Internal Information Quality and Performance Metric Selection

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Abstract:

This paper focuses on the role of firms' internal information quality in designing executive incentive contracts by testing the hypothesis that the quality of a firm's internal information is a friction in performance metric selection. Supporting this hypothesis, we show that higher internal information quality is associated with a greater number of performance metrics and increased dissimilarity from peer firms' contracts, particularly along non-financial dimensions. These relations hold when we examine changes in internal information quality that are likely induced by plausibly exogenous shifts in two financial accounting standards. We further find that incorporating more and more dissimilar non-financial metrics is positively associated with future profitability, but only when internal information quality is high. Overall, this study's findings bring in the perspective that internal information quality is a friction that influences boards' performance metric selection.

JEL classification: D22, D82, J33, M12, M41

Keywords: executive compensation, information environment, managerial incentives, contract design

1. Introduction

The design of executive compensation plans is one of the most important elements of effective corporate governance. A key feature of these plans is the choice of performance metrics against which executives will be explicitly evaluated and paid. For many years, the literature largely emphasized price-based performance metrics given that the lion's share of executives' incentives was shown to be tied to stock price via restricted stock and option grants and vested equity holdings.[1] However, the importance of non-price performance metrics has seen a resurgence—in part due to the increasing use of performance-vested equity awards, which surged after the adoption of ASC 718 in 2006, and in part due to the recent use of non-financial performance metrics in bonus plans.

Given this increasing importance of non-price performance metrics, it is important to understand the determinants of boards' selection of such metrics. Among such determinants, in particular, we focus on the role of internal information quality. Boards' selection of performance metrics increasingly plays the role of providing information to investors since the introduction of the Compensation Discussion and Analysis (CD&A), as prior studies find that boards consider investor reactions when designing executive contracts and writing the CD&A (Laksmana, Tietz, and Yang 2012; Gipper 2021; Packard, Pawliczek, and Skinner 2023). For this relatively underexplored role of performance metric choice as another disclosure device to investors, internal information quality is a natural determinant to examine given prior studies' findings that such quality is the foundation of external disclosure quality in various contexts (Cassar and Gibson 2008; Feng, Li, and McVay 2009; Plumlee and Yohn 2010; Dorantes, Li, Peters, and Richardson 2013; Chen et al. 2018).

Furthermore, internal information quality is crucial for understanding the practical

[1] See, for instance, Jensen and Murphy (1990b, 1990a), Hall and Liebman (1998), Core and Guay (1999), Bushman and Smith (2001), Core, Guay and Verrecchia (2003), Coles, Daniel and Naveen (2006), and Edmans, Gabaix and Jenter (2017).

application of fundamental agency theory underlying executive incentive-compensation when information processing constraints exist. With regard to selecting performance metrics, prior studies generally assume that firms can choose from the same opportunity set of performance metrics when designing incentive contracts for their executives. For instance, when examining whether and why firms include pro-forma earnings metrics or environmental and social performance metrics in their executive compensation plans, practitioners and researchers typically implicitly assume that the cost of including such metrics is the same across firms.[2] However, performance metrics often require metric-specific information processing, and non-financial performance metrics may lack the level of long-standing understanding among executives, directors, and investors that financial performance metrics enjoy. Reflecting this heterogeneity, we observe considerable differences across firms—even within the same industry—in both the number and variety of performance metrics they include in their executive compensation plans.

In this study, we depart from this implicit assumption of frictionless performance metric selection and instead conjecture that the quality of a firm's internal information system is a limiting friction that constrains the breadth and variety of explicit performance metrics used in executive incentive contracts. That is, although economic theory predicts that any performance metric that provides additional information about the executive's actions is valuable in a frictionless world (Holmström 1979), in practice there are processing costs for each candidate metric in the contract. Similar to the information processing constraints faced by investors (e.g., Blankespoor, deHaan, and Marinovic 2020), these costs relate to, for instance, defining the metric, determining appropriate performance targets, collecting data to calculate the metric, and assessing and reacting to actual performance relative to the targets (Ittner and Larcker

[2] For instance, Institutional Shareholder Services Inc. (2024) considers the absence of both long-term and short-term performance metrics and incentives related to ESG criteria as a significant concern in executive incentive contracts. Relatedly, Amundi (2023), the largest asset manager in Europe, has voted against the remuneration of Adobe Inc. and other firms, due to the lack of ESG KPIs in the executive incentive contracts.

