Assessing the Efficiency of Compensation Contracts: A Parsimonious Approach

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Abstract

We modify the work-horse pay-for-performance sensitivity design (where annual changes in CEO compensation are regressed on annual performance measures) by distinguishing between stock returns on information event days, when stock returns better reflect CEO effort, versus those on "regular" (non-event) days. We find that the sensitivity of annual CEO pay to stock returns is 74% larger on information event days versus "regular" days. We distill information events further based on accounting versus non-accounting information events and find that the sensitivity is 80% larger on accounting days than other event days. Consistent with our methodology offering a parsimonious way to assess the efficiency of compensation contracts, our tests reveal that our pay-information return sensitivities are stronger in firms focused on shareholder value maximization. Our study uncovers variations in pay-for-performance sensitivity based on managerial effort that are not documented previously and not readily observable from explicit contracts.

JEL Classification: J33, M41
Keywords: Executive compensation; pay-for-effort sensitivity, pay-for-performance sensitivity; accounting performance

"The CEO pay literature has yet to reach a consensus on the appropriate methodologies and metrics to use in evaluating the implicit relation between CEO pay and company stock- price performance."

Murphy (1999)

1. Introduction

Executive compensation contracts are becoming increasingly complex (e.g., Albuquerque, Carter, Guo, and Lynch, 2025). Within the same compensation package, there often exist several types of compensation, multiple performance metrics with varying measurement periods and vesting conditions, along with intricate performance target structures. Many enduring debates regarding executive compensation in academia, boardrooms, and popular media involve assessing when executive compensation contracts are designed efficiently to address agency problems and when they are set opportunistically to serve the agent (executive) at the expense of the principal (shareholders).[1] The complexity of executive compensation contracts makes it difficult to holistically assess a contract's efficiency and compare it across firms, between executives, and over time. In this study, we develop a new measure of CEO pay-for-performance sensitivity that potentially allows a parsimonious and comparable assessment of the efficiency of compensation contracts.

Explicit managerial compensation contracts typically treat stock returns (either raw or benchmark-adjusted) calculated over a performance evaluation period, generally annually, as a single performance measure. Academic studies have largely followed this convention, where the annual stock return is considered a standalone metric of managerial performance. However, the key element that renders stock returns useful, i.e., responding to the arrival of new information about managerial effort, is unlikely to be uniform during a year. It is therefore natural to expect stock returns on information arrival days to be more informative about managerial effort and thus

[1] Controversies related to alleged excessive CEO pay and low accountability for poor performance have attracted the attention of news media (see, for example, https://time.com/6256076/most-overpaid-ceos-2022/) and spurred a large body of academic research (e.g., Jensen and Murphy, 1990; Garvey and Milbourn, 2006; Edmans, Gosling, and Jenter, 2023).

more strongly associated with executive compensation than other days. Because the annual stock return contains both information and noise, the classic pay-for-*annual stock return performance* sensitivity, as commonly estimated in prior literature (see Bushman and Smith, 2001, for a review), likely estimates the pay-for-*managerial effort* sensitivity with error. Our methodology isolates the elements of annual stock returns that are more likely to be effort-related, to better assess the sensitivity of managerial pay to managerial effort as envisioned in compensation theory (e.g., Holmström, 1979). In particular, we decompose stock returns based on days that are likely to be reflective of managerial effort (i.e., information event days), and especially days with accounting disclosures, and estimate the sensitivities of CEO pay to information event- (accounting event-) stock returns. This allows us to better gauge the extent to which managerial compensation is revised in response to management effort, as predicted by efficient contracting.

We begin by decomposing the annual stock return for each firm-fiscal year (*RET*) into two components based on corporate events that reflect managerial effort – which we label *RET_EFF* (denoting stock returns on days with events that reflect managerial effort) and *RET_NONEFF* (stock returns during the remaining days of the year).[2] We identify all corporate events during the fiscal year where stock prices reflect information about the manager's effort and examine the sensitivity of managerial pay revisions to stock returns around these events (i.e., *RET_EFF*) and contrast this with the sensitivity to stock returns during non-effort-related "regular" trading days (i.e., *RET_NONEFF*).[3] Specifically, we identify trading days within the [-1,+1] window surrounding a particular category of events and compound stock returns over these trading days.[4]

[2] In particular, we calculate *RET_NONEFF* as (1 + *RET*)/(1 + *RET_EFF*) – 1, following the standard formula of compounded stock returns.

[3] We define effort-related events based on Capital IQ that captures all firm-initiated events that are informative about managerial effort. While most of these events result from the firm's own actions, a very small portion might be precipitated by sources external to the firm, such as the firm disclosing that the S&P has decided to include it in its index. We do not include events initiated by the firm but not relevant for managerial effort. We also do not include firm-related announcements that are made by sources outside the firm such as analysts' earnings estimates and recommendations. Appendix A presents a detailed list of event classifications.

[4] This procedure removes overlapping event window returns to avoid double counting. This approach also mitigates the limitation of stock prices, i.e., they include non-CEO-effort-related effects such as discount rate shocks, investor

We expect compensation changes to be more strongly correlated with effort-related returns (i.e., *RET_EFF*) than non-effort-related returns (i.e., *RET_NONEFF*). And that is exactly what we find. While the coefficient on annual stock returns (*RET*) in a regression of CEO compensation changes on annual stock returns (and accounting earnings) is 0.196 and indicates that a 1% annual stock returns correspond to a 0.196% increase in CEO compensation, this coefficient obscures variation amongst its underlying components. In other words, CEO compensation increases only by 0.155% for a 1% non-effort-related stock returns (*RET_NONEFF*) as compared to a 0.27% increase for a 1% effort-related stock returns (*RET_EFF*) – which indicates a stronger pay-for-performance sensitivity in response to CEO effort to the tune of 74% (i.e., (0.270/0.155)-1).[5]

Before proceeding with further descriptions of our analysis, we emphasize that our inferences are distinct from past work (e.g., Beyer et al., 2010; Shao et al., 2021) that shows that accounting event returns have a high explanatory power with respect to annual (quarterly) stock returns. The fact that accounting event returns have a higher explanatory power than non-accounting event returns for annual (quarterly) stock returns does not automatically imply a greater sensitivity of the former than the latter for managerial compensation. In other words, accounting event returns contribute one (percent) for one (percent) to total annual (quarterly) returns just like any other event or non-event returns. To illustrate this, we point to Table 1 in Beyer et al. (2010), where they regress quarterly abnormal stock returns on 3-day announcement returns from various information events (earnings announcements, preannouncements, management forecasts, analyst forecasts, and SEC filings). Despite the substantial differences in partial R2s from the different types of events, the slope coefficients for the different events are all close to one. Our methodology, in contrast, uncovers differential sensitivities of compensation to these different

sentiment effects, block trading effects etc. – since short-window stock returns are known to be less affected by these factors (Ball and Kothari, 1991), thereby making them more suitable for performance evaluation.

[5] We measure total compensation as the sum of cash pay and equity pay. We focus on this flow measure (that excludes changes in CEO wealth) because we are interested in studying the board's actions in setting CEO pay.

return components, which are not readily observable from explicit contracts but nevertheless are as predicted by theory. This is something that has not been documented in prior literature.

Next, we separate effort-related information events into those related to accounting information (either current financial reports or forward-looking forecasts that would be verified by future financial reports) from the rest of the effort-related events. The potential advantages of accounting information over other effort-related events include its close connections to firm-specific information and thus managerial actions (e.g., Sloan, 1993) and its credibility arising from the verifiability requirements of the accounting system and certification by external auditors. This greater credibility applies not only to current financial reports but also to manager's forward-looking disclosures (e.g., Ball, 2001; Ball, Jayaraman and Shivakumar, 2012). Compared to the traditional earnings-based performance metrics (e.g., ROE), stock returns around accounting events can reflect a broader set of financial information than earnings alone. Therefore, accounting event stock returns can be a better gauge of the importance of accounting information for executive compensation than the traditional accounting metrics.

We decompose *RET_EFF* into: effort-related stock returns which are subject to the verifiability requirements and certification effects of the accounting system (*RET_EFF_ACCT*), and the remaining effort-related stock returns (*RET_EFF_NONACCT*).[6] Appendix A provides detailed event classifications. We expect accounting-related events to be more strongly associated with CEO compensation revisions than non-accounting events. Our empirical tests provide evidence consistent with our predictions. There is significant heterogeneity in how CEO compensation responds to effort-related events, depending on the role of accounting disclosures. In particular, CEO compensation changes by 0.184% for a 1% effort-related stock returns that are not "accounting" related. In contrast, this sensitivity increases by 80% for "accounting" related

[6] Here again, *RET_ EFF_NONACCT* = (1 + *RET_ EFF*)/(1 + *RET_ EFF_ACCT*) – 1. In rare cases where events in different categories occur on the same date or adjacent dates, the same trading days can fall in windows around multiple categories of events. In an untabulated analysis, we allow such trading days to be used in the construction of multiple return components and obtain virtually the same results as those from the main analyses.

events and indicates that CEO compensation changes by 0.332% for a 1% "accounting" related stock returns.

If our methodology offers an assessment of the efficiency of compensation contracts, we expect our results to be stronger in firms with greater shareholder alignment where decision makers are more likely to act on effort-related signals. To test this prediction, we use two settings. First, we use data from firms domiciled in other countries but cross-listed in the U.S. to exploit variation in country-level laws that restrict self-dealing by insiders (e.g., Djankov et al., (2008)), and find that managerial compensation is more sensitive to effort-related returns in countries with greater protection from insider rent-extraction. Second, we exploit plausibly exogenous variation in proactive monitoring of our (U.S.) sample firms by institutional owners (e.g., Abramova, Core and Sutherland (2020)) and find that the sensitivity of managerial compensation to effort-related stock returns is attenuated during periods when institutional shareholders are distracted.

We note that our framework does not require that the board of directors explicitly breaks down the annual stock return into a collection of multiple performance measures derived from short-window event returns and then directly assigns different compensation weights to the different return components. Higher compensation weights on effort-related stock return components can manifest through explicit contract provisions not captured by the standard regression framework in the "implicit approach," where executive pay is typically regressed on annual stock returns along with accounting earnings (e.g., Lambert and Larcker 1987; Sloan 1993). For example, management may receive extra pay for specific actions, such as completing an acquisition, that can be partly captured by the short-window announcement stock returns associated with these actions. Executive compensation may also depend on multiple accounting performance measures, for example, sales, cash flows, and balance sheet measures such as liquidity, in addition to accounting earnings; furthermore, these accounting numbers are often tailored and different from their corresponding GAAP benchmarks (e.g., Na et al., 2024; Urcan

and Yoon, 2024). We expect short-window stock returns around information events to serve as a summary measure of these disparate pieces of accounting information, and, importantly, their value implications for managerial compensation. Our methodology therefore offers a parsimonious way to capture the many facets of CEO compensation contracts that may not fit neatly into the compensation framework commonly seen in the literature and a potentially sharper measure of CEO pay-for-performance sensitivity.

Our methodology also allows us to speak to the role played by accounting information in managerial contracts. The increasing importance of stock prices over time in CEO compensation revisions has been interpreted as an inter-temporal decline in the "market-share" of accounting earnings (e.g., Bushman and Smith 2001; Core, Guay, and Verrecchia 2003; Jayaraman and Milbourn 2012). This is consistent with the finding in Bushman, Lerman and Zhang (2016) that earnings, as a summary measure of performance, have become less useful over time due to the higher incidence of one-time and non-operating items as well as the higher frequency of loss firm-years. Shao, Stoumbos and Zhang (2021) also document that the ability of realized earnings to predict future cash flows has been decreasing over time. On the other hand, there is evidence that accounting performance is becoming more relevant in multi-year compensation contracts (e.g., Li and Wang, 2016; Bettis et al., 2018). Our methodology can potentially reconcile these seemingly contradictory perceptions in the literature because stock returns around accounting disclosure days incorporate a richer set of accounting signals and their value implications than the traditional realized earnings. This permits us to revisit the questions regarding the importance of accounting information for managerial compensation. We find that the strength of the association between CEO compensation and accounting-related-event stock returns has remained steady over time,

even though that with realized earnings has declined. This allays concerns about the diminishing role of accounting information for CEO performance evaluation.[7]

Our proposed methodology offers a framework to revisit several long-standing questions in the literature, one of which we delve into in more detail below. We demonstrate the applicability of our methodology to a research question that has drawn much theoretical attention but scant empirical evidence, viz., the role of stock return volatility on the sensitivity of the pay-for-performance contract. In particular, Prendergast (2000, 2002) shows that the relation between stock return volatility and pay-for-performance sensitivity is theoretically ambiguous and depends on the underlying driver of stock return volatility. Under the conventional wisdom that return volatility indicates "noise" in the stock price, one should expect to see less pay-for-performance sensitivity since greater return volatility dampens the ability of stock prices to provide information about managerial effort (e.g., Aggarwal and Samwick (1999)). However, if stock prices move because of more frequent information arrival about managerial effort, then one should expect *more* weight on the stock price signal in evaluating managerial performance for firms with greater stock return volatility. Our empirical framework is able to shed light on this nuanced relation between pay-performance-sensitivity and stock return volatility. We find that while pay-performance-sensitivity is indeed lower in firms with greater stock return volatility (as shown by Aggarwal and Samwick (1999)), this result is driven primarily by non-effort event returns.

We validate the implicit assumption underlying our methodology that information event- (and accounting event-) stock returns explain future fundamentals better than other return components. Our results survive a battery of fixed effects, alternative ways of clustering the standard errors, different horizons of variable measurement and examining the sub-categories (cash vs. equity) of CEO compensation. In addition, our results are little changed when we use

[7] Our results complement recent findings (e.g., Shao et al., 2021) that the importance of earnings announcement returns for explaining the annual stock return has been increasing over time.

industry- and market-adjusted stock returns as performance measures and include industry and market returns as additional controls, suggesting that our findings are distinct from the phenomenon of relative performance evaluation (RPE). We also incorporate total CEO wealth in our analyses and verify that our results are robust.

