monitoring is weaker, CEO awards tend to be more discretionary, and the level of the discretionary portion is not correlated with past performance, present performance, or even future performance. However, regardless of the strength of shareholder monitoring, the portion of the award that is based on pre-specified goals seems to behave according to the optimal contracting theory. Thus, it seems that deviations from optimal contracting occur in the portion of the compensation that is less transparent.

Our study contributes to the existing literature in several ways. First, the disclosure rule allows us to document the large array of performance measures that are used in CEO

compensation contracts and to examine firms' choices across the different measures. Past studies could not observe the choice of performance measures across the different components of compensation contracts because this data was not available. As a result, most studies have estimated the choice of performance measures from observed compensation outcomes.[5] Few previous empirical studies had access to more precise data regarding the terms of the contracts, but even then, the data was available only for particular components of the contract.[6] With the new data, we are able to directly examine the choice of different performance measures in CEO compensation contracts, which could not have been tested before.

Our second contribution is in analyzing the reasons behind tying CEO compensation to pre-specified performance goals.[7] The rich information on the variety of performance measures allows us to shed new light on the reasons behind performance choices and to contribute to the debate about CEO influence over pay practices.

[5] Since data on performance measures was not available until recently, studies have used proxies instead. For example, Kole (1997) uses the level of non-equity awards as a proxy for accounting-based compensation and equity awards as a proxy for market-based compensation. Core, Guay, and Verrecchia (2003) use the ratio of total pay variance unexplained by stock returns to the variance of total pay explained by stock returns to study the use of price and non-price performance measures in CEO compensation. Lambert and Larcker (1987) study how changes in cash compensation are explained by changes in return on equity (accounting performance measure) and firm stock return (market performance measure).

[6] See, for example, Bettis, Bizjak, Coles, and Kalpathy (2008), who analyze vesting provisions in stock and option grants; Sautner and Weber (2008), who study stock options plans for Europeans firms using proprietary data; and Ittner, Larcker, and Rajan (1997), who use proprietary data to investigate the use of financial and non-financial performance measures in CEO annual bonuses. With regard to non-executive employee compensation, see Bouwens and Van Lent (2007), who use survey data to study the performance metrics employed for periodic assessment, bonus decisions, and career paths of business unit managers.

[7] Gillan, Hartzell, and Parrino (2009) study whether the relationship between the firm and its CEO is governed by an explicit employee agreement. However, the scope of their paper is different than ours. They do not explore the choice of performance measures in the compensation contract.

Finally, we should note that the new compensation rules have led to a few other related studies that explore aspects of CEO compensation contracts. Their focus, however, is different than ours.[8]

The paper continues as follows. Section I is a brief review of the financial contracting literature relevant for optimal compensation design. In Section II, we explain the new disclosure requirements issued by the SEC. We describe the database in Section III and in Section IV we provide an empirical analysis of the determinants of the choices of how firms tie CEO compensation to performance. In Section V, we study potential deviations from optimal contracting and the rationales for these deviations. Section VI concludes. We also provide appendices in which we illustrate our data collection methodology, and examine the effect of the rule on the level of disclosure.

I. Development of Hypotheses

A. The Informativeness Hypothesis

In a standard moral-hazard problem, the shareholders (the principals) hire the CEO (the risk-averse agent) to complete a series of tasks to maximize shareholder wealth. Shareholders are risk neutral and do not observe CEO action or level of effort. The action desired by the CEO differs from the one maximizing firm value; thus, the shareholders need to align CEO's incentives with their own. Holmstrom (1979) formulates the optimal compensation contract under the moral-hazard problem and defines the "Informativeness Principle," which means that optimal CEO compensation should depend on the likelihood

[8] Grinstein, Weinbaum, and Yehuda (2009) study the impact of the 2006 disclosure rules on the amount of perquisites disclosed in CEO compensation. Kim and Yang (2009) compare earnings-per-share targets in the annual incentive plans to earnings expectations and explain their difference with corporate governance and firm characteristics.

that the action desired by shareholders is taken by the CEO. Thus, any performance measure that reveals partial information about the action taken (or level of effort provided) by the CEO should be included in the contract. Holmstrom shows that the optimal weight placed on a performance measure in the CEO contract exhibits a positive relation with the signal-to-noise ratio with respect to the CEO action. Hence, ceteris paribus, there is a negative relation between the amount of noise of a performance measure and its use in the compensation contract.

Informativeness Hypothesis: *Ceteris paribus, firms tend to rely less on measures that are noisier signals of the CEO actions desired by shareholders.*

Since the CEO decides on the strategy of the firm, the optimal choice of performance measures should ensure that the CEO adopts shareholders' desired strategy. We expect the desired strategy to vary as a function of the firm's activities and business environment. We list below several firm characteristics that are likely to affect the optimal CEO strategy and hence the choice of performance measures.

Growth Opportunities, Maturity, and Complexity

Firms that have more growth opportunities require managerial focus on making the right investments. Therefore, accounting measures, which focus on current outcomes, will be poorer measures of optimal managerial actions than stock market performance, which focuses on the long-term prospects of the firm (Smith and Watts, 1992). Consistent with

this argument, Kole (1997) finds that firms with more intangible assets are more likely to adopt an equity compensation plan.

In addition, for firms that are in their growth stage, among accounting measures, market share and sales growth will be more relevant than profitability measures such as income measures or accounting returns. These firms are more concerned with establishing market share than with making large profits in the short run. According to the informativeness principle, we should therefore observe a positive relation between growth opportunities and use of sales performance measures. In contrast, mature firms with fewer growth opportunities are more concerned about the efficiency of their investments and the redistribution of their profits. Consistent with a firm's life cycle argument, we therefore expect these firms to assign more weight to accounting performance measures.

There is another related effect of growth opportunities on the performance horizon. Since the impact of certain CEO decisions on firm value in growth firms is not immediate, it is important to measure the performance of the CEO over a longer horizon. Fudenberg, Holmstrom, and Milgrom (1990) show that the length of the managerial contract is positively related to the delay of the arrival of information. Consistent with this argument, Kole (1997) finds that research-intensive firms offer equity grants that vest over a longer time. We should therefore expect firms in the growth stage to rely on long-term performance measures.

Finally, accounting numbers are likely to provide less information about optimal CEO actions if the firm is more complex. Since prices aggregate information beyond accounting numbers, more complex firms are likely to rely more on market-based performance measures than on accounting measures.

Business Environment

Firms in similar industries tend to have similar technological constraints and similar prospects. Therefore, we expect similar contractual terms and reliance on similar performance measures for firms in the same industry.

B. Contract Incompleteness

Some firms do not tie large portions of the CEO compensation to any explicit measure. Such a practice is more likely when it is costly to write all relevant performance contingencies into the contract (Hart, 1995, and Segal, 1999). For example, if renegotiation is costly and there is large uncertainty regarding optimal CEO actions (which might get resolved only after the contract is signed), then the firm might be better-off not committing itself ex-ante to a specific performance measure. We expect firms with more complex operations and firms with more growth opportunities to have more uncertainty about optimal CEO actions. These firms should rely less on pre-specified performance goals and provide more discretion to the board of directors regarding compensation to the CEO. Another measure of the complexity of the firm is how often it needs to change strategy over time. A measure for the need to change strategy is the seniority of the CEO, since CEOs are likely to be replaced when the firm needs to change its strategy (Clayton, Hartzell, and Rosenberg, 2005). According to the incomplete-contracting view, firms whose CEOs have longer tenure are more likely to rely on pre-specified performance goals, while firms whose CEOs have shorter tenure are more likely to give discretion to the board with respect to CEO compensation.

Incomplete Contracting Hypothesis: *Firms that are more complex and firms that have more uncertainty regarding optimal strategy will rely less on pre-specified performance goals and will give more discretion to the board of directors regarding CEO compensation.*

Table I summarizes the empirical predictions in this section.

[Insert Table I here]

II. 2006 Executive Compensation Disclosure Rules—Summary

In December 2006, the SEC issued new compensation disclosure requirements in order "…to provide investors with a clearer and more complete picture of compensation to principal executive officers" (see Background and Overview Section in the SEC Release No. 33-8732A). The two new components of interest for this study are improved narrative disclosure in the new Compensation Discussion and Analysis section and broader formatted tables that capture all compensation components and promote comparability.

In the Compensation Discussion and Analysis section, the registrants are now required to provide material information about compensation policies and must address the following questions:

i. What are the objectives of the company's compensation programs?

ii. What is the compensation program designed to reward?

iii. What is each element of compensation?

iv. Why does the company choose to pay each element?

v. How does the company determine the amount (and, where applicable, the formula) for each element?

vi. How do each element and the company's decisions regarding that element fit into the company's overall compensation objectives and affect decisions regarding other elements?

Firms are now also required to report performance measures and target levels considered by the compensation committee unless they can show that disclosing this information would result in competitive harm to the company.[9]

The SEC reorganizes the compensation tables into three categories:

i. Compensation with respect to the last fiscal year: the Summary Compensation Table and the Grants of Plan-Based Awards Table

ii. Holdings of equity-based interests that relate to compensation or are potential sources of future compensation: the Outstanding Equity Awards at Fiscal Year-End Table and the Option Exercises and Stock Vested Table

iii. Retirement and other post-employment compensation: the Pension Benefits Table and the Nonqualified Deferred Compensation Table

The SEC has also revised the Summary Compensation Table to "provide a clearer picture of total compensation" (see Figure I). The main changes from previous

[9] Some commenters suggested that "competitive harm would be mitigated if disclosure were required on an after-the-fact basis, after the performance related to the award is measured" (see letters from American Federation of Labor and Congress of Industrial Organizations, dated April 5, 2006; Council of Institutional Investors; Governance for Owners; International Association of Machinists and Aerospace Workers; and The Honorable Barney Frank, United States Representative (MA)).

requirements are that stock and option awards valuation is in accordance with FAS 123R. In addition, the components of the compensation are divided somewhat differently than before: Non-Equity Incentive Plan Compensation is the dollar amount earned in the fiscal year from a non-equity incentive plan. The Grants of Plan-Based Awards Table (Panel B) reports information for each grant awarded to the executive, especially future payout of both non-equity and equity grants at the threshold, target, and maximum performance levels. This table is accompanied by a narrative text explaining material factors necessary for understanding it. This includes, among other material factors, the performance measure and/or criteria used to determine the threshold, target, and maximum payout.

[Insert Figure 1 here]

Appendix I illustrates the effect of the rule on the level of disclosure of a sample of 87 firms out of the S&P500 firms in our sample. For each firm we examine the level of disclosure of the different components of compensation in fiscal year 2005 (a year before the rule), in fiscal year 2006 (the first year after the rule) and in fiscal year 2007 (a year after the announcement of the rule). The appendix shows that while some firms have been disclosing information about the pay-performance relation even before the rule, there has been a significant increase in the level of disclosure of performance-based compensation arrangements, especially in non-equity awards.

III. Data and Variables

A. Data

We collect information about CEO compensation contracts from the proxy statements of public U.S. firms after the new SEC requirements took effect. Our sample

includes 494 firms that belong to the S&P 500 index as of December 2007.[10] S&P includes in this index the largest and most prominent U.S. firms. We focus on this set of firms for two main reasons. First, larger firms tend to provide more information about their practices and to comply with the SEC requirements early-on because of their visibility. Second, these firms are the largest in the U.S., and incentive schemes to management in these companies are likely to have a large effect on value.

