Relative Performance Evaluation and Related Peer Groups in Executive Compensation Contracts

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ABSTRACT: Based upon the premise that peer performance captures common exogenous shocks, relative performance evaluation (RPE) entails the use of peer performance in evaluating the performance of executives. In this paper we examine the use of RPE and related peer groups using disclosures collected from S&P 1500 firms' first proxies filed under the SEC's new disclosure rules on executive compensation. We find that 27.34 percent of our sample firms use RPE in determining executive compensation. The use of RPE varies with industry, firm, and executive characteristics as predicted by economic theories. Further, we find evidence supporting both efficient contracting and rent extraction in the peer selection choice. Consistent with efficient contracting, firms exhibiting a higher ability to remove common risk are more likely to be chosen as peers. However, we also find a selection bias in forming RPE peer groups as evidenced by a negative relation between firm performance and the likelihood of being selected as a peer. Finally, we find that CEOs in RPE firms receive greater compensation after controlling for a comprehensive set of economic and governance-related determinants of executive pay. Further investigation shows that the higher level of CEO compensation in RPE firms is at least partly attributable to the selection bias in forming RPE peer groups.

I. INTRODUCTION

Academics and practitioners alike frequently recommend the use of relative performance evaluation (RPE) in executive compensation contracts. Based upon the premise that peer performance captures common exogenous shocks, RPE entails the use of peer performance in evaluating the performance of agents. Economic theory argues that RPE leads to risk sharing benefits in incentive contracting since RPE insulates agents from exogenous shocks (Holmstrom 1982).[1]

Despite RPE's theoretical appeal, however, prior empirical research offers limited evidence on the use of RPE in executive compensation contracts. The major weakness inherent in prior empirical studies is the *implicit* approach in testing the use of RPE. This approach infers the RPE use by regressing executive pay on industry average performance across a population of firms.[2] Due to the lack of information on the actual use of RPE in executive compensation contracts, the implicit approach relies on assumptions about peer group composition, performance metrics used for RPE, and pay components subject to RPE. These assumptions introduce errors in implicit RPE tests (Albuquerque 2007a; Dikolli et al. 2008). More importantly, studies relying on the implicit approach are unable to address fundamental issues regarding the execution and economic consequences of a RPE plan, which are critical to the evaluation of the costs and benefits of RPE as an incentive mechanism (Matsumura and Shin 2006).

In this study, we employ an *explicit* approach to examine a firm's use of RPE and related

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[1] RPE may be beneficial even in the absence of risk-sharing problems. Gibbons and Murphy (1990) hypothesize that if compensation is a function of expected ability, RPE can be useful as a filter of external shocks to help determine the agent's ability.
[2] Examples include Antle and Smith (1986), Barro and Barro (1990), Gibbons and Murphy (1990), Janakiraman et al. (1992), Joh (1999), Aggarwal and Samwick (1999), Garvey and Milbourn (2003), Rajgopal et al. (2006), Jenter and Kanaan (2008), and Albuquerque (2007a, 2007b).

peer groups in executive compensation contracts using disclosures collected from S&P 1500

firms' first proxy statements filed under the SEC's new disclosure rules on executive

compensation. We begin by examining determinants of RPE use in compensation contracts to

assess the descriptive validity of related economic theories. We then examine potential factors

that may influence the selection of peers used in a RPE plan. Lastly, we investigate the effect of

RPE use and peer selection bias, if any, on the level of CEO compensation.

The SEC's new disclosure rules on executive compensation, effective for fiscal years

ending on or after December 15, 2006, allows us to employ an explicit approach to examining

RPE use and related peer groups. Prior to 2006, proxy disclosures on the details of executive

compensation in the U.S. had been voluntary (Byrd et al. 1998; Carter et al. 2009). In contrast,

under the SEC's new disclosure rules, companies are required to provide a "Compensation

Discussion and Analysis" (CD&A) report in their proxy statements, in which firms are obligated

to provide a detailed description of the process used to select performance targets and an

evaluation of how the performance targets translate into an objective compensation

determination.[3] Consequently, firms using RPE in executive compensation contracts are required

to disclose details about RPE plans in CD&A, whereas firms not using RPE face legal action if

they claim the use of RPE. This setting allows us to create unbiased and detailed data on firms'

use of RPE, including the composition of RPE peer groups, for a large sample of U.S. firms.[4]

We first examine the prevalence and determinants of RPE use in executive compensation

contracts. We find that 27.34 percent of our sample firms use RPE to some extent in determining

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[3] In a speech on executive compensation disclosure in October 2008, John White, Director of the SEC's Division of Corporation Finance, noted that "In preparing its disclosure, a company must determine whether performance targets are a material element of its compensation policies and decisions and, if they are material, provide disclosure in accordance with Item 402 of Regulation S-K."
[4] We acknowledge the possibility that the new compensation disclosure rules may have changed firms' decision to use RPE or the features of RPE plans (such as the composition of RPE peers). Consequently, our findings may not generalize to periods prior to this new disclosure regulation.

executive compensation. Further, we find that RPE is more likely to be utilized by firms operating in less concentrated industries, firms facing fewer growth opportunities, firms exposed to a higher level of common risk, and firms with larger market capitalization and better stock performance. In addition, firms with less wealthy CEOs and more independent boards are also more likely to use RPE in compensation contracts. Hence, our evidence suggests that the use of RPE varies with industry competition, the importance of common risk to firm performance (Holmstrom 1982), and the CEO's self-hedging ability (Garvey and Milbourn 2003) in the direction predicted by economic theories.[5] Taken together, these findings support the view that firms consider both the costs and benefits of using RPE as a form of incentive mechanism.

Next, we examine whether firms choose RPE peers in a manner consistent with efficient contracting or rent extraction. Economic theory suggests that the selection of RPE peers should be based on potential peer firms' ability to remove common exogenous risk (Holmstrom 1982). However, Bebchuk and Fried (2003) argue that executive compensation practices are often the product of "managerial power," which allows rent extraction from shareholders. In particular, executives have strong incentives to choose RPE peers that they expect to outperform (as suggested by Gibbons and Murphy (1990) and Murphy (2001)). Our analysis of RPE firms' self-selected peer groups yields evidence that supports both efficient contracting and rent extraction in the peer selection process. Consistent with efficient contracting hypothesis, firms with higher ability to remove common risk (as indicated by the same industry membership as RPE firms and higher performance comovement with RPE firms) are more likely to be chosen as peers. At the same time, we also document a selection bias in forming RPE peer groups—poorly performing firms (relative to industry median performance or RPE firms' performance) are more likely to be

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[5] Our finding that RPE use is negatively associated with industry concentration (an inverse proxy for industry competition) stands in contrast to the prediction in Aggarwal and Samwick (1999), but is consistent with empirical findings by Defond and Park (1999) based on managerial turnover decisions.

selected as peers, after controlling for firm size, industry membership, S&P index membership, and performance comovement. This selection bias is consistent with the notion that RPE peers are opportunistically chosen to justify a higher level of executive pay.

Finally, we examine the effect of RPE use and the RPE peer selection bias on the level of CEO compensation. Economic theory suggests that the use of RPE should lower the level of executive pay because RPE provides more insurance against common risk and hence reduces the risk premium demanded by executives (e.g., Holmstrom 1979, 1982; Prendergast 1999; Gox and Heller 2008). In addition, the use of RPE can constrain excessive pay by limiting the chance of executives getting paid for "luck" (Bertrand and Mullainathan 2001; Bebchuk and Fried 2003). On the other hand, opportunistic behavior in implementing RPE plans, such as the selection bias in forming peer groups, could lead to a higher level of executive pay in RPE firms.[6] Given that we find evidence supporting both efficient contracting and rent seeking in the peer selection process, it is ex ante unclear which force would be more dominant in determining the level of CEO pay. We find that CEOs in RPE firms (non-RPE firms) receive a higher (lower) level of compensation, after controlling for a comprehensive set of economic and governance-related determinants of executive pay. Further investigation demonstrates that the degree of underperformance for RPE peers (relative to industry median performance) is associated with greater CEO compensation. This finding lends further support to the conjecture that the higher level of CEO compensation in RPE firms is at least partly attributable to the selection bias in forming RPE peer groups. These findings support the view that the execution of RPE plans

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[6] Corporate executives can exert significant influence over the implementation of RPE plans. Executive pay recommendations (including the choice of RPE peers) are often prepared by the company's human resource department in collaboration with outside compensation consultants and are approved by the CEO before review by the compensation committee (Murphy 1999). The CEO may exert influence over the hiring and retention of outside compensation consultants who make recommendations on RPE contract design, including the choice of RPE peers (Cadman et al. 2009a and 2009b).

involves opportunistic behavior in a manner consistent with inflating executive pay.

Our study contributes to the executive compensation literature in several ways. First, we employ an explicit approach to provide the first large sample evidence on potential factors influencing the use of RPE. Given only 27.34 percent of our sample firms use RPE in setting executive pay, our explicit approach circumvents shortcomings stemming from implicit RPE tests, where researchers are unable to distinguish between RPE firms and non-RPE firms. We note that Murphy (1999) and Bannister and Newman (2003) also analyze explicit RPE use and provide *descriptive* analysis of RPE plans; however, their samples are small and their studies do not benefit from the mandatory compensation disclosure requirement that is unique to our setting.[7] Our study thus complements prior research examining the use of RPE. In particular, our finding that RPE use is affected by the costs and benefits of RPE as predicted by related economic theories stands in contrast to Carter et al. (2009), who fail to find significant economic determinants for RPE use using a sample of U.K. firms.[8]

Second, our study provides the first direct evidence on the RPE peer selection choice for U.S. firms. Our finding that both efficient contracting and rent extraction explain RPE firms' peer selection process sheds light on the execution of RPE in compensation contracts, which is essential to understanding the overall costs and benefits of RPE. Furthermore, our evidence on RPE peer group composition has important implications for future research. Most implicit tests of RPE use measure peer performance based on two-digit SIC industry average performance, which may contribute to the limited empirical support for RPE (Albuquerque 2007a; Dikolli et

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[7] Murphy (1999) examines the use of RPE in compensation plans based on 177 large U.S. companies included in the 1997 Towers Perrin survey. Bannister and Newman (2003) examine proxy disclosures on RPE use for 160 firms included in the Fortune 250 index in 1992 and 1993.

[8] Carter et al. (2009) use annual report disclosures to examine RPE use in performance-vested equity grants for a sample of 129 U.K. firms. Their evidence regarding the effects of economic factors on RPE use is largely inconsistent with the predictions of related economic theories (Ferri 2009).

al. 2008). We document that RPE peers may operate in industries other than that of the RPE firm and that not all firms from the RPE firm's industry are chosen as peers. We also find that the degree of underperformance, firm size, and performance comovement with RPE firms significantly influence a firm's chance to be selected as a RPE peer. These findings are informative for future studies that aim to form peer groups that better reflect the actual peer choice of RPE firms.

Third, we provide new evidence on the compensation consequences of RPE. The lack of research on the consequences of RPE is mainly due to limited disclosures about actual RPE use. Based on RPE disclosures under the SEC's new disclosure regime, we find that CEOs in RPE firms receive greater compensation than their counterparts in non-RPE firms. This finding contradicts the theoretical benefit of RPE, which implies that RPE reduces managers' risk exposure and thus makes it less costly to compensate managers. Furthermore, we demonstrate that the higher CEO pay in RPE firms is at least partly attributable to the biased selection of RPE peers, which supports the conjecture that self-serving behavior of management could compromise the theoretical benefit of RPE (Gibbons and Murphy 1990; Murphy 2001; Albuquerque 2007b).

Last, but not least, we add to the growing literature on the role and composition of peer groups used for executive compensation decisions. Prior research on the choice of peer groups focuses on the efficient use of *compensation* benchmarking peers and potential self-serving managerial incentives in selecting compensation benchmarking peers (Bizjak et al. 2008; Faulkender and Yang 2008; Cadman et al. 2009b; Albuquerque et al. 2009). However, we know

little about how peers are selected for *performance* benchmarking purposes in RPE contracts.[9] Our evidence on the opportunistic selection of RPE peers suggests that RPE could be utilized to facilitate rent extraction, reinforcing concerns about inappropriate selection of RPE peers as a potential gaming vehicle by executives (Gibbons and Murphy 1990; Murphy 2001).

The next section reviews the related literature. Section III provides the sample selection procedures and descriptive statistics on RPE use in our sample firms. In Section IV, we examine potential determinants of RPE use in executive compensation contracts. Section V investigates the selection process of RPE peers. Section VI examines the role of RPE use and RPE peers' performance on the level of CEO pay. Section VII concludes.

II. RELATED LITERATURE

Literature on RPE

Agency theory suggests that RPE removes the effect of common exogenous shocks on an agent's performance, enabling a principal to better evaluate the agent's efforts (Baiman and Demski 1980; Holmstrom 1982; Lambert 2001). In spite of its theoretical appeal, however, RPE has received only weak and mixed empirical support in the literature (e.g., Antle and Smith 1986; Gibbons and Murphy 1990; Janakiraman et al. 1992; Aggarwal and Samwick 1999; Jenter and Kanaan 2008, among others).

The lack of clear empirical support for the existence of RPE has stimulated a body of research examining the contextual factors that may influence the effectiveness of RPE. For example, prior research documents that RPE is either more or less useful for contracting in competitive environments (Aggarwal and Samwick 1999; Defond and Park 1999; Joh 1999).

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[9] Prior research has also examined performance graph peers and suggested that managers opportunistically select underperforming peers in the performance graph (Lewellen et al. 1996; Porac et al. 1999). See Section II for a discussion of the differences between performance graph peers and peer groups used for setting executive pay.