2003). Within this framework, we predict. Given these considerations, we hypothesize that improvements in firms' internal information quality reduce processing costs for performance metric selection, enabling boards to use a broader set of performance metrics in their executives' incentive contracts.[3]

To study the relation between internal information quality and performance metric selection, we focus on an internal information quality index that combines five well-established measures from prior literature with two additional measures that capture aspects of firms' non-financial information environment. Specifically, our index incorporates variation related to the accuracy of executives' forecasts, the speed at which executives release an earnings announcement after fiscal year closing, audit fees, the absence of Sarbanes-Oxley Section 404 material weaknesses, the absence of restatements, environmental initiatives, and ESG reporting scope.[4] This composite measure is intended to capture the quality of firms' overall information acquisition processes, internal control practices, and the overall efficacy of information systems—in which both financial and non-financial aspects play a complementary role (e.g., Simons 1990; Kaplan and Norton 1992; Chenhall 2003).[5] All of these aspects are crucial for boards' decision-making processes and likely serve as a direct reflection of the internal information quality that influences the design of executive incentive contracts.

We begin our empirical analysis by examining whether firms' internal information quality is positively correlated with the number of performance metrics incorporated into CEO incentive contracts. We show that this correlation exists and continues to hold after controlling

[3] These arguments are somewhat related to the long-standing theoretical and empirical literature on the effects of "signal" and "noise" on the relative weights placed on accounting earnings and stock prices in compensation contracts. In this paper, our focus is not on a horse race between performance metrics with respect to which metric better captures executives' actions, but rather on understanding whether the quality of firms' internal information environment allows firms to use a broader set of performance metrics.

[4] See, for instance, Hogan and Wilkins (2008), Goodman, Neamtiu, Shroff and White (2014), Gallemore and Labro (2015), and Heitzman and Huang (2019).

[5] See, for instance, Cassar and Gibson (2008), Feng et al. (2009), Plumlee and Yohn (2010), and Dorantes et al. (2013) for previous work that uses these measures to proxy for the quality of firms' internal financial information.

for a comprehensive set of time-varying executive, firm, and board characteristics, alongside firm fixed effects to control for time-invariant firm characteristics and year fixed effects to control for common time trends. In addition, we find that internal information quality is positively associated with how dissimilar CEO incentive contracts are compared to those of industry peers, suggesting that internal information quality helps firms develop a firm-specific structure for their compensation plans. Overall, these findings provide descriptive evidence suggesting that higher internal information quality enables boards to tailor performance metrics more effectively to address the unique agency conflicts their firms face.

To further examine the relation between internal information quality and performance metric selection, we first conduct cross-sectional analyses to identify circumstances in which internal information quality is more likely to function as a binding friction that limits the breadth and variety of explicit performance metrics included in CEO incentive contracts. Here, we aim to identify subsamples of firms with stronger demand or need for a broader and more tailored set of performance metrics, and assess whether internal information quality plays a differential role in these settings. We find that the relation is strongest among (1) firms characterized by greater organizational complexity; (2) firms for which internal information is easier to process and act upon; and (3) firms facing heightened external environmental and social pressures. These patterns suggest that limited internal information quality constrains boards' ability to identify and implement appropriate metrics precisely when the demand for customization is greatest—highlighting its role as a friction in performance metric selection.

Of course, firms' internal information environments are endogenously determined, so our main and cross-sectional results mainly capture associations. To supplement these findings, we next examine how shocks to firms' internal information quality—induced by shifts in financial accounting standards (specifically ASC 606 "Revenue from Contracts with Customers" and ASC 842 "Leases")—affect performance metric selection. The goal of this

alternative design, also used by prior literature (e.g., Gallemore and Labro 2015; Shroff 2017; Cheng, Cho, and Yang 2018; Heitzman and Huang 2019), is to leverage plausibly exogenous variation in internal information quality that enhances the credibility of our empirical design.[6] Consistent with previous work, we first show that these accounting standard shifts result in improvements in firms' internal information quality. Building on this finding, and in line with our main findings, we find that these plausibly exogenous shocks to internal information quality coincide with an increase in the number of performance metrics in CEO incentive contracts, as well as a greater divergence from the performance metrics used by industry peers—particularly along the financial accounting-related dimensions. We interpret these findings as evidence that when firms upgrade their financial reporting systems in preparation for the new accounting standards, they also identify new financial performance dimensions to incorporate into executive incentive contracts. In another analysis, we also find that the impact of internal information quality is largely unaffected by external CEO hiring, which likely represents firms' strategic redirection. This finding should further alleviate the concern that our results are solely driven by endogeneity from correlated omitted variables, such as firms' overall business strategy.