For each firm, we read the section about CEO compensation in the proxy statement of fiscal year 2007. We use Compustat's definition of fiscal year, which means that fiscal year 2007 ends between 06/01/2007 and 05/31/2008.

We gather information from the discussion of the compensation arrangements, the summary compensation tables, and the grants plan-based awards tables in the proxy statements. Information about payoffs conditional on achieving certain performance targets is available in the discussion and in the footnotes of the grant plan-based tables. In appendix II we illustrate how we gathered the information from the IBM proxy statement.

Several firms report one payoff for achieving targets across several measures, and they usually provide the different weights assigned to each measure. In the cases where firms do not disclose the weights, we assume that the payoff is divided equally with respect to each performance measure.[11] This assumption is motivated by the fact that most firms that disclose weights use equal weights.

We find that firms classify awards into two categories. The first category consists of awards that are given for achieving a pre-specified performance goal. We call these awards

[10] We are not able to retrieve the proxy statements of 6 firms among S&P 500 members.
[11] A total of 106 firms do not disclose their weights for performance-based cash compensation, and 30 firms do not disclose their weights for performance-based stock compensation.

performance-based awards. The second type of award is given at the discretion of the board. We call these awards discretionary awards. For example, by-and-large stock option plans are considered discretionary awards since they are granted at the discretion of the board and they vest independently of performance.[12] Each type of award (pre-specified or discretionary) can be given in the form of cash, restricted stock, or options.

[Insert Table II here]

Panel A of Table II reports types of awards granted in our sample in fiscal year 2007. We also provide summary statistics of the values of these awards for firms that grant them.[13]

Almost all of our sample firms grant some compensation in cash. Performance-based cash compensation includes non-equity awards and cash bonuses for which the terms are pre-specified.[14] We note that some bonuses are discretionary and will consider the discretionary bonus later in this section when we compute total awards to the CEO. Six CEOs in our sample have a base salary less than or equal to $1, and about 86% of the CEOs receive performance-based cash awards. When granted, the targeted value of performance-based cash awards tends to be much larger than base salary (more than twice on average).

[12] For example, the option plan for the Microsoft Corporation states that the board has discretion to ..."determine the employees to whom, and the time or times at which, Options shall be granted and the number of shares to be represented by each Option…" (Microsoft 1991 Stock Option Plan, as amended and restated as of June 21, 2006. Section 4.b)

[13] With respect to the pre-specified performance-based awards, we use the target payout for the non-equity incentive plan awards and the grant date fair value for the equity incentive plan awards (which is calculated in accordance to FAS123R. In the case of stock awards, the fair value represents the target number of shares to be paid out multiplied by the closing price at grant date).

[14] For 17 firms in our sample, we are able to retrieve the same type of information for the annual bonus as for the non-equity awards (performance measures used, performance thresholds, and payoff conditional on performance).

More than half of our sample firms grant pre-specified performance-based stock awards.[15] This result contrasts with that of Bettis et al. (2008). They collected information about stock and option performance-vesting provisions for 2055 firms between 1995 and 2001 and found a total of 475 firms that granted at least one performance-vesting equity award over the seven years. Their final sample contained 1013 performance-based equity awards. Given their distribution of awards, the probability that a firm would grant a performance-based equity award in a given year was roughly 7%.[16] Sample differences could potentially account for the disparity in results between the two studies. Our sample contains the largest U.S. firms and is more recent. Furthermore, we observe that only 4% of the firms in our sample grant performance-based options awards. For the most part, firms in our sample prefer granting time-vesting awards for this component of compensation rather than performance-based awards. This result contrasts with Bettis et al. (2008). In their sample, they observed that most performance-based equity grants were options-based. This difference may be due to changes in CEO compensation practices over time or because of sample selection.

Overall, performance-based awards are important elements of CEO compensation in our sample. We observe that 90% of firms in our sample grant some type of performance-based award and the average value of these awards is approximately 4.8 million dollars.

In Panel B, we compute the ratio of the value of performance-based awards to the value of total awards (which excludes base salary but includes performance-based awards,

[15] We consider accelerated stock awards (11 observations) and accelerated options awards (3 observations) to be performance-based. These awards are accelerated (given ahead of time) if the manager reaches a pre-specified performance.

[16] Their distribution of the 1013 performance-based equity awards was: 240 firms in a single year, 100 in two years, 61 in three years, 26 in 4 years, 16 in five years, 18 in six years, and 14 in all seven years. Therefore, the probability that a firm grants a performance-based equity award in a given year is equal to 1013/(2055*7).

discretionary bonuses, time-vesting stock awards, and time-vesting options awards). On average, more than half of the value of the awards to the CEO is performance-based. This confirms the importance of understanding the role of performance-based awards in CEO compensation. We argue that this ratio captures the CEO explicit-performance incentives. For performance-based awards, the compensation committee selects ex-ante explicit-performance measures and performance targets, whereas non-performance-based awards are generally given at the discretion of the board.

We extract accounting data from the Compustat database, blockholder ownership and board of directors' characteristics from the Corporate Library database, and managerial compensation and ownership data from the Execucomp database. The terms of the CEO compensation contracts are hand-collected from each firm's proxy statement.

B. Variable Definitions and Summary Statistics

Contractual Terms

[Insert Table III here]

We study the pay-performance terms in the CEO compensation contract, focusing on two main terms: the types of performance measures and the number of years over which the performance is measured (duration).

We read each compensation report and look for whether the compensation is given for achieving a certain level of performance. We look separately at performance measures across non-equity awards, cash bonuses, stock awards, and options awards and aggregate the value assigned to each particular measure across all components. To estimate the proportion of the contract that is based on a particular performance measure, we rely on

the disclosure of the target award associated with achieving the performance. The target award is the amount that CEOs are expected to receive if they meet the target performance, and firms provide this information for the different awards in the proxy statement. We note that the target award is sometimes given for achieving several targets. Whenever firms report the weights associated with each performance measure—for example, 30% of award Z is conditional on achieving earnings X, and 70% of award Z is conditional on achieving stock return Y—we use the weights to assign the respective value associated with each performance measure. In some cases, where the weights are not reported or are not identifiable, we assume that achieving each target contributes equally to the award.[17]

We acknowledge that estimating the portion of compensation attributed to each performance measure using the target compensation associated with each measure is somewhat rough. Some firms might assign targets that are harder to achieve than other firms, and we can neither observe the level of effort for achieving different targets, nor can we observe fully the curvature of the relation between the performance and the payment. Nevertheless, we do not believe that this is a big concern for the purpose of our study because a firm that has some bias in choosing the target value of the awards is likely to have the same bias across different awards; thus, the proportion of the contract that is attributed to each performance measures will remain intact.

We observe three main types of measures: market-based measures, which are performance measures that are based on stock price performance; accounting-based measures, which are performance measures that are based on accounting variables; and non-financial measures, which are performance measures that are based on some

[17] We assume equal weights because when firms do report the proportion of the award, they often assign equal weight to each award.

subjective evaluations, such as customer satisfaction, corporate diversity, etc. In Panel A of Table III, we observe that almost all firms that grant performance-based awards use at least one accounting-based performance measure, while market-based measures are less prevalent since less than a third of the sample firms are using market-based measures. Almost 40% of the firms that grant performance-based awards use non-financial performance measures.

Firms exhibit large variation in the use of accounting-based performance measures. Firms might award CEOs based on income measures (e.g., EPS, net income growth, EBIT), sales growth, accounting returns (e.g., return on equity, return on assets), cash flows, margins, cost reductions, and economic value added (EVA)-type measures. Most firms that use accounting-based measures use income measures, almost 40% use sales measures, and slightly less use accounting returns measures. The other measures are less prevalent.

More than half of our sample firms that grant performance-based awards use between two and four different types of performance measures. For each performance measure, we also document the length of time for evaluating the performance. The performance horizon is the value-weighted average performance horizon for the different awards to the CEO. We observe a large variety of performance horizon, ranging from a quarter to almost eight years. On average the performance horizon of a given compensation contract is slightly less than two years.

[Insert Figure 2 here]

In Figure 2 we plot the average CEO "contract" for our sample. Figure 2.A represents the average proportion of performance-based awards versus non-performance-based awards (excluding base salary but including discretionary bonuses, time-vesting stock

awards, and time-vesting options awards). On average, more than half of the awards are performance-based. Figure 2.B shows the average fraction of the value of performance-based awards assigned to each type of performance measure. Accounting performance measures play a major role: on average, 79% of the performance-based awards are assigned to this type of measure. About 13% of the performance-based awards are assigned to market-based measures and 8% to non-financial measures. Even though more firms use non-financial measures compared to marked-based measures, the average fraction of performance-based awards value assigned to market-based measures is significantly higher. This result shows that firms that use market measures tend to assign a large award to these measures, while firms that use non-financial measures tend to assign a smaller award to these measures. Figure 2.C shows the average fraction of the value of performance-based awards assigned to accounting measures to each type of accounting performance measure. On average more than half of the accounting-based awards are assigned to income measures. Income measures such as EPS tend to be heavily used by the financial press and analysts, making it likely that compensation committees will use this performance measure. We also observe substantial use of sales and accounting returns measures. This is interesting for our empirical test since sales and accounting returns measures are expected to be used by firms at the opposite spectrum in terms of growth and maturity.

[Insert Figure 3 here]

We plot the average CEO "contract" by industry in Figure 3. The industries are defined according to the Fama-French 12 industries classification. Our previous observations still apply across industries. In most industries, the majority of the awards are

performance-based. We observe that in only three industries out of twelve the ratio of performance-based to non-performance-based awards is below 50% (Figure 3.A). Accounting measures and income measures play a major role. In all industries, the largest fraction of performance-based awards is tied to accounting measures (Figure 3.B). Moreover, in all industries, the income measure is the accounting measure on which firms assign the largest weight. However, there are significant variations across industries in the choice of performance measures (Figure 3.C). For instance, firms in the energy and utilities industries assign more than a third of the value of performance-based awards to market-based measures, while firms in the durable goods, manufacturing, business equipment, and shops industries assign a weight lower than or equal to 8% (Figure 3.B). The choice of sales measures also tends to be clustered by industry. No firm in the utility industry uses sales measures, while firms in the health industry, which has high growth opportunities, assign on average 28% (Figure 3.C). Overall, we observe that the nature of the industry in which the firm operates, and thus its business environment, matters in the design of CEO compensation.

Explanatory Variables

We use a host of explanatory variables to test the hypotheses associated with explicit-performance incentives and the choice of performance measures. The natural log of a firm's assets is a proxy for firm size and also for the complexity of its CEO activities. As an additional measure of the complexity of firms' activities, we use the number of business segments in the firm. To measure a firm's investment policy, we use the ratio of research

and development expenses plus capital expenditures to total assets (Investment/A).[18] This measure is also a proxy for the growth opportunities of the firm and to some extent the complexity of CEO activities. As an additional measure of the firms' growth opportunities, we use the value-weighted average Tobin's Q of firm's industry (Q(ind)—industries are classified according to the Fama-French 48 Industries classification).[19, 20] To measure firm maturity, we use the natural logarithm of firm age, defined by the year the firm was founded. Log CEO Tenure is a proxy for CEO experience and the stability of the firm's strategy. We use shareholder monitoring power and board leadership to measure the CEO's ability to affect board decisions (i.e., CEO power). We measure shareholder monitoring power by the ratio of shares held by the outside shareholders who held more than 5% of the total number of shares outstanding to the total number of shares outstanding. Investors who hold a large stake in the firm are less likely to suffer from the free rider problem and are more likely to affect board structure and firm decisions. Thus, in these firms we expect the CEO to have less ability to capture the board and to influence compensation decisions. With regard to board leadership, we use an indicator variable for the CEO as the chairman of the board to measure CEO power. We also include the entrenchment index (E index—see Bebchuk, Cohen, and Ferrell, 2009), which is based on

[18] We set the research and development expenses to zero if this variable is missing. Firms are required to report research and development expenses when these expenses are material. Therefore, when these expenses are immaterial, firms can omit from their reports the research and development expenses line in their income statement, and thus this item would be missing in the Compustat database. Following Loughran and Ritter (1997), we confirm the validity of this procedure by observing that no sample firm in the Chemistry industry has missing R&D items, and all sample firms in the Utilities industry have missing R&D items.

