

Relative Performance Evaluation and Related Peer Groups in Executive Compensation Contracts

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ABSTRACT:

We examine the explicit use of relative performance evaluation (RPE) in executive compensation contracts and the selection of RPE peers. Using S&P 1500 firms' first proxy disclosures under the SEC's 2006 executive compensation disclosure rules, we demonstrate that incorporating details of RPE contracts (such as peer group composition) in the traditional implicit test significantly improves the power to detect RPE use. Our findings suggest that firms consider both costs and benefits of RPE as a form of incentive mechanism when deciding to use RPE. Moreover, the evidence supports both efficient contracting and rent extraction behavior in the RPE peer selection process. Consistent with efficient contracting, RPE firms, especially those with superior performance, tend to select peers that exhibit higher ability to remove common risk and improve fairness in competition. We also find rent extraction behavior in forming RPE peer groups, as evidenced by a negative relation between peer performance and the likelihood of being selected as a peer, especially among underperforming RPE firms.

Keywords: *executive compensation; relative performance evaluation; peer group; SEC regulation.*

Data Availability: *Data are available from public sources indicated in the text.*

I. INTRODUCTION

Relative performance evaluation (RPE) entails the use of peer performance in evaluating agents' performance when setting incentive compensation. Based upon the premise that peer performance captures common exogenous shocks, RPE insulates agents from common risk and also provides a principal with a more informative measure to assess agents' actions. Consequently, RPE leads to risk sharing benefits in incentive contracting (e.g., Lazear and Rosen 1981; Holmstrom 1982; Nalebuff and Stiglitz 1983).

Despite RPE's theoretical appeal, prior empirical research offers mixed evidence that firms use RPE in executive compensation contracts (e.g., Murphy 1999; Prendergast 1999). The major drawback in prior empirical studies is the *implicit* approach in testing the use of RPE. Specifically, due to limited disclosures about RPE contracts, researchers generally infer RPE use by regressing executive pay on industry average performance across a population of firms.¹ This implicit approach relies on simplified assumptions concerning the use of RPE (such as peer group composition, performance metrics and pay components covered by RPE), which unavoidably introduce measurement errors in the implicit test (Murphy 1999; Bannister and Newman 2003). More importantly, studies relying on the implicit approach are unable to examine the execution of RPE contracts (such as the selection of peers), which is critical to the evaluation of costs and benefits of RPE as an incentive mechanism (Matsumura and Shin 2006).

The SEC's new disclosure rules on executive compensation, effective after December 15, 2006, allow us to collect explicit RPE contracts to examine RPE use and related peer groups. We first examine the extent to which incorporating the details of explicit RPE contracts affects the inferences drawn from the traditional implicit test of RPE use. We then utilize related economic

¹ 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 (2007, 2009).

theories to examine firms' decision to explicitly use RPE in executive compensation contracts. Finally, we focus on RPE peer groups, one essential element of RPE contracts, to investigate potential factors that may influence the selection of peers for RPE purpose.

Using S&P 1500 firms' first proxy disclosures under the SEC's new disclosure rules, we find that 25.44 percent of S&P 1500 firms use RPE to some extent in determining executive compensation. We provide evidence that the traditional implicit test is unable to detect RPE use, even among firms that claim to use RPE in setting executive pay. Furthermore, we find that incorporating details of RPE contracts, such as peer group composition, significantly improve the power to detect RPE use. These results illustrate that simplified assumptions about RPE contract details significantly reduce the power of the implicit test.

Concerning firms' decision to explicitly use RPE, we find that firms are more likely to use RPE when they operate in less concentrated industries, have fewer growth opportunities, are exposed to a higher level of common risk, and have larger market capitalization. Moreover, firms employing less wealthy CEOs, having more independent boards, and hiring compensation consultants are more likely to use RPE in setting executive pay. These findings are in line with several economic theories in that firms' tendency to use RPE increases with their exposure to common risk and declines with their CEOs' self-hedging ability (e.g., Lazear and Rosen 1981; Holmstrom 1982; Garvey and Milbourn 2003). The overall evidence supports the view that firms consider both costs and benefits of RPE as a form of incentive mechanism.

Among firms using RPE in pay setting process, we further examine whether firms choose RPE peers in a manner consistent with efficient contracting or rent extraction. From the efficient contracting perspective, the selection of RPE peers should consider potential peer firms' ability to remove common risk (e.g., Holmstrom 1982). Moreover, tournament theory suggests that RPE

peer selection should take into account the similarity between the potential peer firm and the RPE firm, so that they belong to the same “league” where executives have equal chances to outperform given similar effort levels (e.g., Lazear and Rosen 1981). From the rent extraction perspective, executives have incentives to choose RPE peers that they expect to outperform (as suggested by Gibbons and Murphy (1990) and Murphy (2001)), which can inflate peer-adjusted performance and hence increase compensation and external reputation.

Analyzing RPE firms’ self-selected peer groups,² we find evidence supporting both efficient contracting and rent extraction behavior in the peer selection process. Consistent with efficient contracting view, RPE firms tend to choose peers with higher ability to remove common risk and with similar organizational complexity and similar performance. These findings are generally more pronounced for RPE firms outperforming their industry than for underperforming RPE firms. At the same time, we find rent extraction behavior in forming RPE peer groups—firms expected to perform poorly (based on analysts’ target price forecasts) are more likely to be selected as peers. Interestingly, this self-serving bias in peer selection is more significant among underperforming RPE firms. Collectively, our findings suggest that peer selection by outperforming RPE firms is more consistent with efficient contracting view, probably because executives have weak incentive to behave opportunistically when they have less concern of job security and already earn high compensation. Nevertheless, peer selection by underperforming RPE firms reveals rent seeking behavior, probably because executives hope to mitigate potential reputation loss and lowered compensation by manipulating the peer selection process. We also analyze firms’ decision to add and/or drop RPE peers in the subsequent year, and find weak

² Some RPE firms choose published market or industry indices as RPE peer groups. We do not examine these firms’ peer group selection choice for two reasons. First, firms presumably have no flexibility in manipulating the composition of published market or industry indices. Second, testing the selection choice of published indices is practically infeasible to implement due to difficulty in gathering the performance and composition information for a population of indices.

evidence that added peer firms exhibit poorer performance than dropped peer firms.

Our study contributes to the executive compensation literature in several ways. First, our evidence helps to resolve the “RPE puzzle” that has long plagued researchers (Murphy 1999; Prendergast 1999). Our findings indicate that the “RPE puzzle”, or mixed empirical support for RPE use, largely arises from inaccurate assumptions underlying the traditional implicit test. By incorporating details of explicit RPE contracts into the implicit test, we demonstrate that simplified assumptions about RPE contract details cloud the inferences from the implicit test and that incorporating details in RPE contracts (such as peer group composition) can significantly improve the power of the implicit test.

Second, our study provides the first large sample U.S. evidence on the use of RPE and the selection of RPE peers. Our findings on firms’ decision to use RPE confirm several economic theories, and also reveal the importance of compensation consultants in facilitating RPE use. This stands in contrast to Carter et al. (2009), who fail to find supporting evidence on related economic theories when studying explicit RPE use in performance-vested equity plans for a sample of U.K. firms. Concerning RPE firms’ peer selection process, we find that both efficient contracting (captured by common risk and economic similarity) and rent extraction (measured by expected relative performance) explain the likelihood of being selected as a RPE peer. These findings shed light on the execution of RPE contracts, which is essential to understanding the overall costs and benefits of RPE. In particular, our finding of a biased selection of RPE peers supports the conjecture that self-serving behavior of management could compromise the theoretical benefits of RPE (e.g., Gibbons and Murphy 1990; Murphy 2001).

Last, we add to the growing literature on peer groups used in executive compensation contracts. Existing research predominantly focuses on peer groups used for compensation

benchmarking purpose, and have provided mixed evidence concerning whether compensation benchmarking peers are selected efficiently or opportunistically (Bizjak et al. 2008, 2009; Cadman et al. 2009b; Albuquerque et al. 2009; Faulkender and Yang 2009). As explained further in Section II, the purpose of compensation benchmarking peers is to gauge the *level* of compensation, while the purpose of RPE peers is to benchmark the performance target in setting incentive compensation. We document that the use of RPE is much less frequent than the practice of compensation benchmarking, and that selected RPE peers are often different from compensation benchmarking peers. More importantly, we find that the selection of RPE peers reveals both efficient contracting and rent seeking behavior, and the efficient contracting (rent seeking) view better explains outperforming (underperforming) RPE firms' peer selection. Our study thereby fills the void in the extant literature that has paid little attention to RPE peers in the pay setting process.

The next section reviews related literature. Section III describes the SEC's new disclosure rules, the sample selection procedures, and descriptive statistics on RPE use for S&P 1500 firms. In Section IV, we conduct the traditional implicit test of RPE use, with consideration of explicit RPE contract details. In Section V, we examine firms' decision to explicitly use RPE in executive compensation contracts. Section VI investigates the selection process of RPE peers. Section VII concludes.

II. RELATED LITERATURE

Literature on RPE

If common exogenous shocks affect the performance of multiple agents, economic theory predicts that an incentive compensation scheme based on relative performance is superior to that

based on individual performance when the agent is sufficiently risk averse and/or the common uncertainty is high (Lazear and Rosen 1981; Green and Stokey 1983; Holmstrom 1982).³ Since relative performance reduces the effect of common shocks on performance, RPE allows the risk-averse agent to bear less risk and the principal to better evaluate and motivate the agent's effort. Moreover, RPE can improve incentive contracting by providing incentives for executives to outperform their competitors (e.g., Hvide 2002).

Despite its theoretical appeal, RPE also involves implementation costs. Tournament theory suggests that heterogeneity among agents may dilute the benefits of RPE. Specifically, RPE contracts may induce inefficiency if agents in a tournament have unequal chances to win the prize given the same level of effort. Such unequal contests may induce disadvantaged agents to shirk (O'Keefe et al. 1984) and may distort the agents' risk choices—more capable agents become overly conservative in choosing risky investments to preserve their favorable positions, whereas less capable agents overly aggressive in pursuing risky investments (e.g., Rosen 1988; Knoeber and Thurman 1994; Hvide 2002). Prior studies also argue that RPE contracts may create adverse incentives for management to sabotage the performance of peers, collude with peers, and choose inappropriate peer groups (Gibbons and Murphy 1990; Aggarwal and Samwick 1999; Murphy 2001). In addition, empirical evidence is consistent with competitive environments and certain executive attributes (such as self-hedging ability and outside employment opportunities) reducing the benefits of RPE in incentive contracting (e.g., Aggarwal and Samwick 1999; Garvey and Milbourn 2003; Rajgopal et al. 2006). The theory and evidence cited above provide a potential explanation for the lack of consistent empirical evidence supporting the use of RPE in

³ Lazear and Rosen (1981) and Green and Stokey (1983) demonstrate the benefit of RPE in rank-order tournaments where agents' performance ranking is used in determining compensation. Holmstrom (1982) demonstrates that ranking order is not a sufficient statistic for individual output except in special circumstances. Holmstrom (1982) further shows that aggregate measures such as peer average often provide sufficient information about common uncertainty and thus incentive schemes that compare agents' performance with such aggregate measures will be efficient.

executive compensation contracts (e.g., Antle and Smith 1986; Gibbons and Murphy 1990; Janakiraman et al. 1992; Aggarwal and Samwick 1999; Jenter and Kanaan 2008, among others).