Another stream of research highlights the role of executive characteristics in influencing the usefulness of RPE. Garvey and Milbourn (2003), for example, argue that the theoretical benefit of RPE is diminished to the extent that executives can hedge market risk; they find stronger empirical support for RPE in compensating younger and less wealthy executives who are less likely to hedge market risk. Rajgopal et al. (2006) propose a covariation between reservation wages and the economy's fortunes as a potential explanation for the lack of RPE and find that the compensation of more talented CEOs exhibits weaker evidence of RPE.

More recent studies attribute the limited empirical support for RPE to the inappropriate specification of peer groups in implicit RPE tests (Albuquerque 2007a; Dikolli et al. 2008). Albuquerque (2007a) reports stronger evidence of RPE when peers are matched on both industry and size as opposed to industry only. Dikolli et al. (2008) theoretically demonstrate how measurement error in peer group selection and peer performance aggregation introduces biases that cloud the empirical detection of RPE use. They conclude that "[e]mpiricists should take steps to choose peers and aggregation methods that better reflect the choices made by firms."

While prior RPE research largely employs an implicit approach in testing RPE use, a few papers adopt an *explicit* approach by examining the actual use of RPE in executive compensation contracts (Murphy 1999, 2001; Bannister and Newman 2003; Carter et al. 2009). Using proprietary survey data provided by a compensation consulting firm, Murphy (1999) reports that 28.8 percent of 177 large U.S. companies use RPE in annual incentive plans. Bannister and Newman (2003) examine the proxy disclosures of 160 Fortune 250 firms in fiscal years 1992 and 1993 and provide descriptive evidence on the RPE plans used by 45 firms in their sample. Both studies suggest that a lack of empirical support for RPE could be attributable to incorrect assumptions and model misspecifications underlying the implicit RPE tests.

A more recent study by Carter et al. (2009) examines explicit RPE use in performance-vested equity grants for a sample of 129 U.K. firms. Their sample, however, is limited to firms using RPE in performance-vested equity grants. In addition, their research design employs the same set of economic factors aiming to explain *between-firm* differences in RPE use to explain RPE plan characteristics *within* RPE firms, and hence offers little empirical support for related RPE theories (Ferri 2009).[10] More importantly, their U.K.-based results may not generalize to the U.S. setting because RPE use in performance-vested equity plans became prevalent in U.K. mainly due to external pressures from institutional investors (Carter et al. 2009; Ferri 2009).

Literature on Peer Groups

Peer groups used in firms' compensation decisions can be broadly categorized as (1) compensation benchmarking peer groups and (2) RPE peer groups (Cadman et al. 2009b; Albuquerque et al. 2009). Firms frequently use a set of peer groups for pay-level benchmarking to gauge an executive's reservation wage in the market. Compensation benchmarking peer groups therefore represent a set of companies against which a firm competes for executive talent. Recent studies examine compensation benchmarking peer groups and their role in setting executive pay (Bizjak et al. 2008; Faulkender and Yang 2008; Cadman et al. 2009b; Albuquerque et al. 2009). Bizjak et al. (2008) find that compensation benchmarking is an efficient mechanism to gauge the market wage necessary to retain valuable human capital. Using disclosures about compensation benchmarking peers (newly available since the SEC's new disclosure rules), Faulkender and Yang (2008) show that firms select highly paid peers to justify excess CEO compensation, but Cadman et al. (2009b) and Albuquerque et al. (2009) conclude that

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[10] In their analysis on firm-level use of RPE vesting conditions, Carter et al. (2009) find no support for economic determinants of RPE use (e.g., common risk and industry competition) as predicted by economic theories.

compensation benchmarking peers are largely chosen efficiently rather than opportunistically.

Unlike compensation benchmarking peer groups, RPE peer groups are mainly used to filter out common risk and thus to insulate executive pay from the effect of uncontrollable exogenous factors. The use of RPE peer groups is less prevalent than the use of compensation benchmarking peer groups. Cadman et al. (2009b) report that 91 percent of their 893 S&P 1500 firms use peer groups for benchmarking the level of executive pay, which is much higher than 27.34 percent of S&P 1500 firms using RPE as we report in Table 1 Panel A. For firms that use two peer groups (one for compensation benchmarking and the other for RPE), compensation benchmarking peer groups often differ from RPE peer groups.[11] Further, if there exists self-serving incentive in peer selection, the direction of bias in terms of peer performance is opposite for compensation benchmarking peers versus RPE peers. Better performing firms are more likely to be selected as compensation benchmarking peers because they are likely to provide their CEOs with greater pay. In contrast, worse performing firms are more likely to be selected as RPE peers to inflate the firms' relative performance. Hence, the evidence on compensation benchmarking peers is unlikely to apply to RPE peers.

Prior literature on peer groups disclosed in proxy statements also studies performance graph peer groups (Lewellen et al. 1996; Porac et al. 1999).[12] These studies generally find that selected performance graph peers perform worse than the industry average, consistent with an opportunistic selection bias. It should be noted, however, that performance graph peers are rarely

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[11] Cadman et al. (2009b) report that in a random sample of 100 firms disclosing benchmarking peer groups, 7 firms use the same peer groups for both pay benchmarking and RPE purposes, 23 firms have some overlap between the two peer groups, and the remaining 70 firms do not use RPE. Albuquerque et al. (2009) also report a similar finding.
[12] Since 1992, firms have been required to include in proxy statements a performance graph that displays the firm's stock price performance contrasted with the performance of its industry peers (i.e., performance graph peer group) and a broad market-wide index (SEC rule 33-6962). The SEC's new disclosure rule on executive compensation, however, expresses the view that the performance graph should not be presented as part of executive compensation disclosure and thus the performance graph is required only in the company's annual report.

used in setting executive compensation (Byrd et al. 1998; Murphy 1999).[13] Hence, findings on performance graph peers are not suggestive of the role of peer groups in *compensation* decisions.

We are aware of no prior study that investigates the role of RPE peer groups in setting executive pay. Carter et al. (2009) fail to find any bias in RPE peer selection for a sample of U.K. firms that use RPE in performance-vested equity grants. However, they do not link RPE use and RPE peer selection to executive pay, and their U.K.-based findings may not generalize to U.S. firms (Ferri 2009). Using detailed disclosures about RPE peers for S&P 1500 firms, we shed light on the debate concerning whether firms choose RPE peers efficiently or opportunistically in a manner consistent with inflating executive compensation.

III. Sample Selection and Descriptive Statistics

Sample Selection

We begin with the S&P 1500 firms identified using Compustat's annual file for fiscal year 2006. The new Compensation Discussion and Analysis (CD&A) requirement is effective for fiscal years ending on or after December 15, 2006. We thus retrieve firms' first proxy statements filed (for fiscal year 2006 or 2007) under the new executive compensation disclosure regime. Our initial sample consists of 1,419 S&P 1500 firms.

We determine the use of RPE in executive compensation plans by examining the CD&A report in firms' proxy statements. Specifically, if the firm states that at least one type of executive compensation plan (e.g., annual bonus, restricted stock, and stock option) is

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[13] The RPE peer group and the performance graph peer group often differ (Byrd et al. 1998; Murphy 1999; Bannister and Newman 2003). The performance graph peer group generally consists of firms operating in the same industry as the firm of interest (e.g., Lewellen et al. 1996; Porac et al. 1999). Murphy (1999) reports that only 20 percent of the 125 industrial firms in his sample use performance graph peers as RPE peers. Byrd et al. (1998) report that only 10.3 percent of S&P 500 firms in 1992 voluntarily disclosed peer groups for compensation purposes along with performance graph peer groups. Among these disclosing firms, 59.3 percent use the compensation peer groups for pay benchmarking purposes and 40.7 percent use the compensation peer groups for RPE purposes.

determined based on firm performance relative to a group of peers, the firm is identified as a

RPE firm. Otherwise, the firm is identified as a non-RPE firm.[14] When firms state that RPE is

used in setting executive pay, most of the time they also disclose details of the RPE plan such as

specific compensation plans and performance metrics used for RPE as well as the composition of

the RPE peer group. We collect these detailed disclosures about RPE plans as described in the

CD&A section. Note that we take extra care to avoid misclassifying compensation benchmarking

peers as RPE peers, unless the firm explicitly states that the same peer group is used for both

compensation benchmarking purposes and RPE purposes. The Appendix provides several

representative proxy statement disclosures from firms in our sample.

Finally, we obtain financial information from Compustat, stock information from CRSP,

and CEO compensation data from ExecuComp.

Descriptive Statistics on RPE Use

Table 1 provides descriptive evidence on the prevalence of RPE use and on RPE plan

characteristics. As Panel A shows, 388 (27.34 percent) of our sample firms use RPE at least to

some extent in determining executive compensation.[15] For comparison, Bannister and Newman

(2003) report that 28 percent of their sample firms (160 firms included in the Fortune 250 index)

use RPE in 1992-1993. While the percentage of RPE firms in our sample looks comparable to

the percentage reported by Bannister and Newman (2003), our sample firms on average are

much smaller than theirs. For S&P 500 firms, which are more comparable in size to Bannister

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[14] Firms sometimes comment favorably on the principle of RPE, but do not disclose details (such as performance metrics, compensation components, or peer group composition) on the use of RPE in compensation plans. We classify these firms as non-RPE firms since in practice they may not use RPE to compensate executives.

[15] The percentage of RPE firms we report is comparable to that reported by recent compensation benchmarking peer group studies. Albuquerque et al. (2009) report that one-third of their S&P 1500 firms using benchmarking peers also use RPE peers. Cadman et al. (2009b) report a similar finding for a random sample of 100 companies.

and Newman's sample, we find that the percentage of RPE firms is much higher at 38.57 percent, which reflects increased RPE disclosure under the SEC's new disclosure regime and/or more widespread use of RPE since the early 1990's.

In practice, RPE is applicable to cash compensation plans (such as annual bonus and long-term incentive plan) as well as equity-based compensation plans (such as restricted stock and stock option). Table 1 Panel B indicates that for our sample firms, RPE is most often applied solely to equity-based compensation plans (238 firms, or 61.34 percent of RPE firms) and is less common among cash compensation plans (87 firms, or 22.42 percent of RPE firms). This finding stands in contrast to evidence reported by Murphy (1999), who reports that RPE is sometimes used in annual bonus plans but rarely used for equity-based compensation based on a survey of 177 large U.S. firms in 1997. Our finding also indicates heavier use of RPE toward equity-based compensation as compared to Bannister and Newman (2003), who report that 44.44 percent of their sample firms use RPE for long-term plans (including restricted stock, stock option, and long-term incentive plan) based on 160 Fortune 250 firms in the early 1990's. We also find that most of our sample firms apply RPE to only one type of compensation plan, with a small percentage of firms (63 firms, or 16.24 percent of RPE firms) applying RPE to both equity-based and cash compensation plans.

Firms can choose different performance metrics when implementing RPE in compensation contracts. Table 1 Panel C shows that a majority of RPE firms (52.58 percent) use price-based performance metrics (such as stock returns and common shareholder wealth) when implementing RPE. Accounting performance metrics (such as return-on-equity and earnings per share) are also commonly observed (24.74 percent of RPE firms). Only 64 (16.49 percent) RPE firms use both price-based and accounting performance metrics for RPE purposes. An even

smaller percentage of RPE firms (24 firms, or 6.19 percent) use non-financial performance metrics (such as customer satisfaction and market share) in RPE plans. Commonly used RPE performance metrics are listed in Table 1 Panel D.

Finally, we examine the choice and composition of RPE peer groups. Firms may choose to use published market or industry indices as the RPE peer group or they may self-select a group of firms to form the RPE peer group. Table 1 Panel E reports that a majority of RPE firms (224 firms, or 57.73 percent) use self-selected RPE peer groups, and about a third (138 firms, or 35.57 percent) employ published market or industry indices for RPE purposes. A small number of RPE firms (26 firms, or 6.70 percent) choose both published indices and self-selected peer groups for RPE purposes.

With respect to the composition of RPE peer groups, Table 1 Panel F shows that the average (median) number of peers in the self-selected peer group is 14.67 (13) firms, in contrast to an average (median) of 60.41 (65) firms in these firms' corresponding two-digit SIC industry.[16] In addition, about 65.19 percent of self-selected peers operate in the same two-digit SIC industry as the RPE firms.[17] The fact that over one-third of RPE peers belong to industries other than those of the RPE firms reinforces the concern that the key assumption underlying implicit RPE tests—the RPE peer group consists of same-industry firms—is invalid. Finally, about 70.31 percent of self-selected RPE peers belong to the S&P 1500 index, and less than half

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[16] We also examine the stability of the composition of RPE peer groups over time. For a random sample of 50 firms that disclosed self-selected RPE peer groups in 2006, we collected their RPE peer groups in 2007 (i.e., the second year under the SEC's new disclosure regime). We are able to find fiscal 2007 proxy statements for 45 firms among which 5 firms discontinued using RPE in 2007. For the 40 firms that continued using RPE in 2007, the mean (median) percent of 2006 RPE peers retained in 2007 is 82.9 (86.0) percent. When we exclude 11 firms that use the same RPE peer groups in 2006 and 2007, the mean (median) retention rate is 76.4 (80) percent.

[17] Faulkender and Yang (2008) report that the average compensation benchmarking peer group for S&P 900 firms in fiscal year 2006 consists of 18 firms, and 46.5 percent of peers share the same two-digit SIC industry with the disclosing firm. The lower percentage of firms from the same industries in compensation benchmarking peers than in RPE peers suggests that the market for executive talent extends well beyond a firm's industry (Bannister and Newman 2003).

of self-selected peers (45.13 percent) share the same S&P sub-index (S&P 500, S&P Mid-Cap 400, and S&P Small-Cap 600) as the RPE firms.