Overall, our findings underscore that internal information quality acts as a friction in performance metric selection such that the design of observed CEO incentive contracts is sensitive to the frictions imposed by internal information quality. In our two final analyses, we examine (1) in which types of performance metrics internal information quality plays a larger role; and (2) the consequences of this broader set of metrics, specifically whether it is associated with future profitability. Regarding the first analysis, we find that our main specification consistently highlights a stronger association with non-financial metrics. This finding is

[6] While these shocks offer plausibly exogenous variation in firms' internal information environments, our point is not that all changes to executives' incentive contracts stem from exogenous shocks like these.

consistent with the idea that non-financial metrics are less understood and harder to process than financial metrics. Regarding the second analysis, we find that a broader and more dissimilar set of metrics—particularly non-financial metrics—is positively associated with future profitability, but only when used in conjunction with high internal information quality. These findings highlight that the breadth and variety of performance metrics in CEO incentive contracts are not by themselves desirable but are only useful when employed in the right context through higher internal information quality, rather than other factors such as external pressures from compensation consultants (Albuquerque, Carter, Guo, and Lynch 2025).

Our study contributes to the vast literature that examines how firms' agency conflict environments shape their executive incentive contracts. Prior studies have extensively examined the various factors that influence executive incentive contracts, but such studies often abstract away from the cost of incorporating specific performance metrics in executive incentive contracts. Our study extends this literature by deviating from the frictionless world in Holmström (1979) and examining how information environment frictions contribute to the explicit form of executive incentive contracts. Such information environment frictions are much more relevant with the recent surge in non-financial performance metrics such as environmental and social metrics, which typically lack the level of long-standing understanding financial performance metrics enjoy. Our study also complements other studies that also examine drivers of executive incentive contracts that do not stem from their efficacy in dealing with agency conflicts, such as external pressure from compensation consultants and proxy advisors (Albuquerque et al. 2025; Cabezon 2025), and provide a nuanced picture of the role of the breadth and variety of performance metrics. For example, externally imposed breadth can introduce undue complexity in executive incentive contracts and decrease their efficacy (Albuquerque et al. 2025), but breadth driven by internal information quality can be a positive contributor to future profitability.

Our study also contributes to the understanding of performance-vested equity awards used in executive incentive contracts and the explicit performance metrics they rely on. Both topics have become increasingly important since the adoption of ASC 718 in 2006, and as such the literature has paid more attention as well. For example, Bettis, Bizjak, Coles and Kalpathy (2018) document a great increase in the use of performance-vested equity awards and reaffirm their incentives to induce more risk taking. Similarly, Pawliczek (2021) finds that performance-vested equity awards provide sufficient incentives to achieve performance targets, despite the difficulty of understanding such incentives through public disclosures. Closer to our study, Core and Packard (2022) document that the spread of performance-vested equity awards strengthened agency theory's prediction that noisier metrics receive less weight in incentive contracts (Banker and Datar 1989). In contrast, we focus on another agency theory's prediction that any performance metric that can provide additional information about the agent's action should be included in incentive contracts absent frictions (Holmström 1979). By examining the breadth and variety of explicit performance metrics, we investigate the frictions behind the usage of performance-vested equity awards with a focus on firms' internal information quality.

Finally, our study extends previous work that uses proxies for firms' internal information environment. We contribute to this literature by incorporating two non-financial dimensions into a composite measure and by showing that this broader proxy is associated with firms' use of non-financial performance metrics in executive incentive contracts. In doing so, we highlight that internal information quality measures capture not only financial reporting efficacy but also the broader relevance of management practices. This insight might spur future work that focuses on how non-financial information influences, for instance, managerial decision making. Furthermore, we extend the literature that examines how internal information quality affects external disclosure (Cassar and Gibson 2008; Feng et al. 2009; Plumlee and Yohn 2010; Dorantes et al. 2013; Chen et al. 2018) by highlighting an underexplored nature of

executive incentive-compensation design as another disclosure channel for investors (Laksmana et al. 2012; Gipper 2021; Packard et al. 2023).

The paper is organized as follows. Section 2 discusses related literature and develops hypotheses. Section 3 describes our data. Sections 4 through 6 present, respectively, our main, quasi-experimental, and additional tests and results. Section 7 concludes.