More recent studies attribute the limited empirical support for RPE to the inappropriate specification of peer groups in the implicit test of RPE use (Albuquerque 2009; Dikolli et al. 2008). Albuquerque (2009) reports stronger evidence of RPE use when peers are matched on both industry and size as opposed to industry only. Dikolli et al. (2008) theoretically demonstrate how measurement errors in peer group selection and peer performance aggregation introduce biases that cloud the empirical detection of RPE use.

Only a few studies have examined *explicit* RPE use in executive compensation contracts (Murphy 1999, 2001; Bannister and Newman 2003; Carter et al. 2009). Murphy (1999) examines 177 large U.S. firms included in the 1997 Towers Perrin survey, and reports that 28.8 percent of his sample 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 statistics about RPE contracts used by 45 firms in their sample. Both studies claim that a lack of empirical support for RPE use could be attributable to incorrect assumptions and model misspecifications in the implicit test. We formally investigate this claim in Section IV.

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 empirical design employs the same set of economic theories aiming to explain the choice between RPE and non-RPE use to explain RPE contract features *within* firms using RPE, and offers little empirical support for related economic theories.⁴ More importantly, their U.K. evidence may not generalize to the U.S. setting because performance-vested equity plans is more prevalent in U.K., mainly due to external

⁴ 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) as predicted by economic theories.

pressures from institutional investors (Carter et al. 2009; Ferri 2009).

Literature on Peer Groups Used in Executive Compensation Contracts

Peer groups used in compensation contracts can be broadly categorized as compensation benchmarking peer groups and RPE peer groups.⁵ Firms frequently use compensation benchmarking peers to gauge an executive's reservation wage in the competitive labor market. Compensation benchmarking peer groups therefore represent a set of companies against which a firm competes for executive talent. Bizjak et al. (2008) construct compensation benchmarking peers from firms with similar size and same industry membership. They find that compensation benchmarking is an efficient mechanism to gauge the market wage necessary to retain valuable human capital. Since the SEC's new disclosure rules take effect, several studies have examined proxy disclosures about compensation benchmarking peers (Bizjak et al. 2009; Faulkender and Yang 2009; Cadman et al. 2009b; Albuquerque et al. 2009). Bizjak et al. (2009) and Faulkender and Yang (2009) show that firms select highly paid peers to justify excess CEO compensation, but Cadman et al. (2009b) and Albuquerque et al. (2009) conclude that the selection process of compensation benchmarking peers is largely consistent with efficient contracting.

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 common exogenous shocks. Moreover, the implication of peer selection bias for peer performance is opposite for compensation benchmarking peers versus RPE peers, because better performing firms tend to

⁵ 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). Prior literature on peer groups disclosed in proxy statements also studies performance graph peer groups (Lewellen et al. 1996; Porac et al. 1999) and generally finds 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 used in setting executive compensation (Byrd et al. 1998; Murphy 1999). Hence, findings on performance graph peers are not suggestive of the role of peer groups in setting executive compensation. Under the SEC's new disclosure rules, the performance graph is required only in firms' annual reports.

pay higher compensation and thus are more likely to be selected as compensation benchmarking peers, whereas worse performing firms are more likely to be selected as RPE peers to boost firms' relative performance and hence incentive compensation.

In practice, the use of RPE peer groups is less frequent than the use of compensation benchmarking peer groups. For instance, 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 25.44 percent of S&P 1500 firms using RPE as we report in Table 1 Panel A. We also find that for firms using two peer groups (one for compensation benchmarking and the other for RPE), compensation benchmarking peer groups often differ from RPE peer groups.⁶ Hence, the evidence on compensation benchmarking peers may not apply to RPE peers.

III. INSTITUTIONAL BACKGROUND, SAMPLE, AND DESCRIPTIVE STATISTICS

New Disclosure Rules on Executive Compensation

The SEC's new disclosure rules on executive compensation are effective for fiscal years ending on or after December 15, 2006. Appendix A provides the timeline of introducing the new disclosure rules. Prior to 2006, proxy disclosures on the details of RPE contracts in the U.S. had been voluntary (Byrd et al. 1998; Carter et al. 2009). Under the new disclosure rules, companies are required to provide a "Compensation Discussion and Analysis" (CD&A) report in their proxy

⁶ For a total of 232 firms that use self-selected RPE peer groups in our sample, we are able to collect 228 firms' compensation benchmarking peer groups (i.e., four firms do not disclose compensation benchmarking peer groups). For these 228 firms, we examine the extent of overlap between compensation benchmarking peer groups and RPE peer groups. We find that 20 firms use either a broader definition of peers (such as an index) or a proprietary compensation survey data for compensation benchmarking purpose. For the 208 firms that use self-selected peers for pay benchmarking purpose, the mean (median) number of compensation benchmarking peers is 17 (15). Of these 208 firms, 36 firms (17.31%) use the same peer groups for both compensation benchmarking and RPE purposes; 25 firms (12.02%) use RPE peer groups which are a subset of their benchmarking peers; 3 firms (1.44%) use completely different peer groups for two purposes; and the remaining 144 firms (69.23%) have some overlap between the two peer groups, where the mean (median) rate of overlap, defined as the number of common peers between two groups divided by the number of RPE peers, is 71.6% (80.9%)

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.⁷ Consequently, firms explicitly using RPE are required to disclose details about RPE contracts in CD&A, whereas firms not using RPE face legal actions if they claim the use of RPE. This setting allows us to create unbiased and detailed data on firms' explicit RPE contracts for a large sample of U.S. firms.

Mandatory disclosures of RPE use, however, may alter firms' decision to use RPE and/or the execution of RPE contracts (such as the selection of RPE peers). If the enactment of new executive compensation disclosure rules attracts public attention concerning the executive pay setting process, firms may consciously restrain rent seeking activities and thus our findings may understate the extent of rent seeking in periods prior to this new disclosure regulation.

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.⁸ Our initial sample consists of 1,419 S&P 1500 firms with available proxy statements.

⁷ SEC final rules 33-8732a, Item 402(b) (2) (v-vi) state that "In particular, firms need to disclose material information on what specific items of corporate performance are taken into account in setting compensation policies and making compensation decisions... How specific forms of compensation are structured and implemented to reflect these items of the registrant's performance, including whether discretion can be or has been exercised (either to award compensation absent attainment of the relevant performance goal(s) or to reduce or increase the size of any award or payout), identifying any particular exercise of discretion, and stating whether it applied to one or more specified named executive officers or to all compensation subject to the relevant performance goal(s)." Nontransparent or vague disclosures of RPE use may attract SEC attention to be publicized in SEC's comment letters (see, e.g., SEC's comment letter on Blackbaud Inc. proxy filings dated October 28, 2008).

⁸ Since the new disclosure rules are effective for fiscal years ending on or after December 15, 2006 and firms are required to file their proxy statements within 120 days after the fiscal year end, some firms are not subject to the new rules until fiscal year 2007. For our final sample of 1,419 firms, 37 firms fall into this category among which 8 firms use RPE. For these firms, we collect the information on the use of RPE from fiscal 2007 proxy statements. For ease of exposition, we use 2006 (2007) to refer to the first (second) year under the new rules throughout the paper.

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 component of executive compensation (e.g., annual bonus, restricted stock, stock option) is 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.⁹ When firms state that RPE is used in setting executive pay, most of the time they also disclose details of the RPE contracts such as specific performance metrics used for RPE and the composition of the RPE peer group. We collect these detailed disclosures about RPE contracts as described in the CD&A section. We take extra care to avoid misclassifying compensation benchmarking peers as RPE peers. Appendix B provides several representative examples illustrating proxy disclosures about RPE contracts in our sample.

Finally, we obtain CEO compensation data from ExecuComp, financial data from Compustat, stock return data from CRSP, and analysts' target price forecasts from I/B/E/S.

Descriptive Statistics

Table 1 provides descriptive evidence on the frequency of RPE use and main features of RPE contracts. Panel A reports that 361 (25.44 percent) of our sample firms use RPE at least to some extent in determining executive compensation. For comparison, Bannister and Newman (2003) report that 28 percent of their sample firms (160 firms in the Fortune 250 index) use RPE in 1992-1993. While the frequency of RPE use in our sample looks comparable to the frequency reported by Bannister and Newman (2003), our sample firms on average are smaller than theirs. For S&P 500 firms, which have more comparable size to Bannister and Newman's sample, we

⁹ Firms occasionally comment favorably on the principle of RPE, but do not disclose the details on the use of RPE in setting compensation (e.g., no disclosure about compensation components and performance metrics used for RPE and RPE peer group. Also see the last two examples in Appendix B). We classify these firms as non-RPE firms (totally 66 firms) since firms do not disclose the specific compensation component covered by RPE nor the identity of RPE peer group. Under the SEC's new disclosure regime, firms are required to disclose the use and details of RPE contracts if they actually use RPE in setting executive compensation. Nevertheless, our results on firms' decision to use RPE are qualitatively similar if we exclude these non-RPE firms (untabulated).

find a higher frequency of RPE use (37.76 percent), which reflects increased RPE disclosures under the SEC's new disclosure regime and/or more widespread use of RPE since early 1990's.¹⁰

Firms may use RPE in setting cash compensation (such as annual bonus and long-term incentive payout) and/or equity-based compensation (such as restricted stock and stock option). Moreover, firms may choose different performance metrics when implementing RPE. Table 1 Panel B reports the use of RPE by compensation plans and performance metrics. As shown, firms most often apply RPE solely to equity-based compensation plans (214 firms, or 59.28 percent) and less frequently to cash compensation plans (82 firms, or 22.71 percent). 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 in equity-based compensation plans based on a survey of 177 large U.S. firms in 1997. Our finding also indicates heavier use of RPE towards equity-based compensation compared with 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 plans) 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 (65 firms, or 18.01 percent) using RPE in setting both equity-based compensation and cash compensation.