IV. USE OF RPE IN EXECUTIVE COMPENSATION CONTRACTS

A significant body of research examines how the use of RPE varies with industry, firm, and executive characteristics. Most of these studies, however, focus on one contextual variable at a time without controlling for alternative factors that may influence RPE use. Moreover, most prior studies rely exclusively on an implicit test of RPE. In this section we examine multiple factors that potentially influence the decision to incorporate RPE in executive compensation contracts using *explicitly* identified RPE firms.

Determinants of RPE Use

Industry Competition

Prior research has proposed that product market competition influences the use of RPE, but the directional prediction is mixed. On the one hand, Defond and Park (1999) argue that a more competitive environment is characterized by a higher degree of common risk and hence RPE should be more useful in such an environment.[18] Aggarwal and Samwick (1999) and Joh (1999), on the other hand, argue that RPE is less likely to be used in firms facing a more competitive environment due to the concern that RPE may encourage destructive competition.[19] Following these studies, we use industry concentration, measured as the Herfindahl-Hirschman

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[18] Defond and Park (1999) examine RPE use in management turnover decisions and find that RPE-based accounting measures are more closely associated with CEO turnover in highly competitive industries than in less competitive industries. Cheng and Xu (2006) also document a positive effect of industry competition on the use of RPE using a sample of telecommunications firms impacted by the 1996 Telecommunications Act.

[19] Empirically, Aggarwal and Samwick (1999) find that firms operating in more competitive industries place greater *positive* compensation weights on peer performance (i.e., opposite to RPE). Joh (1999) also documents a positive relation between managerial compensation and industry performance in a sample of Japanese firms and labels this strategic group performance evaluation (SGPE).

Index of sales within each two-digit SIC industry, as an inverse proxy for industry competition (*Industry_Concentration*).

Growth Opportunity

Albuquerque (2007b) argues that RPE is less beneficial for firms with high growth options since peer performance is a less informative signal of external shocks for these firms. In contrast, Murphy (2001) predicts that firms with high growth opportunities are more likely to adopt external standards (such as peer performance) in setting executive pay since internal standards provide managers of high growth firms stronger incentives to smooth performance in response to fears of budget ratcheting (Leone and Rock 2002). Following these studies, we use the book-to-market ratio (*BM*) as an inverse proxy for the extent of a firm's growth opportunities.

Common Risk

Theory suggests that evaluating performance relative to a peer group will only be valuable if the agents under evaluation face some common form of uncertainty (Holmstrom 1982). This leads to the prediction that the benefits of using RPE (i.e., filtering out exogenous shocks) increase with the extent to which common risk affects both firm and peer performance (Janakiraman et al. 1992; Matsumura and Shin 2006). Consistent with prior research, we expect that RPE is more likely to be used when the firm's performance is less idiosyncratic and thus more heavily influenced by common risk. We measure idiosyncratic risk based on the standard deviation of residuals from a regression of firm-level stock returns on the value-weighted industry stock returns over the prior 36 months (*Idosyncratic_Risk*).

Executive Attributes

Garvey and Milbourn (2003) posit that executives' ability to hedge market-wide risk substitutes for the benefits of RPE, and find that firms with wealthier and older CEOs (proxies

for greater hedging ability) exhibit weaker evidence of RPE. Following Garvey and Milbourn (2003), we expect that RPE is less likely to be used to compensate wealthier and older executives. We use the value of CEO equity holdings (including both stocks and stock options) to proxy for CEO wealth (*CEO_Wealth*).

Corporate Governance

Bertrand and Mullainathan (2001) document that CEO pay is positively associated with exogenous shocks and that pay-for-luck is less pronounced in better-governed firms (also see Bebchuk and Fried (2003)). Garvey and Milbourn (2006) further document that executive pay is more sensitive to good luck than to bad luck and that this asymmetry is more pronounced in firms with weaker governance. Given RPE's theoretical appeal, we similarly expect that RPE use is positively associated with the quality of corporate governance. We measure governance quality using institutional ownership concentration (*Top5_Instown*), activist institutional ownership (*Activist_Instown*),[20] CEO/Chair duality (*CEO/Chair*), the proportion of outside directors on the board (*Board_Independence*), and the number of directors sitting on the board (*Board_Size*).

Firm Size and Performance

While theory is silent on the effect of firm size on the use of RPE, firm size could capture CEO talent (Himmelberg and Hubbard 2000). Rajgopal et al. (2006) predict and find that firms are less likely to filter out industry and market-wide performance when compensating more

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[20] We classify activist institutions following Cremers and Nair (2005). Cremers and Nair (2005) classify the following institutions as activists (spectrum manager number in parentheses): California Public Employees Retirement System (12000), California State Teachers Retirement (12100 and 12120), Colorado Public Employees Retirement Association (18740), Florida State Board of Administration (38330), Illinois State Universities Retirement System (81590), Kentucky Teachers Retirement Systems (49050), Maryland State Retirement and Pension System (54360), Michigan State Treasury (57500), Montana Board of Investment (58650), Education Retirement Board of New Mexico (63600), New York State Common Retirement Fund (63850), New York State Teachers Retirement System (63895), Ohio School Employees Retirement System (66550), Ohio School Employees Retirement System (66610), Ohio State Teachers Retirement System (66635), Texas Teachers Retirement System (82895, 83360), Virginia Retirement System (90803), and State of Wisconsin Investment Board (93405).

talented CEOs. Hence, we may observe less frequent use of RPE among larger firms. On the other hand, firm size could serve as a crude proxy for shareholder concern about executive pay practices (Bannister and Newman 2003), which may lead to more prevalent use of RPE in larger firms. We use the market value of common equity to measure firm size (*SIZE*).

Firm performance is another potential factor underlying a firm's decision to adopt RPE. To the extent that RPE firms exhibit stronger performance than their peers, RPE may be used as a convenient tool to justify higher executive pay. On the other hand, Rajgopal et al. (2006) propose industry-adjusted market performance as a proxy for CEO talent and find that better performing firms exhibit less evidence of RPE use. We include industry-adjusted operating performance (*ROA_Indadj*) and stock performance (*Return_Indadj*) in our analysis.

Results on RPE Use

To examine firms' choice to use RPE in executive compensation contracts, we estimate the following multivariate logistic regression (firm subscripts are omitted for brevity):

$Prob(RPE_t = 1)$
$= \Phi(\alpha_0 + \alpha_1 Industry\_Concentration_{t-1} + \alpha_2 BM_{t-1} + \alpha_3 Idosyncratic\_Risk_{t-1}$
$+ \alpha_4 Size_{t-1} + \alpha_5 ROA\_Indadj_{t-1} + \alpha_6 Return\_Indadj_{t-1} + \alpha_7 CEO\_Wealth_{t-1}$
$+ \alpha_8 CEO\_Age_{t-1} + \alpha_9 Top5\_Instown_{t-1} + \alpha_{10} Activist\_Instown_{t-1} + \alpha_{11} CEO/Chair_{t-1}$
$+ \alpha_{12} Board\_Independence_{t-1} + \alpha_{13} Board\_Size_{t-1} + \varepsilon_t)$ (1)

The dependent variable, *RPE*, is an indicator variable that equals one for RPE firms, and zero for non-RPE firms. The independent variables include firm characteristics, CEO attributes, and corporate governance factors that potentially influence the use of RPE. Table 2 provides descriptive statistics of the regression variables across RPE firms and non-RPE firms.

Table 3 reports regression results of estimating equation (1). Consistent with the prediction that RPE is more useful in a highly competitive environment (Defond and Park 1999),

but in contrast to the prediction that more intense product market competition (lower industry concentration) discourages the practice of using RPE (Aggarwal and Samwick 1999), we find that firms from less concentrated industries are more likely to implement RPE in compensation plans. We also find that firms exhibiting fewer growth opportunities (higher book-to-market) are more likely to use RPE, which confirms Albuquerque (2007b) but contradicts Murphy (2001). Further, firms with less idiosyncratic risk are more likely to use RPE, in line with the intuition that RPE is more effective at removing exogenous shocks in performance evaluation when the firm shares greater common risk with its peers (Janakiraman et al. 1992).

Larger firms and firms with better stock performance are more likely to use RPE. The latter finding supports the notion that firms choose to use RPE when their relative performance facilitates the justification of higher pay. When CEOs hold a larger value of stocks and options, their firms are less likely to use RPE, which is consistent with Garvey and Milbourn (2003). Finally, RPE is more likely to be applied to compensation plans when the corporate board is more independent, consistent with stronger governance mechanisms encouraging RPE use.

Our prediction model, which includes firm characteristics, CEO attributes, and corporate governance factors, explains about 20 percent of the cross-sectional variation in RPE use in executive compensation plans. Taken together, these results provide strong evidence that the use of RPE varies with industry, firm, and executive characteristics as predicted by economic theories. Our evidence also confirms some of the prior empirical evidence based on implicit tests of RPE use.

V. SELECTION OF RPE PEER GROUPS

In order for RPE to effectively screen out the impact of common exogenous shocks on executive pay, firms need to identify a set of peers that bear common risk. However, while appropriate selection of RPE peer groups enhances the efficiency in compensation contracting, it is conceivable that managers may deliberately select poorly performing firms as their RPE peers in order to overstate peer-adjusted firm performance and hence reap excess compensation (Gibbons and Murphy 1990; Murphy 2001). In this section we compare characteristics between firms that are chosen to be in the RPE peer group and those that are not chosen. We then conduct multivariate regression analysis of the selection process of RPE peers.

Univariate Results

To get a preliminary assessment of which firms are chosen to be members of the RPE peer groups, for each RPE firm we identify all domestic firms listed on Compustat as potential RPE peers.[21] For each potential peer firm (either selected or not selected by the RPE firm), we compute its performance and size relative to the median performance and size of the RPE firm's two-digit SIC industry (excluding the RPE firm of interest). We also compute a potential peer's performance and size relative to those of the RPE firm of interest.

As Table 4 shows, using RPE firms' industry median as the benchmark, selected peer firms have higher stock returns (*PeerReturn_IndReturn*) than the rest of the Compustat universe. On the surface this seems to be inconsistent with the idea that RPE firms opportunistically select poorly performing peers to boost executive pay. However, given S&P 1500 firms are more visible (with larger market capitalization and better firm performance) than the average Compustat firm, their selected peers are likely larger with better firm performance than an

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[21] Some of our sample firms select foreign firms in forming the RPE peer group. We do not include foreign firms listed on Compustat because Compustat only includes foreign firms cross-listed in the U.S. and thus does not represent an unbiased population for foreign firms.

average Compustat firm as well. It is therefore not surprising to observe that selected RPE peers perform better than the rest of the Compustat universe. Indeed, we find that selected peer firms have larger sales (*PeerSales_IndSales*) and larger market capitalization (*PeerMVE_IndMVE*) than unselected potential peers, which potentially confounds the univariate comparison of firm performance across selected and unselected peers. By construction, the results are qualitatively similar when we compare potential peer firms' performance and size with those of RPE firms.

Furthermore, we examine the similarity in industry membership (*Same_SIC2* and *Same_SIC3*), S&P 1500 membership (*SP1500*), and S&P sub-index (S&P 500, S&P Mid-Cap 400, and S&P Small-Cap 600) membership (*Same_SP*), as well as comovement in firm performance between potential peer firms and the RPE firm of interest (*Corr(PeerROA, RPEROA)* and *Corr(PeerReturn, RPEReturn)*). As also shown in Table 4, selected peer firms are more likely to operate in the same industry (either two-digit or three-digit SIC industry) as the RPE firms, and are more likely to belong to the S&P 1500 index and the same S&P sub-index. Furthermore, performance comovement between the potential peers and the RPE firms is much higher for selected peer firms than for unselected peer firms, further supporting the idea that selected peer firms experience similar economic shocks as the RPE firms.

Multivariate Regression Results

To further examine the selection choice of RPE peers, we estimate the following logistic regression for RPE firms that use self-selected peer groups,[22] with standard errors clustered by two-digit SIC industry:

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[22] We do not examine the peer selection choice of RPE firms using published market or industry indices for two reasons. First, RPE firms presumably have no flexibility in manipulating the composition of published market or industry indices. Second, the test is practically infeasible to implement due to difficulty in gathering the performance and composition information for a population of indices.

Prob($RPE\_Peer_{ijt} = 1$)
$= \Phi(\alpha_0 + \alpha_1 PeerReturn\_IndReturn_{ijt-1} (PeerReturn\_RPEReturn_{ijt-1})$
$+ \alpha_2 PeerSales\_IndSales_{ijt-1} (PeerSales\_RPESales_{ijt-1})$
$+ \alpha_3 PeerMVE\_IndMVE_{ijt-1} (PeerMVE\_RPEMVE_{ijt-1})$
$+ \alpha_4 Same\_SIC2_{ijt-1} + \alpha_5 Same\_SIC3_{ijt-1} + \alpha_6 SP1500_{ij} + \alpha_7 Same\_SP_{ijt-1}$
$+ \alpha_8 Corr(PeerROA, RPEROA)\_Pos_{ijt-1} + \alpha_9 Corr(PeerROA, RPEROA)\_Neg_{ijt-1}$
$+ \alpha_{10} Corr(PeerReturn, RPEReturn)\_Pos_{ijt-1} + \alpha_{11} Corr(PeerReturn, RPEReturn)\_Neg_{ijt-1} + \varepsilon_{ijt})$

(2)

The dependent variable, RPE_Peer_{ijt}, is an indicator variable that equals one if the potential peer firm j (i.e., one Compustat domestic firm) is chosen to be a member of the RPE peer group by RPE firm i for year t, and zero otherwise. The independent variables include potential peers' stock performance and size (measured as sales and market capitalization) relative to the RPE firm's two-digit SIC industry median or to the RPE firm of interest over the prior year.[23] Within each RPE firm's potential peer group (i.e., Compustat domestic firms), we rank the relative performance and size among potential peer firms. We then use percentile ranks of the relative performance and size in the estimation to reduce undue influences from extreme observations and to better mimic the peer selection process by focusing on relative ranks of potential peers within each RPE firm. In addition, we include indicator variables to identify cases in which potential peers are included in the same industry, S&P 1500 index, and S&P sub-index as the RPE firm of interest as well as comovement in firm performance with the RPE firm.