2. Related literature and theory development

2.1. Related literature

Since the inception of agency theory, the set of performance metrics included in executive incentive contracts and their optimal weights have been of great importance. At a fundamental level, Holmström (1979) shows that in a frictionless agency conflict environment in which adding more performance metrics to the contract is costless, any performance metric that provides additional information about the agent's action is valuable (i.e., results in a more efficient contract). Subsequent studies have added more frictions to this ideal setting, such as limited ways of aggregating accounting information (Banker and Datar 1989) and lack of performance metrics' congruity in multi-action settings (Feltham and Xie 1994) to examine how the optimal weights of performance metrics change with such frictions.

Initially, however, such interest in performance metrics was mainly based on their empirical use in cash compensation in incentive contracts. As cash compensation increasingly lost its significance due to the advent of time-vested equity awards, the importance of performance metrics also waned (Bushman and Smith 2001; Core et al. 2003; Armstrong, Guay, and Weber 2010). For example, Core et al. (2003) document that cash compensation provides only a small portion of CEOs' total incentives. More importantly, they also find that while the weights of performance metrics in cash compensation are seemingly consistent with agency theory (i.e., noisier metrics have less weight), that pattern does not extend to total compensation,

reducing the importance of studying explicit performance metrics that are concentrated in cash compensation.

However, explicit performance metrics regained significance as their usage in performance-vested equity awards started to gain traction. Performance-vested equity awards gradually became more important in executive compensation after the adoption of ASC 718 in 2006 that made accounting treatments of performance-vested and time-vested equity awards more equalized. Over time, the prevalence of performance-vested equity awards rose to be utilized by a majority of firms, making them responsible for roughly half of all equity awards (Bettis et al. 2018; Pawliczek 2021; Core and Packard 2022). The recent substantial increase in the number of performance metrics used in short-term and long-term performance plans is well evidenced and sparked the realization that performance metrics serve incentive, coordination, and signaling roles that were previously unexplored.

Combined with the growing interest in the use of non-financial (e.g., environmental and social) metrics in executive compensation, this trend has also attracted academic interest. For example, Core and Packard (2022) document that the spread of performance-vested equity awards strengthened agency theory's prediction that noisier metrics receive less weight in incentive contracts, and Cohen, Kadach, Ormazabal and Reichelstein (2023) argue that firms use environmental and social metrics to credibly signal to investors their commitment to focus on these non-financial aspects.[7] Overall, this recent development in the literature suggests that examining explicit performance metrics again has the potential to provide empirical insights about the application of agency theory in executive compensation. Reinforcing this trend,

[7] Prior studies examine explicit performance metrics from various angles, too. For example, Guay, Kepler and Tsui (2019) show that firms include metrics in annual bonus plans to encourage mutual monitoring and to facilitate coordination across the top management team as a whole. Bloomfield, Gipper, Kepler and Tsui (2021) show that firms often include performance metrics that exclude particular costs, thereby shielding executives from costs of prior executives' decisions. Bloomfield (2021) and Feichter, Moers and Timmermans (2022) show that firms use revenue-based and relative-performance performance metrics to signal or induce competitive aggression in product markets.

recent studies suggest that cash compensation provides stronger incentives than previously considered (Guay et al. 2019) or serves different purposes than equity-based compensation (Timmermans 2024), further motivating the study of explicit performance metrics in executive pay design.

2.2. Hypothesis development

Fundamental agency theory argues that the value of additional performance metrics in incentive contracts primarily comes from a more efficient risk sharing between the principal and the agent (Holmström 1979; Banker and Datar 1989). As such, a performance metric is valuable when it provides information about the agent's action without imposing excessive risk to the agent due to the metric's variation unrelated to that action. However, while theoretically sound, in practice each candidate metric in a contract incurs processing costs, such as defining the metric, setting appropriate performance targets, gathering data for calculation, and evaluating performance against targets. Given these considerations, we hypothesize that improved internal information quality reduces the processing costs associated with performance metrics. This reduction, in turn, allows boards to incorporate a wider range of performance metrics into executives' incentive contracts. In addition, the reduction also allows boards to design executives' incentive contracts that better cater to the firm's idiosyncratic situation and thus are dissimilar to those of industry peers, since boards need to rely less on the judgments of industry peers to navigate through the performance metrics that are hard to process on their own.

This discussion leads to our central hypothesis (stated in alternative form) that improvements in internal information quality may make it more likely for boards to increase the breadth and variety of performance metrics in their design of CEO incentive contracts.