Turning to performance metrics used in RPE contracts, a majority of RPE firms (206 firms, or 57.06 percent) solely rely on price-based performance metrics (including stock returns

¹⁰ To better understand the effect of the new disclosure rules on firms' proxy disclosures of RPE use, we compare S&P500 firms' disclosures on RPE use before and after the new disclosure rules. Specifically, we start from 490 S&P500 firms in our sample and collect these firms' disclosures on RPE use in 2005 (the year before the new rules). We then compare the percent of RPE firms in 2005 to that in 2006. For these 490 firms, the percentage of RPE firms in 2005 is 31.22 percent (153 firms), compared with 37.76 percent (185 firms) in 2006. There are 132 firms disclosing the use of RPE for both 2005 and 2006; 53 firms disclosing no use of RPE in 2005 but the use of RPE in 2006; only 21 firms disclosing the use of RPE in 2005 but no use of RPE in 2006. This result appears consistent with more firms adopting RPE in anticipation of more public scrutiny under the new disclosure rules, whereas it is also consistent with increased disclosure of RPE use under the new disclosure regime.

and common shareholder wealth) when implementing RPE. Accounting performance metrics (such as return-on-equity and earnings per share) are also common in RPE contracts (82 firms, or 22.71 percent). Price-based RPE metrics are primarily used in equity-based compensation plans (150 firms out of 206 firms, or 72.82 percent), while accounting-based RPE metrics are more likely to be used in cash compensation plans (35 firms out of 82 firms, or 42.68 percent). Among the remaining RPE firms, 60 firms (16.62 percent) use both price-based and accounting performance metrics for RPE purposes. An even smaller percentage of firms (13 firms, or 3.6 percent) use non-financial performance metrics (such as customer satisfaction and market share) in RPE contracts. The infrequent use of non-financial metrics potentially reflects difficulties in obtaining peer firms' non-financial information (e.g., Ferri 2009). We list commonly used RPE performance metrics in Table 1 Panel C.

Firms that use RPE in setting equity-based compensation can employ RPE in a number of ways. Table 1 Panel D shows that a significant portion of RPE firms (43.01 percent) use RPE to determine the vesting of “performance shares units (PSU)”.¹¹ A number of firms (33.69 percent) use RPE to determine the size of equity grants (including restricted stocks and stock options). Other firms (21.86 percent) link the achievement of RPE performance target to vesting conditions of stock options or restricted stocks (performance-vested equity grants). These statistics indicate that the use of RPE in equity grants with performance-based vesting provisions is now common among U.S. firms.¹²

¹¹ Performance shares are similar to restricted stocks in that they fully vest at the end of certain performance period starting with the grant year (usually three years). However, the range of vesting amount for PSU is usually between 0% and 200% (e.g., see the example of PG&E Corp in Appendix B), which is different from that for restricted stocks units (RSU) capped at 100%.

¹² Gerakos et al. (2007) suggests that most U.S. firms offering performance-vested equity grants link vesting conditions to *absolute* performance target rather than *relative* performance target. The sample period studied by Gerakos et al. (2007) is 1993-2002, which precedes our sample period of 2006. More importantly, they examine performance-vested stock options only, whereas we find that most firms incorporate RPE in stocks-based plans rather than stock options-based plans.

Finally, we examine the choice and composition of RPE peer groups. Firms may choose published market or industry indices or self-select a group of firms to form the RPE peer group. Table 1 Panel E reports the use of RPE by compensation type and RPE peer group choice. As shown, a majority of RPE firms (209 firms, or 57.89 percent) use self-selected RPE peer groups, and about a third of RPE firms (127 firms, or 35.18 percent) employ published market or industry indices. A small number of RPE firms (25 firms, or 6.93 percent) utilize both published indices and self-selected peer groups in RPE contracts. The tendency to use self-selected peer groups (as opposed to published indices) appears similar across equity-based compensation plans and cash compensation plans covered by RPE.

Concerning the composition of RPE peer groups, Table 1 Panel F shows that the average (median) number of peers in self-selected peer groups is 14.694 (13) firms, in contrast to an average (median) of 60.41 (65) firms in these firms' corresponding two-digit SIC industry. Moreover, only 60.92 percent (47.92 percent) of self-selected peers operate in the same two-digit (three-digit) SIC industry as the RPE firms. On a firm level, there are only 39 (25) RPE firms whose self-selected peers entirely come from the same two-digit (three-digit) SIC industry. These statistics reinforces the concern that the key assumption underlying the implicit test of RPE use—the RPE peer group consists of same-industry firms—is invalid. Finally, about 70.37 percent of self-selected RPE peers belong to the S&P 1500 index, and about 45.11 percent share the same S&P sub-index (S&P 500, Mid-Cap 400, and Small-Cap 600) as the RPE firms. On a firm level, there are 25 (10) RPE firms whose self-selected peers all come from the S&P1500 index (the same S&P1500 sub-index as the RPE firms).

Table 2 provides descriptive statistics of firm characteristics, management attributes, and corporate governance for our sample firms. As shown, firms that disclosed RPE use in

compensation contracts differ from the rest of firms in many dimensions, including competitive environment, growth opportunity, idiosyncratic risk, and market capitalization. In addition, RPE firms have different ownership structure and board attributes than non-RPE firms, and more frequently employ compensation consultants when setting executive compensation. We consider these differences in multivariate analyses in Section V.

IV. INCORPORATING EXPLICIT RPE CONTRACT DETAILS IN IMPLICIT TEST OF RPE USE

Prior empirical studies have mostly employed an implicit approach to test the prevalence of RPE use *without* referring to explicit RPE contracts. Given our focus on explicit RPE contracts, we first examine the extent to which incorporating the details of explicit RPE contracts (such as the use of RPE and RPE peer group composition) affects the inferences drawn under the traditional implicit approach. Such evidence would confirm the importance of incorporating RPE contract details in conducting tests of RPE use.

Given that only 25.44 percent of our sample firms explicitly use RPE in determining executive pay, the mixed evidence on RPE use provided by prior implicit RPE studies could be, in part, due to low test power when RPE use is not widespread. Furthermore, implicit RPE studies rely on numerous assumptions concerning the implementation of RPE. In particular, most implicit RPE studies combine all firms from the same two-digit SIC industry to form the RPE peer group, even though same-industry firms may not always be appropriate for RPE purpose (Albuquerque 2009; Dikolli et al. 2008). Hence, the implicit test unavoidably suffers from measurement errors (Murphy 1999; Bannister and Newman 2003; Moers 2006).

We start by replicating Albuquerque (2009), one recent RPE study using the implicit test. Specifically, we estimate the following equation among S&P 1500 firms. We limit the analyses

to the year 2006 since we only collect information about explicit RPE contracts for 2006.

$$CEOPay_t = \alpha_0 + \alpha_1 FirmPerf_t + \alpha_2 PeerPerf_t + \alpha_3 ControlVariables_t + \varepsilon_t \quad (1)$$

The dependent variable, *CEOPay*, is CEO total compensation for 2006, measured as the sum of salary, bonus, fair value of stock option awards and restricted stock awards,¹³ the change in deferred compensation, non-equity incentive plan compensation, and other compensation in thousands of dollars (i.e., TDC1 from ExecuComp). To mitigate skewness in CEO total compensation, we follow prior studies and use its natural logarithm in the estimation (e.g., Murphy 1999; Albuquerque 2009). The independent variables, *FirmPerf_t* and *PeerPerf_t*, are 12-month buy-and-hold stock returns over 2006 for the firm and its RPE peer group, respectively. Albuquerque (2009) proposes that firm size is an important attribute of RPE peers, while prior implicit RPE studies have utilized misspecified peer groups by combining same-industry firms without considering firm size. We thus follow Albuquerque's recommendation and measure *PeerPerf_t* based on the median stock return for firms in the same size quartile and same industry.¹⁴

We also control for firm characteristics and governance attributes that may influence

¹³ Before SFAS 123R, the Black-Scholes value of stock options in the ExecuComp's TDC1 variable could be overstated for firms using performance-vested equity grants that do not fully vest (Ferri 2009). After 2005, however, TDC1 includes the grant date fair value of stock awards (STOCK_AWARD_FV) and option awards (OPTION_AWARDS_FV), which are calculated in accordance with SFAS 123R. Under SFAS 123R, when calculating fair value, firms need to estimate the probability that each vesting condition will be fulfilled in the future and incorporate that probability estimation in fair value calculation. The following is a quote from Mellon's 2006 proxy to illustrate how this has been done. "Performance shares were valued by an external consulting firm using a Monte Carlo valuation methodology. The consultant analyzed the companies comprising our peer group, considering their stock beta and volatility through the grant date. Stock returns were then simulated over the same performance period for Mellon and each of the comparator companies, considering both stock return volatility and the correlation of returns. The consultant's valuation approach considered the conditional probabilities associated with a combined effect of an increased share price at payout and the number of shares expected to be paid out at that time." Thus, for our analyses of 2006, the fair values of stocks and options used in TDC1 would be a reasonable and unbiased estimation of the value that an executive expects to earn in the future.

¹⁴ Please refer to Albuquerque (2009) for a detailed description of the procedures to form industry-size matched peers. Albuquerque (2009) uses natural logarithm of stock returns in the regression. Since stock returns in our sample do not exhibit skewness, we do not use the logarithm transformation. Untabulated results are qualitatively similar if we use natural logarithm of stock returns.

CEO pay, including firm size, growth option, CEO tenure, regulation industry membership, idiosyncratic return variance, CEO/Chair duality, CEO stock ownership, and CEO involving in an interlock relationship. In addition to these controls, we include industry dummies to account for unobservable variation in the industry level of CEO pay.

Table 3 presents results for estimating equation (1). The first column reports results for S&P 1500 firms. As shown, the coefficient on industry-size matched peer returns is insignificantly positive. This result appears inconsistent with Albuquerque's main finding of a negative coefficient on industry-size matched peer returns. This inconsistency is driven by our different sample period.¹⁵ The lack of evidence supporting RPE use in 2006 could result from the infrequent use of RPE in practice. As mentioned earlier, only 25.44 percent of our sample firms explicitly disclose the use of RPE, while the rest of firms may not incorporate RPE in setting executive pay. To enhance the power of the implicit test, we partition the sample based on firms' proxy disclosures concerning RPE use. If the infrequent use of RPE underlies the above insignificant result, we expect to observe stronger evidence on RPE use for firms disclosing RPE use than for firms not disclosing RPE use.¹⁶

Columns (2) and (3) report implicit test results for non-RPE firms and RPE firms, respectively. For non-RPE firms, industry-size matched peer returns have little explanatory power for CEO total compensation. For RPE firms, the coefficient on industry-size matched peer returns is significantly positive. Hence, even among firms explicitly disclosing RPE use, the

¹⁵ Albuquerque's (2009) sample period ranges from 1992 to 2005, while our sample period is limited to one year of 2006. In untabulated results, we are able to replicate Albuquerque's main finding and document a significantly negative coefficient on industry-size matched peer returns over 1992-2005 (Coefficient = -0.217, p-value < .0001, untabulated).