Recall that more than two-thirds (69.07 percent) of RPE firms use stock returns as their performance metric when implementing RPE plans (Table 1 Panel D). These firms are most likely to use stock returns as the basis to select peer firms. To more accurately capture firms'

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[23] Firms usually select their compensation peer groups (for both benchmarking and RPE purposes) at the beginning of the fiscal year (Cadman et al. 2009b; Faulkender and Yang 2008).

peer selection decision, we limit our sample to the 139 RPE firms that employ stock returns as the RPE performance metric in estimating equation (2).[24]

Table 5 reports regression results of estimating equation (2). We require at least 10 firms (excluding the RPE firm of interest) in each industry when benchmarking peer performance against industry median performance, which slightly reduces the sample size. As the table shows, potential peers with lower stock returns, relative to the RPE firms' industry or to the RPE firms themselves, are more likely to be chosen as RPE peers. This stands in contrast to the univariate result reported in Table 4, which is likely confounded by the fact that selected RPE peers (among S&P 1500 firms) are likely more visible with better performance than the rest of the Compustat universe. This evidence suggests a selection bias in RPE peer choice, possibly to overstate a firm's relative performance and in turn justify excessive pay to executives.

Moreover, we find that firms with larger sales and larger market value than RPE firms are more likely to be chosen as RPE peers (the evidence is weak for market value). These findings are consistent with prior research on symbolism in CEO pay—the board is likely to choose RPE peers that are visible and well established to ease the justification of their choices to external constituencies (Westphal and Zajac 1994; Zajac and Westphal 1995).

Consistent with the efficient contracting hypothesis, firms belonging to the same industry (either two-digit or three-digit SIC industry) as the RPE firm and firms with more positive comovement in return-on-assets and stock returns with the RPE firms are more likely chosen as RPE peers. Interestingly, a larger but negative comovement in return-on-assets reduces the chance of being selected as a RPE peer, suggesting that RPE firms tend to avoid selecting rivals or direct competitors (whose earnings performance negatively covaries with the RPE firm) as

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[24] We do not implement similar tests on RPE firms using accounting performance metrics in RPE plans because the heterogeneity in accounting performance metrics used for RPE purposes does not allow a sufficiently large sample size to examine any individual accounting performance metric.

RPE peers. Finally, the likelihood of being selected as a RPE peer is greater when the potential peer firm is included in the S&P 1500 index and from the same S&P sub-index as the RPE firm.

In untabulated results, we estimate equation (2) separately for RPE firms with stock returns ranked above and below the median stock returns for their two-digit SIC industries. We find that the negative coefficient on RPE peers' relative stock performance is highly significant (marginally significant) for RPE firms that underperform (outperform) their industries. In addition, the significant influence of performance comovement over peer selection choice is mainly driven by outperforming RPE firms, while for underperforming RPE firms, performance comovement does not significantly affect the peer selection choice. These untabulated findings support the notion that poorly performing CEOs have stronger incentives to select poorly performing peers to avoid being penalized for poor performance, despite the fact that these peers have limited ability to screen out common risk and are less suitable for RPE purposes.

Overall, the prediction models as specified in equation (2) explain more than 30 percent of the variation in RPE peer selection choice. In untabulated results, we find that industry membership and S&P index membership together explain close to 30 percent of the variation in RPE peer choice. Relative stock performance, firm size, and performance comovement all play a marginal role, together explaining less than 4 percent of the variation in RPE peer choice. Nevertheless, the limited explanatory power of relative stock performance does not preclude opportunistic peer selection bias from influencing CEO pay if the magnitude of the selection bias is sufficiently severe.

Taken together, our analysis strongly supports the efficient contracting view that RPE firms take into consideration the exposure to common shocks when selecting peers for RPE purposes. At the same time, our evidence also indicates the existence of a selection bias in

forming RPE peer groups. While a firm's ability to remove common risk significantly influences its chance of being selected as a RPE peer, we find that RPE firms are more likely to select a poorly performing firm as a peer.

VI. ROLE OF RPE USE AND RPE PEERS' RELATIVE PERFORMANCE ON CEO PAY

While shareholders generally view RPE favorably in the executive pay setting process, the implementation of RPE potentially involves managerial discretion. The analysis in the previous section reveals that RPE firms consider similarity in business operation and performance comovement when selecting RPE peers, but at the same time select poorly performing firms for RPE purposes. It thus remains an open question whether the use of RPE ultimately lowers the level of executive pay due to reduced risk exposure of executives or inflates executive pay due to opportunistic implementation of RPE in compensation contracts (such as selecting underperforming firms as RPE peers to inflate peer-adjusted firm performance). To address this issue empirically, we first examine CEO compensation across RPE firms and non-RPE firms, after controlling for economic and governance-related factors that may influence executive pay and RPE use. We then link CEO compensation with RPE peers' relative performance to investigate whether greater biases in selecting RPE peers translate into greater CEO compensation.

CEO Pay Across RPE Firms and Non-RPE Firms

Table 6 reports CEO compensation across RPE firms and non-RPE firms. As the table shows, the average CEO in RPE firms receives total compensation of $7,540,150, while the average CEO in non-RPE firms receives significantly lower total compensation of $5,263,180.

Turning to individual components of CEO total compensation, the average CEO in RPE firms receives significantly higher base salary, annual bonus, equity-based compensation (including both restricted stocks and stock options), and long-term incentive payouts than the average CEO in non-RPE firms.

To account for economic and governance-related factors that may influence both executive pay and RPE use, we estimate the following multivariate regression for our sample firms, with standard errors adjusted for heteroskedasticity (firm subscripts are omitted for brevity):

$$TotalComp_t$$
$$= \alpha_0 + \alpha_1 RPE_t + \alpha_2 ROA_t + \alpha_3 Return_t + \alpha_4 Sales_t + \alpha_5 BM_t + \alpha_6 \sigma(ROA) + \alpha_7 \sigma(Return)$$
$$+ \alpha_8 TotalComp\_COMPPeer_{t-1} + \alpha_9 Top5\_Instown_t + \alpha_{10} Activist\_Instown_t + \alpha_{11} CEO/Chair_t$$
$$+ \alpha_{12} Board\_Independence_t + \alpha_{13} Board\_Size_t + \varepsilon_t \qquad (3)$$

The dependent variable, *TotalComp*, is CEO total compensation, measured as the sum of annual salary and bonus compensation, the fair value of stock option awards and restricted stock awards, the change in deferred compensation, non-equity incentive plan compensation, and other compensation in thousands of dollars (i.e., TDC1 from ExecuComp).[25] To mitigate skewness in CEO total compensation, we follow prior studies and use its natural logarithm in the estimation (e.g., Murphy 1999). We also examine the salary component and the incentive compensation component (including bonus, equity-based compensation, and long-term incentive compensation) separately in subsequent analysis.

Our variable of interest is RPE use in CEO compensation contracts (*RPE*), measured as an indicator variable that equals one for RPE firms, and zero for non-RPE firms. The other

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[25] For firms using performance-vested equity grants that do not fully vest, the grant value of stock options and restricted stocks included in the ExecuComp's TDC1 variable could be overstated (Ferri 2009). The use of performance-vested equity grants, however, is not widespread among U.S. firms (Gerakos et al. 2007). Gerakos et al. (2007) also provide evidence that most firms adopting performance-vested equity grants link vesting conditions to *absolute* performance target as opposed to peer performance target. To the extent that the use of performance-vested equity grants are more prevalent among non-RPE firms, this measurement error in TDC1 will bias against finding results supporting rent seeking explanation.

independent variables include firm-specific economic determinants of executive pay as suggested by Core et al. (1999). Recent evidence suggests that executive pay for compensation benchmarking peers represents a significant determinant of executive compensation beyond conventional economic determinants of executive pay (e.g., Bizjak et al. 2008; Faulkender and Yang 2008), and thus we also include the median CEO total compensation for the compensation benchmarking peer group (*TotalComp_COMPPeer*). Following Bizjak et al. (2008), we define the compensation benchmarking peer group as firms that operate in the same two-digit SIC industry and that have similar sales over the prior year as the firm of interest. We also include corporate governance attributes in equation (3) since shareholder activism and board monitoring potentially influence both executive pay and RPE use (Core et al. 1999; Bertrand and Mullainathan 2001).

Table 7 Panel A reports regression results of estimating equation (3). As shown, the coefficient on *RPE* is significantly positive (coefficient = 0.124, p-value = 0.076), consistent with the rent seeking view of RPE use that CEOs in RPE firms receive higher total compensation beyond the level predicted by firm-specific economic determinants, compensation benchmarking peers' executive pay, and corporate governance attributes.[26] We further distinguish RPE use for cash compensation (*RPE_CashComp*) versus equity-based compensation (*RPE_EqtyComp*). We find strong evidence that firms using RPE in setting equity-based compensation offer greater

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[26] A potential concern is that the choice to use RPE in compensation plans may be endogenously related to the level of compensation. We are unable to use an instrumental variables (IV) two-stage least squares approach because all the economic determinants of RPE use in equation (1) are also correlated with CEO pay, suggesting that all potential instruments are correlated with the error term in the structural model. Thus, instrumental variable estimates are likely to be more biased and hence are more likely to provide incorrect statistical inference than simple OLS estimates (Larcker and Rusticus 2007). Further, because the endogeneity in our tests is the correlated omitted variables type of endogeneity, we can include a set of determinants of the endogenous regressor (*RPE*) in our regression, mitigating the inconsistency caused by correlated omitted variables (assuming, of course, that we still do not have a correlated omitted variable). However, in the interest of completeness, we estimate a two-stage least squares IV model using the variables included in equation (1) as instruments for RPE use. In this estimation, the inferences regarding the significantly positive relation between CEO total pay and RPE use are unchanged.

CEO total compensation than non-RPE firms (coefficient = 0.171, p-value = 0.006).[27] In contrast, firms using RPE in setting cash compensation provide similar CEO total compensation as non-RPE firms (coefficient = 0.046, p-value = 0.718). Although this last finding does not support the rent seeking view of RPE use, it still contradicts the efficient contracting hypothesis, which posits that the use of RPE lowers the level of CEO total pay due to reduced risk exposure.

As mentioned earlier, RPE firms may choose published market or industry indices as the RPE peer group. Managers presumably have no flexibility in manipulating the composition of published indices, which substantially limits the extent of excess pay through deflating peer group performance. We thus conjecture that the difference in CEO total compensation between RPE firms and non-RPE firms is more pronounced for RPE firms using self-selected peer groups (*RPE_SelfPeer*) as opposed to RPE firms using market or industry indices (*RPE_IndexPeer*). Our findings confirm this conjecture. As reported in Table 7 Panel A, RPE firms using self-selected peer groups provide greater CEO total compensation than non-RPE firms (coefficient = 0.127, p-value = 0.065), while CEO total compensation is similar between RPE firms using published indices and non-RPE firms (coefficient = 0.092, p-value = 0.543).

The results reported in Table 6 indicate that RPE firms are larger than non-RPE firms, raising concerns that the RPE indicator variable may reflect a firm size effect in spite of our control for sales in equation (3). To address this concern, we estimate equation (3) by replacing total compensation with base salary or incentive compensation (including annual bonus, equity-based compensation, and long-term incentive plan) as the dependent variable. Since salary is highly correlated with firm size (Murphy 1999), but is a pay component for which RPE is rarely used, an insignificant coefficient on the RPE indicator variable in the salary regression would

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[27] Higher CEO total pay in RPE firms is unlikely to be driven by higher compensation risk resulting from tougher RPE vesting conditions as documented by Carter et al. (2009) because unlike U.K. firms, performance vested equity grants are not common and linking relative performance to vesting is rare among U.S. firms.

help us rule out the possibility that our previous results are driven by a positive correlation between RPE use and firm size. In Table 7 Panel B, we report that CEO salary is similar across RPE firms and non-RPE firms, refuting firm size as the driver of our findings. The significant difference in CEO total compensation between RPE firms and non-RPE firms is primarily attributable to incentive compensation.

CEO Pay and Opportunistic Selection of RPE Peers

In this subsection we further examine the relation between CEO pay and RPE peers' relative performance to gain a better understanding of the source of excess pay received by RPE firms' CEOs. More specifically, we examine whether greater selection bias in forming RPE peer groups (i.e., deliberately choosing underperforming firms as RPE peers) leads to a higher level of excess compensation. To measure the degree of selection bias, we use the median performance for the RPE firms' two-digit SIC industry as an objective benchmark for evaluating firms' relative performance (e.g., Lewellen et al. 1996; Porac et al. 1999). We then separate the difference in performance between RPE firms' self-selected peers (median) and RPE firms (*PeerReturn_RPEReturn*) into two components. The first component captures the opportunistic use of RPE, computed as the difference in performance between RPE firms' self-selected peers (median) and RPE firms' industry (*PeerReturn_IndReturn*). The second component measures the efficient use of RPE, computed as the difference in performance between RPE firms' industry and RPE firms (*IndReturn_RPEReturn*). To the extent that opportunistic (efficient) implementation of RPE leads to excess (appropriate) executive compensation, we expect that the opportunistic (efficient) component of RPE peers' relative performance is negatively associated with CEO total pay.