Hypothesis 1. *Higher-quality internal information environments are positively associated with the breadth and variety of performance metrics in a CEO's incentive contract.*

Although we expect every firm to benefit from exploiting their high-quality internal information, we posit that these benefits differ across firms. For instance, economic theory predicts that these benefits depend crucially on the board's ability to process the information and the usefulness of having multiple performance metrics with respect to their informativeness and the firm's circumstances. In particular, we examine three broad areas of these determinants: organizational complexity, the ease of internal information processing, and external pressures. These factors are conceptually distinct from those that directly influence the quality of firms' internal information environment. Rather, they determine the demand or need for more customized metrics: for instance, due to the complexity of operations, the interpretability of relevant information, or the external pressures to address stakeholder concerns.

The overarching argument across these dimensions is that when boards face little need to tailor incentive contracts, internal information quality is unlikely to be the binding constraint. By contrast, when complexity, processing capacity, or external pressure increases the demand for customization, internal information quality becomes more likely to serve as a limiting friction. For instance, if the firm operates in an environment where relatively few performance metrics are optimal even in a frictionless setting, internal information quality is less likely to bind, as the unconstrained solution already falls within the feasible set. Similarly, if the board lacks sufficient capacity to process and act on performance-related information, then that capacity itself becomes the limiting factor—rendering any improvement in internal information quality less impactful. Finally, when firms face heightened external environmental or social pressures—such as reputational scrutiny or stakeholder activism—the demand for more customized and externally aligned performance metrics increases. In these settings, internal information quality may be particularly important for helping boards translate these external demands into concrete and credible performance goals.

Collectively, the above discussion leads to our second hypothesis (stated in alternative

form), which predicts that the association between higher-quality internal information environments and the breadth and variety of performance metrics in a CEO's incentive contract varies in the cross-section of firms.

Hypothesis 2. *The increase in the breadth and variety of performance metrics in a CEO's incentive contract in higher-quality internal information environments is moderated by:*
(a) organizational complexity;
(b) the ease of internal information processing; and
(c) external pressures.

3. Data and summary statistics

In this section, we discuss sample selection, key variable measurement, and present summary statistics. Appendix A details all variables.

3.1. Data sources and sample construction

Data to create the sample we use in this study are drawn from twelve sources: (1) ISS Incentive Lab for CEO incentive contract details; (2) ExecuComp for CEO equity holdings; (3) I/B/E/S, (4) Audit Analytics, and (5) LSEG ESG (formerly known as Refinitiv and ASSET4) for the dimensions of firms' internal information quality; (6) Compustat for firm fundamentals; (7) Compustat Customer Segments for how many customer names the firm discloses; (8) CRSP and (9) Fama-French Portfolios and Factors for stock returns; (10) BoardEx for governance details; (11) RepRisk for firms' RepRisk Index scores, which we use to compute firms' reputation risk; and the (12) Hoberg-Phillips Data Library for the degree of product market competition (Hoberg and Phillips 2010, 2016).

The sample begins in fiscal year 2006, following the SEC's (2006) mandate for firms to disclose information about their incentive-compensation contracts, and ends in fiscal year 2023, whereby we require future data on boards' choices for their executives' pay packages.[8]

[8] Because most firms have a December fiscal year-end date, data for fiscal year 2024 is still limited, as these firms currently release their 2024 proxy statements. For example, at the time of writing this draft, we have only 226 observations for 2024 (i.e., those with fiscal year-end dates earlier than December), compared to

The resulting sample consists of 20,409 firm-year observations.

3.2. Contract design details

We measure two aspects of the breadth and variety of performance metrics in CEOs' incentive contracts: (1) the number of performance metrics and (2) the dissimilarity of performance categories relative to industry peers. These two aspects complement each other in that each aspect provides different information about the design of CEOs' pay packages. In supplement analyses, we also disaggregate both aspects into their financial and non-financial components.

With regard to the number of performance metrics, we take into account that incentive contracts can differ from each other in terms of their depth. For example, two incentive contracts are not alike if one firm chooses to use only one performance metric and another firm chooses to use two performance metrics. To measure this dimension, we simply count the number of performance metrics in the CEO's incentive contract. This count includes metrics from both the annual incentive plan and the long-term incentive plan, as reported in the ISS Incentive Lab database. To provide additional granularity, we also construct two related variables. *Number of Financial Metrics* counts the metrics in the following categories (i.e., the "*metricType*" field in the ISS Incentive Lab database): (1) accounting; (2) activity-related; (3) balance sheet-related; (4) cash flow; (5) earnings-related; (6) economic value; (7) investment ratios; (8) market-related; (9) revenue-related; (10) solvency-related; and (11) stock price. *Number of Non-Financial Metrics* counts the metrics in the following categories: (1) CSR; (2) environmental; (3) non-financial; (4) social; and (5) other.