[19] Tobin's Q ratio is the ratio of market value of assets to book value of assets. The market value of assets equals to the book value of assets minus the book value of equity plus the market value of equity.

[20] There might be some reverse causality issue with the Investment/A variable since the investment decision could be affected by the terms in the CEO contract. To check the robustness of our results, we use only Q(ind) and not Investment/A as a proxy for growth opportunities. Our conclusions are not affected, but we get less significance in some specifications (due to the lower total variation in the explanatory variable: firm variations for Investment/A but only industry variations for Q(ind)).

six antitakeover provisions: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments. Firms with a large E index have strong protection against hostile takeovers and thus it is more difficult to replace the incumbent CEO (i.e., the CEO has more power). Finally, in our regressions, we also include industry dummies that are classified according to the Fama-French 12 Industries classification system.[21] Table IV provides descriptive statistics of the explanatory variables.

[Insert Table IV here]

IV. Empirical Analysis

A. Reliance on Pre-specified Performance Goals

We run Tobit regressions to study the proportion of awards that is assigned to pre-specified performance goals (i.e., performance-based awards).[22] We find that firms with complex activities and large growth opportunities tend to tie a lower portion of CEO awards to pre-specified performance goals. This is consistent with the incomplete contracting hypothesis: optimal firm strategy is more uncertain for complex and growth

[21] Some past studies have excluded firms in the Utilities industry (32 observations in our sample) and financial firms (95 observations in our sample). The rationale behind excluding the Utilities industry was that these firms are regulated and thus would have different constraints on compensation. Since in our sample period most firms in the Utilities industry are no longer regulated, we do not consider this a concern. Financial firms have been excluded in some previous studies because they tend to have different compensation packages than other industries. We already control for these differences by including industry dummies. In addition, we run subsample analyses that exclude the financial firms. Except for the regressions displayed in Table X with the performance horizon as the dependent variable, in which the coefficient of blockholder ownership is no longer significant, all the other results hold and in many cases are even strengthened. We also run another subsample analysis with only financial firms. Even though we have a small sample size, most of the results hold (some coefficients are less significant but the signs remain unchanged). Therefore, we believe that including the financial firms does not create any bias in our results compared to previous studies.

[22] To compare with results in Section V, in all our regressions in this section we drop sample firms with missing observations for the main governance characteristics (i.e., blockholder ownership and CEO Chairman dummy). The results do not change if we keep all sample firms.

firms, so these firms tend to use more discretion in rewarding CEOs. Firms where the CEO has longer tenure tend to grant a larger fraction of the awards as performance-based awards. CEO tenure is a proxy for the stability of a firm's strategy and thus we find that firms with more stable strategies tend to rely more on pre-specified performance goals, which is also consistent with the incomplete contracting hypothesis. Furthermore, we observe that industry dummies have significant explanatory power, suggesting that business environment matters a great deal to the decision between explicit and discretionary awards.

[Insert Table V here]

However, some discretionary awards (stock and options time-vesting awards) are in essence performance-based because their value increases if price increases even though the number of shares is fixed. To check the robustness of our results, we define discretionary bonus as the only discretionary award. We use two different dependant variables: the ratio of discretionary bonus to total awards and the ratio of discretionary bonus to the sum of bonus and non-equity awards. Our results are consistent with those in Table V: complex and growth firms tend to use more discretionary rewards.

B. Market and Accounting Performance Measures

We run Tobit regressions to study the proportions of performance-based awards tied to different performance measures. We focus on accounting-based and market-based performance measures because they are the most commonly used performance measures. The fraction assigned to non-financial performance measures is simply equal to one minus

the sum of fractions assigned to accounting and market measures; thus, it is relatively easy to infer the results for non-financial measures.

The choice of performance measures is mainly driven by the nature of a firm's activities. Complex firms tend to tie a larger fraction of the performance-based awards to market measures rather than accounting measures. In addition, young firms and firms with large growth opportunities tend also to tie a larger fraction of the performance-based awards to market measures rather than accounting measures. Furthermore, business environment matters. We observe that industry dummies have significant explanatory power. All these results are consistent with the informativeness hypothesis. Finally, we find that CEOs with longer tenure tend to receive performance-based awards tied to accounting measures rather than market measures. We do not have a clear prediction concerning CEO tenure. However, since CEO tenure might measure the stability of a firm's strategy and because mature firms tend to have more stable strategies, this result is also in line with predictions from optimal contracting theories.[23]

[Insert Table VI here]

C. Sales, Income, and Accounting Returns Performance Measures

Our next step is to study the proportions of performance-based awards tied to the various performance measures among accounting performance measures. Because they

[23] We note that CEO shareholdings might play a role in choice of market versus accounting performance evaluation. For instance, a firm with a CEO with large shareholdings might be less inclined to assign a large fraction of the awards to market-based performance since the CEO already has a lot of incentives to increase the stock price (versus accounting performance). Due to the collinearity issue, we do not include CEO shareholdings and CEO tenure in the same regression (their correlation coefficient is close to 0.5). We substitute CEO tenure with CEO shareholdings in the regressions of Table VI and find that the coefficient for CEO shareholdings is not significant. The results might indicate that, within our sample of large firms, CEO holdings do not seem to play a significant role in the choice of performance measure.

are the measures most commonly used, we focus on income measures, sales, and accounting returns performance measures.

Table VII shows the results. We find that firms that have high investment activities and large growth opportunities tend to tie a larger portion of CEO compensation to sales performance measures, which suggests that these firms are more concerned with establishing market share than with making large profits in the short run. In contrast, firms that have a low level of investments and few growth opportunities tend to tie a larger portion of CEO compensation to income and accounting returns performance measures. We also observe that firms rely more on accounting performance measures when they are more mature and have fewer growth opportunities, which is consistent with a firm's life cycle argument. We also observe that firms in similar industries tend to adopt similar accounting performance measures, especially for sales-based measures. We find less significant results for the income measures, which are, in general, more popular, possibly because analysts and the financial press use them. This potential popularity might play a role in the choice of this measure and might explain the lack of significance.

[Insert Table VII here]

D. Performance Horizon

We run OLS regressions with the value-weighted performance horizon as a dependent variable. Table VIII shows the results. We observe that a significant determinant of performance horizon is firm size. We find that larger firms tend to adopt longer performance horizons. The relation between performance horizon and other variables is not statistically significant. In particular, there is no significant relation between growth

opportunities and performance horizon, as might be suggested by the theory. Furthermore, we do not find that performance horizon is significantly clustered by industry, since the goodness-of-fit measure is not improved when we add the industry dummies. We conjecture that the lack of significance is related to the fact that most firms choose similar vesting periods for their CEOs.

[Insert Table VIII here]

E. Robustness tests - Contract Design and Compensation Consultant Identity

It is possible that our results are influenced by the identity of the compensation consultants. Some compensation consultants might have specific "tastes" in designing CEO contracts and thus influence the contractual terms. In that case the choices of performance measures might be suboptimal. To examine this potential effect, we add dummy variables for each of the most hired compensation consultants in our sample.[24] In untabulated results, we find no relation between the identity of the compensation consultant and any of the choices.[25] Moreover, the addition of these dummy variables does not alter the results concerning the economic determinants.

F. Robustness tests - Reliability of the Data

A concern regarding the data is that firms do not necessarily disclose the right information regarding their compensation contracts. Past studies have shown that disclosed terms of CEO compensation can be manipulated, and we acknowledge that it is

[24] In our sample, we find that 18.02% firms employ Frederick W. Cook & Co., 17.81% Towers Perrin, 13.77% Mercer, 12.55% Hewitt, 7.89% Watson Wyatt & Co., 5.06% Pearl Meyer & Partners, and 3.24% Semler Brossy.
[25] The results are not reported but are available upon request.

possible that firms have manipulated the disclosure of the terms used here.[26] It is also possible that firms rig performance measures after the fact (Morse et al. 2009), and the disclosed measures are simply an ad hoc justification for high compensation to the CEO. While we cannot completely dismiss this interpretation, we try to address these concerns with several tests, as we discuss below.

Persistence of the Choice of Performance Measures

First, we examine the extent to which the choice of performance measures is persistent. If firms are rigging measures after the fact, then we should see fluctuation in the use of performance measures over time.

We randomly choose 30 firms that granted non-equity awards in 2006 and compare the choice of performance measures in 2006 and 2007. Among them, 25 firms used the exact same set of performance measures for the non-equity awards in 2006 and 2007, 4 firms modified the set, and 1 firm completely changed the performance measures used. The firm that changed the set of performance measures had a new CEO in 2007. In comparison, four firms retained the same CEO in 2006 and 2007 but, on average, slightly modified the set of performance measures.[27] For instance, one firm had only earnings per share (EPS) in 2006 and added two measures in 2007—free-cash flow and revenue—but assigned a 50% weight to EPS in 2007, thus keeping EPS as the major performance measure. In this

[26] For example, Lie (2005) has shown that firms falsified the grant dates of options grants in the backdating scandal. (See also Yermack, 1997, and Bebchuk, Grinstein, and Peyers, 2010).

[27] Among the 4 firms, 2 added one performance measure in 2007, and 2 firms added 2 measures in 2007 to the ones they used in 2006. For these 4 firms, we check if these choices were persistent for 2008: 2 firms had the same set of performance measure for 2007 and 2008, one firm added a new measure in 2008, and one firm substituted a measure (but this last firm had a new CEO).

subsample analysis, we find that a large majority of firms keep the same set of performance measures. These results indicate that the choice of performance measures is persistent.

Do They Modify the Contractual Terms in the Vesting Year?

We check and validate that the terms for multi-year awards are not changed over the years. This means that firms do not assign ad hoc measures after the fact but keep the original measures over the term of the contract. We randomly choose 30 firms that granted equity awards in 2007 with a 3-year performance horizon and verify that in the 3 subsequent years (fiscal 2008, fiscal 2009, 2010 proxy) the choice of performance measures and the terms are respected. In all cases, we find that they are respected.