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To test the above conjecture, we modify equation (3) above to estimate the following two equations, with standard errors adjusted for heteroskedasticity (firm subscripts are omitted for brevity):

$TotalComp_t$
$= \alpha_0 + \alpha_1 PeerReturn\_RPEReturn_t$
$+ \alpha_2 PeerROA\_RPEROA_t + \alpha_3 ROA_t + \alpha_4 Return_t + \alpha_5 Sales_t + \alpha_6 BM_t + \alpha_7 \sigma(ROA) + \alpha_8 \sigma(Return)$
$+ \alpha_9 TotalComp\_COMPPeer_{t-1} + \alpha_{10} Top5\_Instown_t + \alpha_{11} Activist\_Instown_t + \alpha_{12} CEO/Chair_t$
$+ \alpha_{13} Board\_Independence_t + \alpha_{14} Board\_Size_t + \varepsilon_t$ (4a)

$TotalComp_t$
$= \alpha_0 + \alpha_{11} PeerReturn\_IndReturn_t + \alpha_{12} IndReturn\_RPEReturn_t$
$+ \alpha_2 PeerROA\_RPEROA_t + \alpha_3 ROA_t + \alpha_4 Return_t + \alpha_5 Sales_t + \alpha_6 BM_t + \alpha_7 \sigma(ROA) + \alpha_8 \sigma(Return)$
$+ \alpha_9 TotalComp\_COMPPeer_{t-1} + \alpha_{10} Top5\_Instown_t + \alpha_{11} Activist\_Instown_t + \alpha_{12} CEO/Chair_t$
$+ \alpha_{13} Board\_Independence_t + \alpha_{14} Board\_Size_t + \varepsilon_t$ (4b)

In equation (4a), our variable of interest is *PeerReturn_RPEReturn,* for which we expect a negative coefficient if RPE is indeed utilized in setting executive pay for RPE firms. In equation (4b), our variables of interests are *PeerReturn_IndReturn* and *IndReturn_RPEReturn.* Suppose firms opportunistically (efficiently) choose RPE peers in setting CEO total pay, then we expect a negative coefficient on *PeerReturn_IndReturn* (*IndReturn_RPEReturn*). Given our sample firms may also use accounting performance metrics for RPE purposes, we also include peers' relative operating performance to control for its possible effect on CEO pay (*PeerROA_RPEROA*). Due to the heterogeneity in accounting performance metrics used in RPE plans, we limit attention to firms that use stock returns as their RPE performance metric to obtain a sufficiently large sample size and to more accurately capture the implementation details of RPE plans.

Table 8 Panel A reports descriptive statistics for the differences in performance between RPE firms, RPE firms' two-digit SIC industry, and RPE firms' self-selected peers. We find that

both RPE peers and RPE firms perform better than RPE firms' industry, and RPE peers also outperform RPE firms in general.[28]

Table 8 Panel B reports regression results for estimating equations (4a) and (4b). We find that the coefficient on *PeerReturn_RPEReturn* is significantly negative (coefficient = -0.944, p-value = 0.009). This finding suggests that RPE firms having higher stock returns (relative to the median stock returns of RPE peer groups) tend to provide greater CEO total compensation, which confirms the use of RPE. Given RPE firms may set alternative relative performance ranking (such as 25 percent or 75 percent) as the performance target, we also use the lower quartile or the upper quartile of stock returns for the peer groups to measure *PeerReturn_RPEReturn* and obtain qualitatively similar results. The negative coefficient on *PeerReturn_RPEReturn*, however, is subject to two alternative explanations. First, it is consistent with the opportunistic selection of RPE peers resulting in excess CEO compensation (i.e., opportunistic use of RPE). Second, peer underperformance may indicate that RPE firms' CEOs have superior managerial skills, in which case this finding captures pay for CEO skill (i.e., efficient use of RPE).

Regression results for equation (4b) seek to distinguish the efficient use of RPE from the opportunistic selection of RPE peers in setting CEO total compensation. As reported in Table 8 Panel B, the coefficient on *PeerReturn_IndReturn* is significantly negative (coefficient = -1.506, p-value = 0.052), which supports the idea that RPE firms opportunistically select underperforming firms to overstate peer-adjusted firm performance and in turn collect greater excess pay. In contrast, the coefficient on *IndReturn_RPEReturn* is negative but insignificant

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[28] It should be noted that this result does not indicate the absence of opportunistic RPE peer selection. First, since peers are selected ex ante (at the year beginning), an ex post comparison of peer returns with RPE firm returns could be misleading. Second, a univariate comparison of firm performance does not shed light on opportunistic peer selection since the peer selection process reflects multiple considerations ranging from industry to size constraint.

(coefficient = -0.729, p-value = 0.191). This evidence does not strongly support the efficient use of RPE, but the small sample size likely weakens the power of our tests.[29]

VII. CONCLUSION

We examine the use of RPE and related peer groups based on disclosures collected from S&P 1500 firms' first proxies filed under the SEC's new disclosure rules on executive compensation. Our findings suggest that firms consider both the costs and benefits of using RPE as an incentive mechanism. Analysis of firms' self-selected RPE peers lends strong support for the efficient use of RPE as well as a selection bias in forming RPE peer groups. Our evidence on the opportunistic choice of RPE peers suggests that RPE may be used as an alternative way to inflate executive pay, in addition to the opportunistic selection of compensation benchmarking peers as documented by Faulkender and Yang (2008).

We further document that CEOs in RPE firms receive a higher level of total compensation after controlling for a comprehensive set of economic and governance-related determinants of executive pay. The fact that CEO pay is greater for RPE firms refutes a theoretically claimed benefit of RPE, namely, that RPE makes it less costly to compensate risk-averse managers due to reduced risk exposure. Moreover, our evidence suggests that one mechanism by which firms opportunistically use RPE to inflate executive pay is through biased selection of RPE peers.

Our study contributes to the executive compensation literature by providing the first large

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[29] As discussed in footnote 17, the composition of RPE peer groups is fairly stable over time. The stability of RPE peer group may facilitate a manager's actions to negatively affect peer firms' performance (Gibbons and Murphy 1990). A RPE firm's ability to negatively affect its peer group's performance will be greater when there are fewer firms in the peer group, when the RPE firm operates in more concentrated industry, and when the RPE firm is of larger size than its RPE peers. However, we do not observe that the coefficient on *PeerReturn_IndReturn* is more negative under the above three conditions (untabulated). Hence, the association between higher CEO pay and underperformance of RPE peers is unlikely due to RPE firms negatively affecting their peers' performance.

sample U.S. evidence based on an explicit approach to testing firms' use of RPE in executive compensation contracts. We also shed light on the RPE peer selection process, and provide evidence suggesting that RPE implementation potentially involves opportunistic managerial behavior. Our study thus answers recent calls for research using public disclosures on RPE peer selection, and adds to the growing literature examining the role and composition of peer groups in setting executive compensation.

A potential caveat of our study is that we are unable to identify firms that use RPE implicitly without adopting a formal explicit RPE plan (e.g., subjective discretion by the board). Future research could examine both explicit and implicit contracting to better capture RPE as an incentive mechanism.

REFERENCES

Aggarwal, R., and A. Samwick.. 1999. Executive compensation, strategic competition and relative performance evaluation: theory and evidence. *Journal of Finance* 54: 1999-2043.

Albuquerque, A. 2007a. Who are your peers? A study of relative performance evaluation. Working paper, Boston University.

_____, 2007b. Do growth option firms use less relative performance evaluation? Working paper, Boston University.

_____, G. De Franco, and R. Verdi. 2009. Peer choice in CEO compensation. Working paper, Boston University.

Antle, R., and A. Smith. 1986. An empirical investigation of the relative performance evaluation of corporate executives. *Journal of Accounting Research* 24: 1-39.

Baiman, S. and J. Demski. 1980. Economically optimal performance evaluation and control systems. *Journal of Accounting Research* 18: 184-220.

Bannister, J. and H. Newman. 2003. Analysis of corporate disclosures on relative performance evaluation. *Accounting Horizons* 17: 235-246.

Barro, J., and R. Barro. 1990. Pay, performance, and turnover of bank CEOs. *Journal of Labor Economics* 8: 448–481.

Bebchuk, L., and J. Fried. 2003. Executive compensation as an agency problem. *Journal of Economic Perspectives* 17: 71-92.

Bertrand, M., and S. Mullainathan. 2001. Are CEOs rewarded for luck? The ones without principals are. *Quarterly Journal of Economics* 116: 901-932.

Bizjak, J., M. Lemmon, and L. Naveen. 2008. Does the use of peer groups contribute to higher pay and less efficient compensation? *Journal of Financial Economics* forthcoming.

Byrd, J., M. Johnson, and S. Porter. 1998. Discretion in financial reporting: the voluntary disclosure of compensation peer groups in proxy statement performance graphs. *Contemporary Accounting Research* 15: 25-52.

Cadman, B., M. Carter., and S. Hillegeist. 2009a. The role and effect of compensation consultants on CEO pay. Working paper, University of Utah.

_____, M. Carter, and K. Semida. 2009b. Compensation peer groups and their relation with CEO compensation. Working paper, University of Utah.

Carter, M., C. Ittner, and S. Zechman. 2009. Explicit relative performance evaluation in performance-vested equity grants. *Review of Accounting studies* forthcoming.

Cheng, S., and X. Xu. 2006. The role of peer performance in managerial compensation surrounding the 1996 telecommunications act. *Journal of Accounting and Public Policy* 25: 596-608.

Core, J., R. Holthausen, and D. Larcker. 1999. Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics* 51: 371-406.

Cremers, K., and V. Nair. 2005. Governance mechanism and equity prices. *Journal of Finance* 60: 2859-2894.

DeFond, M., and C. Park. 1999. The effect of competition on CEO turnover. *Journal of Accounting and Economics* 27: 35-56.

Dikolli, S., C. Hofmann, and T. Pfeiffer. 2008. Efficient benchmarking. Working paper, Duke University.

Faulkender, M., and J. Yang. 2008. Inside the black box: the role and composition of compensation peer groups. Working paper, University of Maryland.

Ferri, F. 2009. Discussion of "Explicit relative performance evaluation in performance-vested equity grants". *Review of Accounting studies* forthcoming.

Garvey, G. and T. Milbourn. 2003. Incentive compensation when executives can hedge the market: evidence of relative performance evaluation in the cross section. *Journal of Finance* 58: 1557-1581.

_____, and T. Milbourn. 2006. Asymmetric benchmarking in compensation: executives are rewarded for good luck but not penalized for bad. *Journal of Financial Economics* 82: 197-226.

Gerakos, J., C. Ittner, and D. Larcker. 2007. The structure of performance-vested stock option grants. In R. Antle, p. Liang, & F. Gjesdahl (Eds.), *Essays on accounting theory in honor of Joel S. Demski*: Springer.

Gibbons, R., and K. Murphy. 1990. Relative performance evaluation for chief executive officers. *Industrial and Labor Relations Review* 43: 30-51.

Gox, R., and U. Heller., 2008. The dual role of peer groups in executive pay: relative performance evaluation versus benchmarking. Working paper, University of Fribourg.

Himmelberg, C., and R. Hubbard. 2000. Incentive pay and market for CEOs: An analysis of pay-for-performance sensitivity. Working paper, Columbia University.

Holmstrom, B., 1979. Moral hazard and observability. *Bell Journal of Economics* 10: 74-91.

_____, 1982. Moral hazard in teams. *Bell Journal of Economics* 13: 324–340.

Janakiraman, S., R. Lambert, and D. Larcker. 1992. An empirical investigation of the relative performance evaluation hypothesis. *Journal of Accounting Research* 30: 53–69.

Jenter, D., and F. Kanaan. 2008. CEO turnover and relative performance evaluation. Working paper, Stanford University.

Joh, S., 1999. Strategic managerial incentive compensation in Japan: relative performance evaluation and product market collusion. *Review of Economics and Statistics* 81: 303-313.

Lambert, R. 2001. Contracting theory and accounting. *Journal of Accounting and Economics* 32: 3-87.

Larcker, D., and T. Rusticus. 2007. Endogeneity and empirical accounting research. *European Accounting Review* 16: 207-215.

Leone, A. and S. Rock. 2002. Empirical tests of budget ratcheting and its effect on managers' discretionary accrual choice. *Journal of Accounting and Economics* 33: 43-68.

Lewellen, W., T. Park, and B. Ro. 1996. Self-serving behavior in managers' discretionary information disclosure decisions. *Journal of Accounting and Economics* 21: 227-251.

Matsumura, E.M. and J.Y. Shin. 2006. An empirical analysis of an incentive plan with relative performance measures: Evidence from a postal service. *The Accounting Review* 81: 533-566.

Murphy, K., 1999. Executive compensation. In: Ashenfleter, O., Card, D., (Eds.). *Handbook of Labor Economics*, Vol. 3. North-Holland, Amsterdam.

_____, 2001. Performance standards in incentive contracts. *Journal of Accounting and Economics* 30: 245-278.

Porac, J., J. Wade and T. Pollock. 1999. Industry categories and the politics of the comparable firm in CEO compensation. *Administrative Science Quarterly* 44: 112-144.