¹⁶ The maintained assumption is that RPE disclosing firms more heavily rely on RPE in setting CEO pay than RPE non-disclosing firms. This is a reasonable assumption since the SEC's new disclosure rules require firms to provide transparent and sufficient information concerning the use of performance target in setting executive pay. Nontransparent or vague disclosures of RPE use would violate the SEC's reporting requirement and may be publicized in SEC's comment letters (Robinson et al. 2009).

implicit test provides no supporting evidence that these firms use relative performance when setting CEO pay. These results indicate that the infrequent use of RPE is unlikely to be the dominate factor that drives the insignificant evidence on RPE use in the implicit test.

Next, we further refine the implicit test of RPE use by considering the disclosed details in explicit RPE contracts. First, we incorporate RPE peer group composition in the implicit test. Specifically, we measure $PeerPerf_i$ based on the median stock return for self-selected RPE peers as disclosed in firms' 2006 proxy statements. Column (4) shows that the coefficient on self-selected peer returns is significantly negative, consistent with firms using these self-selected peers for RPE purpose when setting CEO pay. The contrasting results across Columns (3) and (4) highlight the importance of peer group composition in tests of RPE use.¹⁷ The implicit test is likely to have low power and even produces misleading results due to inaccurate identification of RPE peers employed in pay setting process.

Second, we consider one design feature of RPE contracts—performance-based vesting condition—that has recently gained popularity in the U.S. (e.g., Gerakos et al. 2007). Prior implicit RPE studies generally use *contemporaneous* peer performance to explain executive pay. However, as shown in Table 1 Panel C, firms often link RPE-based performance target with vesting conditions of equity grants, so that *future* peer performance significantly affects the fair value of equity grants (e.g., Gerakos et al. 2007; Carter et al. 2009). SFAS 123R requires firms to consider this design feature when valuing CEO equity-based compensation (e.g., considering the firm's and peers' expected future performance and the likelihood of future vesting realizations). However, compensation committees may not use contemporaneous peer performance to project

¹⁷ The sample size under Column (3) is larger than the sample size under Column (4) because Column (4) only utilizes RPE firms disclosing self-selected RPE peer groups. If we restrict to these RPE firms in Column (3), results are qualitatively similar as those reported. The coefficient on $PeerPerf$ remains positive, albeit statistically insignificant (Coefficient = 1.063, p-value = 0.181, untabulated).

future peer performance. Hence, the traditional approach that uses contemporaneous peer performance in testing RPE use may produce low power tests when RPE is used in determining the vesting conditions instead of the size of equity grants.

In the last two columns of Table 3, we examine the influence of RPE-based vesting conditions over the implicit test of RPE use. As shown in Column (5), when RPE is used in determining the size of equity grants, the coefficient on self-selected peer returns is significantly negative, supporting the use of RPE. In contrast, Column (6) shows that, when RPE is solely used in determining vesting conditions, there is no evidence of RPE use, even though these firms explicitly disclose RPE use in setting CEO pay. Hence, failure to incorporate this feature of RPE contracts is likely to confound empirical results based on the implicit test of RPE use.¹⁸

V. USE OF RPE IN EXECUTIVE COMPENSATION CONTRACTS

Prior research has proposed a variety of factors that may affect firms' decision to use RPE in compensation contracts. However, due to the constraint of the implicit approach, most empirical studies have examined one contextual factor at a time without controlling for alternative factors that may also influence RPE use. In this section, we utilize explicit disclosures about RPE use to examine multiple factors that may influence the decision to incorporate RPE in executive compensation contracts.

Determinants of RPE Use

Common risk. Theory predicts that the risk-sharing benefit of RPE increases with the extent to which common risk affects both firm and peer performance (e.g., Holmstrom 1982).

¹⁸ Other features of RPE contracts relate with compensation components, performance metrics, hurdle rates in achieving RPE-based performance target (e.g., median, 25%, or 75% of peer group performance), etc. Combing *all* specific features of RPE contracts in studying RPE use will substantially reduce the sample size, and is beyond the scope of the current study.

Consistent with prior research, we expect that firms are more likely to use RPE when their performance is more heavily influenced by common risk and thus less idiosyncratic. We measure idiosyncratic risk based on the standard deviation of residuals from a regression of firm-level stock returns on value-weighted industry stock returns over prior 36 months (*Idiosyncratic_Risk*).

Availability of similar peers. As reviewed in Section II, including firms with unequal ability in the RPE peer group could induce executives to shirk or pursue inefficient risky investments. Therefore, firms are less likely to use RPE if potential peers exhibit dissimilar ability. We argue that firm size reflects organizational complexity and firm performance reflects existing economic conditions, both of which affect executives' ability to compete with potential peers. To measure the availability of peers with similar ability, we first divide firms within the same two-digit SIC industry into deciles based on market value of equity or annual stock returns. The availability of similar peers is measured by the absolute differences in market value of equity or annual stock returns between the firm and the median of the decile that the firm belongs to (*/SIZE_Rkadj/* and */Return_Rkadj/*, respectively).

Industry competition. Aggarwal and Samwick (1999) and Joh (1999) argue that firms facing a more competitive environment are less likely to use RPE due to the concern that RPE may encourage destructive competition.¹⁹ Following these studies, we use industry concentration, measured as the Herfindahl-Hirschman Index of sales within each two-digit SIC industry, as an inverse proxy for industry competition (*Industry_Concentration*).

Growth opportunity. 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 (such as historical earnings growth) provide managers of high growth

¹⁹ Empirically, Aggarwal and Samwick (1999) find that firms operating in more competitive industries place more *positive* weights on peer performance in setting executive pay. Joh (1999) documents a similar finding based on a sample of Japanese firms and labels this strategic group performance evaluation (SGPE).

firms stronger incentives to smooth performance in response to fears of budget ratcheting (Leone and Rock 2002). We use book-to-market ratio (*BM*) as an inverse proxy for growth opportunity.

Size. 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) propose that a covariation between reservation wages and the economy's fortunes potentially explains the lack of RPE evidence. They predict and find that firms are less likely to filter out industry and market-wide performance when compensating more 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 public scrutiny and shareholder concern about executive pay practices (Bannister and Newman 2003), which may induce firms to commit to explicit RPE use. We use the market value of equity to measure firm size (*SIZE*).

Firm Performance. 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. On the other hand, for firms having stronger performance than their peers, RPE may be used as a convenient tool to justify higher executive pay. We include industry-adjusted operating performance (*ROA_Indadj*) and stock performance (*Return_Indadj*) in our analysis.²⁰

Executive Attributes. Garvey and Milbourn (2003) argue that the theoretical benefit of RPE is diminished to the extent that executives can hedge market risk. They find that firms with wealthier and older CEOs (proxies for greater self-hedging ability) exhibit weaker evidence of RPE. Following Garvey and Milbourn (2003), we use the value of CEO equity holdings to proxy for CEO wealth (*CEO_Wealth*), and also include the age of CEO (*CEO_Age*) in the analysis.

Ownership structure and board attributes. Bertrand and Mullainathan (2001) document

²⁰ Since we cannot identify the *first* year that firms adopt RPE, our causal inferences should be interpreted with caution. In particular, a positive relation between RPE use and firm performance could result from RPE's incentive effect in that RPE provides incentives for management to outperform their competitors.

that CEO pay is positively associated with exogenous shocks and such 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 for firms with weaker governance. Given RPE's theoretical benefits, 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*) as defined in Cremers and Nair (2005), 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*).

Compensation consultant. Since the design and implementation of RPE contracts demand specialized knowledge and expertise, the availability of professional advices from compensation consultants may influence firms' decision to use RPE. Compensation consultants have access to proprietary information on industry-wide compensation practices and on potential competitors, and hence can facilitate the structuring and execution of RPE contracts (Cadman et al. 2009a; Murphy and Sandino 2009). We construct an indicator variable, *CompConsultant*, to identify firms that have disclosed the use of compensation consultants in setting executive pay based on their first proxies filed under the SEC's new disclosure rules.

Results on RPE Use

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

$$\begin{aligned}
 \text{Prob}(RPE_t = 1) = & \Phi(\alpha_0 + \alpha_1 Idiosyncratic_Risk_{t-1} + \alpha_2 |SIZE_Rkadj|_{t-1} + \alpha_3 |Return_Rkadj|_{t-1} \\
 & + \alpha_4 Industry_Concentration_{t-1} + \alpha_5 BM_{t-1} + \alpha_6 Size_{t-1} + \alpha_7 ROA_Indadj_{t-1} \\
 & + \alpha_8 Return_Indadj_{t-1} + \alpha_9 CEO_Wealth_{t-1} + \alpha_{10} CEO_Age_{t-1} + \alpha_{11} Top5_Instown_{t-1} \\
 & + \alpha_{12} Activist_Instown_{t-1} + \alpha_{13} CEO/Chair_{t-1} + \alpha_{14} Board_Independence_{t-1} \\
 & + \alpha_{15} Board_Size_{t-1} + \alpha_{16} CompConsultant_t + \varepsilon_t)
 \end{aligned} \tag{2}$$

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 4 reports regression results of estimating equation (2). We find that 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 (e.g., Janakiraman et al. 1992).²¹ In contrast to the prediction that more intense product market competition (lower industry concentration) discourages the use of RPE (Aggarwal and Samwick 1999), we find that firms from less concentrated industries are more likely to implement RPE in compensation plans. Our result, however, is consistent with the evidence in DeFond and Park (1999), which show that a more competitive environment is characterized by a higher degree of common risk and hence brings greater benefits of using RPE.²² We also find that firms exhibiting fewer growth opportunities (higher book-to-market) are more likely to use RPE, which contradicts Murphy (2001). This finding, however, is in line with the argument in Albuquerque (2007) 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.²³

²¹ To facilitate the comparison with prior work, we replace idiosyncratic risk measure with the absolute value of the coefficient on value-weighted industry returns when regressed on firm-level returns over prior 36 months ($|Beta|$). We find an insignificant positive coefficient on $|Beta|$. We argue that *Idiosyncratic_Risk* is a better proxy for common risk than $|Beta|$ because it captures both correlation in performance and the overall uncertainty.

²² 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 (a proxy for greater common risk) than in less competitive industries. Our finding that *Industry_Concentration* (reverse proxy for industry competition) is negatively related to RPE use even after controlling for *Idiosyncratic_Risk* (our proxy for common risk) suggests that industry concentration may capture common risk above and beyond *Idiosyncratic_Risk*. Given that appropriate RPE peers may not constitute all firms from the same industry, our common risk proxy (*Idiosyncratic_Risk*), measured with industry-level returns, may involve measurement errors.