With regard to the dissimilarity of performance categories relative to industry peers, we further take into account that one firm's incentive contract may differ from rival firms'

approximately 1,400 in both 2022 and 2023. To ensure consistency in firm coverage across years, we therefore restrict our sample to fiscal year 2023.

incentive contracts. This dimension provides further information about contract design if firms choose performance metrics belonging to different performance categories. For example, one firm might choose one financial performance metric and one social performance metric whereas another firm might choose one financial performance metric and one environmental performance metric (which is in a different category than a social one). Although both firms have two performance metrics and two performance categories, these incentive contracts are not alike. Therefore, we create a measure of contract dissimilarity that considers these differences. We label this variable *Metrics Dissimilarity*. To compute this variable, we first calculate for each industry-year the average number of performance metrics in each of the sixteen performance categories (i.e., the "*metricType*" field). The industry classification follows the 48 industry groups identified by Fama and French (1997). We then compute contract dissimilarity as the distance between the number of performance metrics in each performance category in the focal CEO's contract vis-à-vis the industry-year average contract:

$$\sum_{i=1}^{N=16} |f_i - a_i| , \tag{1}$$

where f_i is the focal CEO's number of performance metrics in performance category i, a_i is the industry-year average number of performance metrics in performance category i, and N is the total number of performance categories.[9,10]

[9] This distance measure, also known as Manhattan distance, calculates dissimilarity by summing the absolute differences across categories. An alternative is Euclidean distance, which sums the squared differences and thereby amplifies larger discrepancies more than smaller ones. We follow previous work that suggests the Manhattan distance metric is consistently more preferable than the Euclidean distance metric because the latter is more prone to distortion from extreme values (Aggarwal, Hinneburg, and Keim 2001). Nevertheless, our results remain robust when we instead use Euclidean distance to measure dissimilarity across performance categories (untabulated).

[10] ISS Incentive Lab updated its categories for performance metrics on a few occasions over recent years to capture shifts in executive compensation practices. These changes include, for instance, separating financial metrics into accounting-based, price-based, and ratio-based categories, as well as adding distinct categories for environmental metrics. While these expansions increase the raw values for the *Metrics Dissimilarity* measure, they likely do not impact our results for two reasons. First, year fixed effects capture much of the temporal variation introduced by these updates. Second, the updates only reclassify metrics without affecting differences between firms that were using similar metrics. For instance, if two firms used comparable categories (e.g., an

In parallel, we also construct *Financial Metrics Dissimilarity* and *Non-Financial Metrics Dissimilarity*, which compute the same distance-based measure but restrict attention to the eleven financial categories and the five non-financial categories, respectively. These dissimilarity metrics allow us to assess how uniquely a firm structures its incentive contract within the financial and non-financial domains relative to its industry peers.

3.3. Internal information quality

One key construct in all our empirical analyses is the quality of firms' overall internal information environments. Previous work has used a variety of publicly available proxies to measure this construct, including the accuracy of executives' forecasts, the speed at which executives release an earnings announcement after fiscal year closing, audit fees, the absence of Sarbanes-Oxley Section 404 material weaknesses, and the absence of restatements (Hogan and Wilkins 2008; Goodman et al. 2014; Gallemore and Labro 2015; Heitzman and Huang 2019). These proxies are broadly understood to reflect underlying aspects of firms' information acquisition processes, internal control effectiveness, and the design and functioning of internal information systems (Cassar and Gibson 2008; Feng et al. 2009; Plumlee and Yohn 2010; Dorantes et al. 2013). However, it is an open question whether these measures also capture *non-financial* aspects of firms' internal environments. Although prior work suggests that financial and non-financial information aspects are complementary in supporting firms' strategic and operational goals (e.g., Simons 1990; Kaplan and Norton 1992; Chenhall 2003), we broaden our measurement to better reflect this complementarity by supplementing the five financial proxies with two non-financial indicators drawn from LSEG ESG: environmental initiatives and ESG reporting scope. These additions help capture the presence of broader internal systems for tracking and managing non-financial performance dimensions.

earnings and a stock price metric), their choices remain comparable after these database changes—as values for both firms will move in the same direction.