We perform several validation tests of our methodology. Our empirical framework requires that stock returns providing information about managerial effort (especially on information event days), therefore, we expect to observe a stronger sensitivity between compensation and stock returns for executives whose effort is better captured by stock returns. And that is indeed what we find – the incremental importance of effort-related versus non-effort related stock returns is more important for CEOs, i.e., those whose effort is better captured by stock returns, than for other executives.[8] Similarly, we expect our results to be stronger when the credibility of the financial reporting system is greater. We measure this in two ways – first, when the firm experiences an Internal Control Weakness (ICW); and second, when the firm's auditor experiences a degradation in its credibility. We find in both cases that the sensitivity of executive compensation to accounting-related stock returns is weaker during periods when financial reporting credibility is compromised.[9]

Our paper makes several contributions. We are the first to offer a methodology that disentangles annual stock returns in pay-for-performance sensitivity designs into managerial effort-related and -unrelated components by parsing out information arrival events at the daily frequency. This allows us to better assess the sensitivity of managerial pay to managerial effort as

[8] This prediction is akin to a difference-in-differences specification, where the difference between effort-related and non-effort related stock returns for compensation revisions (first difference) is expected to be more important for CEOs as compared to other executives (second difference). We therefore view these tests as more stringent implications of our methodology. Also, we find similar results when using executive ranks as proxied by their lagged pay levels.

[9] Neither the presence of an ICW nor the decrease in auditor credibility alters the sensitivity of managerial compensation changes to non-accounting-related returns or to non-effort-related returns – which is reassuring.

envisioned in compensation theory (e.g., Holmström, 1979) and to gauge the overall efficiency of compensation contracts.

Second, our study expands the evidence on the role of accounting information in influencing managerial compensation. We show that accounting information performs a much broader role in managerial performance evaluation beyond earnings realizations. Our findings alleviate the concern about the diminishing role in recent times of accounting information for managerial performance evaluation.

Third, our methodology offers a framework for examining some open questions in the compensation literature such as the ambiguous role of stock return volatility in performance evaluation (e.g., Prendergast (2000, 2002)). Another setting where our methodology is likely to be useful is the unsettled debate about pay-for-luck – where managers are alleged to be paid for non-effort-related actions (e.g., Bertrand and Mullainathan 2001). By decomposing stock returns into effort-related versus non-effort-related components, our framework offers a convenient way to shed new light on this debate – which we leave for future work.

2. Data and Research Design

2.1. Sample Selection

Our sample is based on the intersection of the ExecuComp, Compustat, CRSP, Audit Analytics and Capital IQ databases. We obtain financial information from Compustat and daily stock return from CRSP.[10] ExecuComp provides managerial compensation, age and tenure information. We retrieve the types and the dates of corporate events from Capital IQ's Key Developments database. We follow Edmans et al. (2018) and start our sample at fiscal year 2002, when the Capital IQ's Key Developments database starts to have wide coverage. The sample period ends at fiscal year 2018 for most of the ExecuComp, Compustat, and CRSP data items.[11]

[10] While our main results are based on total stock returns, we verify robustness (in Internet Appendix IA.2) to using market-adjusted and industry-adjusted returns following the Relative Performance Evaluation literature.
[11] In calendar time, the Capital IQ events and daily stock returns that are used in our sample can be from as late as May 2019, which is the latest end month for fiscal year 2018.

Because we measure cash flow from operations at future years relative to the compensation and stock return information, our cash flow data are from fiscal years 2003-2019. Table 1 shows our sample selection process.

2.2. Research Design and Variable Measurement

We estimate the following three equations to test our hypotheses on the relation between managerial compensation and various components of stock return performance. Each equation reflects a different level in the decomposition of annual stock returns.

$$\Delta log(1+TOTALCOMP)_{it} = \beta_0 + \beta_1 RET_{it} + \beta_2 CH_ROA_{it} + Controls + Industry/Year\ Fixed\ Effects + u_{it} \quad [1]$$

$$\Delta log(1+TOTALCOMP)_{it} = \beta_0 + \beta_1 RET_NONEFF_{it} + \beta_2 RET_EFF_{it} + \beta_3 CH_ROA_{it} + Controls + Industry/Year\ Fixed\ Effects + u_{it} \quad [2]$$

$$\Delta log(1+TOTALCOMP)_{it} = \beta_0 + \beta_1 RET_NONEFF_{it} + \beta_2 RET_EFF_NONACCT_{it} + \beta_3 RET_EFF_ACCT_{it} + \beta_4 CH_ROA_{it} + Controls + Industry/Year\ Fixed\ Effects + u_{it} \quad [3]$$

All three equations have the same dependent variable, $\Delta log(1+TOTALCOMP)$, standing for the change in the natural logarithm of total CEO compensation from year *t-1* to year *t*. Total compensation (data item TDC1 in ExecuComp) is the sum of salary, bonus, long-term incentive plan payouts, the value of restricted stock grants, the value of options granted during the year, and any other annual pay for the manager.[12] The variables of interest are the stock return variables, which are different across the three equations depending on the level of return decomposition. Capital IQ's Key Developments covers material events that may affect the market value of securities and assigns them to various event types. Based on the event types assigned by Key Developments, we further categorize these events based on whether they reflect managerial effort and whether they are accounting information events that are subject to the verifiability requirements of the accounting system. The classification of events is not always clear cut and

[12] We verify (in Internet Appendix IA.3) that our results are robust to conditioning on the level of CEO wealth.

requires judgement. We report in Appendix A the categories of corporate events from Capital IQ's Key Developments database, as well as the classifications that we apply in subsequent return decompositions.[13]

In Equation [1], we follow prior literature and measure stock performance as the cumulative stock return (*RET*) over the fiscal year. In Equation [2], we decompose the annual stock return into *RET_EFF* (stock returns around corporate events that capture managerial effort), and *RET_NONEFF* (the remainder of the annual stock return). To do this, we use information from Capital IQ's Key Developments and identify the trading days that fall within the [-1,+1] window around any corporate events that revise the future value implications of managerial effort. Compounding returns over these (all other) trading days results in *RET_EFF* (*RET_NONEFF*). Figure 1 provides a graphical illustration of the definitions of return components and the corresponding events underlying the return components. We expect stock price reactions to events reflecting managerial effort to hold greater importance for performance evaluation than non-effort-related days, and predict that managerial compensation is more sensitive to *RET_EFF* than to *RET_NONEFF*, i.e., $\beta_1 < \beta_2$ in Equation [2].

Applying the above methodology to Equation [3], we decompose *RET_EFF* into *RET_EFF_ACCT* (stock returns around accounting information events) and *RET_EFF_NONACCT* (stock returns around non-accounting information events). Specifically, among the trading days used to measure *RET_EFF*, we identify those days that fall within the [-1,+1] window around any accounting information events – both forward-looking such as management forecasts as well as backward-looking such as earnings announcements. Compounding returns over these (all other) trading days results in *RET_EFF_ACCT* (*RET_EFF_NONACCT*). We expect stock price reactions to accounting information events to be

[13] Later we verify that our results are generalizable to the pre-2002 period by decomposing annual returns into earnings announcement period returns and all other days.

more informative about managerial effort than price reactions to non-accounting-related events partly due to the verification effect of the accounting system, and predict compensation to be more sensitive to *RET_EFF_ACCT* than to *RET_EFF_NONACCT*, i.e., $\beta_2 < \beta_3$ in Equation [3].

Each of the three equations contains the same set of control variables. First, we follow the literature and control for realized performance *CH_ROA*, defined as the year-to-year change in ROA. Following Leone, Wu, and Zimmerman (2006), we include *SALES* and $SALES^2$ to control for potential (non-linear) size effects. We control for other firm characteristics through *LEVERAGE* (the ratio of total debts to total assets), *BTM* (book-to-market ratio), *RETVOL* (daily stock return volatility), *EARNVOL* (standard deviation of ROA over the preceding five years), and *LOSS* (an indicator variable for negative ROA). We also control for CEO characteristics with *TENURE* (CEO tenure) and *AGE* (CEO age).[14] Lastly, we include industry (based on 2-digit SIC codes) and year fixed effects and cluster the standard errors at the industry level. To mitigate the influence of extreme observations, we winsorize all continuous variables at 1% and 99%.

2.3. Descriptive Statistics

Panel A of Table 2 provides descriptive statistics. The average CEO receives an annual compensation of $5.52 million (*TOTALCOMP*). *Δlog(1+TOTALCOMP)* has a mean of 0.064, indicating that CEOs in our sample on average receive an increase of 6.4% in total compensation. The mean annual stock return (*RET*) is 0.132 (i.e., 13.2%), with stock returns occurring around corporate events about managerial effort (*RET_EFF*) averaging at 0.060 (i.e., 6%) and the remaining 0.071 (i.e., 7.1%) coming through during "regular" days.[15] The split of *RET_EFF* into *RET_EFF_ACCT* and *RET_EFF_NONACCT* depicts means of 0.027 (i.e., 2.7%) and 0.033 (3.3%) respectively. Panel B of Table 2 reports the Pearson correlations of the variables.

3. Empirical Tests

[14] In untabulated analyses, we include control variables specified in changes and obtain similar results.

[15] Since the typical firm has on average 79 effort-related event days and 172 non-effort-related event days in a year, the mean *RET_EFF* of 0.060 translates to about 8 basis points per effort-related event day as compared to about 4 basis points for non-effort-related event days (i.e., 0.071/172).

3.1. Preliminary Test – Future Operating Cash Flows and Stock Return Components

Our hypotheses are predicated on the notion that different stock return components have differential information content regarding managerial effort. To provide evidence on this, we directly examine the association between the various components of stock returns with the firm's future operating cash flows. Specifically, we estimate a modified version of Equations [1]-[3] by replacing the main dependent variable with future cash flow from operations scaled by beginning of year total assets – and measured over the one to three years following the year in which stock returns are measured (*CFO1*, *CFO2* and *CFO3* respectively). When the measurement window is longer than a year, we take the average of annual cash flows. The regressions include the same explanatory variables as those defined in Equations [1]-[3].

Columns (1)-(3) of Table 3 report the estimation results with *CFO1* as the dependent variable. Consistent with prior findings that stock returns incorporate information about future performance (e.g., Kothari and Sloan 1992; Lundholm and Myers 2002; Tucker and Zarowin 2006), column (1) shows that annual returns (*RET*) are positively associated with one-year ahead operating cash flows. Column (2) splits *RET* into *RET_EFF* and *RET_NONEFF* and shows that *RET_EFF* is significantly related to future cash flows, while *RET_NONEFF* is not, with these coefficients being significantly different (at the 5% level). These results indicate that stock returns around information events that speak to managerial effort are relatively more informative about future cash flows than stock returns on other days. Column (3) splits *RET_EFF* into accounting events (*RET_EFF_ACCT*) and non-accounting events (*RET_EFF_NONACCT*) and finds that the former is significantly associated with future cash flows, while the latter is not. The coefficients are significantly different at the 1% level. Overall, stock returns around accounting information events that speak to managerial effort are more informative about future cash flows than those around non-accounting events and also those around non-event days. In columns (4)-(5), we estimate Equation [3] with future cash flows measured over the two-year (*CFO2*) and three-year

(*CFO3*) horizons. The sample size decreases due to the requirement of future data. However, the results are similar.

3.2. Main Results – CEO Compensation and Stock Return Components

Table 4 reports the results from estimating equations [1]-[3], with CEO compensation as the dependent variable. Column (1) shows that both *RET* and *CH_ROA* are significantly associated with the change in CEO compensation, confirming the findings in prior studies. Column (2) shows that while both *RET_EFF* and *RET_NONEFF* are significantly associated with the change in CEO compensation, the coefficient on *RET_EFF* is 0.270 while that on *RET_NONEFF* is 0.155. In other words, while a one percent increase in stock returns around effort-related events (*RET_EFF*) is associated with a 0.27% increase in CEO compensation, a similar 1% increase in stock returns around other days (i.e., *RET_NONEFF*) is associated with a 0.155% increase in CEO compensation. The former effect is 74% larger than the latter (= 0.270/0.155 – 1). An F-test shows that this difference is significant at the 1% level and indicates that stock return reactions to effort-related events are more reflective of CEO effort and thus more important in compensation.

In column (3), we decompose *RET_EFF* into *RET_EFF_ACCT* and *RET_EFF_NONACCT*. While both coefficients are significantly associated with compensation changes, that on *RET_EFF_ACCT* is about 80% larger at 0.332 as compared to the 0.184 on the latter (= 0.332/0.184 – 1), with the difference being significant at the 1% level, consistent with our hypothesis that stock returns induced by events about CEO effort that are also verifiable by the accounting system are more important in setting CEO compensation. F-tests show that the coefficient on *RET_EFF_ACCT* is significantly larger than both *RET_ NONEFF* and

RET_EFF_NONACCT, while the coefficient on *RET_EFF_NONACCT* is not statistically different from that on *RET_NONEFF*.[16,17]

We conduct several robust tests and report the results in the Internet Appendix. Table IA.1 shows that our inferences generally hold for both equity and cash compensation, albeit stronger for the former. Table IA.2 reports that our results are little changed when we control for relative performance evaluation (RPE) in our analyses. Specifically, we include in the regressions value-weighted returns on peer groups using four alternative peer definitions: (1) SIC2 industry peers, (2) size-matched SIC2 industry peers following Albuquerque (2009), (3) size and BTM-matched TNIC-3 product market peers (per Hoberg and Phillips 2016) following Jayaraman et al. (2021), and (4) market portfolio peers. Furthermore, we show that decomposing peer portfolio returns with the focal firm's event windows or using a modified specification to capture relative performance evaluation does not affect our results either. Thus, the results suggest that the differential sensitivity of compensation to the various firm stock return components is not driven by the practices of relative performance evaluation (RPE) in executive compensation. In Table IA.3 we incorporate total CEO wealth in our analyses and verify that our results are robust.

3.3. The Role of Shareholder Alignment

If our methodology offers an assessment of the efficiency of compensation contracts, we expect our results to be stronger in firms with greater shareholder alignment where decision makers are more likely to act on effort-related signals. We do so by partitioning the sample along the governance dimension. In other words, we expect that the greater sensitivity of CEO compensation to effort-related stock returns is more prevalent in firms with stronger governance. Since

[16] When a firm-year observation has no event in any event category, we set the corresponding event return to zero. In untabulated analyses, we set the event return to missing instead of zero in such cases; the sample size drops to 21,620 and the results remain similar.

[17] In untabulated analyses, we include firm, executive, or firm*executive fixed effects and adjust standard errors for clustering at the level of firm, executive, or firm*executive, respectively. The inferences remain the same.

measuring corporate governance can be problematic, we use two distinct designs to test this prediction.