²³ Albuquerque's (2007) argument suggests that growth options affect a firm's common risk exposure and hence the informativeness of peer performance about the firm's common risk. Given we have controlled for *Idiosyncratic_Risk* (our proxy for common risk), the positive relation between book-to-market ratio and RPE use suggests that book-to-market ratio may capture common risk above and beyond *Idiosyncratic_Risk*.

Furthermore, we find that larger firms are more likely to use RPE, consistent with firm size serving as a proxy for public scrutiny and shareholder concern about executive pay. We also find that 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, firms with more independent boards are more likely to use RPE, consistent with stronger internal governance encouraging RPE use. Firms hiring compensation consultants are also more likely to use RPE, suggesting that compensation consultants' specialized knowledge and expertise facilitate the use of RPE. Among all determinants of RPE use, compensation consultant appears to have the greatest impact on RPE use—increasing the likelihood of using RPE by 16%.²⁴

In summary, our evidence confirms the importance of common risk and CEOs' self-hedging ability in firms' decision to use RPE, and shows that firms with more independent boards and hiring compensation consultants are more likely to use RPE. However, some of our results conflict with prior evidence based on the implicit test of RPE use (e.g., the effect of industry competition). We also find little evidence that firms' decision to use RPE is influenced by the availability of peers with similar ability. Further research is needed to fully understand the effect of economic factors on firms' decision to use RPE. Collectively, however, firms appear to consider both costs and benefits in deciding the use of RPE in executive compensation contracts.

We acknowledge that firms may use RPE implicitly through boards' subjective discretion, rather than pre-committing to a formulaic explicit RPE contract (e.g., Ferri 2009). For example, boards may make discretionary bonus adjustments in spirit of RPE to reduce risk from

²⁴ Firms may use RPE to determine a substantial portion or a minimal amount of executive pay. While acknowledging the difficulty to ascertain the amount of compensation that results from RPE use, we develop a rough proxy for the extent of RPE use (*RPE_prop*) based on the ratio of RPE-involved compensation (e.g., bonus and long-term incentive payout, restricted stocks, or stock options) to total compensation. We exclude RPE firms with *RPE_prop* less than 10%, and re-estimate equation (2). Untabulated results are qualitatively similar as those reported, except that *|SIZE_Rkadj|* is marginally negative (p-value = 0.081). We also estimate equation (2) using Tobit regression by replacing *RPE* with *RPE_prop*, and obtain qualitatively similar results as those reported.

exogenous factors (Murphy and Oyer 2003). Given we cannot identify firms that implicitly use RPE, our test above intends to evaluate firms' decision to *explicitly* use RPE.

VI. SELECTION OF RPE PEER GROUPS

The effectiveness of RPE in screening common risk critically depends on how efficiently the RPE peer group is selected. In this section, we first discuss potential determinants for RPE peer selection. Next, 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.

Determinants for RPE peer selection

Common risk exposure. To better shield executives from common exogenous shocks, RPE firms need to select peers that bear greater common risk with the firms. To measure potential peers' common risk exposure, we consider the similarity in industry membership (*Same_SIC2* and *Same_SIC3*), S&P 1500 membership (*SP1500*), and S&P sub-index membership (*Same_SP*), as well as comovement in firm performance between a potential peer and the RPE firm of interest ($Corr(PeerReturn, RPEReturn)$).

Similar ability. To avoid potential inefficiencies induced by unequal contests (such as shirking and suboptimal risk choices), RPE firms need to identify peers exhibiting similar ability or facing similar environment as the firms (e.g., Lazear and Rosen 1981; Hvide 2002).²⁵ To measure the similarity in ability and environment, we construct $|PeerReturn - RPEReturn|$ and

²⁵ Lazear and Rosen (1981) refer to the mechanism of selecting similar agents in a tournament as “splitting leagues”. Besides obvious examples from sports games where subgroups of players with similar ability participate in separate tournaments, there is scant empirical evidence on whether firms consider “splitting leagues” in the design of tournament-style incentive schemes.

$|PeerMVE_RPEMVE|$, defined as the absolute differences in annual stock returns and market value of equity, respectively, between a potential peer and the RPE firm of interest.

Self-serving bias. Prior research suggests that managers may deliberately select poorly performing firms as RPE peers to inflate peer-adjusted firm performance and thus reap excess compensation and/or enhance external reputation (Gibbons and Murphy 1990; Murphy 2001). Since firms usually select their compensation peer groups (for benchmarking and/or RPE purposes) at the beginning of the fiscal year (e.g., Cadman et al. 2009b; Faulkender and Yang 2009), we measure self-serving bias using potential peers' *expected* performance at the beginning of 2006. Specifically, we construct *PeerReturn_IndReturn*, defined as a potential peer's expected stock performance minus the median expected stock performance for the RPE firm's two-digit SIC industry (excluding the RPE firm of interest). We measure expected stock performance as the difference between the first analysts' consensus 12-month target price forecast (issued within 90 days after the year beginning) and the prevailing stock price, scaled by the prevailing stock price.

Symbolism. RPE firms are 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). To test such symbolism behavior in peer selection process, we construct *PeerSales_IndSales* and *PeerMVE_IndMVE*, defined as the differences in sales and market value of equity, respectively, between a potential peer and the median levels for the RPE firm's two-digit SIC industry (excluding the RPE firm of interest).

Univariate Results

To get a preliminary assessment of which firms are chosen to be members of the RPE peer groups, for each RPE firm that disclosed self-selected peers, we identify all domestic firms

listed on Compustat that are not selected as RPE peers.²⁶ We provide descriptive statistics about selected peers and unselected peers in Table 4. Recall that about 74% of RPE firms use stock returns as their performance metric when implementing RPE contracts (Table 1 Panel E). These firms are most likely to use stock returns as the basis to select peer firms. To more accurately capture firms' peer selection process, we limit the analysis to the 135 RPE firms that employ self-selected peer groups and use stock returns as the RPE performance metric.²⁷

As shown in Table 5, 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. These results suggest that selected peer firms experience similar economic shocks as the RPE firms. Consistent with firms choosing peers with similar ability and/or facing similar environment, we find that selected peers have closer size and stock performance to those of RPE firms than unselected peers.

Table 5 also reveals a potential peer selection bias, in that selected peer firms have significantly lower expected stock performance than the rest of the Compustat universe. Finally, consistent with symbolism in setting CEO pay, we find that selected peer firms have larger sales and larger market capitalization than unselected peers.

Multivariate Regression Results

²⁶ 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 random sample for foreign firms. In addition, Compustat collects firms' reported accounting numbers, while cross-listed firms may report financial statements using non-U.S. accounting standards.

²⁷ Results based on all RPE firms with self-selected peers are qualitatively similar as those reported in the tables (untabulated). We do not conduct similar tests on RPE firms using accounting performance metrics in RPE contracts 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.

To further examine the selection of RPE peers, we estimate the following logistic regression for RPE firms that disclosed self-selected peer groups and used stock returns as RPE-based performance metrics, with standard errors clustered by RPE firms:

$$\begin{aligned}
\text{Prob}(RPE_Peer_{ijt}=1) = & \Phi(\alpha_0 + \alpha_1 Same_SIC2_{ijt-1} + \alpha_2 Same_SIC3_{ijt-1} + \alpha_3 SP1500_{ij} \\
& + \alpha_4 Same_SP_{ijt-1} + \alpha_5 Corr(PeerReturn, RPEReturn)_{s_{ijt-1}} \\
& + \alpha_6 |PeerMVE_RPEMVE|_{ijt-1} + \alpha_7 |PeerReturn_RPEReturn|_{ijt-1} \\
& + \alpha_8 PeerReturn_IndReturn_{ijt-1} + \alpha_9 PeerSales_IndSales_{ijt-1} + \alpha_{10} PeerMVE_IndMVE_{ijt-1} \\
& + \varepsilon_{ijt}) \tag{3}
\end{aligned}$$

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.

Given that the relative proportion of selected versus unselected RPE peers is highly unbalanced, the estimated coefficients from logistic regressions could be significantly biased and inefficient (e.g., Owen 2007). To alleviate this imbalance, we follow the commonly used undersampling method to randomly remove unselected peers when estimating logistic regressions (e.g., Chawla et al. 2003). Specifically, for each RPE firms, we randomly select a set of peers from domestic Compustat firms that are not chosen by the RPE firm. We require that for each RPE firm, the number of unselected peers in the random sample equals the number of selected peers. As reported in Table 4, unselected peers generated from random sampling have largely similar characteristics as the population of unselected peers. To ensure the robustness of our results, we generate 100 random samples for each regression reported in Table 5, and find very consistent results across each random generation (untabulated).

Table 6 Panel A reports regression results of estimating equation (3). Consistent with the efficient contracting view, firms belonging to the same industry (either two-digit or three-digit SIC industry) as the RPE firm, firms included in the S&P 1500 index and from the same S&P

sub-index as the RPE firm, and firms with higher return comovement are more likely to be chosen as RPE peers. We also find some evidence that similar firms are more likely to be selected as RPE peers—firms with closer size to that of the RPE firm more likely serve as RPE peers, although more similar stock performance does not significantly increase firms' chances of being selected as RPE peers. Concerning selection bias, we find significant evidence that firms with lower expected stock performance are more likely to be chosen as RPE peers. Consistent with symbolism in setting CEO pay, firms with larger sales than the RPE firm's industry are more likely to be chosen as RPE peers.

Among all variables affecting the peer selection choice, industry membership seems to have the greatest economic significance. For instance, firms from the same two-digit SIC industry as the RPE firm are 41.6% more likely to be selected as RPE peers than firms from different industries. S&P index membership also has substantial influences over the peer selection likelihood. Performance comovement, size similarity, self-selection bias, and symbolism variables have much smaller economic impacts on RPE peer selection. Collectively, our findings support both efficient contracting and rent seeking behavior in the RPE peer selection process.

We next examine potential influences of RPE firm performance on the relative importance of the two competing considerations in peer selection—efficient contracting versus rent extraction, because underperforming managers presumably have greater concerns over job insecurity and pay reduction, and hence have stronger incentives to manipulate the peer selection process. To examine this issue, we re-estimate equation (3) among RPE firms with below-industry versus above-industry stock returns during 2006. Results are reported in Table 6 Panel B. Consistent with our conjecture, we find that the negative relation between potential peers'

expected performance and the likelihood of being selected as RPE peers is more (less) pronounced for RPE firms underperforming (outperforming) their industries. Moreover, the positive impact of stock performance comovement over RPE peer selection choice is significant among outperforming RPE firms, but insignificant among underperforming RPE firms. These findings suggest that peer selection by outperforming firms reflects more efficient contracting considerations, probably due to managers having less concern of job insecurity and already being well paid. On the contrary, peer selection by underperforming firms reflects more rent seeking considerations, probably because managers' concerns about potential reputation loss and lowered compensation provide stronger incentives to manipulate the peer selection process in these firms.