Reality Check: Pay for Performance Sensitivity Taking into Account the New Information

Our last test compares how the realizations of CEO compensation are explained by firm performance with and without the use of the new information disclosed under the 2006 SEC requirements. In the contractual terms, we observe how firms rely on market and accounting performance; thus, we consider both types of performance in this test. Our framework is inspired by the one used in the seminal paper by Aggarwal and Samwick (1999) and is also consistent with more recent papers (e.g., Rajgopal, Shevlin, and Zamora, 2006). We define CEO total direct compensation (TDC) as the dependent variable, dollars returns (total shareholder returns (TSR) multiplied by market capitalization at the beginning of the year) as the firm's market performance, and net income as the firm's accounting performance.[28] We use the proportion of performance-based awards tied to

[28] We winsorize TSR at 5% in the Compustat database.

market (accounting) measures to capture the extent to which firms rely on market (accounting) performance. The coefficients are estimated via median regressions.[29] We control for firm size, year fixed-effects, and industry fixed-effects, and study 3 years of compensation and performance.[30] Our results confirm the informativeness of the contractual terms. While we find that there is pay-for- (stock price) performance, we observe that firms tying a larger proportion of their performance-based awards to market performance have significantly larger pay-for-performance sensitivity. The results are even more significant concerning accounting performance. Without the use of the new information disclosed under the 2006 SEC requirements, we do not obverse significant pay-for- (accounting) performance, though it is significant once we add the weights. These conclusions do not change when we study both types of performance at the same time. Therefore, our results indicate that firms that assign larger weights on market (accounting) performance have greater pay for market (accounting) performance sensitivity. Hence, we find strong evidence that the use of contractual terms (i.e., the choice of performance measures) is indeed informative.

[Insert Table IX here]

In light of these results, we conclude that the choice of performance measure is persistent, binding and, indeed, informative.

[29] Median regressions are also used in Aggarwal and Samwick (1999) and Rajgopal, Shevlin, and Zamora (2006). See, for instance, Koenker and Hallock (2001) for an explanation of quantile regression. Compared to ordinary least squares regressions, median regressions are less influenced and more robust to the presence of large outliers, since they are based on the median as the measure of the distribution's center instead of the mean. Large outliers and skewness of the data are important issues in compensation regression; for instance, in our sample (in 2007) the values of TDC vary from 0 to 75 million dollars, and its mean is about 10 million dollars. Due to this issue, median regressions give us more precise estimates.

[30] In our regressions, we drop the observations for which TDC is equal to zero (21 observations). Conclusions remain unchanged if we keep these observations.

V. Deviations from Optimal Contracting

In this subsection, we investigate potential deviations from optimal contracting by assessing whether measures of CEO power influence the design of the contract. A recent argument regarding the design of compensation contracts is that because it is often captured by the CEO, the board of directors often has little power to challenge the CEO over compensation decisions. The CEOs often have the power to influence who will sit on the boards, and the directors often feel obligated to the CEOs and are afraid to challenge them, especially when it comes to compensation decisions (e.g., Bebchuk and Fried, 2003, 2004). According to these arguments, when the CEOs have more power to affect their compensation decisions, they will choose not to base their compensation on explicit-performance measures, but rather will choose ad-hoc outcomes to rationalize their large compensation. To the extent that powerful managers have some explicit-performance measures in the compensation contracts, they will choose performance measures that are easier to manipulate, such as accounting measures or short-horizon measures.

To test this argument, we include governance characteristics in our cross-sectional analysis to examine whether governance has an effect on the structure of the compensation contract.[31] The results are reported in Table X.

We use three different measures to capture CEO power: the proportion of ownership by shareholders who own more than 5% of the shares outstanding (shareholder monitoring, Bertrand and Mullainathan, 2000, 2001), an indicator variable for CEO

[31] Since we do not have a clear prediction on the relation between CEO power and the use of the different accounting measures, we do not study the relation between the choice of the different accounting measures and governance characteristics.

Chairman (board leadership), and the E-index (anti-takeover protection, Bebchuk, Cohen, and Ferrell, 2009).

Panel A shows a potential relation between the strength of corporate governance mechanisms and the reliance on discretionary awards. We find a significant positive relation between concentration of holdings by shareholders and the proportion of awards based on explicit-performance measures. In addition, the coefficient for CEO Chairman is negative (but not significant), which is also consistent with the CEO power hypothesis. In contrast, the coefficient for the E-index is positive and not significant, a result inconsistent with the CEO power hypothesis.

While weaker governance is associated with more reliance on discretionary awards, it does not seem to affect the choice between performance measures in the pre-specified portion of compensation. Panel A also shows that CEO power does not influence firm choice between accounting- and market-based awards. This portion of the award, which is based on pre-specified goals, is not affected.

Finally, we find a significant positive relation between concentration of holdings by shareholders and performance horizon (consistent with the CEO power hypothesis). However, the coefficient for the E index is significant and positive, which is not consistent with the CEO power hypothesis.[32] The coefficient for CEO Chairman is positive as well.

Overall, the results suggest potential relations between weaker governance and heavier reliance on discretionary awards and the performance horizon of the pre-specified

[32] We obtain similar results if we use the G index (i.e., the governance index proposed by Gompers, Ishii, and Metrick (2003), which is based on 24 antitakeover provisions that are equally weighted) instead of the E index, except that the coefficient for the G index is not significant at 10% in the performance horizon regression.

awards. However, the only relevant variable is the concentration of ownership by shareholders. None of the other governance variables has a significant effect.

To further explore the effect of concentration of ownership on deviation from optimal contracting, we examine whether concentration of holdings alters the economic relations that we find in the previous section. We test whether the fundamental relations between compensation structure and firm size, complexity, and maturity change if we have low concentration of ownership. To that end, we split our sample into two equal subsamples, based on the level of shareholder ownership concentration. We then run the original specifications on each of the subsamples and compare the coefficients of the economic variables across the two subsamples. We present the results in Panel B of Table X.

Overall, we cannot reject the similarity of the coefficients across the different subsamples. These findings suggest that the ownership structure does not alter the fundamental relation between complexity, growth, maturity, and compensation structure.

[Insert Table X here]

One potential reason for the weak evidence of the relation between contract structure and governance is that firms that need to disclose the contract will hide their agenda by showing a contract that is sound economically. In that case, firms might compensate the manager sub-optimally with the discretionary portion of the compensation. Since the reasons behind discretionary payments lack transparency, it is difficult to make conclusions about the appropriateness of these payments. This portion of CEO compensation remains the gray area in our analysis. On the one hand, we find consistent results with the rent extraction argument: CEOs who are less monitored receive

a larger portion of their compensation via discretionary awards. On the other hand, according to the incomplete contracting hypothesis, there are economic rationales concerning the use of discretion, and we find results consistent with this hypothesis: complex firms use more discretionary rewards.

So we further investigate the link between discretionary awards and firm performance. We analyze the pay-for-performance sensitivity in the discretionary portion of CEO compensation. The results are reported in Table XI. We use similar specifications to those in Section III.C. We define market performance as dollar returns to shareholders and accounting performance as net income. We use past performance (fiscal 2006—Panel A) and present performance (fiscal 2007—Panel B) because some discretionary awards are granted at the beginning and at the end of fiscal 2007. The dependent variable is the value of the discretionary awards granted to the CEO in 2007. We use median regression and control for firm size (at the beginning of fiscal 2007) and industry dummies. We find that neither market nor accounting performance significantly explain the level of discretionary awards.

[Insert Table XI here]

While no pay-for-past-performance could indicate sub-optimality of the contract, it is also possible that the board pays the CEO for actions that are not easily observable or cannot be easily contracted. If this is the case, then to the extent that these actions maximize value, we should observe a correlation between the non-discretionary awards and future firm value. We therefore study whether there is some relation between discretionary awards and future performance (Panel C). We do not find any significant relation.

These results cast doubt on the optimality of these awards and call for further research to understand the reasons for awarding discretionary awards. Moreover, these results are consistent with our findings that weaker governance structures are associated with lack of shareholder monitoring.

VI. Conclusion

The new disclosure requirements introduced in December 2006 by the SEC have enabled us to observe the contractual terms of CEO compensation and more precisely how the board links CEO compensation to performance. We find strong evidence that the use of the contractual terms (i.e., the choice of performance measures) is indeed informative. Our results indicate that firms that assign larger weights on market (accounting) performance have greater pay for market (accounting) performance sensitivity. Moreover, our evidence suggests that firms base the majority of the awards on explicit and pre-specified performance measures. Furthermore, we find significant variations in the use of performance measures. On average, firms rely mostly on accounting-based performance measures, among which they put heavier weights on income measures, sales, and accounting returns. Our findings are in line with predictions from optimal contracting theories: firms with complex activities and large growth opportunities tend to rely less on explicit-performance measures and tend to tie a larger fraction of the award to market-based measures rather than to accounting-based measures. Growth firms tend to rely on sales measures among accounting measures, whereas mature firms tend to rely more on accounting returns. CEOs with long tenure, a measure of the stability of firm strategy, tend

to receive a larger fraction of awards tied to explicit-performance measures and a larger fraction of performance-based awards tied to accounting-based measures.

We find mixed evidence of deviations from optimal contracting when shareholder monitoring is weak. For the most part, the discretionary portion of the compensation is larger when shareholder monitoring is weaker, and the discretionary awards seem to be decoupled from performance. Further investigation of the discretionary portion of compensation is a fruitful area for future research.

Appendix I: Evolution of compensation disclosure: 2005-2007

In this appendix we examine the level of disclosure of the different components of CEO compensation for a sample of 87 firms that belong to the S&P 500. We examine the proxy statements of fiscal 2005 (a year before the rule), fiscal 2006 (immediately after the rule) and fiscal 2007 (after the rule).

Disclosure Evolution						
	2005 (N=87)		2006 (N=87)		2007 (N=87)	
Items	Nbr of Firms	Proportion	Nbr of Firms	Proportion	Nbr of Firms	Proportion
Information about consulting service and peer group:						
Firm employs an external consulting firm and its name is reported	17	20%	66	76%	79	91%
Use of a peer group	73	84%	81	93%	86	99%
Information about benchmarking:						
Total direct compensation benchmarked against a peer group	14	16%	14	16%	22	25%
Base salary is targeted as a certain proportion of total direct compensation	2	2%	26	30%	28	32%
Base salary benchmarked against a peer group	19	22%	22	25%	29	33%
Details of performance based non equity awards and cash bonus:						
Disclosure of performance threshold	8	9%	33	38%	54	62%
Disclosure of payoff conditional on performance	13	15%	63	72%	73	84%
Details of performance based stock awards:						
Disclosure of performance threshold	9	10%	36	41%	38	44%
Disclosure of payoff conditional on performance	28	32%	45	52%	48	55%
Details of non-performance based stock awards:						
Disclosure of vesting schedule	40	46%	40	46%	43	49%
Details of performance based stock-option awards:						
Disclosure of performance threshold	0	0%	3	3%	0	0%
Disclosure of payoff conditional on performance	0	0%	4	5%	0	0%
Details of non-performance based stock-option awards:						
Disclosure of vesting schedule and pricing method	68	78%	68	78%	67	77%

Appendix II: Illustration of our Data Collection Methodology

In this appendix, we illustrate our data collection methodology using the 2008 Proxy Statement of the company IBM. We start by looking at the Grants of Plan-Based Awards Table to identify the performance-based and time-vesting awards granted to CEO Palmisano in fiscal year 2007.