Our first setting uses data from firms domiciled in other countries but cross-listed in the U.S. to exploit variation in country-level laws that restrict self-dealing by insiders (e.g., Djankov et al., (2008)). The idea is that compensation practices are more likely to be efficient when firms are domiciled in environments that inhibit rent extraction through self-dealing by corporate insiders (as documented by the large "law and finance" literature). To test this prediction, we supplement our baseline regression sample with a sample of foreign firms that are cross-listed in the U.S. We identify cross-listed firms based on COMPUSTAT's variable FINC, following the prior literature (e.g., Gong, Ke, and Yu, 2013). We obtained CEO compensation information for these cross-listed firms from Capital IQ's People Intelligence database.

Table 5 presents the results, with Panel A including both U.S. and international firms, and Panel B employing only the latter. We define *INDEX* based on the Anti-Self-Dealing index that measures the strength of minority shareholder protection against self-dealing by the controlling shareholder, as constructed by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008), and adjust the index by subtracting the index value of the U.S. from the index values of all countries, such that the U.S. has an index value of zero and all other countries' index values reflect their differences from the U.S.[18] Model (2) distinguishes between *RET_EFF* and *RET_NONEFF* while model (3) decomposes *RET_EFF* further into *RET_EFF_ACCT* and *RET_EFF_NONACCT*. Consistent with our earlier results, the coefficient on *RET_EFF* (which represents CEO pay-for-performance in the US) is significantly positive and larger than the coefficient on *RET_NONEFF*. More pertinent to our prediction, the coefficient on *RET_EFF*INDEX* is positive and significant, suggesting that the incremental sensitivity of CEO pay to effort-related stock returns is more pronounced in firms domiciled in countries that better protect shareholders from rent-extraction

[18] The data are available at https://scholar.harvard.edu/shleifer/publications/law-and-economics-self-dealing.

by insiders. Model (3) shows that the effort-related stock return result is driven by accounting-related stock returns, in that the coefficient on *RET_EFF_ACCT*INDEX* is positive and significant. Finally, we observe similar results in Panel B of Table 5 that uses only international firms by excluding US firms from the sample.

Our second setting uses shocks to the governance environment to gauge the mechanism through which CEO performance evaluation occurs. We rely on Kempf et al. (2017) who develop a firm-level measure of institutional investor distraction by exploiting exogenous shocks to unrelated parts of institutional shareholders' portfolios, *DISTRACTION*. The mean (median) of *DISTRACTION* is 0.134 (0.139) in our sample, comparable to that reported by Kempf et al. (2017) and Abramova et al. (2020). Panel C of Table 5 reports the estimation results where we add to Equations [1]-[3] *DISTRACTION_HIGH*, an indicator variable that equals one when *DISTRACTION* is in the top quartile, and its interactive terms with all of the return variables. Column (3) shows that the coefficient on *RET_EFF_ACCT* DISTRACTION_HIGH* is negative and significant at the 1% level. Comparing the coefficient on *RET_EFF_ACCT*DISTRACTION_HIGH* (-0.139) with that on *RET_EFF_ACCT* (0.362) indicates that the sensitivity of CEO compensation changes to stock returns around accounting-related information events decreases by 38% (-0.139/0.362) when the shareholders are distracted.[19] In columns (4)-(6), we follow Abramova et al. (2020) and further control for institutional ownership (*IO*) and top-five institutional ownership (*IO_5*), as well their interactive terms with all stock return components and *CH_ROA*, and the inference remain unchanged.[20]

[19] One would expect investor distraction to also mitigate the effect of non-accounting-effort-related information event stock returns on CEO compensation revisions. We do uncover this effect economically with the coefficient on *RET_EFF_NONACCT*DISTRACTION_HIGH* being negative (-0.050) and weakening the main effect by 27% (-0.050/0.183). However, this coefficient falls below the conventional range of statistical significance.

[20] We use demeaned versions of *IO* and *IO_5* to facilitate the interpretation of the coefficients on the stand-alone terms of the return components and *CH_ROA*.

Overall, we interpret these results as evidence that the sensitivity of managerial performance to effort-related stock returns depends on the extent to which "decision-makers" (such as the board and institutional investors) act in shareholders' interest.

3.4. Alternative Stock Return Decompositions

In addition to decomposing returns based on Capital IQ's event classifications, we also employ an alternative strategy where we decompose annual stock returns based on whether they are related to earnings announcements. This research design does not rely on Capital IQ Key Developments information and thus allows us to use a longer sample period from 1993 to 2018. Specifically, we construct *RET_EA* by compounding daily stock returns over the trading days that fall within the [-1,+1] window around all of the earnings announcements during the fiscal year; compounding daily stock returns over all other trading days of the fiscal year results in *RET_NONEA*. We estimate the following model.

$$\Delta log(1+TOTALCOMP)_{it} = \beta_0 + \beta_1 RET_NONEA_{it} + \beta_2 RET_EA_{it} + \beta_3 CH_ROA_{it} + Controls + Industry/Year\ Fixed\ Effects + u_{it} \quad [4]$$

This equation differs from previous equations only in the return decomposition into *RET_EA* and *RET_NONEA*. We expect *RET_EA* to capture a significant portion of stock return reaction to verifiable accounting information events. Thus, we predict that CEO compensation is more sensitive to *RET_EA* than to *RET_ NONEA*, i.e., $\beta_1 < \beta_2$ in Equation [4].

Table 6 reports estimates of Equation [4]. Column (1) reports estimation results where the dependent variable is the average cash flows over the future three years. *RET_EA* is significantly associated with future cash flows, while *RET_NONEA* is not, with the coefficient being essentially zero. F-test indicates that the coefficients on *RET_EA* and *RET_NONEA* are different from each other at the 1% level. Column (2) reports estimation results where the dependent variable is the change in the log of total compensation. Both *RET_EA* and *RET_NONEA* are significantly positive, but the coefficient on *RET_EA* is larger than that on *RET_NONEA*, with the difference

being both statistically and economically significant; on average, a 1% increase in stock returns around earnings announcements translates into an 84% (0.356/0.193 – 1) larger increase in CEO compensation than a similar increase in stock returns around non-earnings announcements.

There is evidence in prior literature suggesting a declining role of accounting information in CEO performance evaluation (e.g., Bushman and Smith, 2001). To shed more light on this issue, we plot in Figure 2 the average coefficients on *CH_ROA*, *RET_NONEA* and *RET_EA* over three roughly equal time periods in the sample: Early (1993-2001), Middle (2002-2010) and Late (2011-2018). We can see that the coefficient on *CH_ROA* has been steadily declining over time, going from 0.305 in the Early period to 0.197 in the Middle to 0.169 in the Late, suggesting the declining "market-share" of accounting earnings in CEO performance evaluation. However, we find that the coefficient on *RET_EA* remains steady throughout the three periods.

3.5. Implications of Our Methodology for the Relation between Stock Return Volatility and Pay-Performance Sensitivity

Based on the theory of Holmström and Milgrom (1987), Aggarwal and Samwick (1999) predict that the manager's pay-performance sensitivity is decreasing in the volatility of firm performance that is not driven by the manager's actions. However, Prendergast (2000, 2002) points out that the principal should place a *greater* weight on the performance measure if that measure varies more due to changes in the agent's effort. Central to our paper is the observation that the various components of firm stock return based on the nature of underlying events are differentially reflective of managers' actions and effort. To the extent that a stock return component is more reflective of CEO effort, the volatility of the stock return component constitutes less of a risk to the manager. We thus predict that the negative relation between stock return volatility and pay-performance sensitivity should be less pronounced for stock return components that are more reflective of CEO effort.

We test this prediction by adding to Equations [1]-[3] the volatility of each stock return component, calculated with daily stock returns, and its interactive term with the corresponding

stock return variable. All return volatility measures are lagged, following Aggarwal and Samwick (1999); for example, *RETVOL_EFF* is the standard deviation of daily stock returns for the trading days around effort-related corporate events over the previous year. We have also used demeaned versions of the stock return volatility variables in the regressions in order to facilitate the interpretation of the coefficients on the standalone return variables. Column (1) in Table 7, based on the annual stock return, shows that the coefficient (-3.993) on *RET*RETVOL* is significantly negative, confirming Aggarwal and Samwick's (1999) finding. In columns (2)-(3), we decompose the annual stock return following the event-based method described earlier in the paper. Column (2) shows that the coefficient (-5.348) on *RET_NONEFF*RETVOL_NONEFF* (the interactive term between stock return component that is not based on effort-related events and its volatility) is significantly negative, while the coefficient (-1.453) on *RET_EFF*RETVOL_EFF* (the interactive term between stock return component that is based on effort-related events and its volatility) has a much smaller magnitude and is statistically insignificant. F-test rejects the equality of these two coefficients at the 1% level. Similarly, in column (3), when we further decompose the stock return components based on accounting disclosure events, the coefficient on *RET_EFF_ACCT*RETVOL_EFF_ACCT* is less negative than that on *RET_NONEFF*RETVOL_NONEFF*, and F-tests continue to reject the null that the former coefficient is equal to the latter.[21] The results support our prediction that, when a return component is reflective of managerial effort, its volatility is considered less of a risk to be borne by the managers, and would exhibit a less negative association with pay-performance sensitivity, consistent with the theory of Holmström and Milgrom (1987), Aggarwal and Samwick (1999), and Prendergast (2000, 2002).

3.6. Validation Tests

[21] In Internet Appendix IA.4, we verify that our inferences are not confounded by potential noise in the return volatility measures due to differences in the number of trading days used in the estimations.

In this section, we seek to validate our empirical methodology by performing two cross-sectional tests. Our empirical framework requires that stock returns providing information about managerial effort (especially on information event days) . In our validation tests below, we perform sensitivity tests to ascertain whether the "signal" is indeed more relevant under certain scenarios than others. We provide a brief discussion of each test here, before delving into the details.

Our first validation test exploits executive-level variation within the firm. Our main proxy for employee importance is the CEO title. We expect stock returns to be more relevant signals of managerial effort for the CEO than for other executives. We also use the rank of the executives, proxied by their lagged pay levels, as an alternative proxy for managerial importance, with the idea that executives with greater marginal products of effort are paid more.

Our second validation test partitions our sample based on financial reporting credibility. We reason that if the differential sensitivity of effort-related returns vis-à-vis non-effort related returns is indeed on account of the financial reporting apparatus, then our results should be weaker during times when the authenticity of the firm's financial reporting system is compromised. In other words, stock returns (especially around accounting-related information events) should be viewed as less informative when the credibility of the underlying financial reporting system is compromised. We explore two such scenarios – first, when the firm experiences an Internal Control Weakness (ICW); and second, when the firm's auditor experiences a degradation in its credibility.

3.6.1. Executive-level Variation

With regard to the first prediction, we expect the incremental importance of effort-related stock returns relative to non-effort related stock returns to be more important for CEOs. Panel A of Table 8 presents results for this test. To conduct the analyses with the compensation of both CEOs and non-CEO top executives, we add to our baseline sample of CEO compensation the corresponding observations of non-CEO executives with disclosed compensation information

from the same firm-years in ExecuComp. The SEC rule requires disclosure of compensation information for the five named executive officers (NEOs) of each firm, which includes the CEO and the other four highest-paid executives before 2006, and the CEO, the CFO, and the other three highest-paid executives after 2006. We define *CEO* as an indicator variable that equals one for CEOs, and zero for other executives. We interact *CEO* with our stock return decompositions (*RET_EFF* and *RET_NONEFF*) in model (2) and with our accounting-based information events (*RET_EFF_ACCT* and *RET_EFF_NONACCT*) in model (3). Consistent with our expectations, the coefficient on *RET_EFF*CEO* is significantly positive in model (2), indicating that the sensitivity of managerial compensation to effort-related stock returns is more pronounced for CEOs. Model (3) shows that these results are stronger for accounting-related event returns than for non-accounting related returns. In particular, while both the coefficient on *RET_EFF_ACCT*CEO* (0.117) and that on *RET_EFF_NONACCT*CEO* (0.043) are significantly positive, the former is almost three times as large as the latter, with the difference significant at the 1% level as indicated by the F-test. Panel B of Table 8 documents similar results using the rank of lagged total compensation to capture the relative importance of the executives. We define *RANK* as the rank of previous year's total compensation (TDC1) for the executives within the firm. *RANK*=4 (or 3, 2, 1, 0) indicates that the executive receives the highest (second highest, third highest, fourth highest, fifth highest) compensation, in the previous year, among the top executives of the firms. Consistent with our expectations, the coefficient on *RET_EFF*RANK* is positive and significant in model (2), and the coefficient on *RET_EFF_ACCT*RANK* is positive and significant in model (3).

3.6.2. Role of Financial Reporting Credibility

The superior signal value of *RET_EFF_ACCT* for managerial effort can be partly attributable to the verification effect of the accounting system. In this section, we seek to reinforce this channel by partitioning the sample based on instances where the credibility of the reporting system is compromised. We therefore expect the sensitivity of CEO compensation to

RET_EFF_ACCT to weaken during these instances. We capture the (diminished) credibility of a firm's accounting information with two proxies: 1) the existence of Internal Control Weaknesses (ICWs), and 2) a negative shock to the auditor's reputation.