One potential confounding issue is that RPE peers are often used to benchmark the level of executive pay. The dual role of compensation peer groups could weaken evidence supporting the RPE peer selection bias because firms have incentive to choose highly paid benchmarking peers, which likely have good performance, to justify higher executive pay. To examine this possibility, we hand collect compensation benchmarking peers for RPE firms with self-selected peers (also see footnote 4). We then re-estimate equation (3) by requiring selected RPE peers not to be included in the compensation benchmarking peer group. For comparison purpose, we also re-estimate equation (3) by requiring selected RPE peers to be also used for compensation benchmarking purpose. Table 6 Panel C reports regression results. We find that the RPE peer selection bias—the negative relation between potential peers' expected performance and the likelihood of being selected as RPE peers—persists when RPE peers are not used for compensation benchmarking. Hence, the possibility that RPE peers may serve as compensation benchmarking peers is unlikely to alter our inferences.

Analysis of Inter-temporal Changes in RPE Peer Group Composition

To provide further evidence on peer selection choice, we analyze the inter-temporal changes in RPE peer group composition. If peer selection choice conforms to efficient contracting, we expect to observe added peers exhibiting greater ability to remove common risk and greater similarity than dropped peers. On the other hand, if firms desire poorly performing peers when forming RPE peer groups, we expect that added RPE peers have worse performance than dropped RPE peers. To the extent that equation (3) may neglect certain aspects that influence firms' selection of RPE peers, we may not observe significant differences in variables included in equation (3) between added and dropped peer firms.

Starting with 232 firms that disclosed self-selected RPE peers in 2006, we find that 180 firms continued using RPE in 2007, among which 155 firms disclosed self-selected RPE peer groups. For the 155 firms that disclosed self-selected peer groups in both 2006 and 2007, 22 firms used the same RPE peer groups and 133 firms modified their RPE peer groups in 2007. For the 133 firms, the portion of 2006's RPE peers retained in 2007 is 73.6 percent. This high retention rate raises the concern that testing differences between added and dropped RPE peers may lack power.

Table 7 reports the differences in factors affecting the selection of RPE peers between the added and dropped peers. The sample includes 75 firms that have both dropped and added RPE peers in 2007 and have available data on required variables. We find that added peers' industry-adjusted expected performance is significantly negative, whereas dropped peers' industry-adjusted expected performance is insignificant. While this finding supports self-serving bias in RPE peer selection, the contrast between added and dropped peers is statistically insignificant. This weak evidence could reflect low test power and/or increased public scrutiny of peer selection process under the SEC's new regulation, which forces firms to restrain opportunistic

behavior in peer selection. Interestingly, added peers have closer firm size to RPE firms than dropped peers, consistent with more (less) similar firms being added to (dropped from) the RPE peer group.

Taken together, results provided in this section support the efficient contracting view that firms take into consideration the exposure to common shocks and the similarity between firms when selecting RPE peers. At the same time, we also find a selection bias in forming RPE peer groups, in that firms are more likely to select expected underperforming firms as RPE peers. Importantly, our results show that RPE firms' performance significantly influences the relative importance of efficient contracting versus rent extraction in explaining RPE peer selection.

VII. CONCLUSION

We examine the use of RPE and related peer groups based on disclosures from S&P 1500 firms' first proxies filed under the SEC's 2006 executive compensation disclosure rules. We demonstrate that using the disclosed RPE peer groups, instead of firms with similar size and industry, can significantly improve the power of the implicit test to detect RPE use. This finding highlights the importance of incorporating explicit RPE contract details in testing the use of RPE. Concerning firms' decision to explicitly use RPE, our findings suggest that firms consider both costs and benefits of RPE as an incentive mechanism. Analysis of firms' self-selected RPE peers lends support for the efficient use of RPE as well as a self-serving selection bias in forming RPE peer groups.²⁸ We further show that the evidence supporting efficient contracting is more

²⁸ Other than selecting underperforming peers, there exist alternative channels through which firms can manipulate the achievability of RPE-based performance target and hence executive pay (such as through lowering the threshold of RPE-based performance target or selecting RPE-based performance metrics). We acknowledge that other design features of RPE contracts (other than peer selection) may also exhibit self-serving bias. Given firms do not observe realized peer performance when selecting RPE peers, it is arguable that selecting (expected) underperforming peers is less visible than some other channels such as lowering the threshold of RPE-based performance target (e.g.,

pronounced among outperforming RPE firms, whereas the evidence supporting selection bias is more significant among underperforming RPE firms.

Our study contributes to the executive compensation literature by providing the first large sample U.S. evidence on firms' decision to explicitly use RPE in executive compensation contracts. We also shed light on the RPE peer selection process, and provide supporting evidence that RPE implementation involves both efficient contracting and rent seeking 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 used in setting executive compensation. One limitation of our study is that we are unable to identify firms that use RPE implicitly without pre-committing to a formal explicit RPE contract. Future research could examine both explicit and implicit contracting to better understand RPE as an incentive mechanism.

lowering the threshold from 50 percentile to 25 percentile). Thus, it is possible that our empirical evidence may understate the extent of self-serving bias in designing and implementing RPE contracts.

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APPENDIX A

Timeline of Introducing the SEC's New Executive Compensation Disclosure Rules

October 16, 1992 to January 27, 2006: “Executive Compensation Disclosure”

The 1992 regulation eschewed a mostly narrative disclosure approach adopted in 1983 in favor to formatted tables that capture all executives' compensation.

January 27, 2006: SEC released the proposed rule “Executive Compensation and Related Party Disclosure”

The proposed rule combines a broader-based tabular presentation with improved narrative disclosure supplementing the tables.

January 27, 2006 to April 10, 2006: Open for public comments

SEC had received more than 20,000 comment letters, most of which supported the new disclosure reform.

August 29, 2006: SEC released the final rule “Executive Compensation Disclosure”

August 29, 2006 to October 23, 2006: Open for public comments

Effective Date:

“Companies must comply with these disclosure requirements in Forms 8-K for triggering events that occur on or after November 7, 2006 and in Forms 10-K and 10-KSB for fiscal years ending on or after December 15, 2006. Companies other than registered investment companies must comply with these disclosure requirements in Securities Act registration statements and Exchange Act registration statements (including pre-effective and post-effective amendments), and in any proxy or information statements filed on or after December 15, 2006 that are required to include Item 402 and 404 disclosure for fiscal years ending on or after December 15, 2006. Registered investment companies must comply with these disclosure requirements in initial registration statements and post-effective amendments that are annual updates to effective registration statements on Forms N-1A, N-2 (except those filed by business development companies) and N-3, and in any new proxy or information statements, filed with the Commission on or after December 15, 2006.” (directly quoted from the SEC)

APPENDIX B

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 seven companies. The first five companies are classified as RPE firms. The last two companies are classified as non-RPE firms due to lack of details about RPE use in compensation contracts. 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
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.

Consolidated Graphics Inc.

Overall Compensation Philosophy and Policies

Our compensation philosophy regarding members of the Board and the Company's Executive Officers is to maintain compensation policies which align compensation with the Company's overall business strategy, values and

management initiatives. The policies are intended to (1) reward individuals for long-term strategic management and enhancement of shareholder value; (2) **support a performance-oriented environment that rewards achievement of internal Company goals and recognizes the Company's performance compared to the performance of similarly situated companies**; (3) attract and retain individuals whose abilities are considered essential to the long-term future and competitiveness of the Company; and (4) align the financial interests of the Company's directors and Executive Officers with those of the shareholders.

Federated Investors Inc.

Compensation Philosophy and Objectives

The investment management business is highly competitive and experienced professionals have significant career mobility. Our ability to attract, retain and properly motivate highly qualified professionals is a critical factor in maintaining our competitive position within the investment management industry and ensuring our future success. Accordingly, our compensation program is comprised of competitive levels of cash compensation together with equity and other components that are consistent with shareholder interests. Our compensation program is designed to reward outcomes related to a variety of factors including our revenues, earnings, earnings on a per share basis, and return on equity and payout ratio. **Additional consideration is given to our investment and financial performance as measured against other similar companies within the investment management industry, and the performance of our stock.** Federated's Chief Executive Officer, Chief Financial Officer and its three other most highly compensated executive officers are referred to herein as the "Named Executive Officers."

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

Panel A: Relative Performance Evaluation Use

	Number of firms	Percent (%)
RPE firms	361	25.44
Non-RPE firms	1,058	74.56
Total	1,419	100

RPE (Non-RPE) firms include 361 (1,058) 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 and Performance Metrics

	Price-based metrics	Accounting metrics	Price-based and accounting metrics	Others	Total
Equity-based compensation plan only					
Restricted Stock	126	26	17	3	172
Stock option	3	1	1	0	5
Restricted Stock and stock option awards	21	7	6	3	37
Subtotal	150	34	24	6	214
Cash compensation plan only	32	35	12	3	82
Equity-based and cash compensation plans	24	13	24	4	65
Total	206	82	60	13	361

“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.

“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 C: Commonly Used Price-based and Accounting Performance Metrics for Relative Performance Evaluation

	Number of firms	Percent (%)
Stock returns	266	73.68
Return-on-equity	50	13.85
Growth of earnings	42	11.63
Earnings	39	10.81
Growth of sales	24	6.65
Return-on-asset	14	3.88
Cash flow	13	3.60

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

Panel D: Details of Relative Performance Evaluation Use in Equity-based Compensation Plan

	Number of firms	Percent (%)
RPE determines:		
Vesting condition and subsequent grants of PSU (type 1)	120	43.01
Size of initial equity grants (type 2)	94	33.69
Vesting condition of initial equity grants (type 3)	61	21.86
Both type 1 and 3	2	0.72
Both type 2 and 3	2	0.72
Total	279	100

“Vesting condition and subsequent grants of PSU” category includes firms that use RPE to determine the vesting of “performance share units (PSU)”. Performance shares are similar to restricted stocks in that they fully vest at the end of certain performance period starting with the grant year (usually three years). However, the range of vesting amount for PSU is usually between 0% and 200% (sometimes 150%), which is very different from that for restricted stock units (RSU) capped at 100%. “Size of initial equity grants” category includes firms that use RPE to determine the size of initial equity grants. “Vesting condition of initial equity grants” category includes firms whose stock options or RSUs are vested conditioned on achievement of RPE goals. This category also includes firms where the vesting schedule of stock options or restricted stock is accelerated if the company achieves certain RPE target.