A key advantage of relying on publicly available data is that it allows for broad coverage across firms and years, mitigating concerns around data availability, sample selection, and generalizability that often arise with proprietary measures of internal information quality (e.g., those based on executive surveys). To ensure that our inferences are not unique to one specific measure of information quality used by prior literature—but rather apply to this theoretical construct more generally—we construct an internal information quality index that combines all proxies. Specifically, we define *IIQ* as the first principal component of the following seven measures of firms' internal information quality: (1) *Forecast Accuracy*, which is the absolute difference between management's quarterly estimate of earnings per share and the firm's quarterly realized earnings per share, multiplied by negative one, such that larger values correspond to higher internal information quality; (2) *EA Speed*, which is the number of days between the end of the fiscal year and the firm's earnings announcement, divided by 365 and multiplied by negative one; (3) *Audit Intensity*, which is the firm's audit fees scaled by firm size and multiplied by negative one; (4) *No SOX404 Weakness*, which indicates the absence of Sarbanes-Oxley Section 404 material weaknesses in internal controls; (5) *No Restatements*, which indicates the absence of restatements; (6) *Environmental Initiatives*, which indicates the presence proactive environmental investments or expenditures to reduce future risks or increase future opportunities; and (7) *ESG Reporting Scope*, which indicates the presence of comprehensive environmental and social reporting.[11] For each financial dimension, we compute the average value over the past three years. We then combine these values with the two non-financial indicators to construct a rolling index. This variable explains 24.906% of the total variance across all seven measures, with its eigenvalue exceeding 1 at $0.249 \times 7 \approx 1.743$.

[11] In Section 6.2, we perform robustness checks that use the seven underlying dimensions of firms' internal information quality as independent variables.

3.4. Summary statistics

Table 1 presents summary statistics for the variables used in our analysis. Table 2 presents correlations between the variables used in our main analysis, with Spearman and Pearson correlation coefficients above and below the diagonal, respectively. Firms include, on average, 5.670 performance metrics in their CEO pay packages, with 3.882 financial metrics and 1.788 non-financial metrics. The average contract dissimilarity score is 4.441. The correlation between the number of metrics and dissimilarity measures ranges from 0.597 to 0.826, indicating that contracts with more metrics also tend to differ more from peer contracts in terms of metric composition. The average contract dissimilarity score implies that the average firm's contract differs $4.441 / 16 \times 100 \approx 27.756\%$ from rival firms' contracts within each performance category.

Another way to put the average contract dissimilarity score into context is by comparing it to the average of 5.670 performance metrics used in a typical CEO contract. At face value, this suggests that firms differ from the industry benchmark by approximately 78% of the number of metrics in the average contract (i.e., $4.441 / 5.670 \approx 78.325\%$). However, this interpretation can be misleading and should be treated with caution. The dissimilarity score reflects the total number of category-level differences—that is, how performance metrics are distributed across sixteen possible performance categories—rather than how many metrics are used in total. For example, two firms may each use five performance metrics, but if one firm focuses on financial metrics and the other on non-financial ones, their dissimilarity score may still be high despite having the same total count. Conversely, a firm with seven metrics could have a low dissimilarity score if its category usage closely matches the industry average. Therefore, while the dissimilarity score is numerically comparable to the number of metrics, it captures a fundamentally different dimension of contract design: variation in metric composition, not just metric count.

Absolute summary statistics for our composite measure of internal information quality (*IIQ*) are relatively uninformative because it is a principal component score with a mean of zero and a standard deviation of one. To provide additional context, Figure 1 plots the evolution of the average values of firms' internal information quality, alongside the number of performance metrics and the dissimilarity of the focal CEO's incentive contract relative to industry peers, over time. Although all three variables exhibit a shared upward trend, we note that identifying time-series patterns is not the main focus of our analysis, which leverages firm and year fixed effects.[12] Figure 2 disaggregates the evolution of performance metrics and contract dissimilarity into financial and non-financial components, showing that both dimensions contribute to overall trends, although non-financial components are rising faster in terms of growth rate. Finally, Figure 3 plots the evolution of the average values of the seven proxies underlying firms' internal information quality over time, where larger values represent better internal information quality for all seven proxies. Notably, the non-financial components show more pronounced increases in recent years. The patterns in Figures 2 and 3, which are generally more pronounced for non-financial components, are consistent with the rising attention to the non-financial aspect of firms' performance (e.g., ESG) in recent years.