3.6.2.1. Internal Control Weakness

We expect the compensation sensitivity to stock returns around accounting information events to decrease when the credibility of a firm's accounting system is in doubt. We measure the credibility of accounting system with internal control weaknesses. By definition, when there is a material weakness in internal control, there is "more than a remote likelihood that a material misstatement of the annual or interim financial statements will not be prevented or detected" (PCAOB 2004). Studies have shown that internal control quality is positively related to earnings quality (e.g., Doyle, Ge, and McVay, 2007; Ashbaugh-Skaife et al., 2008). Panel A of Table 9 reports the estimation results where we add to Equations [1]-[3] an indicator variable, *ICW*, for the existence of material internal control weaknesses in fiscal year *t*, and its interaction terms with all of the return components.[22] In column (3), the coefficient on *RET_EFF_ACCT*ICW* is significantly negative, suggesting significant discount on the stock return around accounting information events in the presence of internal control weaknesses, compared to situations without internal control weakness. In particular, comparing the coefficient of -0.148 to *RET_EFF_ACCT* (0.339) indicates that the sensitivity of CEO compensation changes to returns around accounting-related information events decreases by 44% (-0.148/0.339) during periods of internal control weaknesses. Consistent with previous results, F-tests (F-stat = 29.38) indicate that the coefficients on *RET_EFF_ACCT* and *RET_EFF_NONACCT* are statistically different from each other, suggesting that the board assigns a significantly larger weight to stock returns around accounting information events when there is no internal control weakness. However, in the presence of

[22] Information obtained from Audit Analytics indicates that about 4.3% of the firm-year observations have at least one material internal control weaknesses reported under either SOX Section 302 or Section 404 (Doyle et al., 2007). SOX 302 is effective for fiscal years ending after August 29, 2002. Thus, we drop from the sample 84 firm-year observations with fiscal years ending before August 29, 2002.

internal control weaknesses, F-tests (F-stat = 0.02) indicate that the difference between the coefficients on *RET_EFF_ACCT* and *RET_EFF_NONACCT* becomes statistically insignificant.[23]

3.6.2.2 Auditor Reputation

Since internal control weaknesses are endogenous to firm characteristics and performance fundamentals, they can affect managerial incentives through channels other than accounting credibility. To mitigate this concern, we develop a proxy for accounting credibility based on external shocks to the auditor's reputation via restatements by the auditor's *other* clients in the same audit office as the focal firm.[24] The audit reputation shock measure is constructed in the following steps. For each firm-year observation (firm *i* year *t*), we identify the current audit office of firm *i* and all firms (*excluding the focal firm i*) that announce restatements in year *t* using information from Audit Analytics. Within this group of restating firms that announce restatements in year *t*, we identify those that have had an auditor-client relationship with the focal firm's audit office *during the restatement period* (the period for which earnings are restated) and thus cause a negative reputation shock to the focal firm's audit office by restating their earnings.[25] For all of the restating firms that are linked to firm *i*'s audit office through the restatement-period auditor-client relationship, we calculate the sum of audit fees as *FEE_RESTATE* and, with it, construct a proxy for the audit office reputation shock due to clients restating earnings as:

$$RESTATE_PCT_{it} = FEE_RESTATE_{it} / FEE_CLIENTS_{it} \quad [4]$$

[23] While one might predict a similar effect with accounting earnings as well, we are unable to detect such an adjustment effect given that ROA is weakly associated with CEO compensation revisions to begin with.

[24] In this analysis, we eliminate all observations coded by Audit Analytics as clerical application in order to ensure that our sample includes material GAAP misapplications and not unintentional reporting errors (Hennes, Leone, and Miller, 2008; Bens, Goodman, and Neamtiu, 2012).

[25] In establishing the auditor-client relationship, we do not require the restating firms and the focal firm's audit office to have a *current* auditor-client relationship; instead, we require the restating firms to have a *historical* auditor-client relationship for the year(s) for which the earnings are restated (the restatement period). In other words, while we require all restatements to be announced in year *t*, the restated earnings are for a year (or years) in which the restating firm and firm *i*'s audit office had an auditor-client relationship. In over 98% of the restatements in our sample, the restated earnings were reported within two years in the past.

The scaling variable *FEE_CLIENTS* is a measure of the size of the client office, defined as the total audit fees of all current clients except the focal firm.[26] Panel B of Table 9 reports the estimation results where we add to Equations [1]-[3] *RESTATE_PCT_HIGH*, an indicator variable that equals one when *RESTATE_PCT* is in the top quartile, and its interactive terms with all of the return variables.[27] Column (3) shows that the coefficient on *RET_EFF_ACCT*RESTATE_PCT_HIGH* is negative and significant at the 5% level; in contrast, the coefficient on *RET_EFF_NONACCT*RESTATE_PCT_HIGH* is positive and insignificant. Comparing the coefficient on *RET_EFF_ACCT*RESTATE_PCT_HIGH* (-0.08) with that on *RET_EFF_ACCT* (0.363) indicates that the sensitivity of CEO compensation changes to stock returns around accounting-related events decreases by 22% (-0.08/0.363) when the reputation of the auditor is impaired.[28]

4. Conclusion

Our study extends the role of stock returns in managerial compensation by distinguishing between two types of daily stock returns – days on which information about managerial effort is revealed (which we term "effort-related" event days) and all other days (which we label "regular" days). We predict that managerial compensation revisions are more sensitive to effort-related daily returns as compared to non-effort-related daily returns, and that is precisely what we find. In terms of economic magnitude, the pay-for-performance sensitivity on effort-related event days is 74% more pronounced than regular days. We further decompose effort-related event days into accounting-related and non-accounting related and find that pay-for-performance sensitivity is more pronounced for accounting-related event days as compared to non-accounting-related event days. In line with our methodology as a parsimonious approach to assessing the efficiency of

[26] Audit fees are commonly used as a measure of auditor market share (e.g., Francis et al., 2005; Reichelt, and Wang, 2010). The mean (median) of *RESTATE_PCT* is 0.103 (0.028) in our sample.
[27] The sample size is reduced by 1,564 observations as we drop firm-year observations for which Audit Analytics does not provide information on auditor city office or shows two different auditors for the same year.
[28] In untabulated analyses, we add to the regression an indicator variable that equals one when the focal firm restates its earnings for the year, and zero otherwise. The inferences are unchanged.

compensation contract, we find stronger pay–information return sensitivities in firms that focus on shareholder value maximization.

Our study offers a methodology to gauge the extent to which managerial compensation is sensitive to public signals about managerial effort. Our findings suggest much higher sensitivities of executive pay to more direct measures of management effort than the traditional pay-for-performance sensitivity based on annual stock returns. Our methodology also allows us to speak to the role of accounting information in setting executive pay. We show that accounting information performs a much broader role in managerial performance evaluation beyond earnings realizations.

Overall, distinguishing between days on which information about managerial effort is revealed versus other days uncovers substantial variation in pay-for-performance sensitivity not documented in the prior literature and not readily observable from explicit contracts.

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Appendix A: Event Classifications

Cap IQ event ID	Capital IQ Description	EFFORT	ACCT	Sample count	Sample freq.	Cap IQ freq.
Events included in the measurement of both RET_EFF and RET_EFF_ACCT						
51	Conference Presentation Calls	Yes	Yes	104,380	9.66%	8.73%
28	Announcements of Earnings	Yes	Yes	90,384	8.37%	8.55%
48	Earnings Calls	Yes	Yes	70,691	6.54%	6.24%
29	Corporate Guidance - New/Confirmed	Yes	Yes	57,009	5.28%	4.98%
27	Corporate Guidance – Raised	Yes	Yes	8,957	0.83%	0.78%
73	Impairments/Write Offs	Yes	Yes	7,550	0.70%	0.67%
	Events less frequent than 0.5%	Yes	Yes	14,942	1.38%	1.40%
Events included in the measurement of RET_EFF but not RET_EFF_ACCT						
149	Investor Conference	Yes	No	89,617	8.30%	7.28%
23	Client Announcements	Yes	No	75,742	7.01%	7.44%
41	Product-Related Announcements	Yes	No	68,657	6.36%	6.50%
55	Expected Earnings Release Date	Yes	No	67,461	6.25%	5.96%
45	Dividend Affirmations	Yes	No	36,801	3.41%	3.14%
231	Buyback Tranche Update	Yes	No	35,366	3.27%	2.83%
81	M&A Transaction Closings	Yes	No	27,181	2.52%	2.67%
31	Business Expansions	Yes	No	26,309	2.44%	2.42%
62	Annual General Meetings	Yes	No	17,889	1.66%	1.55%
25	Lawsuits & Legal Issues	Yes	No	17,423	1.61%	1.85%
3	Seeking Acquisitions/Investments	Yes	No	16,274	1.51%	1.36%
80	M&A Transaction Announcements	Yes	No	15,592	1.44%	1.61%
87	Fixed Income Offerings	Yes	No	14,500	1.34%	1.36%
42	Debt Financing Related	Yes	No	13,538	1.25%	1.35%
22	Strategic Alliances	Yes	No	11,542	1.07%	1.06%
65	M&A Rumors and Discussions	Yes	No	10,677	0.99%	1.03%
93	Shelf Registration Filings	Yes	No	9,980	0.92%	0.95%
46	Dividend Increases	Yes	No	9,666	0.89%	0.82%
21	Discontinued Operations/Downsizings	Yes	No	8,882	0.82%	0.94%
77	Changes in Company Bylaws/Rules	Yes	No	6,963	0.64%	0.64%
232	Buyback Transaction Announcements	Yes	No	6,687	0.62%	0.58%
95	Index Constituent Adds	Yes	No	5,927	0.55%	0.58%
215	Preferred Dividend	Yes	No	5,691	0.53%	0.51%
	Events less frequent than 0.5%	Yes	No	61,113	5.66%	7.18%
Events included in the measurement of neither RET_EFF nor RET_EFF_ACCT						
16	Executive/Board Changes – Other	No	No	62,780	5.81%	6.66%
78	Board Meetings	No	No	2,157	0.20%	0.19%
92	End of Lock-Up Period	No	No	1,539	0.14%	0.18%
58	Ticker Changes	No	No	210	0.02%	0.04%
79	Fiscal Year End Changes	No	No	33	0.00%	0.01%
Total				1,080,110	100%	100%

This appendix reports event classifications used in decomposing stock returns. EFFORT indicates events that reflect CEO effort while ACCT indicates whether an event is associated with accounting information disclosures. It also reports the frequency of each event type in the sample and also Capital IQ Key Developments sample over 2002-2018.

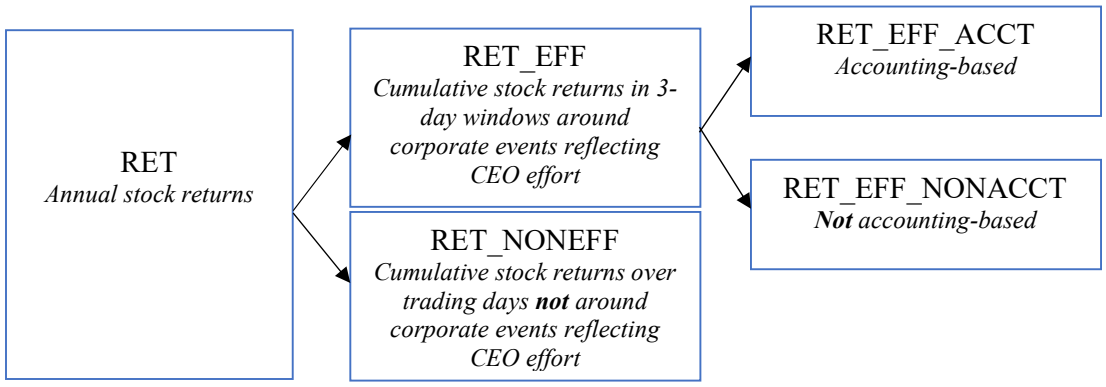
Appendix B: Variable Definitions

Variable	Definition
RET_{it}	Stock return, for firm *i* over fiscal year *t*.
RET_EFF_{it}	Cumulative return over days [-1,+1] around corporate events that reflect managerial effort, for firm *i* in fiscal year *t*. Appendix A presents a detailed list of event categories.
RET_NONEFF_{it}	Cumulative stock return over trading days that are NOT within [-1,+1] windows around corporate events that reflect managerial effort, for firm *i* in fiscal year *t*; *RET_NONEFF* = (1 + *RET*)/(1 + *RET_EFF*) – 1.
$RET_EFF_ACCT_{it}$	Cumulative stock return over days within [-1,+1] around corporate events that reflect managerial effort and are subject to the verifiability requirements and certification effects of the accounting system, for firm *i* in fiscal year *t* .
$RET_EFF_NONACCT_{it}$	Cumulative stock return over trading days that are within [-1,+1] windows around corporate events reflect managerial effort but are NOT within [-1,+1] windows around corporate events that are subject to the verifiability requirements and certification effects of the accounting system, for firm *i* in fiscal year *t*; *RET_EFF_NONACCT* = (1 + *RET_EFF*)/(1 + *RET_EFF_ACCT*) – 1.
RET_EA_{it}	Cumulative stock return over days [-1,+1] around all earnings announcements in fiscal year *t*.
RET_NONEA_{it}	Cumulative stock return over trading days not within any [-1,+1] trading-day windows around any earnings announcement in fiscal year *t*.
$\Delta log(1+TOTALCOMP)_{it}$	The change, from year *t-1* to year *t*, in the natural logarithm of one plus *TOTALCOMP*. *TOTALCOMP* stands for total compensation (ExecuComp data item TDC1, defined as Salary + Bonus + Other Annual + Restricted Stock Grants + LTIP Payouts + All Other + Value of Option Grants).
$CFO1_{it}$	Cash flow from operations in year *t+1*, scaled by assets at the beginning of the year.
$CFO2_{it}$	The mean of cash flows from operation in years *t+1* and *t+2*, each scaled by total assets at the beginning of the year.
$CFO3_{it}$	The mean of cash flows from operation in years *t+1*, *t+2*, and *t+3*, each scaled by total assets at the beginning of the year.
CH_ROA_{it}	Change in ROA from year *t-1* to year *t*; ROA is income before extraordinary items, scaled by total assets at the beginning of the year.
$SALES_{it}$	Sales revenue (in millions of dollars) of year *t*.
$LEVERAGE_{it}$	The ratio of total debts to total assets at year *t*.
BTM_{it}	The ratio of book value of equity to market value of equity at year *t*.
$RETVOL_{it}$	The standard deviation of daily stock return over fiscal year *t*.
$TENURE_{it}$	CEO tenure at year *t*.
AGE_{it}	CEO age at year *t*.

$EARNVOL_{it}$	The standard deviation of ROA over year t-5 to year t-1.
$LOSS_{it}$	An indicator variable that equals one if *ROA* at year *t* is negative, and zero otherwise.
ICW_{it}	An indicator variable that equals one if firm *i* reports material internal control weaknesses at year *t*, and zero otherwise.
$RESTATE_PCT_HIGH_{it}$	Indicator variable for a negative shock to the reputation of the focal firm *i*'s audit office because other (non-focal-firm) clients have restated their earnings during year *t*.
$DISTRACTION_HIGH_{it}$	An indicator variable for distraction to firm *i*'s institutional investors during year *t*, following Kempf, Manconi, and Spalt (2017).
$RETVOL_{it}$	The standard deviation of daily stock return for firm *i* over fiscal year *t*.
$RETVOL_EFF_{it}$	The standard deviation of daily stock return over the trading days around the events underlying the return variable RET_EFF_{it}.
$RETVOL_NONEFF_{it}$	The standard deviation of daily stock return over the trading days around the events underlying the return variable RET_NONEFF_{it}.
$RETVOL_EFF_ACCT_{it}$	The standard deviation of daily stock return over the trading days around the events underlying the return variable $RET_EFF_ACCT_{it}$.
$RETVOL_EFF_NONACCT_{it}$	The standard deviation of daily stock return over the trading days around the events underlying the return variable $RET_EFF_NONACCT_{it}$.
CEO_{it}	Indicator variable that equals one when the executive is the CEO, and zero otherwise.
$RANK_{it}$	The rank of total compensation level (TDC1) for the executives within the firm. *RANK*=4 (or 3, 2, 1, 0) indicates that the executive receives the highest (second highest, third highest, fourth highest, fifth highest) compensation, for the previous year, among the top executives of the firms.
$INDEX_{it}$	Strength of minority shareholder protection against self-dealing by insiders, as constructed by Djankov et al., (2008).[29] We adjust the index by subtracting the value of the U.S. from the values of all countries, such that the U.S. has an index value of zero and all other countries' index values reflect their differences from the U.S.