Prendergast, C., 1999. The provision of incentives in firms. *Journal of Economic Literature* 37: 7-63.

Rajgopal, S., T. Shevlin, and V. Zamora. 2006. CEO's outside employment opportunities and the lack of relative performance evaluations in compensation contracts. *Journal of Finance* 61: 1813-1844.

Westphal, J. and E. Zajac. 1994. Substance and symbolism in CEO's long-term incentives plans. *Administrative Science Quarterly* 39: 267-390.

Zajac, E., and J. Westphal. 1995. Accounting for the explanations of CEO compensation: substance and symbolism. *Administrative Science Quarterly* 40: 283-308.

Examples of Disclosures about Relative Performance Evaluation (RPE)

The comments below are excerpts from the "Compensation Discussion and Analysis" (CD&A) from proxy statements filed after December 16, 2006 for four companies. Discussions about RPE use are bolded.

General Electric Co.

Performance share units (PSUs). Since 2003, we have compensated the CEO with PSUs in lieu of any other equity incentive compensation because the MDCC and the CEO believe that the CEO's equity incentive compensation should be fully at risk and based on key performance measures that are aligned with investors. The receipt of shares underlying PSUs is determined entirely by the performance of the company against two key metrics: an internal metric that measures the cash-producing capability of the company and **an external metric that measures the performance of the company against a broad market index**.… PSUs will convert into shares of GE stock at the end of the five-year performance period only if the specified performance objectives have been achieved. Half of the PSUs will convert into shares of GE stock only if GE's cash flow from operating activities, adjusted to exclude the effect of unusual events, has grown an average of 10% or more per year over the five-year performance period. Otherwise, they will be cancelled. **The remaining PSUs will convert into shares of GE stock only if GE's total shareowner return meets or exceeds that of the S&P 500 over the five-year performance period. Otherwise, they will be cancelled.**

PG&E Corp.

In establishing levels of executive compensation, each year the Committee reviews the appropriateness of the comparator groups used to assess the competitiveness of PG&E corporation's compensation programs (Pay Comparator Group) and PG&E Corporation's corporate performance (**Performance Comparator Group**), and approves the objectives, general framework, and elements of officer compensation for the following year.… The primary comparator group used for purposes of setting 2006 officer compensation consists of all companies listed in the Dow Jones Utility Index and the Standard & Poor's Electrics Index, and all California investor-owned utilities (the "Pay Comparator Group"): AES Corporation, Allegheny Energy, Inc., Ameren Corporation, American Electric Power Company, Inc., CenterPoint Energy, Inc., Cinergy Corp., Consolidated Edison, Inc., DTE Energy Company, Dominion Resources, Inc., Duke Energy Group, Edison International, Entergy Corporation, Exelon Corporation, First Energy Corp., FPL Group, Inc., NiSource Inc., PPL Corporation, Pinnacle West Capital Corporation, Progress Energy, Inc., Public Service Enterprise Group, Sempra Energy, Southern Company, TECO Energy, Inc., TXU Corp., Williams Companies, and Xcel Energy Inc. This group of companies is broad enough to provide statistical validity and data availability, represents the segment of the market where PG&E Corporation and Pacific Gas and Electric Company recruit officers with industry-specific experience, and is determined on an objective and transparent basis. **For purposes of corporate performance comparisons (including the relative total shareholder return measured for the 2006-2008 performance share award cycle), the Committee uses a subgroup of 12 companies that have similar characteristics and business models as PG&E Corporation (the "Performance Comparator Group"): Ameren Corporation, American Electric Power, CenterPoint Energy, Inc., Consolidated Edison, Entergy Corporation, FPL Group, NiSource Inc., Pinnacle West Capital, Progress Energy, Inc., Southern Company, TECO Energy, and Xcel Energy. This group of companies is a subset of the Pay Comparator Group and, like PG&E Corporation, is focused on core regulated-utility activities with either a distribution or an integrated-utility focus.**

Performance shares.
The payment for performance shares will be in cash and will be calculated by multiplying (1) the number of vested performance shares, (2) the average closing price of PG&E Corporation common stock over the last 30 calendar days of the year preceding the vesting date, and (3) a payout factor based on corporate performance.… **There will be no payout for TSR ("total shareholder return") performance below the 25th percentile of the Performance Comparator Group; there will be a 25 percent payout if TSR is at the 25th percentile; there will be a 100 percent payout if TSR is at the 75th percentile; and there will be a 200 percent payout if PG&E Corporation's TSR ranks first in the Performance Comparator Group.** If PG&E Corporation's TSR is between the 25th percentile and the 75th percentile, or above the 75th percentile, award payouts will be determined by straight-line interpolation, adjusted to round numbers (i.e., the nearest multiple of five). The performance shares are

tied directly to PG&E Corporation's performance for shareholders and align officers' interests with those of shareholders.

Cleco Corp.

Our Compensation Committee uses two comparator groups to design executive officer compensation plans and track comparable performance of those plans. These groups are referred to as comparator group(s), peer group(s), peers or the competitive market throughout this discussion. The Base Peer Group was selected based on the companies being of approximate size and scope to Cleco (after regression analysis for size differences), employing similar labor and talent pools and having their executive officer compensation data being available to the outside independent consultant who analyzes the market data for the Compensation Committee. The Compensation Committee considers the availability of such detailed market data to be critical in making comparative compensation decisions. As such, compensation policy and program design decisions, as well as annual performance targets are established against the Base Peer Group. **The Incentive Peer Group was selected by the Compensation Committee in order to measure the actual performance results of our incentive plans. The Incentive Peer Group is based on the companies being part of a recognized stock market index, as well as being in the same general industry classification system. This helps ensure the Compensation Committee evaluates our actual incentive plan performance against a group of companies whose scope of operations and market capitalization is similar to Cleco's.** Data from the peer groups are an integral part of the decision process used by the Compensation Committee in determining the design, component parts and levels of awards contained in our executive officer pay programs.

Base Peer Group
For 2006 and 2007, executive officer compensation levels were evaluated using the Base Peer Group. This includes base salary, annual and long-term incentive plan targets, other potential equity awards and total compensation. The Base Peer Group consists of companies that are generally either in the Edison Electric Institute ("EEI") Index or the S&P Small and MidCap Electric Utilities Index. We are included in both indices. The Base Peer Group consisted of the following 17 companies: Alliant Energy Corporation; Ameren Corporation; Black Hills Corporation; CH Energy Group, Inc.; DPL, Inc.; Duquesne Light Holdings, Inc.; El Paso Electric Company; Entergy Corporation; Great Plains Energy Inc.; IDACORP, Inc.; NSTAR; Otter Tail Corporation; Pinnacle West Capital Corporation; PNM Resources, Inc.; PPL Corporation; SCANA Corporation;

Incentive Peer Group
For 2006, the relative actual performance of the financial measures used in our annual and long-term incentive plans was determined using the Incentive Peer Group. **The Incentive Peer Group consisted of the following 15 companies contained in the S&P Small and MidCap Electric Utilities Index: Allete, Inc.; Central Vermont Public Service; DPL, Inc.; Duquesne Light Holdings, Inc.; El Paso Electric Company; Great Plains Energy Inc.; Green Mountain Power Corporation; Hawaiian Electric Industries; IDACORP, Inc.; Northeast Utilities; Pepco Holdings, Inc.; Sierra Pacific Resources; UIL Holdings Corporation; UniSource Energy Corporation; and Westar Energy, Inc.** The same 15 companies will be used as the Incentive Peer Group in 2007.

Cimarex Energy Co.

Cash Incentive Awards. The cash awards are intended to provide incentive to achieve specific performance targets. Cash incentives are awarded from a performance-based cash pool. The target cash incentive pool is equal to 100% of base salaries. The actual performance-based cash incentive pool is calculated as described below and generally is based upon the relationship of our actual cash flow to a predetermined cash flow target, production growth, proved reserve growth and **relative stock price performance among peers**.
…
The actual cash incentive pool is determined as follows: **Determine the peer stock performance factor based on Cimarex's stock price performance relative to performance of our peer group. For purposes of determining peer group stock price performance, companies in the Dow Jones U.S. Exploration & Production Index with comparable revenue and market capitalization are used (See Table 5 below).** In 2006, our stock price increased by 0%, and our performance rank was in the bottom quartile, resulting in a 0% peer stock performance factor (See Table 6 below).

Table 5

Table 5
Stock Performance Factor Peer Group

Anadarko Petroleum Corporation	Meridian Resource Corp.
Apache Corporation	Newfield Exploration Company
Cabot Oil & Gas Corporation	Occidental Petroleum Corporation
Chesapeake Energy Corporation	Pioneer Natural Resources Co.
Devon Energy Corp.	Pogo Producing Company
EOG Resources Inc.	Stone Energy Corporation
Forest Oil Corp.	XTO Energy Inc.

Table 6
Peer Stock Performance Factor

Clmarex Quartile Rank	% of Peer Group Performance Factor Earned
1st	100
2nd	75
3rd	0
4th	0

Keithley Industrial Inc.

Long Term Compensation Program
The Committee awards a mix of options and performance units that reflects the executives' ability to impact the Company's execution of its long-term plans…. Performance units are expressed as a number of shares and are earned over a three-year period, **with payout dependent upon the Company's three-year sales growth in comparison to sales growth of a pre-defined group of peer companies over the same period**, which for 2007 included:

Aeroflex Inc.	Agilent Technologies, Inc.
Anritsu Corp.	Chroma ATE, Inc.
Lecroy Corp.	National Instruments Corp.
Tektronix, Inc.	Yokogawa Electric Corp.
Advantest Corp.	Credence Systems Corp.
Eagle Test Systems, Inc.	LTX Corp.
Nanometrics, Inc.	Photon Dynamics, Inc.
Rudolph Technologies, inc.	Teradyne, Inc.
Therma-Wave, Inc.	Verigy Ltd.
EXFO Electro Optical Engineering, Inc.	JDS Uniphase Corp.
Tollgrade Communications, Inc.	

These companies are public companies of all sizes, both domestic and international, included in the peer group because they are either direct competitors in the traditional test and measurement field or in the related automated testing equipment/semiconductor test or communications test fields. The related fields are included in the group to ensure the group is large enough to be significant. Some of the companies used in this group are not used in the peer group used for compensation purposes, either because their revenue size is significantly larger than the Company or because they are internationally based and no compensation proxy data is available. This group is reviewed annually and adjusted to reflect changes in the market including merger and acquisitions.

TABLE 1
Descriptive Statistics of Relative Performance Evaluation Use in Executive Compensation Plans
among S&P 1500 Firms

Panel A: Relative Performance Evaluation (RPE) Use

	Number of firms	Percent (%)
RPE firms	388	27.34
Non-RPE firms	1,031	72.66
Total	1,419	100

RPE (Non-RPE) firms include 388 (1,031) S&P 1500 firms listed in the Compustat annual file for 2006 that explicitly disclose (do not mention) the use of relative performance evaluation in executive compensation plans in their first annual proxies filed under the SEC's 2006 executive compensation disclosure rules. We are unable to find proxy statements for 81 S&P 1500 firms.

Panel B: Relative Performance Evaluation Use by Type of Compensation Plan

	Number of firms	Percent (%)
Equity-based compensation plan only		
Restricted stock	176	45.36
Stock option	5	1.29
Restricted stock and stock option	57	14.69
Subtotal	238	61.34
Cash compensation plan only	87	22.42
Equity-based and cash compensation plans	63	16.24
Total	388	100

"Equity-based plan only" category includes firms that use relative performance evaluation in setting equity-based compensation (such as restricted stock and stock option)**.** "Cash plan only" category includes firms that use relative performance evaluation in setting cash compensation (such as annual bonus and long-term incentive plan). "Equity and cash plans" category includes firms that use RPE in both equity-based and cash compensation plans.

Panel C: Performance Metrics Used in Relative Performance Evaluation

	Number of firms	Percent (%)
Price-based metrics	204	52.58
Accounting metrics	96	24.74
Price-based and accounting metrics	64	16.49
Others	24	6.19
Total	388	100

"Price-based metrics" category includes firms that use price-based performance metrics (such as stock returns and shareholder wealth) to implement relative performance evaluation in compensation plans. "Accounting metrics" category includes firms that use accounting performance metrics (such as return-on-equity, earnings per share, earnings growth, etc.) to implement relative performance evaluation in compensation plans. "Price-based and accounting metrics" category includes firms that use both price-based and accounting performance metrics to implement relative performance evaluation in compensation plans. "Others" category includes firms that use non-financial performance metrics (such as customer satisfaction and market share) to implement relative performance evaluation in compensation plans. See Panel D below for a more detailed breakdown of performance metrics.

Panel D: Commonly Used Price-based and Accounting Performance Metrics

	Number of firms	Percent (%)
Stock returns	268	69.07
Return-on-equity	56	14.43
Growth of earnings	49	12.63
Earnings per share	40	10.31
Net income	32	8.25
Growth of sales	26	6.70
Cash flow	18	4.64
Return-on-asset	14	3.61
Sales	10	2.58

The percentages sum to over 100 percent as some firms employ multiple performance metrics when applying relative performance evaluation in compensation plans.

Panel E: Peer Group Choice

	Number of firms	Percent (%)
Self-selected peers	224	57.73
Market/Industry index	138	35.57
Market/Industry index and Self-selected peers	26	6.70
Total	388	100

"Market/Industry index" category includes firms that chose published market/industry indices as the peer groups to implement relative performance evaluation in compensation plans. "Self-selected peers" category includes firms that chose individual firms as the peer groups to implement relative performance evaluation in compensation plans. 'Market/Industry index and Self-selected peers" includes firms that chose both published market/industry indices and individual firms as the peer groups to implement relative performance evaluation in compensation.