2007 Grants of Plan-Based Awards Table

				ESTIMATED FUTURE PAYOUTS UNDER NON-EQUITY INCENTIVE PLAN AWARDS(2)			ESTIMATED FUTURE PAYOUTS UNDER EQUITY INCENTIVE PLAN AWARDS(3)							
NAME (a)	TYPE OF AWARD (1)	GRANT DATE (b)	COMPEN-SATION COMMITTEE APPROVAL DATE	THRESHOLD ($) (c)	TARGET ($) (d)	MAXIMUM ($) (e)	THRESHOLD (#) (f)	TARGET (#) (g)	MAXIMUM (#) (h)	ALL OTHER STOCK AWARDS: NUMBER OF SHARES OF STOCK OR UNITS(4)(5) (#) (i)	ALL OTHER OPTION AWARDS: NUMBER OF SECURITIES UNDER-LYING OPTIONS(6) (#) (j)	EXERCISE OR BASE PRICE OF OPTION AWARDS(7) ($/SH) (k)	CLOSING PRICE ON THE NYSE ON THE DATE OF GRANT ($/SH)	GRANT DATE FAIR VALUE OF STOCK AND OPTION AWARDS(8) ($) (l)
S.J. Palmisano	AIP	N/A	2/27/2007	$ 0	$ 5,000,000	$ 15,000,000								
	PSU	5/8/2007	2/27/2007				18,421	73,685	110,528					$ 7,574,818
	RSU	5/8/2007	2/27/2007							31,579				3,246,321
	SO	5/8/2007	2/27/2007								58,264	$ 102.80	$ 103.29	1,498,550

(1) Type of Award:
AIP = Annual Incentive Plan
RSU = Restricted Stock Unit
SO = Nonqualified Stock Option
PSU = Performance Share Unit
RRSU = Retention Restricted Stock Unit

(2) These amounts will be adjusted based on performance and paid on or before March 15, 2008.
(3) Amounts shown are numbers of PSUs. These awards will be adjusted for performance and be payable on February 1, 2010.
(4) RSUs will vest in three equal annual installments on the first three anniversaries of the grant date.
(5) The RRSU awarded to Mr. Daniels will vest 100% on December 18, 2012.
(6) All of the options shown above will vest 100% on May 8, 2010.
(7) All SOs have an exercise price equal to the average of the high and low prices of IBM stock on the NYSE on the date of grant.
(8) Amounts in this column represent the market value of the full 2007 awards indicated, calculated in accordance with FAS 123R. For option awards, that number is calculated by multiplying the Black-Scholes value by the number of options awarded. For PSUs, RSUs and RRSUs, that number is calculated by multiplying the average high and low prices of IBM stock on the NYSE on the date of grant by the number of units awarded.

In 2007, IBM granted to Mr. Palmisano non-equity and equity performance-based awards: respectively, annual incentive awards (AIP) and performance share awards (PSU). IBM also granted equity time-vesting awards: restricted shares awards (RSU) and nonqualified stock option awards (SO). RSU and SO vest independently of firm performance, and thus according to the SEC definition, RSU and SO are not performance-based awards. In contrast, the amount of AIP and PSU that will be paid to the CEO is conditional on performance; thus, according to the SEC definition, AIP and PSU are performance-based awards. Performance-based awards are tied to pre-specified performance targets. For these awards, we consider the amount that is likely to be

expensed by the company (i.e., the target value for non-equity awards and the fair value for equity awards). Furthermore, the CEO did not receive any discretionary bonus in 2007. Therefore, we can now compute the proportion of value of the CEO awards in 2007 that is tied to pre-specified performance targets:

Proportion of the value of CEO awards tied to pre-specified performance targets (i.e., proportion of performance-based awards)

$$= \frac{\text{Non-Equity Performance-based Awards + Equity Performance-based Awards}}{\text{Discretionary Bonus + Non-Equity Performance-based Awards + Equity Performance-based Awards + Equity Time-vesting Awards}}$$

$$= \frac{5{,}000 + 7{,}574.818}{0 + 5{,}000 + 7{,}574.818 + 3{,}246.321 + 1{,}498.55}$$

$$= 72.60\%$$

Therefore 72.60% of the value of CEO awards in 2007 is tied to pre-specified targets.

We then identify the performance measures used in the performance-based awards and their respective weights. This information is usually located in the Compensation Discussion and Analysis Section, but sometimes one can also find it in the footnotes of the Grants of Plan-Based Awards Table or of the Summary Compensation Table.

We copy below two paragraphs of the Compensation Discussion and Analysis Section in which we identify the performance measures:

Annual Incentive Program

The Company sets business objectives at the beginning of each year that are reviewed by the Board of Directors. These objectives translate to targets for the Company and for each business unit for purposes of determining the target funding of the Annual Incentive Program. Actual funding levels can vary from 0% to 200% of target, depending on performance against objectives.

At the end of the year, management assesses the financial performance for the Company based on performance against financial metrics, as set out below.

FINANCIAL METRIC	WEIGHTING IN OVERALL SCORE
Net Income	60%
Revenue Growth	30%
Cash Flow	10%

Overall funding for the Annual Incentive Plan is based on the performance results against these targets and is typically not adjusted except for extraordinary events if deemed appropriate by the Chairman and CEO and Compensation Committee. This adjustment can be either up or down. For example, adjustments are usually made for large divestitures and acquisitions. In addition, an adjustment can be recommended by the Chairman and CEO based on factors such as individual and unit performance, client satisfaction, market share growth and workforce development, among others. The Compensation Committee reviews the financial scoring and qualitative adjustments and approves the Annual Incentive Plan funding level. Once the funding level has been approved, a lower-performing executive will receive as little as zero payout and the most exceptional performers are capped at three times target (payouts at that level are rare and only possible when IBM's performance has also been exceptional).

Performance Share Unit Program

EPS and cash flow targets for the Performance Share Unit program are set at the beginning of each three-year performance period, taking into account the Company's financial model shared with investors, including the impact our ongoing share buyback program has on EPS. At the end of the three years, the score is calculated based on results against the predetermined targets, with the following weights:

FINANCIAL METRIC	WEIGHTING IN OVERALL SCORE
Earnings Per Share (EPS)	80%
Cash Flow	20%

Adjustments can be made for extraordinary events if deemed appropriate by the Chairman and Compensation Committee — for example, large divestitures.

The accelerated stock repurchase and associated borrowing improved actual EPS results for 2007. Given that the Performance Share Unit Program is based on results for the period 2005-2007, the resulting effect on the program score was marginal.

The final score, which is approved by the Compensation Committee, adjusts the planned value of the actual Performance Share Unit award from 0% to 150%. There is no discretionary adjustment to the Performance Share program score.

Given this information, we can now compute the proportion of performance-based awards tied to the different performance measures. We first observe that IBM uses only accounting-based measures. Therefore, the proportion of performance-based awards tied to accounting (market)-based measures is 100% (0%). IBM uses three types of accounting measures: Income Measure (Net Income and EPS), Revenue Measure (Revenue Growth), and Cash-Flow Measure. Below are the details of the calculations of their weights:

Among accounting measures, proportion of value of performance-based awards tied to measure X

$$= \left(\frac{\text{Non-Equity Performance-based Awards}}{\text{Non-Equity Perf.-based Awards + Equity Perf.-based Awards}} \times \text{weight of X in Non-Equity Performance-based Awards}\right.$$

$$\left. + \frac{\text{Equity Performance-based Awards}}{\text{Non-Equity Perf.-based Awards + Equity Perf.-based Awards}} \times \text{weight of X in Equity Performance-based Awards}\right)$$

$$\times \frac{1}{\text{Proportion of value of Performance-based Awards tied to Accounting Measures}}$$

Therefore, we obtain the following weights:

$$\text{Income Weight} = \frac{5{,}000}{5{,}000 + 7{,}574.818} \times 60\% + \frac{7{,}574.818}{5{,}000 + 7{,}574.818} \times 80\% = 72.05\%$$

$$\text{Revenue Weight} = \frac{5{,}000}{5{,}000 + 7{,}574.818} \times 30\% = 11.93\%$$

$$\text{Cash-Flow Weight} = \frac{5{,}000}{5{,}000 + 7{,}574.818} \times 10\% + \frac{7{,}574.818}{5{,}000 + 7{,}574.818} \times 20\% = 16.02\%$$

We are also interested in the performance horizon used by IBM to set the performance goals. The performance horizon is 1 year for AIP and 3 years for PSU. We can now compute the performance horizon of CEO performance-based awards:

Performance Horizon

$$= \left(\frac{\text{Non-Equity Performance-based Awards}}{\text{Non-Equity Perf.-based Awards + Equity Perf.-based Awards}} \times \text{Performance Horizon for Non-Equity Performance-based Awards}\right.$$

$$+ \left(\frac{\text{Equity Performance-based Awards}}{\text{Non-Equity Perf.-based Awards + Equity Perf.-based Awards}} \times \text{Performance Horizon for Equity Performance-based Awards}\right.$$

$$= \frac{5{,}000}{5{,}000+7{,}574.818} \times 1 \text{ year} + \frac{7{,}574.818}{5{,}000+7{,}574.818} \times 3 \text{ years} = 2.20 \text{ years}$$

REFERENCES

Aggarwal, Rajesh K., and Andrew A. Samwick, 1999, The Other Side of the Trade-Off: The Impact of Risk on Executive Compensation, *The Journal of Political Economy* 107: 65-105

Bebchuk, Lucian A., Alma Cohen, and Allen Ferrell, 2009, What Matters in Corporate Governance?, *The Review of Financial Studies* 22: 783-827

Bebchuk, Lucian A., and Jesse M. Fried, 2003, Executive Compensation as an Agency Problem, *Journal of Economic Perspectives* 17: 71-92

Bebchuk, Lucian A., and Jesse M. Fried, 2004, *Pay without Performance: The Unfulfilled Promise of Executive Compensation*, Harvard University Press

Bebchuk, Lucian A., Yaniv Grinstein, and Urs Peyer, 2010, Lucky CEOs and Lucky Directors, *The Journal of Finance,* Forthcoming

Bebchuk, Lucian A., and Robert J. Jackson Jr., 2005, Executive Pensions, *Journal of Corporation Law* 30: 823-855

Bertrand, Marianne, and Sendhil Mullainathan, 2000, Agents With and Without Principals, *American Economics Review* 90:203-208

Bertrand, Marianne, and Sendhil Mullainathan, 2001, Are CEOs Rewarded for Luck? The Ones without Principals Are, *Quarterly Journal of Economics* 116: 901-932

Bettis, Carr, John Bizjak, Jeffrey Coles, and Swaminathan Kalpathy, 2008, *Stock and Option Grants with Performance-Based Vesting Provisions*, Working Paper, Arizona State University, Portland State University, and Southern Methodist University

Bouwens, Jan, and Laurence Van Lent, 2007, Assessing the Performance of Business Unit Managers, *Journal of Accounting Research* 45:667-698

Clayton, Matthew C., Jay C. Hartzell, and Joshua Rosenberg, 2005, The Impact of CEO Turnover on Equity Volatility, *Journal of Business* 78: 1779-1808

Core, John E., Wayne R. Guay, and Robert E. Verrecchia, 2003, Price versus Non-Price Performance Measures in Optimal CEO Compensation Contracts, *The Accounting Review* 78: 957-981

Fudenberg, Drew, Bengt Holmstrom, and Paul Milgrom, 1990, Short-Term Contracts and Long-Term Agency Relationships, *Journal of Economic Theory* 51: 1-31

Gillan, Stuart L., Jay C. Hartzell, and Robert Parrino, 2009, Explicit versus Implicit Contracts: Evidence from CEO Employment Agreements, *The Journal of Finance* 64: 1629-1655

Gompers, Paul A., Joy L. Ishii, and Andrew Metrick, 2003, Corporate Governance and Equity Prices, *Quarterly Journal of Economics* 118: 107-155

Grinstein, Yaniv, David Weinbaum, and Nir Yehuda, 2009, *The Economic Consequences of Perks Disclosure*, Working Paper, Cornell University

Hart, Oliver, 1995, *Firms, Contracts, and Financial Structure*, Oxford University Press

Holmstrom, Bengt, 1979, Moral Hazard and Observability, *The Bell Journal of Economics* 10: 74-91