[29] The data are available at https://scholar.harvard.edu/shleifer/publications/law-and-economics-self-dealing.

Figure 1: Illustration of the Definitions of Return Components and the Corresponding Events



This figure provides a graphical illustration of the definitions of return components and the corresponding events underlying the return components.

Figure 2: Average Coefficients over Three Time Periods from Yearly Regression Estimates of Equation [4]

This figure plots the averages over the three sub-periods of our sample of the yearly coefficients on *CH_ROA*, *RET_EA*, and *RET_NONEA* from estimates of Equation [4].

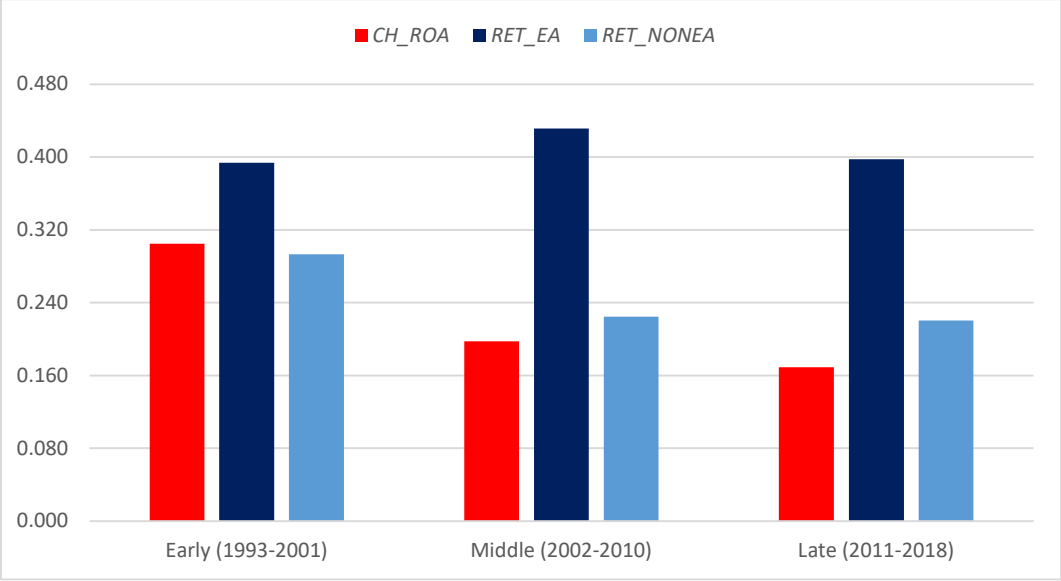


Table 1: Sample Selection Procedures

Total firm-year observations in ExecuComp from 2002 to 2018.	33,204
Less:	
Observations where the CEO was not in office for the entire current and previous year	8,706
Observations where fiscal year end was changed in the current or previous year	103
Observations with insufficient data to calculate the change in compensation	165
Observations that could not be merged with CRSP	917
Observations with insufficient data to construct control variables	1,559
Final Regression Sample	21,754

Table 2 Panel A: Descriptive Statistics

Variable	Mean	Std	10th%	25th%	Median	75th%	90th%
TOTALCOMP ($ millions)	5.520	5.451	0.937	1.810	3.771	7.226	12.423
EQUITYCOMP ($ millions)	4.344	4.896	0.209	0.969	2.710	5.918	10.647
Δlog(1+TOTALCOMP)	0.064	0.559	-0.536	-0.150	0.061	0.297	0.672
CFO1	0.100	0.089	0.013	0.047	0.091	0.145	0.212
CFO2	0.101	0.083	0.015	0.051	0.092	0.143	0.205
CFO3	0.100	0.080	0.016	0.052	0.092	0.142	0.202
RET	0.132	0.417	-0.339	-0.117	0.100	0.321	0.607
RET_NONEFF	0.071	0.298	-0.274	-0.099	0.053	0.215	0.409
RET_EFF	0.060	0.272	-0.243	-0.094	0.038	0.188	0.376
RET_EFF_NONACCT	0.033	0.160	-0.140	-0.051	0.021	0.104	0.213
RET_EFF_ACCT	0.027	0.208	-0.214	-0.090	0.014	0.129	0.271
ROA	0.047	0.093	-0.027	0.012	0.045	0.089	0.142
LOSS	0.156	0.363	0.000	0.000	0.000	0.000	1.000
CH_ROA	-0.000	0.080	-0.063	-0.018	0.001	0.018	0.058
SALES ($ millions)	5,758	13,595	208	504	1,388	4,472	13,056
LEVERAGE	0.233	0.198	0.000	0.060	0.207	0.356	0.501
BTM	0.528	0.413	0.142	0.268	0.452	0.696	1.001
EARNVOL	0.052	0.071	0.005	0.012	0.027	0.060	0.125
RETVOL	0.025	0.013	0.012	0.015	0.021	0.030	0.041
TENURE	8.793	7.006	2.000	4.000	7.000	12.000	19.000
AGE	56.574	6.945	48.000	52.000	57.000	61.000	65.000

Please refer to Appendix B for variable definitions.

Table 2 Panel B: Pearson Correlations

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	*Δlog(1+TOTALCOMP)*										
(2)	*CFO1*	0.05***									
(3)	*CFO2*	0.04***	0.93***								
(4)	*CFO3*	0.04***	0.89***	0.97***							
(5)	*RET*	0.16***	0.14***	0.14***	0.13***						
(6)	*RET_NONEFF*	0.08***	0.07***	0.07***	0.07***	0.71***					
(7)	*RET_EFF*	0.14***	0.12***	0.12***	0.11***	0.63***	-0.04***				
(8)	*RET_EFF_NONACCT*	0.05***	0.03***	0.03***	0.02***	0.36***	-0.05***	0.59***			
(9)	*RET_EFF_ACCT*	0.14***	0.12***	0.13***	0.12***	0.51***	-0.01*	0.78***	-0.01		
(10)	*ROA*	0.09***	0.57***	0.57***	0.56***	0.20***	0.12***	0.17***	0.06***	0.19***	
(11)	*LOSS*	-0.09***	-0.28***	-0.27***	-0.26***	-0.16***	-0.11***	-0.13***	-0.04***	-0.15***	-0.64***
(12)	*CH_ROA*	0.10***	0.08***	0.07***	0.06***	0.29***	0.18***	0.24***	0.10***	0.23***	0.37***
(13)	*SALES*	-0.01	0.02***	0.01**	0.01	-0.01	-0.02***	0.01	0.02***	-0.00	0.06***
(14)	*LEVERAGE*	-0.01	-0.12***	-0.12***	-0.13***	-0.06***	-0.04***	-0.05***	-0.02***	-0.05***	-0.16***
(15)	*BTM*	-0.06***	-0.35***	-0.38***	-0.39***	-0.31***	-0.23***	-0.22***	-0.12***	-0.18***	-0.31***
(16)	*EARNVOL*	-0.02***	0.02**	0.03***	0.03***	0.03***	-0.00	0.02***	0.02***	-0.00	-0.17***
(17)	*RETVOL*	-0.07***	-0.11***	-0.11***	-0.11***	-0.14***	-0.14***	-0.06***	-0.04***	-0.05***	-0.33***
(18)	*TENURE*	-0.02***	0.00	-0.00	-0.00	0.00	0.01	0.00	-0.00	0.00	0.02***
(19)	*AGE*	-0.02***	-0.02***	-0.03***	-0.03***	-0.00	0.01*	-0.01**	-0.00	-0.01**	0.02***

		(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(12)	*CH_ROA*	-0.23***							
(13)	*SALES*	-0.10***	-0.00						
(14)	*LEVERAGE*	0.10***	-0.02***	0.05***					
(15)	*BTM*	0.23***	-0.12***	-0.05***	-0.11***				
(16)	*EARNVOL*	0.31***	0.03***	-0.13***	-0.07***	-0.06***			
(17)	*RETVOL*	0.44***	-0.04***	-0.18***	-0.01	0.27***	0.41***		
(18)	*TENURE*	-0.02***	-0.01	-0.07***	-0.07***	0.01	-0.03***	0.00	
(19)	*AGE*	-0.06***	-0.00	0.07***	0.02***	0.03***	-0.11***	-0.11***	0.42***

Please refer to Appendix B for variable definitions. ***, **, * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Table 3: The Relation between Future Cash Flows from Operations and Stock Return Components

Dependent Variable	*CFO1*			*CFO2*	*CFO3*
	(1)	(2)	(3)	(4)	(5)
RET	0.006**				
	(2.051)				
RET_NONEFF		0.001	0.000	0.001	-0.001
		(0.207)	(0.048)	(0.188)	(-0.321)
RET_EFF		0.009**			
		(2.423)			
RET_EFF_NONACCT			-0.001	-0.003	-0.007*
			(-0.275)	(-0.789)	(-1.862)
RET_EFF_ACCT			0.015***	0.016***	0.013***
			(3.350)	(4.468)	(3.602)
CH_ROA	-0.009	-0.009	-0.010	-0.009	-0.013
	(-0.554)	(-0.522)	(-0.582)	(-0.725)	(-1.051)
SALES	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.918)	(-0.964)	(-0.954)	(-1.156)	(-1.162)
$SALES^2$	0.000	0.000	0.000	0.000	0.000
	(0.639)	(0.674)	(0.678)	(0.850)	(0.853)
LEVERAGE	-0.063***	-0.063***	-0.063***	-0.060***	-0.057***
	(-8.921)	(-8.951)	(-8.947)	(-7.800)	(-6.544)
BTM	-0.057***	-0.057***	-0.057***	-0.058***	-0.058***
	(-9.160)	(-9.166)	(-9.169)	(-8.568)	(-8.030)
RETVOL	-0.566***	-0.573***	-0.568***	-0.593***	-0.596***
	(-3.017)	(-3.052)	(-3.032)	(-3.136)	(-2.981)
TENURE	0.000	0.000	0.000	0.000	0.000
	(1.022)	(1.015)	(1.001)	(0.730)	(0.929)
AGE	-0.000	-0.000	-0.000	-0.000	-0.000
	(-1.184)	(-1.163)	(-1.145)	(-1.067)	(-1.336)
EARNVOL	0.014	0.014	0.015	0.022	0.020
	(0.777)	(0.791)	(0.809)	(1.072)	(0.743)
LOSS	-0.056***	-0.056***	-0.056***	-0.048***	-0.043***
	(-6.689)	(-6.694)	(-6.683)	(-6.494)	(-6.258)
Intercept	0.175***	0.175***	0.175***	0.175***	0.176***
	(16.186)	(16.234)	(16.336)	(15.463)	(14.330)
F test:*RET_NONEFF=RET_EFF*		**5.77****			
F test:*RET_NONEFF=RET_EFF_ACCT*			11.11***	18.96***	12.71***
F test:*RET_NONEFF=RET_EFF_NONACCT*			0.14	0.92	2.46

F test:*RET_EFF_NONACCT=RET_EFF_ACCT*			**12.97*** **	**18.04*** **	**13.52*** **
Fixed Effects		Year & SIC2		Year & SIC2	
Clustering		SIC2		SIC2	
Observations	20,897	20,897	20,897	18,926	17,018
R-squared	0.326	0.326	0.327	0.360	0.367

Please refer to Appendix B for variable definitions. All regressions include two-digit SIC and year fixed effects. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table 4: The Relation between CEO Compensation and Stock Return Components

Dependent Variable	*Δlog(1+TOTALCOMP)*		
	(1)	(2)	(3)
RET	0.196***		
	(15.105)		
RET_NONEFF		0.155***	0.152***
		(9.667)	(9.576)
RET_EFF		0.270***	
		(18.061)	
RET_EFF_NONACCT			0.184***
			(7.882)
RET_EFF_ACCT			0.332***
			(17.701)
CH_ROA	0.327***	0.301**	0.283**
	(2.792)	(2.602)	(2.404)
SALES	-0.000**	-0.000***	-0.000**
	(-2.562)	(-2.657)	(-2.638)
$SALES^2$	0.000	0.000	0.000
	(1.505)	(1.579)	(1.610)
LEVERAGE	0.005	0.009	0.010
	(0.367)	(0.617)	(0.673)
BTM	0.003	0.007	0.007
	(0.291)	(0.690)	(0.675)
RETVOL	-1.156**	-1.279**	-1.228**
	(-2.329)	(-2.616)	(-2.576)
TENURE	-0.001***	-0.001***	-0.001***
	(-3.360)	(-3.424)	(-3.402)
AGE	-0.002***	-0.002***	-0.002***
	(-3.679)	(-3.592)	(-3.489)
EARNVOL	-0.042	-0.027	-0.018
	(-0.917)	(-0.618)	(-0.417)
LOSS	-0.062***	-0.059***	-0.056***
	(-5.112)	(-4.738)	(-4.429)
Intercept	0.182***	0.178***	0.176***
	(7.419)	(7.179)	(7.052)
F test:*RET_NONEFF=RET_EFF*		**90.59*** **	
F test:*RET_NONEFF=RET_EFF_ACCT*			102.88***
F test:*RET_NONEFF=RET_EFF_NONACCT*			2.29
F test:*RET_EFF_NONACCT=RET_EFF_ACCT*			**24.67*** **
Fixed Effects		Year & SIC2	
Clustering		SIC2	
Observations	21,754	21,754	21,754
R-squared	0.045	0.047	0.048

Please refer to Appendix B for variable definitions. All regressions include two-digit SIC and year fixed effects. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table 5: The Role of Shareholder Alignment on Pay-for-performance Sensitivity
Panel A: Sample Including Both U.S. Firms and Cross-listed Firms