Panel F: Industry Similarity, S&P 1500 Identity, and Number of Peers in the Self-selected Peer Groups

	Mean	Standard Deviation	25%	Median	75%	N
Number of self-selected peers	14.665	8.523	9	13	18	248
Percent (%) of self-selected peers in the same industry (two-digit SIC) as the RPE firms	65.19	32.91	40.00	75.96	93.75	248
Percent (%) of self-selected peers in the S&P1500 index	70.31	22.32	58.33	75.00	86.36	248
Percent (%) of self-selected peers in the same S&P1500 sub-index as the RPE firms	45.13	27.51	23.43	41.67	68.99	248

There are 2 firms that mentioned the use of self-selected peers in implementing relative performance evaluation in executive compensation plans, but that did not disclose the composition of the RPE peer group.

TABLE 2
Mean (Median) of Variables Used to Predict the Use of Relative Performance Evaluation in Executive Compensation Plans among S&P 1500 Firms

	Non-RPE firms (N = 1,031)	RPE firms (N = 388)	Tests of differences
Firm Characteristics:			
Industry_Concentration	0.392	0.305	0.087***
	(0.331)	(0.257)	0.074***
BM	0.598	0.682	-0.083***
	(0.601)	(0.697)	-0.095***
Idosyncratic_Risk	-2.644	-2.951	0.308**
	(-2.640)	(-3.004)	0.364***
SIZE	7.765	8.481	-0.716***
	(7.620)	(8.351)	-0.731***
ROA_Indadj	0.012	0.007	0.005
	(0.000)	(0.000)	0.000
Return_Indadj	0.020	0.023	-0.003
	(-0.009)	(0.000)	-0.009
CEO Attributes:			
CEO_Wealth	9.963	10.063	0.100
	(10.091)	(10.164)	0.004
CEO_Age	55.884	56.044	-0.160
	(56.000)	(56.000)	0.000
Corporate Governance:			
Top5_Instown	0.389	0.379	0.010
	(0.369)	(0.356)	0.013
Activist_Instown	0.028	0.029	-0.001
	(0.028)	(0.029)	-0.001**
CEO/Chair	0.595	0.651	-0.056
	(1.000)	(1.000)	0.000
Board_Independence	0.817	0.852	-0.035***
	(0.857)	(0.889)	-0.032***
Board_Size	8.944	10.465	-1.522***
	(9.000)	(10.000)	-1.000***

***/**/* indicate significance at less than the 1%/5%/10% level based on two-tailed t-tests or z-tests of the mean or median differences. *Industry_Concentration* is the sum of the squares of the market shares of the firms' sales within each two-digit SIC industry. *BM* is book value of assets divided by the sum of the market value of equity and book value of liabilities. *Idosyncratic_Risk* is the natural logarithm of the standard deviation of regression residuals, where regression residuals are obtained from regressing the firm's stock returns on the value-weighted industry (same two-digit SIC code) stock returns over the prior 36 months. *Size* is the natural logarithm of the market value of equity. *ROA_Indadj* is return-on-assets minus the median return-on-assets for the same industry (two-digit SIC code). *Return_Indadj* is buy-and-hold annual stock returns minus the median buy-and-hold annual stock returns for the same industry (two-digit SIC code). *CEO_Wealth* is the natural logarithm of the value of equity (including both stocks and stock options) held by the CEO. *CEO_Age* is the age of the CEO. *Top5_Instown* is the stock ownership by the top 5 institutions as a percentage of total institutional ownership. *Activist_Instown* is the percentage of holdings by activist institutions as defined by Cremers and Nair (2005). *CEO/Chair* is equal to one if the CEO serves as Chairman of the Board, and zero otherwise. *Board_Independence* is the percentage of independent directors serving on the board. *Board_Size* is the number of directors serving on the board. Variables are measured over or at the end of fiscal year 2005 (2006) if a firm's first proxy filed under the SEC's 2006 executive compensation disclosure rules is for fiscal year 2006 (2007). Firm characteristics and CEO attributes (except *Industry_Concentration* and *CEOAge*) are winsorized at the top and bottom one percentiles. Number of observations varies depending on data availability.

TABLE 3
Logistic Regression of Relative Performance Evaluation Use in Executive Compensation Plans
among S&P 1500 Firms

Independent Variables	Predicted Sign	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
Firm Characteristics:				
Industry_Concentration	+/−	-1.009***	-0.938***	-1.027***
		(0.001)	(0.002)	(0.002)
BM	+/−	1.778***	1.726***	1.536***
		(<.0001)	(<.0001)	(0.001)
Idosyncratic_Risk	−	-0.812***	-0.851***	-0.752***
		(0.000)	(<.0001)	(0.001)
Size	+/−	0.251***	0.335***	0.270***
		(0.000)	(<.0001)	(0.001)
ROA_Indadj	+/−	0.361	0.483	0.444
		(0.718)	(0.647)	(0.720)
Return_Indadj	+/−	0.567**	0.695**	0.591*
		(0.039)	(0.016)	(0.075)
CEO Attributes:				
CEO_Wealth	−		-0.131***	-0.105**
			(0.003)	(0.041)
CEO_Age	−		0.001	0.009
			(0.953)	(0.502)
Corporate Governance:				
Top5_Instown	+			-0.530
				(0.603)
Activist_Instown	+			10.552
				(0.347)
CEO/Chair	−			0.018
				(0.920)
Board_Independence	+			2.768***
				(0.008)
Board_Size	+/−			0.057
				(0.149)
Intercept		-6.054***	-5.557***	-8.275***
		(<.0001)	(<.0001)	(<.0001)
Number of RPE / Non-RPE firms		341 / 904	322 / 850	274 / 663
Percent concordant / discordant		71.6 /28.0	72.3 /27.4	74.4 /25.3
Pseudo R-square		0.165	0.177	0.207
Wald χ^2		129.129	128.963	118.128
(p-value)		(<.0001)	(<.0001)	(<.0001)

The dependent variable is *RPE*, which is equal to one if the firm explicitly reported RPE use in executive compensation plans in its first annual proxy filed under the SEC's 2006 executive compensation disclosure rules, and zero otherwise. See Table 2 for other variable definitions. Firm characteristics and CEO attributes (except *Industry_Concentration* and *CEOAge*) are winsorized at the top and bottom one percentiles. The sample includes S&P 1500 firms listed in the Compustat annual file for 2006 that have available information on relative performance evaluation use in executive compensation plans and available information on regression variables. Two-tailed p-values are in parentheses. ***/**/* indicate significance at less than the 1%/5%/10% level based on two-tailed Chi-square tests.

TABLE 4
Mean (Median) of Variables Used to Explain RPE Peer Selection Choice for S&P 1500 Firms Using Stock Returns as the Performance Metric and Self-selected Peers in Relative Performance Evaluation

	Unselected potential peers (N = 484,561)	Selected RPE peers (N = 1,547)	Tests of differences
PeerReturn_IndReturn	0.044	0.072	-0.028***
	(-0.006)	(0.028)	-0.034***
PeerSales_IndSales	2,123.020	8,254.910	-6,131.890***
	(27.221)	(2,285.160)	-2,257.939***
PeerMVE_IndMVE	3,200.190	13,800.050	-10,599.860***
	(56.855)	(3,792.900)	-3,736.045***
PeerReturn_RPEReturn	-0.025	0.017	-0.042***
	(-0.055)	(0.013)	-0.068***
PeerSales_RPESales	-6,724.730	1,306.800	-8,031.530***
	(-1,700.640)	(111.603)	-1,812.243***
PeerMVE_RPEMVE	-12,392.610	1,477.740	-13,870.350***
	(-2,774.520)	(40.875)	-2,815.395***
Same_SIC2	0.048	0.565	-0.517***
	(0)	(1)	-1***
Same_SIC3	0.022	0.441	-0.420***
	(0)	(0)	0
SP1500	0.333	0.811	-0.478***
	(0)	(1)	-1***
Same_SP	0.115	0.543	-0.428***
	(0)	(1)	-1
CORR(PeerROA,RPEROA)	0.198	0.379	-0.180***
	(0.266)	(0.510)	-0.244***
CORR(PeerReturn,RPEReturn)	0.004	0.168	-0.163***
	(0.008)	(0.257)	-0.248***

***/**/* indicate significance at less than the 1%/5%/10% level based on two-tailed t-tests or z-tests of the mean or median differences. Selected RPE peers include domestic firms that are chosen by a RPE firm as RPE peers. Unselected potential peers include all the other domestic firms that are not chosen by a RPE firm as RPE peers. *PeerReturn_IndReturn*, *PeerSales_IndSales,* and *PeerMVE_IndMVE* are the pair-wise differences between annual stock returns, sales, and market value of equity for the potential peer and median annual stock returns, sales, and market value of equity, respectively, for the RPE firm's industry (two-digit SIC code) excluding the RPE firm of interest (requires at least 10 firms other than the RPE firm in the industry). *PeerReturn_RPEReturn*, *PeerSales_RPESales,* and *PeerMVE_RPEMVE* are the pair-wise differences between annual stock returns, sales, and market value of equity for the potential peer and annual stock returns, sales, and market value of equity, respectively, for the RPE firm. *Same_SIC2* and *Same_SIC3* are equal to one if the RPE firm and the potential peer share the same two-digit and three-digit SIC code, respectively, and zero otherwise. *SP1500* is equal to one if the potential peer is in the S&P 1500 index, and zero otherwise. *Same_SP* is equal to one the potential peer is in the same S&P 1500 sub-index (S&P 500, S&P Mid-Cap 400, and S&P Small-Cap 600) as the RPE firm, and zero otherwise. *CORR(PeerROA,RPEROA)* is the Pearson correlation of return-on-assets between the RPE firm and the potential peer over the prior five years. *CORR(PeerReturn,RPEReturn)* is the Pearson correlation of annual stock returns between the RPE firm and the potential peer over the prior five years. Variables are measured over or at the end of fiscal year 2005 (2006) if a firm's first proxy filed under the SEC's 2006 executive compensation disclosure rules is for fiscal year of 2006 (2007). All non-dichotomous variables are winsorized at top and bottom one percentiles except *CORR(PeerROA,RPEROA)*and *CORR(PeerReturn,RPEReturn)*.

TABLE 5
Logistic Regression of Peer Firm Selection Choice for S&P1500 Firms Using Stock Returns as the Performance Metric and Self-selected Peers in Relative Performance Evaluation

Independent Variables	Predicted Sign	Coefficient (p-value)	Coefficient (p-value)
PeerReturn_IndReturn	−	-0.004***	
		(0.001)	
PeerSales_IndSales	+	0.037***	
		(<.0001)	
PeerMVE_IndMVE	+	0.005	
		(0.103)	
PeerReturn_RPEReturn	−		-0.004***
			(0.001)
PeerSales_RPESales	+		0.038***
			(<.0001)
PeerMVE_RPEMVE	+		0.004
			(0.147)
Same_SIC2	+	2.391***	2.418***
		(<.0001)	(<.0001)
Same_SIC3	+	1.864***	1.916***
		(<.0001)	(<.0001)
SP1500	+	0.754***	0.702***
		(<.0001)	(<.0001)
Same_SP	+	1.255***	1.281***
		(<.0001)	(<.0001)
CORR(PeerROA,RPEROA)_Pos	+	0.328***	0.356***
		(0.002)	(0.000)
CORR(PeerROA,RPEROA)_Neg	+/-	-0.330***	-0.342***
		(0.007)	(0.004)
CORR(PeerReturn,RPEReturn)_Pos	+	0.534***	0.528***
		(<.0001)	(<.0001)
CORR(PeerReturn,RPEReturn)_Neg	+/-	0.161	0.176
		(0.334)	(0.260)
Intercept		-10.242***	-10.273***
		(<.0001)	(<.0001)
Number of RPE / Unselected peers		1,446 / 449,928	1,547 / 484,561
Percent concordant / discordant		85.4 / 4.8	84.9 / 4.70
Pseudo R-square		0.335	0.338
Wald χ^2		5,757.477	6,288.303
(p-value)		(<.0001)	(<.0001)

The dependent variable is *RPE_Peer*, which is equal to one if the firm (one Compustat domestic firm) is chosen as a peer for relative compensation evaluation (RPE) purposes, and zero otherwise. *CORR(PeerROA,RPEROA)_Pos* and *CORR(PeerROA,RPEROA)_Neg* are the absolute values of *CORR(PeerROA,RPEROA)* if this correlation is positive and negative, respectively, and zero otherwise. *CORR(PeerReturn,RPEReturn)_Pos* and *CORR(PeerReturn,RPEReturn)_Neg* are the absolute values of *CORR(PeerReturn,RPEReturn)* if this correlation is positive and negative, respectively, and zero otherwise. We use percentile ranks of *PeerReturn_IndReturn*, *PeerSales_IndSales, PeerMVE_IndMVE*, *PeerReturn_RPEReturn*, *PeerSales_RPESales,* and *PeerMVE_RPEMVE* (ranked within each RPE firm) in the estimation. See Table 4 for the other variable definitions. All non-dichotomous variables are winsorized at the top and bottom one percentiles except *CORR(PeerROA,RPEROA)* and *CORR(PeerReturn,RPEReturn)*. The sample includes all Compustat domestic firms for the 139 RPE firms choosing

self-selected peer groups and using stock returns as the performance metric in relative performance evaluation. Two-tailed p-values in parentheses are based on clustered standard errors at the two-digit SIC industry level. ***/**/* indicate significance at less than the 1%/5%/10% level based on two-tailed Chi-square tests.