Panel E: Relative Performance Evaluation Use by Type of Compensation Plan and Peer Group Choice

	Self-selected peers	Market/Industry index	Market/Industry index and Self-selected peers	Total
Equity-based compensation plan only				
Restricted Stock	91	72	9	172
Stock option	4	1	0	5
Restricted Stock and stock option awards	21	10	6	37
Subtotal	116	83	15	214
Cash compensation plan only	51	25	6	82
Equity-based and cash compensation plans	42	19	4	65
Total	209	127	25	361

“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” category includes firms that chose published market/industry indices 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: Number of Peers in the Self-selected Peer Groups and Industry Similarity and S&P 1500 Identity for Self-Selected Peers

	Mean	Standard Deviation	25%	Median	75%	N
Number of self-selected peers	14.694	8.721	9	13	18	232
Percent of self-selected peers in the same two-digit SIC industry as the RPE firms (%)	60.92	33.39	34.85	66.67	91.67	232
Percent of self-selected peers in the same three-digit SIC industry as the RPE firms (%)	47.92	34.93	14.84	45.45	83.33	232
Percent of self-selected peers in the S&P1500 index (%)	70.37	22.42	58.58	74.60	86.36	232
Percent of self-selected peers in the same S&P1500 sub-index as the RPE firms (%)	45.11	27.77	23.67	40.00	67.71	232

There are two 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. There are 39 (25) RPE firms whose self-selected peer firms all come from the same two-digit (three-digit) SIC industry. There are 25 (10) RPE firms whose self-selected peer firms all come from the S&P1500 index (the same S&P1500 sub-index as the RPE firms).

TABLE 2
Descriptive Statistics of the Sample

	Non-RPE firms (N = 1,058)		RPE firms (N = 361)		Mean Differences	Median Differences
	Mean	Median	Mean	Median		
Firm Characteristics:						
<i>Idiosyncratic_Risk</i>	-2.635	-2.614	-3.005	-3.046	0.370***	0.432***
<i>/SIZE_Rkadj/</i>	5.348	5.081	6.325	5.969	-0.977***	-0.888***
<i>/Return_Rkadj/</i>	0.049	0.024	0.040	0.022	0.009**	0.002
<i>Industry_Concentration</i>	0.124	0.085	0.110	0.072	0.014**	0.013***
<i>BM</i>	0.600	0.602	0.682	0.692	-0.082***	-0.090***
<i>SIZE</i>	7.654	7.466	8.484	8.355	-0.830***	-0.889***
<i>ROA_Indadj</i>	0.014	0.000	0.005	0.000	0.009	0.000
<i>Return_Indadj</i>	0.017	-0.007	0.019	-0.001	-0.002	-0.006
CEO Attributes:						
<i>CEO_Wealth</i>	8.972	9.868	9.435	10.011	-0.463	-0.143
<i>CEO_Age</i>	55.882	56.000	56.053	56.000	-0.171	0.000
Corporate Governance:						
<i>Top5_Instown</i>	0.392	0.372	0.374	0.353	0.018**	0.019**
<i>Activist_Instown</i>	0.028	0.028	0.028	0.029	0.000	-0.001**
<i>CEO/Chair</i>	0.601	1.000	0.659	1.000	-0.058*	0.000
<i>Board_Independence</i>	0.817	0.857	0.857	0.889	-0.040***	-0.032***
<i>Board_Size</i>	8.957	9.000	10.518	10.000	-1.561***	-1.000***
<i>CompConsultant</i>	0.798	1.000	0.904	1.000	-0.106***	0.000

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 contracts. *Idiosyncratic_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_Rkadj/* is the natural logarithm of the absolute difference between the firm's market value of equity and the median market value of equity for the firm's corresponding decile. */Return_Rkadj/* is the absolute difference between the firm's annual stock returns and the median annual stock returns for the firm's corresponding decile. *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. *Size* is the natural logarithm of the market value of equity. *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. *CompConsultant* is equal to one if the firm uses compensation consultant in the pay setting process (as disclosed in their first annual proxies filed under the SEC's 2006 executive compensation disclosure rules), and zero otherwise. *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. ***/**/* indicate significance at less than the 1%/5%/10% level based on two-tailed t tests (z tests) on mean (median) differences.

TABLE 3
Implicit Test of RPE Use (following Albuquerque 2009) With and Without Incorporating Explicit RPE Contract Details

Independent Variables	Predicted Sign	Full sample (S&P 1500)	RPE non-disclosing firms	RPE disclosing firms	RPE disclosing firms with self-selected peers		
		(1)	(2)	(3)	All (4)	Unrelated to vesting conditions (5)	Related to vesting conditions (6)
		Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
Firm Stock Return	+	0.329*** (0.001)	0.274** (0.013)	0.907*** (<.0001)	0.844*** (0.001)	0.759* (0.077)	0.694** (0.039)
Peer Return (Industry/Size)	-	0.536 (0.135)	0.145 (0.728)	1.501** (0.023)			
Peer Return (Self-selected Peers)	-				-1.292** (0.016)	-1.671** (0.029)	0.258 (0.849)
Control variables:							
Firm size (sales)	+	0.471*** (<.0001)	0.479*** (<.0001)	0.436*** (<.0001)	0.429*** (<.0001)	0.450*** (<.0001)	0.387*** (<.0001)
Growth option	+	0.077*** (0.006)	0.064** (0.0353)	0.208*** (<.0001)	0.259*** (<.0001)	0.241*** (0.006)	0.323*** (<.0001)
CEO Tenure	+	-0.247** (0.093)	-0.206 (0.4149)	0.288 (0.706)	-0.737*** (0.006)	-1.042** (0.018)	-0.790** (0.069)
Regulation dummy	-	-0.072* (0.044)	-0.055 (0.187)	-0.137** (0.0478)	-0.116 (0.200)	-0.074 (0.642)	-0.237 (0.141)
Idiosyncratic variance	+	1.047 (0.319)	0.487 (0.682)	4.900** (0.028)	1.304 (0.564)	2.509 (0.5663)	-1.803 (0.746)
CEO/Chair	+	0.232*** (<.0001)	0.203*** (0.001)	0.373*** (<.0001)	0.483*** (<.0001)	0.557*** (0.006)	0.578*** (0.003)
CEO ownership dummy	+	0.072 (0.261)	0.077 (0.287)	0.061 (0.710)	0.003 (0.986)	0.104 (0.688)	0.095 (0.813)
Interlock dummy	+	-0.925* (0.029)	-1.426*** (<.0001)	0.597 (0.623)	0.454 (0.682)	0.413 (0.713)	n/a
Intercept		3.356*** (<.0001)	4.536*** (<.0001)	3.169*** (0.000)	4.837*** (<.0001)	4.971*** (<.0001)	5.009*** (<.0001)
Industry dummies		Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square		0.555	0.538	0.673	0.724	0.741	0.805
Number of observations		1,128	837	291	183	94	89

The full sample includes S&P 1500 firms from the ExecuComp database for the year 2006 merged with Compustat and CRSP data. The dependent variable, *CEOPay*, is the natural logarithm of total CEO compensation for 2006 in thousands of dollars (TDC1). Firm stock return (*FirmPerf*) is 12-month buy-and-hold stock returns for 2006. Peer return (*PeerPerf*) is measured in two ways. Peer return Industry/Size is the median 12-month buy-and-hold stock returns for 2006 (excluding own-firm performance) for the industry and size matched peer group (see Albuquerque (2009) for details). Peer return (Self-selected Peers) is the median 12-month buy-and-hold stock returns for 2006 for the self-selected peer group by RPE firms. Firm size (sales) is the natural logarithm of sales for 2005. Growth option is the ratio of the market value of equity to the book value of assets at the beginning of 2006. CEO Tenure is the natural logarithm of the number of years since the CEO assumed office. Regulation dummy is an indicator variable equal to one for firms in the gas and electric industries with SIC codes from 4900 to 4939, and zero otherwise. Idiosyncratic variance is the difference between firm-level stock return variance and the industry's average return variance, calculated over the previous 36 months. CEO/Chair is an indicator variable equal to one if the CEO is the board chair, and zero otherwise. CEO ownership dummy is an indicator variable equal to one if the proportion of shares held by the CEO is lower than the sample median, and zero otherwise. Interlock dummy is an indicator variable equal to one if the CEO is involved in an interlock relationship requiring disclosure in the proxy statement, and zero otherwise. The standard errors are heteroskedasticity-consistent using the Huber-White correction and are clustered by firm. **/**/* indicate significance at less than the 1%/5%/10% level based on two-tailed t tests.

TABLE 4
Logistic Regression of Relative Performance Evaluation Use in Executive Compensation Contracts
among S&P 1500 Firms

Independent Variables	Predicted Sign	Coefficient (p-value)	Change in Probability Q1 vs Q3 Values
Firm Characteristics:			
<i>Idiosyncratic_Risk</i>	-	-0.881*** (0.000)	0.022
<i> SIZE_Rkadj </i>	-	-0.082 (0.229)	-0.046
<i> Return_Rkadj </i>	-	1.454 (0.239)	0.012
<i>Industry_Concentration</i>	+/-	-2.138** (0.024)	-0.037
<i>BM</i>	+/-	1.733*** (0.001)	0.128
<i>Size</i>	+/-	0.460*** (0.000)	0.025
<i>ROA_Indadj</i>	+/-	0.487 (0.715)	0.011
<i>Return_Indadj</i>	+/-	0.283 (0.481)	0.020
CEO Attributes:			
<i>CEO_Wealth</i>	-	-0.172*** (0.002)	-0.051
<i>CEO_Age</i>	-	0.009 (0.524)	0.019
Corporate Governance:			
<i>Top5_Instown</i>	+	0.364 (0.694)	0.012
<i>Activist_Instown</i>	+	9.377 (0.418)	0.021
<i>CEO/Chair</i>	-	0.040 (0.828)	0.010
<i>Board_Independence</i>	+	3.853*** (0.001)	0.016
<i>Board_Size</i>	+/-	0.045 (0.282)	0.032
<i>CompConsultant</i>	+	0.663** (0.016)	0.160
Intercept		-11.153*** (<.0001)	
Number of RPE / Non-RPE firms		255 / 640	
Percent concordant / discordant		76.8 / 23.0	
Pseudo R-square		0.249	
Wald χ^2		128.406	
(p-value)		(<.0001)	

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 contracts and available information on regression variables. 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 Change in Probability columns show the change in the probability of using RPE as the result of moving from the first to the third quartile value of the variable of interest (for indicator variables, moving from zero to one), holding all other variables constant at their mean values (for indicator variables, the benchmark probability is determined with the zero value). 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 5
Mean (Median) of Variables Used to Explain RPE Peer Selection for Selected RPE Peers and Unselected RPE Peers