Dependent Variable	*Δlog(1+TOTALCOMP)*		
	(1)	(2)	(3)
*RET*INDEX*	0.029		
	(0.147)		
RET_NONEFF*INDEX		**-0.305***	**-0.296**
		(-1.701)	**(-1.608)**
RET_EFF*INDEX		**0.448***	
		(1.870)	
RET_EFF_NONACCT*INDEX			**-0.100**
			(-0.273)
RET_EFF_ACCT*INDEX			**1.356*****
			(3.408)
RET	0.188***		
	(14.488)		
RET_NONEFF		0.151***	0.149***
		(9.373)	(9.499)
RET_EFF		0.261***	
		(17.188)	
RET_EFF_NONACCT			0.177***
			(8.161)
RET_EFF_ACCT			0.324***
			(15.638)
*CH_ROA*INDEX*	-0.891	-0.765	-1.035
	(-1.247)	(-1.071)	(-1.476)
CH_ROA	0.329**	0.306**	0.289**
	(2.615)	(2.442)	(2.279)
INDEX	0.021	0.024	0.025
	(0.336)	(0.404)	(0.423)
F test:*RET_NONEFF*INDEX = RET_EFF*INDEX*		**9.51*****	
F test:*RET_NONEFF*INDEX = RET_EFF_ACCT*INDEX*			**10.75*****
F test:*RET_EFF_NONACCT*INDEX = RET_EFF_ACCT*INDEX*			**5.26****
Control Variables & Intercept		Yes	
Fixed effects		SIC2 & Year	
Clustering		SIC2	
Observations	21,724	21,724	21,724
R-squared	0.046	0.048	0.049

Please refer to Appendix B for variable definitions. All regressions include two-digit SIC and year fixed effects. For presentation simplicity, the coefficients on control variables, which are the same as those in Table 4, and intercept are suppressed. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table 5: The Role of Shareholder Alignment on Pay-for-performance Sensitivity
Panel B: Subsample of Cross-listed Firms

Dependent Variable	*Δlog(1+TOTALCOMP)*		
	(1)	(2)	(3)
*RET*INDEX*	0.005		
	(0.031)		
RET_NONEFF*INDEX		**-0.287***	**-0.286**
		(-1.711)	**(-1.645)**
RET_EFF*INDEX		**0.354***	
		(1.693)	
RET_EFF_NONACCT*INDEX			**-0.062**
			(-0.169)
RET_EFF_ACCT*INDEX			**1.155****
			(2.653)
RET	0.129***		
	(2.918)		
RET_NONEFF		0.147***	0.150***
		(3.066)	(2.931)
RET_EFF		0.160***	
		(3.663)	
RET_EFF_NONACCT			0.139**
			(2.023)
RET_EFF_ACCT			0.184***
			(4.115)
*CH_ROA*INDEX*	-0.984	-0.916	-1.159
	(-1.313)	(-1.212)	(-1.487)
CH_ROA	0.216	0.218	0.223
	(1.521)	(1.517)	(1.534)
INDEX	0.067	0.071	0.071
	(0.877)	(0.976)	(0.976)
F test:*RET_NONEFF*INDEX = RET_EFF*INDEX*		**7.59*****	
F test:*RET_NONEFF*INDEX = RET_EFF_ACCT*INDEX*			**6.87****
F test:*RET_EFF_NONACCT*INDEX = RET_EFF_ACCT*INDEX*			**3.13***
Control Variables & Intercept		Yes	
Fixed effects		SIC2 & Year	
Clustering		SIC2	
Observations	1,380	1,380	1,380
R-squared	0.073	0.079	0.085

Please refer to Appendix B for variable definitions. All regressions include two-digit SIC and year fixed effects. For presentation simplicity, the coefficients on control variables, which are the same as those in Table 4, and intercept are suppressed. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table 5: The Role of Shareholder Alignment on Pay-for-performance Sensitivity
Panel C: The Effect of Institutional Shareholder Distraction

Dependent Variable	*Δlog(1+TOTALCOMP)*					
	(1)	(2)	(3)	(4)	(5)	(6)
*RET*DISTRACTION_HIGH*	-0.011			-0.010		
	(-0.485)			(-0.433)		
*RET_NONEFF*DISTRACTION_HIGH*		0.043	0.043		0.042	0.042
		(1.074)	(1.093)		(1.031)	(1.053)
*RET_EFF*DISTRACTION_HIGH*		-0.083**			-0.082**	
		(-2.419)			(-2.369)	
RET_EFF_NONACCT*DISTRACTION_HIGH			**-0.050**			**-0.048**
			(-0.678)			**(-0.651)**
RET_EFF_ACCT*DISTRACTION_HIGH			**-0.139*****			**-0.139*****
			(-3.497)			**(-3.505)**
*RET*IO*				0.110		
				(1.305)		
*RET_NONEFF*IO*					0.107	0.096
					(0.822)	(0.733)
*RET_EFF*IO*					0.072	
					(0.813)	
*RET_EFF_NONACCT*IO*						-0.020
						(-0.105)
*RET_EFF_ACCT*IO*						0.106
						(0.999)
*RET*IO_5*				-0.155		
				(-0.827)		
*RET_NONEFF*IO_5*					-0.155	-0.149
					(-0.484)	(-0.464)
*RET_EFF*IO_5*					-0.216	
					(-1.291)	
*RET_EFF_NONACCT*IO_5*						-0.126
						(-0.264)
*RET_EFF_ACCT*IO_5*						-0.283
						(-1.217)
RET	0.193***			0.191***		
	(15.058)			(14.714)		
RET_NONEFF		0.136***	0.131***		0.134***	0.130***
		(8.459)	(8.416)		(8.083)	(8.106)
RET_EFF		0.286***			0.285***	

		(13.818)			(13.368)	
RET_EFF_NONACCT			0.183***			0.183***
			(5.054)			(4.969)
RET_EFF_ACCT			0.362***			0.360***
			(15.943)			(15.847)
*CH_ROA*DISTRACTION_HIGH*	0.099	0.116	0.144	0.092	0.110	0.139
	(0.450)	(0.514)	(0.658)	(0.428)	(0.494)	(0.644)
*CH_ROA*IO*				-0.240	-0.253	-0.282
				(-1.019)	(-1.096)	(-1.218)
*CH_ROA*IO_5*				1.669*	1.682*	1.722*
				(1.793)	(1.776)	(1.797)
CH_ROA	0.398**	0.364**	0.343**	0.373**	0.340**	0.318*
	(2.552)	(2.334)	(2.245)	(2.293)	(2.083)	(1.996)
DISTRACTION_HIGH	0.023**	0.024**	0.024**	0.023**	0.024**	0.024**
	(2.187)	(2.292)	(2.265)	(2.226)	(2.331)	(2.303)
IO				-0.062**	-0.063**	-0.063**
				(-2.361)	(-2.389)	(-2.283)
IO_5				0.217***	0.223***	0.227***
				(3.516)	(3.484)	(3.297)
F test: *RET_EFF=RET_NONEFF*		46.27***			41.70***	
F test: *RET_EFF+RET_EFF*DISTRACTION_HIGH= RET_NONEFF+RET_NONEFF*DISTRACTION_HIGH*		0.33			0.37	
F test: *RET_EFF_ACCT=RET_EFF_NONACCT*			**19.04*** **			**18.09*** **
F test: *RET_EFF_ACCT+RET_EFF_ACCT*DISTRACTION_HIGH= RET_EFF_NONACCT+RET_EFF_NONACCT*DISTRACTION_HIGH*			**1.43**			**1.31**
Control Variables & Intercept			Yes			
Fixed Effects			Year & SIC2			
Clustering			SIC2			
Observations	19,059	19,059	19,059	19,059	19,059	19,059
R-squared	0.044	0.046	0.047	0.045	0.047	0.048

Please refer to Appendix B for variable definitions. All regressions include two-digit SIC and year fixed effects. For presentation simplicity, the coefficients on control variables, which are the same as those in Table 4, and intercept are suppressed. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table 6: The Relation between CEO Compensation and Stock Return over Earnings Announcement Windows and Non-earnings Announcement Windows

Dependent Variable	*CFO3*	*Δlog(1+TOTALCOMP)*
	(1)	(2)
RET_NONEA	-0.000	0.193***
	(-0.077)	(13.996)
RET_EA	0.026***	0.356***
	(4.707)	(13.939)
CH_ROA	-0.009	0.288***
	(-0.692)	(2.822)
F test: *RET_NONEA=RET_EA*	**24.32*** **	**39.63*** **
Control Variables & Intercept	Yes	
Fixed Effects	Year & SIC2	
Clustering	SIC2	
Observations	23,134	29,211
R-squared	0.347	0.050

RET_EA is cumulative stock return over trading days that are within [-1,+1] windows around all earnings announcements for firm *i* in fiscal year *t*. *RET_NONEA* is cumulative stock return over trading days that are NOT within [-1,+1] windows around any earnings announcement for firm *i* in fiscal year *t*. Please refer to Appendix B for definitions of other variables. All regressions include two-digit SIC and year fixed effects. For presentation simplicity, the coefficients on control variables, which are the same as those in Table 4, and intercept are suppressed. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively

Table 7: CEO Compensation and Stock Return Components – the Effect of Return Volatility

Dependent Variable	*Δlog(1+TOTALCOMP)*		
	(1)	(2)	(3)
*RET*RETVOL*	-3.993***		
	(-5.371)		
RET_NONEFF*RETVOL_NONEFF		**-5.348*** **	**-5.256*** **
		(-4.986)	**(-4.875)**
RET_EFF*RETVOL_EFF		**-1.453**	
		(-1.592)	
RET_EFF_NONACCT*RETVOL_EFF_NONACCT			**-1.020**
			(-0.460)
RET_EFF_ACCT*RETVOL_EFF_ACCT			**-1.930** **
			(-2.266)
RET	0.231***		
	(20.144)		
RET_NONEFF		0.200***	0.196***
		(14.431)	(14.020)
RET_EFF		0.275***	
		(19.547)	
RET_EFF_NONACCT			0.177***
			(8.167)
RET_EFF_ACCT			0.345***
			(18.250)
RETVOL	1.282*		
	(1.849)		
RETVOL_NONEFF		0.880	0.641
		(1.256)	(0.768)
RETVOL_EFF		0.351	
		(0.728)	
RETVOL_EFF_NONACCT			0.277
			(0.476)
RETVOL_EFF_ACCT			0.329
			(0.881)
CH_ROA	0.333***	0.314***	0.297**
	(2.942)	(2.807)	(2.595)
F test:*RET_NONEFF*RETVOL_NONEFF=RET_EFF*RETVOL_EFF*		**15.42*** **	
F test:*RET_NONEFF*RETVOL_NONEFF=RET_EFF_ACCT*RETVOL_EFF_ACCT*			**9.87*** **
Control Variables & Intercept		Yes	
Fixed Effects		Year & SIC2	
Clustering		SIC2	
Observations	20,659	20,619	20,503
R-squared	0.047	0.048	0.049

All stock return volatility variables (*RETVOL*, *RETVOL_NONEFF*, *RETVOL_EFF*, *RETVOL_EFF_NONACCT*, and *RETVOL_EFF_ACCT*) are demeaned in order to facilitate interpretation of the standalone return variables. Please refer to Appendix B for variable definitions. All regressions include two-digit SIC and year fixed effects. For presentation simplicity, the coefficients on control variables, which are the same as those in Table 4, and intercept are suppressed. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table 8: Within-executive Variation in Pay-for-performance Sensitivity
Panel A: The Importance of Executives as Measured by the CEO Title

Dependent Variable	*Δlog(1+TOTALCOMP)*		
	(1)	(2)	(3)
*RET*CEO*	0.053***		
	(5.763)		
RET_NONEFF*CEO		**0.029*** **	**0.029*** **
		(2.862)	**(2.774)**
RET_EFF*CEO		**0.086*** **	
		(6.546)	
RET_EFF_NONACCT*CEO			**0.043** **
			(2.221)
RET_EFF_ACCT*CEO			**0.117*** **
			(6.990)
RET	0.140***		
	(17.221)		
RET_NONEFF		0.121***	0.119***
		(10.471)	(10.394)
RET_EFF		0.183***	
		(16.843)	
RET_EFF_NONACCT			0.139***
			(9.419)
RET_EFF_ACCT			0.218***
			(13.734)
*CH_ROA*CEO*	0.018	0.007	-0.003
	(0.270)	(0.105)	(-0.050)
CH_ROA	0.352***	0.335***	0.325***
	(4.981)	(4.948)	(4.717)
CEO	0.007***	0.006***	0.007***
	(3.884)	(3.572)	(3.772)
F test:*RET_NONEFF*CEO = RET_EFF* CEO*		**19.96*** **	
F test:*RET_NONEFF* CEO = RET_EFF_ACCT* CEO*			**27.27*** **
F test:*RET_EFF_NONACCT* CEO = RET_EFF_ACCT* CEO*			**10.18*** **
Control Variables & Intercept		Yes	
Fixed effects		SIC2 & Year	
Clustering		SIC2	
Observations	93,323	93,323	93,323
R-squared	0.039	0.040	0.041

Please refer to Appendix B for variable definitions. All regressions include two-digit SIC and year fixed effects. For presentation simplicity, the coefficients on control variables, which are the same as those in Table 4, and intercept are suppressed. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table 8: Within-executive Variation in Pay-for-performance Sensitivity
Panel B: The Importance of Executives as Measured by Compensation Rank

Dependent Variable	*Δlog(1+TOTALCOMP)*		
	(1)	(2)	(3)
*RET*RANK*	0.013***		
	(3.709)		
RET_NONEFF*RANK		**0.011*** **	**0.011*** **
		(2.950)	**(2.925)**
RET_EFF*RANK		**0.019*** **	
		(3.298)	
RET_EFF_NONACCT*RANK			**0.010**
			(1.139)
RET_EFF_ACCT*RANK			**0.025*** **
			(4.978)
RET	0.122***		
	(13.971)		
RET_NONEFF		0.102***	0.100***
		(9.136)	(7.117)
RET_EFF		0.160***	
		(9.763)	
RET_EFF_NONACCT			0.125***
			(5.209)
RET_EFF_ACCT			0.187***
			(9.986)
*CH_ROA*RANK*	0.011	0.008	0.005
	(0.660)	(0.455)	(0.281)
CH_ROA	0.330***	0.318***	0.311***
	(4.470)	(4.564)	(3.891)
RANK	-0.037***	-0.038***	-0.037***
	(-14.717)	(-14.506)	(-18.217)
F test:*RET_NONEFF*RANK = RET_EFF*RANK*		**1.55**	
F test:*RET_NONEFF*RANK = RET_EFF_ACCT*RANK*			
F test:*RET_EFF_NONACCT*RANK = RET_EFF_ACCT*RANK*			**6.20** **
			2.67
Control Variables & Intercept		Yes	
Fixed effects		SIC2 & Year	
Clustering		SIC2	
Observations	93,323	93,323	93,323
R-squared	0.048	0.049	0.049