Ittner, Christopher D., David F. Larcker, and Madhav V. Rajan, 1997, The Choice of Performance Measures in Annual Bonus Contracts, *The Accounting Review* 72: 231-255

Jensen, Michael, 1986, Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers, *American Economic Review* 76: 323-329

Kim, Daniel Sungyeon, and Jun Yang, 2009, *Beating the Target: A Closer Look at Annual Incentive Plans*, Working Paper, Indiana University

Koenker, Roger, and Kevin F. Hallock, 2001, Quantile Regression, *The Journal of Economic Perspectives* 15: 143-156

Kole, Stacey R., 1997, The Complexity of Compensation Contracts, *Journal of Financial Economics* 43: 79-104

Kuhnen, Camelia M., and Jeffrey Zwiebel, 2008, *Executive Pay, Hidden Compensation and Managerial Entrenchment*, Working Paper, Stanford University

Lambert, Richard A., and David F. Larcker, 1987, An Analysis of the Use of Accounting and Market Measures of Performance in Executive Compensation Contracts, *Journal of Accounting Research* 25:85-125

Lie, Erik, 2005, On the Timing of CEO Stock Option Awards, *Management Science* 51:802-812

Loughran, Tim, and Jay R. Ritter, 1997, The Operating Performance of Firms Conducting Seasoned Equity Offerings, *The Journal of Finance* 52: 1823-1850

Morse, Adair, Vikram K. Nanda, and Amit Seru, 2009, Are Incentive Contracts Rigged By Powerful CEOs? *The Journal of Finance,* Forthcoming

Rajgopal, Shivaram, Terry Shevlin, and Valentina Zamora, 2006, CEOs' Outside Opportunities and the Lack of Relative Performance Evaluation in Compensation Contracts, *The Journal of Finance* 61: 1813-1844

Sautner, Zacharias, and Martin Weber, 2008, *Corporate Governance and the Design of Stock Option Programs*, Working Paper, University of Amsterdam, and University of Mannheim

Segal, Ilya, 1999, Complexity and Renegotiation: A Foundation for Incomplete Contracts, *Review of Economic Studies* 66: 57-82

Smith, Clifford W. Jr., and Ross L. Watts, 1992, The Investment Opportunity Set and Corporate Financing, Dividend, and Compensation Policies, *Journal of Financial Economics* 32: 263-292

U.S. Securities and Exchange Commission, 2006, Final Rule: Executive Compensation Disclosure (Release Nos. 33-8732A), available online at http://www.sec.gov/rules/final/2006/33-8732a.pdf

Yermack, David, 1997, Good Timing: CEO Stock Option Awards and Company News Announcements, *The Journal of Finance* 52: 449-476

Table I
Hypotheses

Table I summarizes the hypotheses and their predicted effect on the explanatory variables.

	Test 1	Test 2		Test 3			Test 4
	Explicit-Performance Awards	Market	Accounting	Sales	Income	Accounting Return	Performance Horizon
• **Optimal Contracting:**							
Complexity	-	+	-				
Growth	-	+	-	+	-/+	-	+
Maturity	+	-	+	-	-/+	+	-
CEO Tenure	+	-	+				
• **Deviations from Optimal Contracting:**							
Monitoring	+	+	-				+
CEO Power	-	-	+				-

Table II
Components of CEO Compensation in 2007

Table II describes the different components of CEO compensation awarded in 2007 for a sample of 494 firms (S&P 500 members). We report the numbers and proportion of firms that grant the different types of awards. We also provide summary statistics of the (target) value of these awards for firms that grant these awards in thousands of dollars.

Panel A: Components of CEO Compensation in 2007

	# Firms with awards > 0	Proportion	Value of awards in thousands of $ (firms with awards > 0) Mean	Median	SD
Compensation in cash	492	99.60%	3690	2600	4062
- Base Salary	488	98.79%	1064	1000	511
- Pre-specified performance award (Bonus + Non-Equity awards)	425	86.03%	2433	1532	3172
Compensation in stock	386	78.14%	4593	3208	4511
- Discretionary awards (Other Stock awards)	214	43.32%	3546	2050	4581
- Pre-specified performance awards (Stock Incentive Plan awards)	257	52.02%	3945	2961	3394
Compensation in options	354	71.66%	4005	2825	5331
- Discretionary awards (Other Option awards)	342	69.23%	3880	2825	5052
- Pre-specified performance awards (Option Incentive Plan awards)	19	3.85%	4758	2421	6234
Any type of pre-specified performance-based compensation *(Bonus + Non-Equity awards + Stock Incentive Plan awards + Option Incentive Plan awards)*	447	90.49%	4779	3496	5272

Panel B: Proportion of Awards Tied to Pre-specified Performance Measures

	N	Mean	SD	p25	Median	p75
Pre-specified performance-based awards/ Total awards *(excluding Base Salary)*	482	52%	30%	28%	53%	72%

Table III
Contractual Terms of CEO Compensation in 2007

Table III describes the contractual terms of CEO compensation for a sample of 494 S&P 500 firms in 2007. Panel A and B report the proportions of firms using different types of performance measures. These proportions are computed for firms that grant performance-based awards and for which the respective performance measures are identified in their proxy statements. Panel C provides descriptive statistics about the number of different types of performance measures used and reports information about the performance-vesting horizon for firms that grant performance-based awards. Performance Horizon is the value-weighted average performance horizon, in years, for the different awards of the CEO.

Panel A: Types of performance measure

Stats \ Component	Accounting	Market	Non-financial
% of users among firms that grant perf.-based awards	98%	30%	39%

Panel B: Types of accounting performance measure

Stats \ Component:	Income	Sales	Acct. Return	Cash Flows	Margins	Cost Red.	EVA
% of users among firms that use accounting perf. measures	87%	39%	37%	23%	9%	6%	5%

Panel C: Number of performance measures & Performance Horizon

Stats \ Component	# Metrics	Performance Horizon
Mean	2.81	1.89
SD	1.29	1.00
p25	2	1
p50	3	1.81
p75	4	2.44
Min	1	0.25
Max	7	7.92
N	442	446

Table IV
Explanatory Variables—Summary Statistics

Table IV provides descriptive statistics for the explanatory variables used in this study for a sample of 494 S&P 500 members in 2007. The explanatory variables are from fiscal year 2006 data (unless stated otherwise). Log Assets is the natural logarithm of a firm's total assets (in millions). Investment/ A is a ratio of the sum of research and development expenses and capital and expenditure expenses to total assets. Q(ind) is the value-weighted average Tobin's Q ratio of firm's industry (we use the Fama and French 48 Industries classification). Log Firm Age is the natural logarithm of 2007 minus the year the firm was founded plus one. Log CEO Tenure is the natural logarithm of the difference between the end of 2007 and the date the executive became the CEO (expressed in years) plus one. Prop. Ownership by Blockholder 5% is the ratio of shares held by the outside shareholders who held more than 5% of the total number of shares outstanding to the number of shares outstanding. CEO Chairman is a dummy indicating whether or not the CEO was also the chairman of the board in fiscal year 2006. E Index is an entrenchment index based on six provisions: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments (see Bebchuk, Cohen, and Ferrell, 2009).

Stats	Log Assets	# Business Segment	Investment/ A	Q(ind)	Log Firm Age	Log CEO Tenure	Prop. Ownership by Blockholder 5%	CEO Chairman	E index
Mean	9.52	2.69	0.07	2.25	3.63	1.75	0.17	0.53	2.29
SD	1.41	1.83	0.06	0.76	1.00	0.74	0.14	0.50	1.32
p25	8.49	1	0.02	1.71	3.04	1.23	0.06	0	1
p50	9.38	2	0.05	2.19	3.71	1.73	0.14	1	2
p75	10.31	4	0.09	2.72	4.48	2.23	0.24	1	3
Min	6.20	1	0.00	1.11	0.00	0.00	0.00	0	0
Max	14.45	8	0.36	3.77	5.41	3.82	1.00	1	5
N	494	494	491	489	494	494	472	494	451

Table V
Performance-based Awards

Table V shows results of Tobit regressions (left censored at 0 and right censored at 1) with the ratio of the value of performance-based awards to total awards as the dependent variable. The independent variables are defined in Table IV. The constant term is included but not reported. Robust standard errors are reported in parentheses. The symbol *** indicates that the p-value is less than 0.01, ** that it is less than 0.05, and * that it is less than 0.1.

	Tobit Regressions		
	(1)	(2)	(3)
VARIABLES	Perf/Total	Perf/Total	Perf/Total
Log Assets	-0.0323**	-0.0137	-0.0173
	(0.0130)	(0.0142)	(0.0152)
# Business Segments			0.00966
			(0.00942)
Investment / A	-1.170***	-1.557***	-1.652***
	(0.328)	(0.385)	(0.384)
Q(ind)			-0.0434
			(0.0390)
Log Firm Age	0.0143	0.0179	0.0179
	(0.0179)	(0.0178)	(0.0174)
Log CEO Tenure			0.0442*
			(0.0250)
Industry Dummies	No	Yes	Yes
Observations	457	457	452
Pseudo R-squared	0.0344	0.103	0.122

Table VI
Weights of Market and Accounting Performance Measure

Table VI shows results of Tobit regressions (left censored at 0 and right censored at 1). The dependent variables are the proportions of the value of performance-based awards assigned to market and accounting performance measures. The independent variables are defined in Table IV. The constant term is included but not reported. Robust standard errors are reported in parentheses. The symbol *** indicates that the p-value is less than 0.01, ** that it is less than 0.05, and * that it is less than 0.1.

	Tobit Regressions					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Prop.Mkt	Prop.Mkt	Prop.Mkt	Prop.Acct	Prop.Acct	Prop.Acct
Log Assets	0.135***	0.102***	0.0813***	-0.0813***	-0.0521***	-0.0442**
	(0.0266)	(0.0285)	(0.0288)	(0.0173)	(0.0183)	(0.0185)
# Business Segments			0.0305			-0.0122
			(0.0199)			(0.0115)
Investment / A	1.454*	0.471	0.778	-1.223***	-0.677	-0.888*
	(0.806)	(0.896)	(0.892)	(0.459)	(0.472)	(0.491)
Q(ind)			0.0183			-0.00285
			(0.0988)			(0.0524)
Log Firm Age	-0.0516	-0.0396	-0.0389	0.0473**	0.0325	0.0308
	(0.0393)	(0.0359)	(0.0359)	(0.0223)	(0.0211)	(0.0213)
Log CEO Tenure			-0.0695			0.0739**
			(0.0536)			(0.0325)
Industry Dummies	No	Yes	Yes	No	Yes	Yes
Observations	420	420	416	420	420	416
Pseudo R-squared	0.0386	0.139	0.146	0.0444	0.148	0.161

Table VII
The Choice across Accounting Performance Measures

Table VII shows results of Tobit regressions (left censored at 0 and right censored at 1). The dependent variables are the proportions of the performance-based awards assigned to sales, income, and accounting returns performance measures among accounting performance measures. The independent variables are defined in Table IV. The constant term is included but not reported. Robust standard errors are reported in parentheses. The symbol *** indicates that the p-value is less than 0.01, ** that it is less than 0.05, and * that it is less than 0.1.