TABLE 6
Mean (Median) of Variables Used to Explain CEO Compensation Level among S&P 1500 Firms

	Non-RPE firms (N = 1,031)	RPE firms (N = 388)	Tests of differences
CEO Compensation:			
TotalComp	5,263.180	7,540.150	-2,276.970***
	(3,076.230)	(4,885.420)	-1,809.190***
Salary	736.687	866.292	-127.605***
	(701.008)	(851.000)	-149.992***
Bonus	334.435	520.642	-186.208***
	(0.000)	(0.000)	0.000
EqtyComp	2,431.980	3,606.520	-1,174.540***
	(1783.878)	(2,012.910)	-1,229.032***
LTIP	16.487	37.156	-20.669**
	(0.000)	(0.000)	0.000
Firm Characteristics			
ROA	0.071	0.063	0.008**
	(0.063)	(0.053)	0.010***
Return	0.122	0.146	-0.024
	(0.094)	(0.138)	-0.044**
Sales	5,171.760	11,054.810	-5,883.050***
	(1,546.360)	(3,585.570)	-2,039.210***
σ(ROA)	0.045	0.034	0.011***
	(0.025)	(0.018)	0.007**
σ(Return)	0.418	0.325	0.093***
	(0.329)	(0.266)	0.063***
TotalComp_COMPPeer	4,120.690	5,458.950	-1,338.260***
	(3,236.790)	(4,648.580)	-1,411.790***

***/**/* indicate significance at less than the 1%/5%/10% level based on two-tailed t-tests or z-tests of the mean or median differences. Variables reported in Table 2 are not repeated here. *TotalComp* is the sum of salary, bonus, fair value of stock option awards and restricted stock awards, change in deferred compensation, non-equity long-term incentive plan compensation, and other compensation in thousands of dollars (i.e., TDC1 as provide by ExecuComp). *Salary* is the annual salary in thousands of dollars. *Bonus* is the annual bonus payout in thousands of dollars. *EqtyComp* is the fair value of stock option awards and restricted stock awards in thousands of dollars. *LTIP* is the long-term incentive plan payout in thousands of dollars. *ROA* is return-on-asset for 2006. *Return* is buy-and-hold annual stock returns for 2006. *Sales* is the annual sales for 2006 in millions of dollars. *σ(ROA)* is the standard deviation of *ROA* over 2001-2005 (requiring at least three years with non-missing data). *σ(Return)* is the standard deviation of *Return* over 2001-2005 (requiring at least three years with non-missing data). *TotalComp_COMPPeer* is the median *TotalComp* for our sample firm's compensation peer group for 2005. Compensation peer group consists of firms in the same two-digit SIC industry as our sample firm and with the prior year's sales similar to our sample firm (refer to Bizjak et al. (2008) for details). All variable are winsorized at top and bottom one-percentiles except that *σ(ROA)* and *σ(Return)* are winsorized at the top one-percentile only. Number of observations varies depending on data availability. Number of observations varies depending on data availability.

TABLE 7
Ordinary Least Squares Regressions of CEO Compensation Level on An Indicator for the Use of Relative Performance Evaluation in Executive Compensation Plans among S&P 1500 Firms

Panel A: CEO Total Compensation as the Dependent Variable

Independent Variables	Predicted Sign	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
RPE	+	0.124[*] (0.076)				
RPE_CashComp	+		0.046 (0.718)			
RPE_EqtyComp	+			0.171[***] (0.006)		
RPE_SelfPeer	+				0.127[*] (0.065)	
RPE_IndexPeer	+					0.092 (0.543)
Firm Characteristics:						
ROA	+	-1.316 (0.153)	-1.625 (0.149)	-1.432 (0.124)	-1.632[*] (0.096)	-1.733 (0.120)
Return	+	0.367[**] (0.028)	0.343[*] (0.058)	0.330[*] (0.052)	0.349[**] (0.044)	0.334[*] (0.077)
Sales	+	0.116[***] (<.0001)	0.150[***] (<.0001)	0.101[***] (<.0001)	0.123[***] (<.0001)	0.157[***] (<.0001)
BM	−	-0.331 (0.143)	-0.342 (0.210)	-0.402[*] (0.076)	-0.442[*] (0.062)	-0.302 (0.257)
σ(ROA)	+	-0.828 (0.381)	-1.116 (0.310)	-0.755 (0.477)	-0.847 (0.389)	-1.439 (0.258)
σ(Return)	+	-0.144 (0.594)	-0.109 (0.727)	-0.172 (0.529)	-0.130 (0.657)	-0.137 (0.649)
TotalComp_COMPPeer	+	0.823[***] (<.0001)	0.878[***] (<.0001)	0.834[***] (<.0001)	0.822[***] (<.0001)	0.911[***] (<.0001)
Corporate Governance:						
Top5_Instown	−	-2.359[***] (<.0001)	-2.380[***] (<.0001)	-2.192[***] (<.0001)	-2.402[***] (<.0001)	-2.293[***] (<.0001)
Activist_Instown	−	-0.533	-1.247	0.040	-0.857	-2.132

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		(0.880)	(0.754)	(0.991)	(0.821)	(0.581)
CEO/Chair	+	0.317***	0.332***	0.313***	0.307***	0.331***
		(<.0001)	(0.000)	(<.0001)	(0.000)	(0.000)
Board_Independence	−	1.095***	0.888**	1.006**	0.817**	0.985**
		(0.005)	(0.043)	(0.018)	(0.050)	(0.033)
Board_Size	+/−	0.080***	0.077***	0.087***	0.088***	0.082***
		(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
Intercept		7.157***	7.361***	7.156	7.394***	7.202***
		(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
Industry Dummies		Included	Included	Included	Included	Included
Number of firms		963	772	909	835	755
Adjusted R-square		0.330	0.298	0.331	0.327	0.302

The dependent variable is natural logarithm of *TotalComp*. *RPE* is equal to one if the firm explicitly reported RPE use in executive compensation plans in its annual proxy, and zero otherwise. *RPE_CashComp* is equal to one if the firm explicitly reported RPE use in executive cash compensation plans in its annual proxy, and zero if the firm did not explicitly reported RPE use in compensation plans. *RPE_EqtyComp* is equal to one if the firm explicitly reported RPE use in executive equity-based compensation plans in its annual proxy, and zero if the firm did not explicitly reported RPE use in compensation plans. *RPE_SelfPeer* is equal to one if the firm explicitly reported RPE use in executive compensation plans and used a self-selected peer group for RPE purpose in its annual proxy, and zero if the firm did not explicitly reported RPE use in compensation plans. *RPE_IndexPeer* is equal to one if the firm explicitly reported RPE use in executive compensation plans and used a public market or industry index for RPE purpose in its annual proxy, and zero if the firm did not explicitly reported RPE use in compensation plans. See Table 2 and Table 6 for the other variable definitions. Dependent variable and firm characteristics are winsorized at top and bottom one-percentiles except that *σ(ROA)* and *σ(Return)* are winsorized at the top one-percentile only. For ease of exposition, coefficients on *Sales* and *TotalComp_COMPPeer* are multiplied by 10,000. Fama-French 12 industry dummies are included in the estimation but not reported in the above table. The sample includes S&P 1500 firms listed in Compustat annual file for 2006 that have available information on the relative performance evaluation use in executive compensation plans and available information on regression variables. Two-tailed p-values in parentheses are based on Huber-White robust standard errors. ***/**/* indicate significance at less than the 1%/5%/10% level based on two-tailed t-tests.

Panel B: CEO Salary or Incentive Compensation as the Dependent Variable

Independent Variables	Predicted Sign	Salary Coefficient (p-value)	IncentiveComp Coefficient (p-value)
RPE	+	0.034	0.470***
		(0.262)	(0.006)
Firm Characteristics:			
ROA	+	-0.155	-4.000***
		(0.606)	(0.003)
Return	+	-0.031	1.090***
		(0.607)	(0.001)
Sales	+	0.050***	0.162***
		(<.0001)	(0.002)
BM	−	0.029	-1.349***
		(0.747)	(0.004)
σ(ROA)	+	-0.406	-1.852
		(0.109)	(0.347)
σ(Return)	+	-0.152	-0.043
		(0.151)	(0.912)
TotalComp_COMPPeer	+	0.180***	0.974***
		(0.007)	(0.000)
Corporate Governance:			
Top5_Instown	−	-0.608***	-3.530***
		(0.000)	(0.000)
Activist_Instown	−	-1.447	-3.624
		(0.466)	(0.711)
CEO/Chair	+	0.128***	0.484***
		(<.0001)	(0.003)
Board_Independence	−	0.360*	2.510***
		(0.086)	(0.007)
Board_Size	+/−	0.053***	0.109***
		(<.0001)	(0.006)
Intercept		-0.608***	-3.530***
		(0.000)	(0.000)
Industry dummies		Included	Included
Number of firms		963	963
Adjusted R-square		0.340	0.192

The dependent variable is natural logarithm of *Salary* or *IncentiveComp* (measured as the sum of *Bonus, EqtyComp,* and *LTIP*). *RPE* is equal to one if the firm explicitly reported RPE use in executive compensation plans in its 2006 annual proxy, and zero otherwise. See Table 2 and Table 6 for the other variable definitions. Dependent variable and firm characteristics are winsorized at top and bottom one-percentiles except that *σ(ROA)* and *σ(Return)* are winsorized at the top one-percentile only. For ease of exposition, coefficients on *Sales* and *TotalComp_COMPPeer* are multiplied by 10,000. Fama-French 12 industry dummies are included in the estimation but not reported in the above table. The sample includes S&P 1500 firms listed in Compustat annual file for 2006 that have available information on the relative performance evaluation use in executive compensation plans and available information on regression variables. Two-tailed p-values in parentheses are based on Huber-White robust standard errors.***/**/* indicate significance at less than the 1%/5%/10% level based on two-tailed t-tests.

TABLE 8
CEO Compensation Level and Self-selected RPE Peers' Relative Performance among S&P 1500 Firms Using Stock Returns as the Performance Metric and Self-selected Peers in Relative Performance Evaluation

Panel A: Descriptive Statistics of Self-selected Peers' Relative Performance

	Mean	Standard Deviation	25%	Median	75%	N
PeerReturn_RPEReturn	0.016	0.225	-0.079	0.035	0.158	121
PeerReturn_IndReturn	0.019	0.090	-0.027	0.023	0.072	121
IndReturn_RPEReturn	-0.003	0.198	-0.080	0.001	0.109	121

PeerReturn_RPEReturn is the difference between the median annual stock returns for the selected RPE peers and annual stock returns for the RPE firm. *PeerReturn_IndReturn* is the differences between the median annual stock returns for the selected RPE peers and the median annual stock returns for the RPE firm's industry (two-digit SIC code) excluding the RPE firm of interest (requiring at least 10 firms other than the RPE firm in the industry). *IndReturn_RPEReturn* is the difference between the median annual stock returns for the RPE firm's industry (two-digit SIC code) and annual stock returns for the RPE firm. All variables are winsorized at top and bottom one-percentiles. Variables are measured for fiscal year of 2006.

Panel B: Ordinary Least Squares Regressions with CEO Total Compensation as the Dependent Variable

Independent Variables	Predicted Sign	Coefficient (p-value)	Coefficient (p-value)
PeerReturn_RPEReturn	−	-0.944***	
		(0.009)	
PeerReturn_IndReturn	−		-1.506*
			(0.052)
IndReturn_RPEReturn	−		-0.729
			(0.191)
PeerROA_RPEROA	−	-1.477	-2.008*
		(0.256)	(0.096)
Firm Characteristics:			
ROA	+	-1.190	-1.516
		(0.457)	(0.312)
Return	+	-0.321	-0.220
		(0.485)	(0.679)
Sales	+	0.034	0.032
		(0.403)	(0.413)
BM	−	-0.273	-0.203
		(0.581)	(0.663)
σ(ROA)	+	-3.396**	-3.836**
		(0.010)	(0.014)
σ(Return)	+	0.668*	0.705*
		(0.080)	(0.062)
TotalComp_COMPPeer	+	0.426***	0.423**
		(0.007)	(0.011)
Corporate Governance:			
Top5_Instown	−	-1.842*	-1.813*
		(0.095)	(0.087)
Activist_Instown	−	-7.131	-4.504
		(0.520)	(0.689)
CEO/Chair	+	0.343**	0.350**
		(0.036)	(0.035)
Board_Independence	−	1.452	1.105**
		(0.112)	(0.014)
Board_Size	+/-	0.106**	0.107**
		(0.012)	(0.013)
Intercept		6.688***	6.561***
		(<.0001)	(<.0001)
Industry dummies		Included	Included
Number of firms		92	92
Adjusted R-square		0.655	0.660

The dependent variable is the natural logarithm of *TotalComp.* See Panel A and Tables 2 and 6 for the other variable definitions. All variables (except corporate governance variables) are winsorized at the top and bottom one percentiles except *σ(ROA)* and *σ(Return),* which are winsorized at the top one percentile only. For ease of exposition, coefficients on *Sales* and *TotalComp_COMPPeer* are multiplied by 10,000. Fama-French 12-industry dummies are included in the estimation but not reported in the above table. The sample includes S&P 1500 firms that use stock returns as the RPE performance metric and self-selected peer groups in relative performance evaluation and that have available information on regression variables. Two-tailed p-values in parentheses are based

on Huber-White robust standard errors. $^{***}/^{**}/^{*}$ indicate significance at less than the 1%/5%/10% level based on two-tailed t-tests.