Please refer to Appendix B for variable definitions. All regressions include two-digit SIC and year fixed effects. For presentation simplicity, the coefficients on control variables, which are the same as those in Table 4, and intercept are suppressed. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table 9: Role of Financial Reporting Credibility
Panel A: Internal Control Weaknesses

Dependent Variable	*Δlog(1+TOTALCOMP)*		
	(1)	(2)	(3)
*RET*ICW*	0.007		
	(0.137)		
*RET_NONEFF*ICW*		0.054	0.056
		(0.839)	(0.875)
*RET_EFF*ICW*		-0.074	
		(-1.094)	
RET_EFF_NONACCT*ICW			**0.026**
			(0.230)
RET_EFF_ACCT*ICW			**-0.148****
			(-2.220)
RET	0.193***		
	(14.290)		
RET_NONEFF		0.149***	0.146***
		(8.596)	(8.569)
RET_EFF		0.272***	
		(16.431)	
RET_EFF_NONACCT			0.179***
			(7.620)
RET_EFF_ACCT			0.339***
			(16.730)
*CH_ROA*ICW*	-0.177	-0.125	-0.112
	(-0.682)	(-0.479)	(-0.429)
CH_ROA	0.352***	0.325***	0.306***
	(3.162)	(2.967)	(2.749)
ICW	-0.019	-0.017	-0.019
	(-1.076)	(-0.949)	(-1.076)
F test: *RET_EFF=RET_NONEFF*		81.53***	
F test: *RET_EFF+RET_EFF*ICW =RET_NONEFF+RET_NONEFF*ICW*		0.01	
F test: *RET_EFF_ACCT=RET_EFF_NONACCT*			**29.38*****
F test: *RET_EFF_ACCT+RET_EFF_ACCT*ICW =RET_EFF_NONACCT+RET_EFF_NONACCT*ICW*			**0.02**
Control Variables & Intercept		Yes	
Fixed Effects		Year & SIC2	
Clustering		SIC2	
Observations	21,670	21,670	21,670
R-squared	0.045	0.047	0.048

Please refer to Appendix B for variable definitions. All regressions include two-digit SIC and year fixed effects. For presentation simplicity, the coefficients on control variables, which are the same as those in Table 4, and intercept are suppressed. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table 9: Role of Financial Reporting Credibility
Panel B: Auditor Reputation

Dependent Variable	*Δlog(1+TOTALCOMP)*		
	(1)	(2)	(3)
*RET*RESTATE_PCT_HIGH*	-0.030		
	(-1.065)		
*RET_NONEFF*RESTATE_PCT_HIGH*		-0.034	-0.036
		(-0.730)	(-0.776)
*RET_EFF*RESTATE_PCT_HIGH*		-0.042*	
		(-1.818)	
RET_EFF_NONACCT*RESTATE_PCT_HIGH			**0.019**
			(0.326)
RET_EFF_ACCT*RESTATE_PCT_HIGH			**-0.080****
			(-2.151)
RET	0.201***		
	(14.432)		
RET_NONEFF		0.155***	0.153***
		(8.252)	(8.159)
RET_EFF		0.284***	
		(17.917)	
RET_EFF_NONACCT			0.171***
			(5.679)
RET_EFF_ACCT			0.363***
			(18.070)
*CH_ROA*RESTATE_PCT_HIGH*	0.210	0.206	0.217
	(1.565)	(1.531)	(1.583)
CH_ROA	0.276**	0.249*	0.226*
	(2.070)	(1.933)	(1.715)
RESTATE_PCT_HIGH	-0.005	-0.004	-0.004
	(-0.541)	(-0.378)	(-0.427)
F test: *RET_EFF=RET_NONEFF*		62.21***	
F test: *RET_EFF+RET_EFF*RESTATE_PCT_HIGH =RET_NONEFF+RET_NONEFF*RESTATE_PCT_HIGH*		10.76***	
F test: *RET_EFF_ACCT=RET_EFF_NONACCT*			**26.26*****
F test: *RET_EFF_ACCT+RET_EFF_ACCT*RESTATE_PCT_HIGH =RET_EFF_NONACCT+RET_EFF_NONACCT*RESTATE_PCT_HIGH*			**2.22**
Control Variables & Intercept		Yes	
Fixed Effects		Year & SIC2	
Clustering		SIC2	
Observations	20,190	20,190	20,190
R-squared	0.045	0.048	0.049

Please refer to Appendix B for variable definitions. All regressions include two-digit SIC and year fixed effects. For presentation simplicity, the coefficients on control variables, which are the same as those in Table 4, and intercept are suppressed. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Internet Appendix

We present results from additional analyses in this section.

IA.1. Splitting Total Compensation into its Cash and Equity Components

We re-estimate Equations [1]-[3] by replacing the dependent variable (change in total compensation) with the change in cash compensation and the change in equity compensation respectively. While we expect our results to hold for equity compensation, we are agnostic about cash compensation, as earnings realizations are more relevant in its determination (e.g., Bushman and Smith, 2001). Columns (1)-(3) in Table IA.1 show that all return components are positively associated with cash compensation. While the coefficients on *RET_EFF_ACCT* and *RET_NONEFF* are statistically different from each other, the coefficients on *RET_EFF_ACCT* and *RET_EFF_NONACCT* are not. In untabulated analyses, we replace cash compensation with bonus and obtain similar results. When the change in equity compensation is the dependent variable, columns (4)-(6) report coefficients on the return components that are larger than their counterparts in Table 4. In contrast, the coefficients on *CH_ROA* in these columns, while positive, are insignificantly different from zero. These results are consistent with the general understanding in the literature that stock returns play a dominant role in determining equity compensation.[30]

IA.2. The Relation to the Relative Performance Evaluation (RPE) Literature

Prior research (e.g., Albuquerque 2009; Jayaraman et al., 2021) indicates that firms, in setting executive compensation, use relative performance evaluation that shields executives from external (usually market-level or industry-level) shocks. Our methodology goes beyond RPE in that we decompose *firm-specific* returns. We expect the differential sensitivity of compensation to the various firm stock return components, which we predict and find, to be distinct from RPE that is based on industry-wide or market-wide return shocks. To confirm our expectation, we start with controlling for the effect of RPE in compensation by adding to our regressions an additional control for value-weighted peer returns, with peer groups defined as firms in the same SIC2 industry, firms of similar size in the same SIC2 industry following Albuquerque (2009), firms of similar size and BTM in the same TNIC-3 product market industry (per Hoberg and Phillips 2016) following Jayaraman et al. (2021), or firms in the whole market portfolio, respectively. For brevity, we only report estimation results following equation [3], with full return decomposition. The results, as reported in columns (1), (3), (5)[31], and (7) in Panel A of Table IA.2, are similar to those reported in the baseline analyses and continue to show differential sensitivity of compensation to the various components of firm stock return, with the coefficient on *RET_EFF_ACCT* larger than that on *RET_EFF_NONACCT*, all statistically significant at the 1% level as indicated by the corresponding F-tests. The coefficients on peer returns (*PEERRET*) are all significantly negative, consistent with the findings of the RPE literature that on average firms filter out uncontrollable

[30] There are 279 observations in our sample where equity compensation equals zero for either year t or year t-1. Dropping these observations or applying the Inverse Hyperbolic Sine Transformation, instead of the log transformation, to equity compensation does not change our inferences.

[31] The sample size reduces to 16,387 observations when we follow Jayaraman et al. (2021) and require each focal firm-year to be matched with at least two peers within the closest one-quarter of TNIC peers in terms of size and BM.

common shocks in determining CEO compensation. In columns (2), (4), (6), and (8), we further decompose peer returns (*PEERRET*) into four components using the events windows of the focal firms. Our results remain similar. The coefficients on *RET_EFF_ACCT* are essentially unchanged, and the coefficient on *RET_EFF_ACCT* is larger than that on *RET_EFF_NONACCT* at the 1% significance level in all four specifications. We also note that, across all specifications reported in the eight columns in this panel, the coefficients on the firm stock return components and their relative magnitude are similar to those reported in our baseline regressions in column (3) of Table 4. In Panel B Table IA.2, we replace focal firm returns and its components with peer-adjusted firm returns, defined as focal firm returns (or its various components) minus the portfolio returns (or its corresponding components) of the four alternative peer groups. Our results remain similar. Overall, the evidence suggests that the differential sensitivity of compensation to the firm stock return components based on the nature of various firm-specific events, as documented in this paper, is likely distinct from the phenomenon of relative performance evaluation.

IA.3. CEO Compensation, Stock Return Components, and the Level of CEO Wealth

As the central focus of the paper is on CEO performance evaluation, we examine the sensitivity of CEOs' flow compensation to various stock return components. We recognize that CEO equity portfolios play a major role in providing incentives. Thus, we carry our analyses over subsamples partitioned on different levels of CEO firm-related wealth, which is measured following Daniel, Li, and Naveen (2020) as the value of CEO's stock and option portfolio at the beginning of the year. Columns (3) and (6) in Table IA.3 show that in both high and low CEO wealth subsamples, the coefficient on *RET_EFF_ACCT* is larger than that on *RET_EFF_NONACCT*, and the difference is both statistically and economically significant. In columns (9) and (12), we add the additional control for the logarithm of CEO wealth and the results remain the same.

IA.4. Randomized Stock Return Volatility

One potential concern with the stock return volatility analysis is that the coefficient estimate on the interactive term between a stock return component and its volatility may be biased towards zero due to the noise in measuring daily stock return volatility if the number of underlying trading days is small. For example, in the regression reported in column (2) of Table 6, the median number of trading days underlying *RET_EFF* is 71, compared to 180 for *RET_NONEFF*.[32] We conduct an additional randomized test that uses the same number of trading days in calculating the volatility for both *RET_EFF* and *RET_NONEFF*. Specifically, for each firm-year observation, we count the number of trading days underlying *RET_EFF*, and then randomly draw (without replacement) the same number of trading days out of all trading days underlying *RET_NONEFF*, which we use to construct the randomized volatility measure *RETVOL_NONEFF_R*. We then run the same regression as the main *RETVOL* tests, except that the original volatility measure *RETVOL_NONEFF* is replaced with the randomized volatility measure *RETVOL_NONEFF_R*.

[32] The corresponding median number of trading days for *RET_ EFF_ACCT* is 34.

We repeat this randomization for 100 times and obtain 100 sets of coefficient estimates, among which the coefficients on *RET_NONEFF*RETVOL_NONEFF_R* and *RET_EFF*RETVOL_EFF* are of interest to us. Column (1) of Panel A of Table IA.4 reports the mean and the median of these two coefficients from the 100 randomized test, as well as the t-test and the Wilcoxon rank-sum test for the equality of the two coefficients. Both tests indicate that the coefficient on *RET_NONEFF*RETVOL_NONEFF_R* is significantly more negative than that on *RET_EFF*RETVOL_EFF* at the 1% level. Columns (2) of Panel A report the randomized tests involving the finer return decomposition, and the results continue to confirm the findings as reported in Table 6. Last, we also apply randomization on the return measure itself (*RET_NONEFF*) to generate the randomized return measure (*RET_NONEFF_R*) using the same number of trading days as that used for the other return components (*RET_EFF* or *RET_EFF_ACCT*). The randomized test results, as reported in Panel B of Table IA.4, continue to support our inferences.

Table IA.1: Cash and Equity Compensation

Dependent Variable	*Δlog(1+CASHCOMP)*			*Δlog(1+EQUITYCOMP)*		
	(1)	(2)	(3)	(4)	(5)	(6)
RET	0.069***			0.306***		
	(10.870)			(9.771)		
RET_NONEFF		0.060***	0.060***		0.238***	0.233***
		(7.274)	(7.362)		(6.911)	(6.958)
RET_EFF		0.096***			0.426***	
		(10.695)			(10.768)	
RET_EFF_NONACCT			0.079***			0.284***
			(4.875)			(6.163)
RET_EFF_ACCT			0.109***			0.523***
			(10.849)			(10.958)
CH_ROA	0.208***	0.196***	0.192***	0.318	0.277	0.250
	(5.597)	(5.284)	(5.184)	(1.247)	(1.087)	(0.966)
F test:*RET_NONEFF=RET_EFF*		**10.05*** **			**43.22*** **	
F test:*RET_NONEFF=RET_EFF_ACCT*			17.43***			62.91***
F test:*RET_NONEFF=RET_EFF_NONACCT*			1.13			1.18
F test:*RET_EFF_NONACCT=RET_EFF_ACCT*			**2.19**			**16.26*** **
Control Variables & Intercept			Yes			
Fixed Effects			Year & SIC2			
Clustering			SIC2			
Observations	21,754	21,754	21,754	21,754	21,754	21,754
R-squared	0.109	0.111	0.110	0.023	0.024	0.024

Please refer to Appendix B for variable definitions. All regressions include two-digit SIC and year fixed effects. For presentation simplicity, the coefficients on control variables, which are the same as those in Table 4, and intercept are suppressed. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table IA.2: The Relation to Relative Performance Evaluation
Panel A: Firm Returns Based on Raw Returns