	Tobit Regressions								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	P. Sales	P. Sales	P. Sales	P. Income	P. Income	P. Income	P. Acct R.	P. Acct R.	P. Acct R.
Log Assets	-0.0192	-0.00545	0.0167	-0.0713***	-0.0781***	-0.0719***	0.114***	0.122***	0.114***
	(0.0168)	(0.0179)	(0.0184)	(0.0191)	(0.0208)	(0.0215)	(0.0289)	(0.0314)	(0.0319)
# Bus. Segments			-0.0151			-0.0102			-0.0112
			(0.0109)			(0.0155)			(0.0202)
Investment / A	1.587***	0.891*	0.821*	-1.042*	-1.215*	-1.280*	-1.494*	-0.860	-0.636
	(0.393)	(0.482)	(0.464)	(0.549)	(0.665)	(0.677)	(0.837)	(1.022)	(1.014)
Q(ind)			0.163***			0.0192			-0.265***
			(0.0447)			(0.0579)			(0.0793)
Log Firm Age	0.000290	0.00502	0.00473	-0.0321	-0.0103	-0.00508	0.0984**	0.0411	0.0418
	(0.0210)	(0.0215)	(0.0218)	(0.0255)	(0.0254)	(0.0256)	(0.0404)	(0.0375)	(0.0372)
Log CEO Tenure			0.00582			-0.00482			-0.00541
			(0.0292)			(0.0407)			(0.0514)
Industry Dummies	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	432	432	428	432	432	428	432	432	428
Pseudo R-squared	0.0423	0.183	0.218	0.0215	0.0692	0.0687	0.0497	0.136	0.154

Table VIII
Performance Horizon

Table VIII shows results of three OLS regressions. The dependent variables are the value weighted contract length of performance-based awards (Perf H). The independent variables are defined in Table IV. The constant term is included in the regression but not reported. Robust standard errors are reported in parentheses. The symbol *** indicates that the p-value is less than 0.01, ** that it is less than 0.05, and * that it is less than 0.1.

	OLS		
	(1)	(2)	(3)
VARIABLES	Perf H.	Perf H.	Perf H.
Log Assets	0.167***	0.167***	0.132***
	(0.0382)	(0.0446)	(0.0430)
# Business Segments			-0.00986
			(0.0239)
Investment / A	0.394	0.397	0.515
	(1.176)	(1.236)	(1.214)
Q(ind)			-0.160*
			(0.0962)
Log Firm Age	-0.00285	-0.0145	-0.0194
	(0.0499)	(0.0533)	(0.0537)
Log CEO Tenure			0.00370
			(0.0684)
Industry Dummies	No	Yes	Yes
Observations	420	420	416
R-squared	0.049	0.060	0.056

Table IX
Pay-for-Performance Sensitivity Taking into Account the New Information

Table IX shows results of median regressions for a sample of S&P 500 firms with CEO unchanged from previous year (2006-2007 and 2007-2008). The sample covers the year 2006 to 2008. The dependent variable is CEO total direct compensation (TDC). Market capitalization is the number of shares outstanding multiplied by the firm's stock price. Market performance is defined as dollar return to shareholders (i.e., total shareholder returns (TSR) multiplied by market capitalization at the beginning of the year). Accounting performance is defined as the firm's net income. The value of TDC is in thousands of dollars while market capitalization, market and accounting performance are in millions of dollars. Market Weight and Accounting Weight are the proportions of the value of performance-based awards assigned to market and accounting performance measures in the 2007 contract. The constant term, year fixed effects, and industry dummies are included but not reported. Bootstrapped standard errors based on 20 replications are reported in parentheses. The symbol *** indicates that the p-value is less than 0.01, ** that it is less than 0.05, and * that it is less than 0.1.

	Median Regressions					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	TDC	TDC	TDC	TDC	TDC	TDC
Market Cap (t-1)	0.0970***	0.0959***	0.0826***	0.0405**	0.0934***	0.0721***
	(0.0117)	(0.0107)	(0.0134)	(0.1744)	(0.0124)	(0.0249)
Market Perf.	0.110**	0.0358			0.106**	0.0537
	(0.0442)	(0.0444)			(0.0447)	(0.0463)
Market Weight * Market Perf.		0.201***				0.142**
		(0.0708)				(0.0715)
Accounting Perf.			0.0940	0.0746	0.0582	-0.211
			(0.115)	(0.2699)	(0.0606)	(0.313)
Accounting Weight * Accounting Perf.				1.010***		0.793**
				(0.3502)		(0.370)
Observations	1269	1269	1269	1269	1269	1269
Pseudo R-squared	0.130	0.135	0.125	0.135	0.131	0.142

Table X
Contract Design and Corporate Governance

Table X shows results of Tobit regressions (left censored at 0 and right censored at 1) and OLS regressions. The dependent variables are the ratio of the value of performance-based awards to total awards (Perf/Total), the proportions of the value of performance-based awards assigned to market and accounting performance measures (Prop. Mkt and Prop. Acct, respectively), and the value weighted contract length of performance-based awards (Perf H). The independent variables are defined in Table IV. In Panel B, we provide subsample results. Firms are sorted by the proportion of ownership by shareholders who own more than 5% of the shares outstanding: we classify firms into two groups, low (first half of the distribution) and high (second half of the distribution) blockholder ownership. The constant term is included in the regression but not reported. Robust standard errors are reported in parentheses. The symbol *** indicates that the p-value is less than 0.01, ** that it is less than 0.05, and * that it is less than 0.1.

	Panel A							
	Tobit	Tobit	Tobit	Tobit	Tobit	Tobit	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Perf/Total	Perf/Total	Prop.Mkt	Prop.Mkt	Prop.Acct	Prop.Acct	Perf H.	Perf H.
Log Assets	-0.00902	-0.00662	0.0822***	0.0926***	-0.0457**	-0.0507**	0.140***	0.179***
	(0.0152)	(0.0167)	(0.0289)	(0.0305)	(0.0193)	(0.0202)	(0.0412)	(0.0417)
# Bus. Segments	0.0109	0.00876	0.0320	0.0299	-0.0129	-0.0123	-0.00577	-0.00343
	(0.00934)	(0.00946)	(0.0197)	(0.0191)	(0.0115)	(0.0118)	(0.0240)	(0.0240)
Investment / A	-1.695***	-1.670***	0.793	0.639	-0.886*	-0.721	0.503	0.699
	(0.381)	(0.390)	(0.893)	(0.870)	(0.496)	(0.508)	(1.215)	(1.293)
Q(ind)	-0.0319	-0.0187	0.0346	0.0376	-0.00901	-0.0102	-0.127	-0.111
	(0.0389)	(0.0395)	(0.101)	(0.0981)	(0.0529)	(0.0535)	(0.0932)	(0.0940)
Log Firm Age	0.0223	0.0116	-0.0408	-0.0604*	0.0310	0.0413*	-0.0227	-0.0423
	(0.0175)	(0.0181)	(0.0367)	(0.0365)	(0.0217)	(0.0227)	(0.0547)	(0.0577)
Log CEO Tenure	0.0475	0.0529*	-0.109*	-0.0767	0.0842**	0.0709*	-0.0475	0.00623
	(0.0290)	(0.0303)	(0.0617)	(0.0615)	(0.0364)	(0.0379)	(0.0803)	(0.0848)
Governance Characteristics:								
Prop. Ownership By 5% Block	0.288***	0.286**	0.413	0.413	-0.158	-0.194	0.791**	0.889**
	(0.106)	(0.115)	(0.258)	(0.256)	(0.144)	(0.147)	(0.368)	(0.380)
CEO Chairman	-0.00839	-0.0173	0.137	0.123	-0.0365	-0.0422	0.182	0.126
	(0.0418)	(0.0437)	(0.0884)	(0.0900)	(0.0517)	(0.0547)	(0.128)	(0.135)
E index		0.00695		0.0247		0.00220		0.0676*
		(0.0143)		(0.0296)		(0.0182)		(0.0351)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	452	432	416	400	416	400	416	400
R-squared							0.074	0.095
Pseudo R-squared	0.134	0.125	0.156	0.164	0.164	0.154		

	Panel B							
VARIABLES	Tobit Perf/Total	Tobit Perf/Total	Tobit Prop.Mkt	Tobit Prop.Mkt	Tobit Prop.Acct	Tobit Prop.Acct	OLS Perf H.	OLS Perf H.
Subsample sorted by	Prop. Ownership By 5% Blockholder		Prop. Ownership By 5% Blockholder		Prop. Ownership By 5% Blockholder		Prop. Ownership By 5% Blockholder	
	Low (1^{st} Half)	High (2^{nd} Half)	Low (1^{st} Half)	High (2^{nd} Half)	Low (1^{st} Half)	High (2^{nd} Half)	Low (1^{st} Half)	High (2^{nd} Half)
Log Assets	-0.00533	-0.0193	0.124***	0.0195	-0.0579**	-0.00764	0.166***	0.148*
	(0.0187)	(0.0258)	(0.0437)	(0.0442)	(0.0246)	(0.0317)	(0.0464)	(0.0801)
# Bus. Segments	-0.000592	0.0205	0.0234	0.0191	0.0117	-0.0251	0.0110	-0.0373
	(0.0138)	(0.0141)	(0.0332)	(0.0263)	(0.0199)	(0.0155)	(0.0382)	(0.0360)
Investment / A	-1.936***	-1.648***	-0.430	1.155	-0.454	-0.924	1.960	-0.814
	(0.517)	(0.542)	(1.461)	(1.030)	(0.736)	(0.613)	(2.698)	(1.179)
Q(ind)	-0.0597	-0.0114	-0.259	0.139	0.157*	-0.0817	-0.227*	-0.0846
	(0.0596)	(0.0540)	(0.168)	(0.123)	(0.0848)	(0.0666)	(0.131)	(0.136)
Log Firm Age	0.0401*	-0.00202	0.00199	-0.0586	-0.00542	0.0608**	0.0510	-0.0217
	(0.0221)	(0.0265)	(0.0554)	(0.0432)	(0.0297)	(0.0278)	(0.0615)	(0.0825)
Log CEO Tenure	0.0755**	0.0143	-0.0209	-0.0899	0.0336	0.101**	-0.00466	0.0173
	(0.0311)	(0.0407)	(0.0788)	(0.0706)	(0.0460)	(0.0440)	(0.0885)	(0.108)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	220	232	201	215	201	215	201	215
R-squared							0.117	0.096
Pseudo R-squared	0.215	0.106	0.174	0.201	0.199	0.198		

Table XI
Discretionary Awards and Firm (Past, Present, and Future) Performance

Table XI shows results of median regressions for a sample of S&P 500 firms with CEO unchanged from the previous year. The dependent variable is the discretionary awards granted to the CEO in 2007. Market capitalization is the number of shares outstanding multiplied by the firm stock price. Market performance is defined as dollar return to shareholders (i.e., total shareholder returns (TSR) multiplied by market capitalization at the beginning of the year). Accounting performance is defined as the firm's net income. The value of discretionary wards is in thousands of dollars while market capitalization, market and accounting performance are in millions of dollars. Market Weight and Accounting Weight are the proportions of the value of performance-based awards assigned to market and accounting performance measures in the 2007 contract. Past performance is defined as 2006 performance (Panel A). Present performance is defined as 2007 performance (Panel B). Future performance is defined as 2008 performance (Panel C). The constant term, year fixed effects, and industry dummies are included but not reported. Bootstrapped standard errors based on 20 replications are reported in parentheses. The symbol *** indicates that the p-value is less than 0.01, ** that it is less than 0.05, and * that it is less than 0.1.