	Selected RPE peers (N = 1,668)		Unselected RPE peers (N = 363,618)		Unselected RPE peers used in Table 6 (N = 1,668)	
	Mean	Median	Mean	Median	Mean	Median
<i>Same_SIC2</i>	0.634	1	0.034	0	0.032	0
<i>Same_SIC3</i>	0.454	0	0.016	0	0.016	0
<i>SP1500</i>	0.862	1	0.481	0	0.469	0
<i>Same_SP</i>	0.528	1	0.157	0	0.146	0
<i>CORR(PeerReturn,RPEReturn)</i>	0.364	0.474	0.197	0.265	0.186	0.250
<i> PeerMVE_RPEMV </i>	12,081.380	3,222.640	15,326.800	4,005.010	13,738.910	3,939.830
<i> PeerReturn_RPEReturn </i>	0.244	0.175	0.389	0.294	0.366	0.274
<i>PeerReturn_IndReturn</i>	-0.028	-0.029	0.057	-0.002	0.050	-0.002
<i>PeerSales_IndSales</i>	8,533.020	2,911.060	2,303.540	152.038	2,223.040	125.269
<i>PeerMVE_IndMVE</i>	14,927.690	3,884.600	3,605.680	377.334	3,402.570	318.729

Selected RPE peers include domestic firms that are chosen by a RPE firm as RPE peers. Unselected RPE peers include all the other domestic firms that are not chosen by a RPE firm as RPE peers. Unselected RPE peers used in Table 6 include a set of randomly generated firms from Unselected RPE peers and are used in Table 6 regressions. We limit to RPE firms that use stock returns as the performance metric and self-selected peers in RPE contracts. *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, Mid-Cap 400, and Small-Cap 600) as the RPE firm, and zero otherwise. *CORR(PeerReturn,RPEReturn)* is the Pearson correlation of annual stock returns between the RPE firm and the potential peer over the prior five years. *|PeerMVE_RPEMV|* and *|PeerReturn_RPEReturn|* are the absolute values of the pair-wise differences between market value of equity and annual stock returns for the potential peer and market value of equity and annual stock returns for the RPE firm. *PeerReturn_IndReturn*, *PeerSales_IndSales*, and *PeerMVE_IndMVE* are the pair-wise differences between analysts' forecasted annual stock returns, sales, and market value of equity for the potential peer and median analysts' forecasted 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). 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). *|PeerMVE_RPEMV|* and *|PeerReturn_RPEReturn|* are winsorized at top one percentiles. *PeerReturn_IndReturn*, *PeerSales_IndSales*, and *PeerMVE_IndMVE* are winsorized at top and bottom one percentiles. The mean differences between Selected RPE peers and Unselected RPE peers are all statistically significant at less than 1% level.

TABLE 6
Logistic Regression of Peer Firm Selection for S&P1500 Firms Using Stock Returns as the Performance Metric and Self-selected Peers in Relative Performance Evaluation

Panel A: All RPE Peers

Independent Variables	Predicted Sign	Coefficient (p-value)	Change in Probability Q1 vs Q3 Values
<i>Same_SIC2</i>	+	2.394*** ($<.0001$)	0.416
<i>Same_SIC3</i>	+	1.005*** ($<.0001$)	0.232
<i>SP1500</i>	+	0.525*** ($<.0001$)	0.128
<i>Same_SP</i>	+	0.940*** ($<.0001$)	0.219
<i>CORR(PeerReturn,RPEReturn)</i>	+	0.246*** (0.001)	0.049
<i> PeerMVE_RPEMVE </i>	-	-0.013*** (0.000)	-0.033
<i> PeerReturn_RPEReturn </i>	-	-0.178 (0.197)	-0.014
<i>PeerReturn_IndReturn</i>	-	-0.921*** ($<.0001$)	-0.038
<i>PeerSales_IndSales</i>	+	0.019** (0.016)	0.024
<i>PeerMVE_IndMVE</i>	+	0.017*** (0.000)	0.028
Intercept		-1.416*** ($<.0001$)	
Number of selected / unselected peers		1,668 / 1,668	
Percent concordant / discordant		92.4 / 7.5	
Pseudo R-square		0.668	
Wald χ^2 (p-value)		895.429 $<.0001$	

Panel B: RPE firms Underperforming and Outperforming their industries

Independent Variables	Predicted Sign	Underperforming RPE Firms		Outperforming RPE Firms	
		Coefficient (p-value)	Change in Probability Q1 vs Q3 Values	Coefficient (p-value)	Change in Probability Q1 vs Q3 Values
<i>Same_SIC2</i>	+	2.841*** ($<.0001$)	0.445	2.068*** ($<.0001$)	0.388
<i>Same_SIC3</i>	+	0.633** (0.018)	0.153	1.362*** ($<.0001$)	0.296
<i>SP1500</i>	+	0.213* (0.093)	0.053	1.094*** ($<.0001$)	0.249
<i>Same_SP</i>	+	1.127*** ($<.0001$)	0.255	0.777*** ($<.0001$)	0.185
<i>CORR(PeerReturn,RPEReturn)</i>	+	0.089 (0.4415)	0.016	0.267*** (0.004)	0.057
<i> PeerMVE_RPEMVE </i>	-	-0.013*** (0.001)	-0.037	-0.016* (0.069)	-0.034
<i> PeerReturn_RPEReturn </i>	-	0.072 (0.724)	0.005	-0.312 (0.132)	-0.026
<i>PeerReturn_IndReturn</i>	-	-1.337*** ($<.0001$)	-0.051	-0.588** (0.018)	-0.026
<i>PeerSales_IndSales</i>	+	0.020 (0.163)	0.027	0.020** (0.012)	0.023
<i>PeerMVE_IndMVE</i>	+	0.014** (0.026)	0.028	0.019*** (0.008)	0.029
Intercept		-1.303*** ($<.0001$)		-2.058*** ($<.0001$)	
Number of selected / unselected peers		792 / 792		876 / 876	
Percent concordant / discordant		93.1 / 6.7		92.1 / 7.8	
Pseudo R-square		0.690		0.665	
Wald χ^2		436.588		446.964	
(p-value)		$<.0001$		$<.0001$	

Panel C: RPE Peers Not Used and Used For Compensation Benchmarking Purpose

Independent Variables	Predicted Sign	RPE Peers Not Used For Benchmarking		RPE Peers Used For Benchmarking	
		Coefficient (p-value)	Change in Probability Q1 vs Q3 Values	Coefficient (p-value)	Change in Probability Q1 vs Q3 Values
<i>Same_SIC2</i>	+	2.566 ^{***} ($<.0001$)	0.429	0.642 ^{**} (0.026)	0.155
<i>Same_SIC3</i>	+	2.044 ^{***} (0.000)	0.385	1.089 ^{***} ($<.0001$)	0.248
<i>SP1500</i>	+	0.443 ^{**} (0.043)	0.109	0.688 ^{***} ($<.0001$)	0.165
<i>Same_SP</i>	+	0.852 ^{***} (0.000)	0.201	0.415 [*] (0.052)	0.102
<i>CORR(PeerReturn,RPEReturn)</i>	+	0.259 [*] (0.068)	0.051	0.287 ^{***} (0.001)	0.056
<i> PeerMVE_RPEMVE </i>	-	-0.021 ^{**} (0.011)	-0.052	-0.001 (0.613)	-0.002
<i> PeerReturn_RPEReturn </i>	-	-0.306 (0.193)	-0.024	1.054 ^{***} ($<.0001$)	0.084
<i>PeerReturn_IndReturn</i>	-	-1.236 ^{***} (0.000)	-0.049	-2.841 ^{***} ($<.0001$)	-0.118
<i>PeerSales_IndSales</i>	+	0.007 (0.610)	0.010	-0.007 (0.181)	-0.008
<i>PeerMVE_IndMVE</i>	+	0.022 ^{**} (0.027)	0.036	0.010 ^{***} (0.003)	0.017
Intercept		-1.349 ^{***} ($<.0001$)		-2.130 ^{***} ($<.0001$)	
Number of selected / unselected peers		511 / 511		1,157 / 1,157	
Percent concordant / discordant		89.3 / 10.6		93.1 / 6.8	
Pseudo R-square		0.578		0.687	
Wald χ^2		228.344		628.931	
(p-value)		$<.0001$		$<.0001$	

The sample includes selected peers and unselected peers (generated from random sampling) for the 135 RPE firms choosing self-selected peer groups and using stock returns as the performance metric in relative performance evaluation. 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. See Table 5 for the other variable definitions. *|PeerMVE_RPEMVE|* and *|PeerReturn_RPEReturn|* are winsorized at top one percentiles. *PeerReturn_IndReturn*, *PeerSales_IndSales*, and

PeerMVE_IndMVE are winsorized at top and bottom one percentiles. For ease of exposition, coefficients on *PeerSales_IndSales*, *PeerMVE_IndMVE*, and *|PeerMVE_RPEMV|* are multiplied by 1,000. The Change in Probability columns show the change in the probability of being selected as a RPE peer as the result of moving from the first to the third quartile value of the variable of interest (for indicator variables, moving from zero to one), holding all other variables constant at their mean values (for indicator variables, the benchmark probability is determined with the zero value). Two-tailed p-values in parentheses are based on clustered standard errors at the RPE firm level. ***/**/* indicate significance at less than the 1%/5%/10% level based on two-tailed Chi-square tests.

TABLE 7
Mean (Median) of Variables Used to Explain RPE Peer Selection
for Peers Unchanged, Added, and Dropped in 2007

	Peers Added (1)	Peers Dropped (2)	Peers Unchanged (3)	Paired t-statistic (1)-(2)
Selection Bias:				
<i>PeerReturn</i>	0.101	0.115	0.096	-1.55
<i>PeerReturn_IndReturn</i>	-0.035	-0.014	-0.038	-1.55
Other Determinants of Peer Selection				
<i>Same_SIC2</i>	0.614	0.653	0.703	-1.63
<i>Same_SIC3</i>	0.481	0.465	0.552	-1.27
<i>SP1500</i>	0.720	0.707	0.789	0.15
<i>Same_SP</i>	0.590	0.507	0.643	1.49
<i>CORR(PeerReturn,RPEReturn)</i>	0.357	0.424	0.394	-1.54
<i> PeerMVE_RPEMVE </i>	15,428.350	21,772.750	15,703.120	-1.68*
<i> PeerReturn_RPEReturn </i>	0.232	0.253	0.222	-0.89
<i>PeerSales_IndSales</i>	10,252.390	14,182.150	11,710.980	-0.70
<i>PeerMVE_IndMVE</i>	18,447.670	22,862.210	19,342.390	-0.52

The sample includes 75 firms that report two different RPE peer groups for 2006 and 2007 and have available data on required variables. All variables are measured at the beginning of 2007. *PeerReturn* is peer firms' expected stock performance (based on analysts' target price forecasts at the beginning of 2007). See Table 5 for the other variable definitions. Bold figures indicate significance level at less than 5%. * indicate significance at less than the 10% level based on two-tailed paired t-tests of the mean differences.