Dependent Variable	*Δlog(1+TOTALCOMP)*							
	Peers defined by							
	Industry		Industry-Size		TNIC-3 Size BTM		Market	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
RET_NONEFF	0.181***	0.171***	0.182***	0.173***	0.174***	0.163***	0.175***	0.170***
	(10.301)	(9.559)	(11.295)	(10.419)	(9.714)	(9.148)	(10.791)	(11.346)
RET_EFF_NONACCT	0.213***	0.211***	0.213***	0.221***	0.190***	0.195***	0.207***	0.215***
	(8.409)	(7.200)	(8.372)	(8.454)	(6.522)	(5.842)	(8.786)	(7.489)
RET_EFF_ACCT	0.348***	0.358***	0.346***	0.354***	0.325***	0.338***	0.343***	0.348***
	(18.403)	(14.655)	(18.467)	(14.998)	(13.670)	(11.824)	(17.541)	(14.980)
PEERRET	-0.122***		-0.095***		-0.094***		-0.215***	
	(-4.324)		(-5.077)		(-5.170)		(-4.635)	
PEERRET_NONEFF		-0.090***		-0.074***		-0.073***		-0.193***
		(-2.751)		(-3.112)		(-2.914)		(-4.598)
PEERRET_EFF_NONACCT		-0.119**		-0.126***		-0.118**		-0.262***
		(-2.050)		(-2.869)		(-2.400)		(-2.931)
PEERRET_EFF_ACCT		-0.175**		-0.145**		-0.167***		-0.263***
		(-2.413)		(-2.379)		(-3.220)		(-2.814)
CH_ROA	0.283**	0.281**	0.277**	0.275**	0.259**	0.254**	0.287**	0.286**
	(2.401)	(2.381)	(2.487)	(2.453)	(2.254)	(2.217)	(2.419)	(2.394)
F test:*RET_NONEFF=RET_EFF_ACCT*	82.96***	55.44***	81.61***	52.04***	39.76***	31.18***	95.90***	65.65***
F test:*RET_NONEFF=RET_EFF_NONACCT*	2.32	2.00	2.08	3.82*	0.35	1.00	2.38	2.52
F test:*RET_EFF_NONACCT=RET_EFF_ACCT*	**19.58*** **	**16.69*** **	**17.82*** **	**15.89*** **	**12.68*** **	**10.72*** **	**21.26*** **	**15.70*** **
F test:*PEERRET_NONEFF =PEERRET_EFF_ACCT*		1.67		1.38		2.81		0.84
F test:*PEERRET_NONEFF =PEERRET_EFF_NONACCT*		0.19		0.94		0.61		0.63
F test:*PEERRET_EFF_NONACCT=PEERRET_EFF_ACCT*		**0.40**		**0.07**		**0.40**		**0.00**
Control Variables & Intercept	Yes		Yes		Yes		Yes	
Fixed Effects	Year & SIC2		Year & SIC2		Year & SIC2		Year & SIC2	

Clustering	SIC2		SIC2		SIC2		SIC2	
Observations	21,754	21,754	21,591	21,591	16,387	16,387	21,754	21,754
R-squared	0.049	0.049	0.049	0.049	0.046	0.046	0.049	0.049

All firm stock return variables (*RET_NONEFF, RET_EFF_NONACCT*, and *RET_EFF_ACCT*) are raw returns. *PEERRET* denotes the peer return measured in year t. *PEERRET_NONEFF*, *PEERRET_EFF_NONACCT*, and *PEERRET_EFF_ACCT* refer to the peer returns for the NONEFF, EFF_NONACC, and EFF_ACC windows of the focal firm in year t. In columns (1)–(2), peer return is the value-weighted industry return based on 2-digit SIC codes. In columns (3)–(4), peer return is the value-weighted return from firms in the same 2-digit SIC industry and the same size quartile (based on beginning-of-year market value), following Albuquerque (2009). In columns (5)–(6), peer return is the value-weighted return from one quarter of TNIC-3 product market peers (Hoberg and Phillips, 2016) chosen based on the closeness of size (i.e., market value of equity) and book-to-market ratio within each focal firm's TNIC-3 group and year, following Jayaraman et al. (2021). In columns (7)–(8), peer return is measured as the value-weighted market return. For presentation simplicity, the coefficients on control variables, which are the same as those in Table 4, and intercept are suppressed. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table IA.2: The Relation to Relative Performance Evaluation
Panel B: Firm Returns Based on Peer-Adjusted Returns

Dependent Variable	*Δlog(1+TOTALCOMP)*							
	Peers defined by							
	Industry		Industry-Size		TNIC-3 Size BTM		Market	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
RET_NONEFF_Adj	0.171***	0.173***	0.170***	0.171***	0.153***	0.154***	0.169***	0.170***
	(9.674)	(9.747)	(9.810)	(9.853)	(8.037)	(7.947)	(10.997)	(11.175)
RET_EFF_NONACCT_Adj	0.204***	0.205***	0.213***	0.214***	0.186***	0.186***	0.212***	0.214***
	(7.071)	(7.035)	(8.191)	(8.175)	(5.901)	(5.977)	(7.785)	(7.601)
RET_EFF_ACCT_Adj	0.363***	0.362***	0.352***	0.355***	0.330***	0.335***	0.355***	0.353***
	(15.178)	(14.936)	(14.305)	(14.847)	(11.235)	(11.689)	(15.424)	(14.922)
PEERRET	0.075***		0.095***		0.084***		-0.022	
	(3.207)		(5.265)		(4.500)		(-0.518)	
PEERRET_NONEFF		0.079***		0.093***		0.083***		-0.028
		(2.911)		(4.210)		(3.558)		(-0.662)
PEERRET_EFF_NONACCT		0.095**		0.093**		0.071		-0.049
		(2.003)		(2.261)		(1.602)		(-0.634)
PEERRET_EFF_ACCT		0.187***		0.211***		0.171***		0.084
		(3.236)		(4.370)		(4.279)		(1.053)
CH_ROA	0.285**	0.279**	0.281**	0.276**	0.265**	0.261**	0.285**	0.284**
	(2.409)	(2.373)	(2.488)	(2.468)	(2.303)	(2.282)	(2.398)	(2.394)
F test:*RET_NONEFF_Adj =RET_EFF_ACCT_Adj*	63.10***	60.24***	51.31***	57.00***	32.05***	35.85***	80.82***	72.68***
F test:*RET_NONEFF_Adj =RET_EFF_NONACCT_Adj*	1.50	1.40	3.32*	3.47*	1.17	1.13	2.71	2.54
F test:*RET_EFF_NONACCT_Adj =RET_EFF_ACCT_Adj*	**21.17*** **	**20.56*** **	**18.66*** **	**18.97*** **	**11.67*** **	**12.77*** **	**19.60*** **	**18.44*** **
F test:*PEERRET_NONEFF =PEERRET_EFF_ACCT*		4.52**		6.47**		4.71**		2.98*
F test:*PEERRET_NONEFF =PEERRET_EFF_NONACCT*		0.09		0.00		0.07		0.09
F test:*PEERRET_EFF_NONACCT=PEERRET_EFF_ACCT*		**1.61**		**3.23***		**2.41**		**2.34**
Control Variables & Intercept	Yes		Yes		Yes		Yes	
Fixed Effects	Year & SIC2		Year & SIC2		Year & SIC2		Year & SIC2	

Clustering	SIC2		SIC2		SIC2		SIC2	
Observations	21,754	21,754	21,591	21,591	16,387	16,387	21,754	21,754
R-squared	0.048	0.049	0.048	0.049	0.045	0.045	0.049	0.049

All firm stock return variables (*RET_NONEFF_Adj, RET_EFF_NONACCT_Adj*, and *RET_EFF_ACCT_Adj*) are peer adjusted returns. *PEERRET* denotes the peer return measured in year t. *PEERRET_NONEFF*, *PEERRET_EFF_NONACCT*, and *PEERRET_EFF_ACCT* refer to the peer returns for the NONEFF, EFF_NONACC, and EFF_ACC windows of the focal firm in year t. In columns (1)–(2), peer return is the value-weighted industry return based on 2-digit SIC codes. In columns (3)–(4), peer return is the value-weighted return from firms in the same 2-digit SIC industry and the same size quartile (based on beginning-of-year market value), following Albuquerque (2009). In columns (5)–(6), peer return is the value-weighted return from one quarter of TNIC-3 product market peers (Hoberg and Phillips, 2016) chosen based on the closeness of size (i.e., market value of equity) and book-to-market ratio within each focal firm's TNIC-3 group and year, following Jayaraman et al. (2021). In columns (7)–(8), peer return is measured as the value-weighted market return. For presentation simplicity, the coefficients on control variables, which are the same as those in Table 4, and intercept are suppressed. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table IA.3: CEO Compensation and Stock Return Components – Different CEO Wealth Level

Dependent Variable	*Δlog(1+TOTALCOMP)*											
	CEO_WEALTH											
	High			Low			High			Low		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
RET	0.212***			0.186***			0.209***			0.176***		
	(9.723)			(10.631)			(9.502)			(10.184)		
RET_NONEFF		0.133***	0.128***		0.163***	0.162***		0.129***	0.124***		0.151***	0.150***
		(4.995)	(4.888)		(6.662)	(6.707)		(4.808)	(4.686)		(6.282)	(6.307)
RET_EFF		0.311***			0.243***			0.307***			0.234***	
		(12.567)			(12.746)			(12.333)			(12.541)	
RET_EFF_NONACCT			0.205***			0.178***			0.201***			0.168***
			(5.235)			(4.878)			(5.086)			(4.508)
RET_EFF_ACCT			0.383***			0.294***			0.379***			0.284***
			(13.258)			(12.410)			(13.271)			(12.147)
CH_ROA	0.412***	0.381**	0.358**	0.237**	0.217*	0.201*	0.410***	0.379**	0.357**	0.226*	0.206*	0.190
	(2.692)	(2.499)	(2.400)	(2.047)	(1.916)	(1.731)	(2.676)	(2.487)	(2.388)	(1.974)	(1.837)	(1.653)
log(1+CEO_WEALTH)							-0.013**	-0.013**	-0.013**	-0.031***	-0.031***	-0.032***
							(-2.440)	(-2.359)	(-2.358)	(-4.821)	(-5.031)	(-5.081)
F test:*RET_NONEFF=RET_EFF*		**78.81*** **			**15.89*** **			**78.60*** **			**16.75*** **	
F test:*RET_NONEFF=RET_EFF_ACCT*			86.78***			21.73***			86.91***			21.59***
F test:*RET_NONEFF=RET_EFF_NONACCT*			4.46**			0.21			4.45**			0.28
F test:*RET_EFF_NONACCT=RET_EFF_ACCT*			**14.32*** **			**5.91*** **			**14.40*** **			**5.67*** **
Control Variables & Intercept	Yes						Yes					
Fixed Effects	Year & SIC2						Year & SIC2					
Clustering	SIC2						SIC2					
Observations	10,515	10,515	10,515	10,527	10,527	10,527	10,515	10,515	10,515	10,527	10,527	10,527
R-squared	0.044	0.047	0.047	0.058	0.059	0.060	0.044	0.047	0.048	0.060	0.062	0.062

CEO_WEALTH is CEO firm-related wealth, measured at the beginning of the year, as the value of the CEO's stock and option portfolio following Daniel, Li, and Naveen (2020). Please refer to Appendix B for definitions of other variables. All regressions include two-digit SIC and year fixed effects. For presentation simplicity, the coefficients on control variables, which are the same as those in Table 4, and intercept are suppressed. T-statistics (in parentheses below the coefficient estimates) are based on standard errors adjusted for clustering at the two-digit SIC level. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table IA.4: Randomized Stock Return Volatility
Panel A: Tests with Randomized *RETVOL_NONEFF*

	(1)		(2)	
	Mean	Median	Mean	Median
*RET_NONEFF*RETVOL_NONEFF_R*	-5.028	-5.066	-4.491	-4.481
*RET_EFF*RETVOL_EFF*	-1.656	-1.654		
*RET_EFF_ACCT*RETVOL_EFF_ACCT*			-1.836	-1.838
T test: *RET_NONEFF*RETVOL_NONEFF_R=RET_EFF*RETVOL_EFF*	110.60***			
Wilcoxon rank-sum test: *RET_NONEFF*RETVOL_NONEFF_R=RET_EFF*RETVOL_EFF*	12.22***			
T test:*RET_NONEFF*RETVOL_NONEFF_R=RET_EFF_ACCT*RETVOL_EFF_ACCT*			65.76***	
Wilcoxon rank-sum test:*RET_NONEFF*RETVOL_NONEFF_R=RET_EFF_ACCT*RETVOL_EFF_ACCT*			12.22***	

This panel reports key results from the regressions reported in Panel A under an alternative specification, where we replace *RETVOL_NONEFF* with a randomized version *RETVOL_NONEFF_R*, such that the number of trading days used to construct *RETVOL_NONEFF_R* is the same as that used for *RETVOL_EFF* in column (1), or as that used for *RETVOL_EFF_ACCT* in column (2). We provide detailed explanation of the randomization procedure in Section IA.4 of the Internet Appendix. The distributional information for the key coefficients, as well as tests of differences between them, is based on 100 repetitions of randomized regressions. All other variables are the same as those included in the regressions of Table 6; for presentation simplicity, we suppress the coefficients on the other variables and intercept. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.

Table IA.4: Randomized Stock Return Volatility
Panel B: Tests with Randomized *RETVOL_NONEFF* and *RET_NONEFF*

	(1)		(2)	
	Mean	Median	Mean	Median
*RET_NONEFF_R*RETVOL_NONEFF_R*	-4.245	-4.325	-3.450	-3.574
*RET_EFF*RETVOL_EFF*	-1.406	-1.402		
*RET_EFF_ACCT*RETVOL_EFF_ACCT*			-1.597	-1.597
T test: *RET_NONEFF_R*RETVOL_NONEFF_R=RET_EFF*RETVOL_EFF*	19.04***			
Wilcoxon rank-sum test: *RET_NONEFF_R*RETVOL_NONEFF_R=RET_EFF*RETVOL_EFF*	11.73***			
T test:*RET_NONEFF_R*RETVOL_NONEFF_R=RET_EFF_ACCT*RETVOL_EFF_ACCT*			8.57***	
Wilcoxon rank-sum test: *RET_NONEFF_R*RETVOL_NONEFF_R=RET_EFF_ACCT*RETVOL_EFF_ACCT*			8.17***	

This panel reports key results from the regressions reported in Panel A under an alternative specification, where we replace *RETVOL_NONEFF* with a randomized version *RETVOL_NONEFF_R*, such that the number of trading days used to construct *RETVOL_NONEFF_R* is the same as that used for *RETVOL_EFF* in column (1), or as that used for *RET_EFF_ACCT* in column (2). Similarly, we also replace *RET_NONEFF* with a randomized version *RET_NONEFF_R*, such that the number of trading days used to construct *RET_NONEFF_R* is the same as that used for *RET_EFF* in column (1), or as that used for *RET_EFF_ACCT* in column (2). We provide detailed explanation of the randomization procedure in Section IA.4 of the Internet Appendix. The distributional information for the key coefficients, as well as tests of differences between them, is based on 100 repetitions of randomized regressions. All other variables are the same as those included in the regressions of Table 6; for presentation simplicity, we suppress the coefficients on the other variables and intercept. ***, **, * represent two-tailed statistical significance at the 1%, 5% and 10% levels, respectively.