Panel A: Discretionary Awards and Firm Past Performance

	Median Regressions					
VARIABLES	(1) Discretionary Awards	(2) Discretionary Awards	(3) Discretionary Awards	(4) Discretionary Awards	(5) Discretionary Awards	(6) Discretionary Awards
Market Cap (t-1)	0.0367***	0.0397**	0.0328	0.0350	0.0285	0.0218
	(0.0102)	(0.0193)	(0.0347)	(0.0249)	(0.0244)	(0.0259)
Market Perf.	0.0299	0.0341			0.0309	0.0460
	(0.0428)	(0.0704)			(0.0371)	(0.0632)
Market Weight * Market Perf.		-0.244				-0.208
		(0.298)				(0.501)
Accounting Perf.			0.108	-0.00454	0.117	0.0724
			(0.408)	(0.575)	(0.365)	(0.752)
Accounting Weight * Accounting Perf.				0.212		0.251
				(0.667)		(0.881)
Observations	395	395	395	395	395	395
Pseudo R-squared	0.1164	0.1209	0.1155	0.1170	0.1171	0.1227

Panel B: Discretionary Awards and Firm Present Performance						
	Median Regressions					
VARIABLES	(1) Discretionary Awards	(2) Discretionary Awards	(3) Discretionary Awards	(4) Discretionary Awards	(5) Discretionary Awards	(6) Discretionary Awards
Market Cap (t-1)	0.0420***	0.0374***	0.0447***	0.0519***	0.0460***	0.0458**
	(0.00652)	(0.00772)	(0.0156)	(0.0185)	(0.0177)	(0.0219)
Market Perf.	-0.0349	-0.0164			-0.0317	-0.0225
	(0.0233)	(0.0197)			(0.0307)	(0.0226)
Market Weight * Market Perf.		-0.0983				-0.0542
		(0.177)				(0.119)
Accounting Perf.			-0.0659	-0.196	-0.0502	-0.0758
			(0.238)	(0.440)	(0.221)	(0.363)
Accounting Weight * Accounting Perf.				0.171		0.0474
				(0.527)		(0.309)
Observations	400	400	400	400	400	400
Pseudo R-squared	0.1213	0.1237	0.1130	0.1176	0.1223	0.1254

Panel C: Discretionary Awards and Firm Future Performance						
	Median Regressions					
VARIABLES	(1) Discretionary Awards	(2) Discretionary Awards	(3) Discretionary Awards	(4) Discretionary Awards	(5) Discretionary Awards	(6) Discretionary Awards
Market Cap (t-1)	0.0299**	0.0277*	0.0438***	0.0452***	0.0415*	0.0387**
	(0.0116)	(0.0142)	(0.00793)	(0.00718)	(0.0232)	(0.0162)
Market Perf.	-0.0290	-0.0431			-0.00950	-0.0240
	(0.0271)	(0.0324)			(0.0458)	(0.0357)
Market Weight * Market Perf.		0.0507				0.0397
		(0.101)				(0.0824)
Accounting Perf.			-0.0856	-0.106	-0.0819	-0.0794
			(0.0620)	(0.255)	(0.0789)	(0.253)
Accounting Weight * Accounting Perf.				0.148		0.140
				(0.286)		(0.355)
Observations	395	395	395	395	395	395
Pseudo R-squared	0.1136	0.1165	0.1162	0.1243	0.1170	0.1274

Panel A: Summary Compensation Table

Name and Principal Position	Year	Salary ($)	Bonus ($)	Stock Awards ($)	Option Awards ($)	Non-Equity Incentive Plan Compensation ($)	Change in Pension Value and Nonqualified Deferred Compensation Earnings ($)	All Other Compensation ($)	Total ($)
PEO									
PFO									
A									
B									
C									

Panel B: Grants of Plan-Based Awards Table

Name	Grant Date	Estimated Future Payouts Under Non-Equity Incentive Plan Awards			Estimated Future Payouts Under Equity Incentive Plan Awards			All Other Stock Awards: Number of Shares of Stock or Units (#)	All Other Option Awards: Number of Securities Underlying Options (#)	Exercise or Base Price of Option Awards ($/Sh)
		Threshold ($)	Target ($)	Maximum ($)	Threshold (#)	Target (#)	Maximum (#)			
PEO										
PFO										
A										
B										
C										

Figure 1. New Compensation Tables with Respect to Last Fiscal Year.

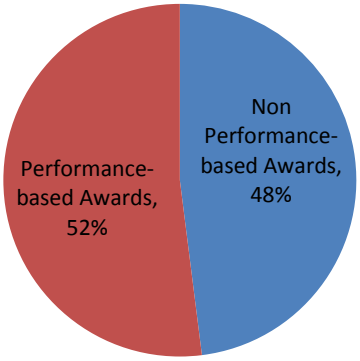

Figure 2.A: Performance-based Awards

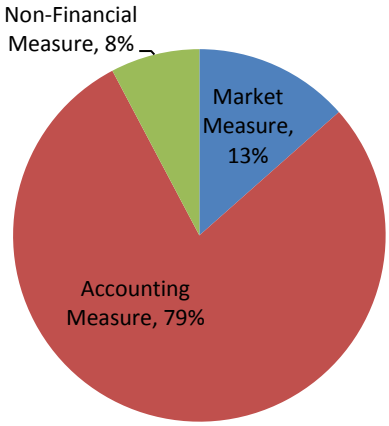

Figure 2.B: Type of Performance Measure

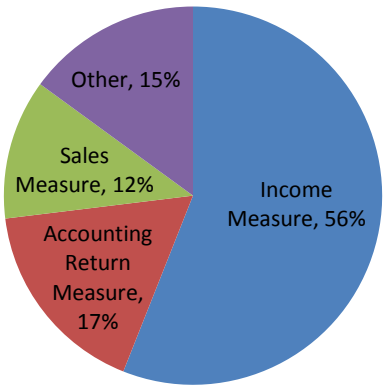

Figure 2.C: Type of Accounting Performance Measure

Figure 2. Average Proportion of Performance-based Awards and the Average Weights of Performance Measures.

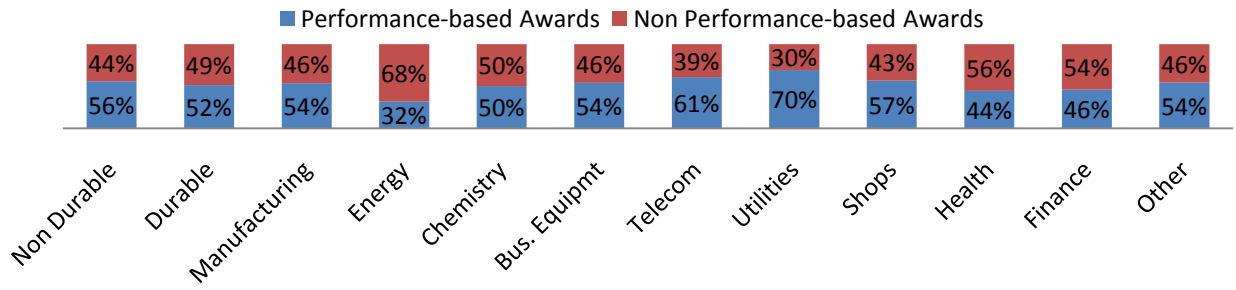

Figure 3.A: Performance-based Awards

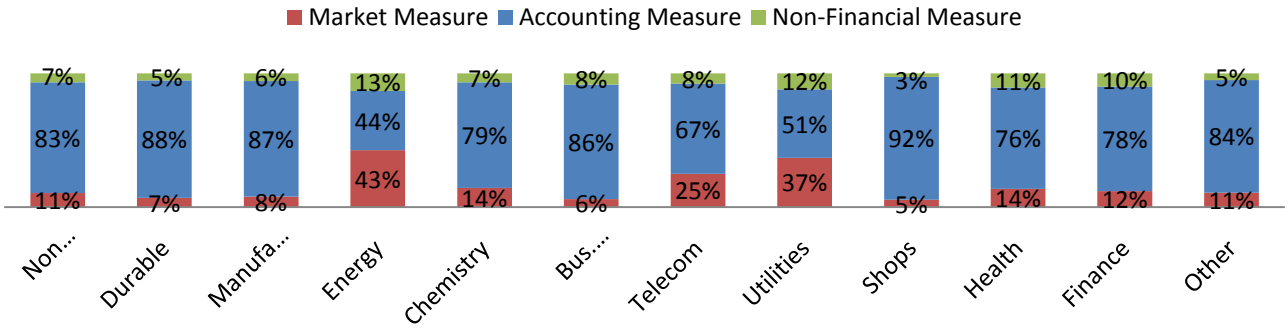

Figure 3.B: Type of Performance Measure

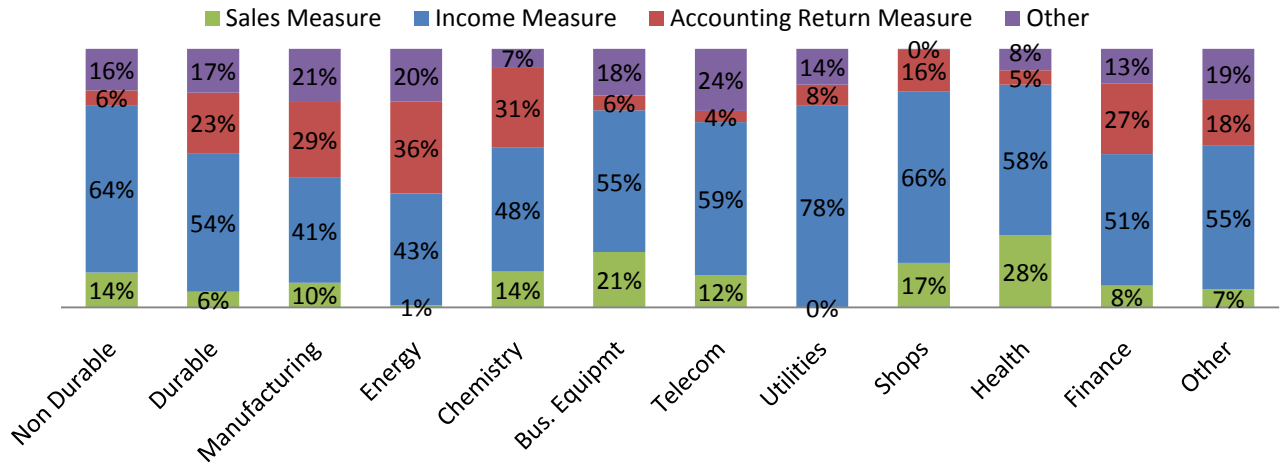

Figure 3.C: Type of Accounting Performance Measure

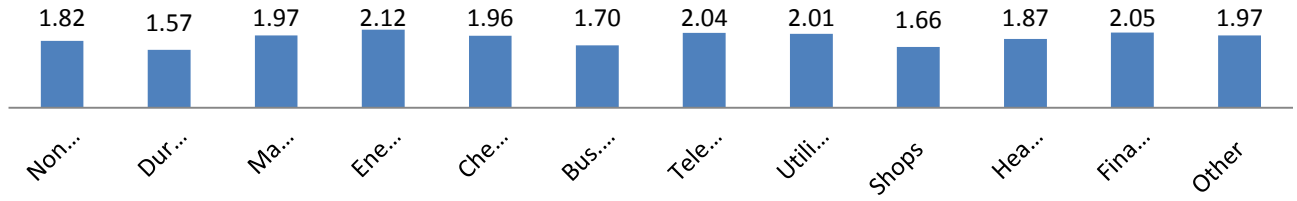

Figure 3.D: Performance Horizon (in years)

Figure 3. Average Proportion of Performance-based Awards, Average Weights of Performance Measures, and Average Performance Horizon by Industry.