4. Main empirical tests and results

4.1. Internal information quality and performance metric selection

In this section, we test Hypothesis 1 by examining how firms' internal information environment relate to executives' contract design details by estimating equations of the form:

$$[Contract_{it+1}] = \beta \cdot IIQ_{it} + \mathbf{\Phi} \cdot X_{it} + \mathbf{T} \cdot \tau_i + \mathbf{\Omega} \cdot \xi_t + \varepsilon_{it+1}, \quad (2)$$

[12] In addition, prior studies suggest that non-financial metrics may have been on the rise due to them enabling executives' rent extraction (Bebchuk and Tallarita 2022), although there are also counterarguments (Cohen et al. 2023). However, this possibility of rent extraction is unlikely to be related to our study as higher internal information quality is less likely to facilitate rent extraction through having more performance metrics.

where the indices *i* and *t* correspond to firm and time, respectively.

[*Contract*] is one of the two measures of executives' contract design details (see Section 3.2 for details). *IIQ* is our composite measure of firms' overall internal information quality (see Section 3.3 for details). *X* is a vector of control variables, which we discuss below. All independent variables are measured prior to the dependent variable to capture the most recent factors contemporaneous with boards' choices for executives' incentive contracts. To correct for any arbitrary correlation in the firm-year specific error term ε_{it+1} across time within a given firm, we base inferences on standard errors clustered at the level of treatment (i.e., firm) to conform to Abadie, Athey, Imbens and Wooldridge (2023).

Hypothesis 1 provides the testable prediction that *on average* and *within a given firm*, time-series variation in internal information quality is positively associated with time-series variation in performance metric selection. This prediction delineates that β in Eq. (2) should be positive. It also implies that this test should consist of an analysis that relies on a comparison within firms, implying the inclusion of firm fixed effects τ_i (and year fixed effects ξ_t to rule out common time trends unrelated to our prediction). This within-firm design has an added benefit that it helps to reduce concerns that omitted time-invariant firm-specific characteristics are driving our results. To assess the robustness and interpretability of our findings, we also estimate variants of Eq. (2) using alternative fixed effects specifications. These include models with only firm fixed effects and models that replace all fixed effects with industry fixed effects (based on the 48 Fama and French (1997) industry classifications).

To reduce the influence of confounders on the parameter estimates of interest, we include in *X* an array of "executive-year," "firm-year," and "governance-year" time-varying controls for which there exists economic theory or empirical evidence to support a relation with our key constructs. Executive-level controls are the CEO's equity portfolio incentives (*Delta* and *Vega*), his/her age (*Age*), and his/her tenure (*Tenure*) (Core and Guay 1999; Guay 1999).

Firm-level controls are included to replicate a representative set of controls used in prior literature examining the design of incentive contracts. This set of controls includes the number of product market competitors and their mean similarity with the focal firm, based on the Text-based Network Industry Classifications (TNIC) data from Hoberg and Phillips (2010, 2016) (*Number of Rivals* and *Rival Similarity*). It also includes the firm's annual revenue (*Sales*), book-to-market ratio (*Book-to-Market*), leverage (*Leverage*), sales growth (*Sales Growth*), and cash and cash equivalents balance (*Cash*). Governance-level controls include an indicator equal to one if the CEO is also the Chairman of the Board (*CEO Duality*), the number of board members (*Board Size*), the fraction of board members that is independent (*Board Independence*), and the fraction of board members that sits on at least three other boards (*Board Experience*) (Linck, Netter, and Yang 2008; Field, Lowry, and Mkrtchyan 2013).

Table 3 presents the results from estimating the relation between internal information quality and details of CEOs' incentive contracts, with the first three columns presenting results for specifications where the dependent variable is *Number of Metrics*, and the last three columns presenting results for specifications where the dependent variable is *Metrics Dissimilarity*. Across all specifications, we find that the coefficient on *IIQ* is positive.[13] Jointly, this pattern suggests that both across firms and within a given firm, variation in internal information quality is positively associated with the number of performance metrics and the dissimilarity in performance categories relative to industry peers.[14]

Although we recognize that both internal information quality and performance metric

[13] To caveat, the positive association we document should not be interpreted as evidence that ever-higher internal information quality will lead firms to adopt performance metrics across all metric categories. Rather, our findings suggest that internal information systems act as a friction. As this friction diminishes, firms can move closer to their unconstrained optimal contract—one that aligns with their strategic objectives and monitoring needs, which likely does not include metrics across all categories.

[14] The sharp reduction in the coefficient on *IIQ* once year fixed effects are included suggests a strong temporal component in the association we examine. This reflects both the causal effect of overall improvements in internal information quality—especially for non-financial data, as shown in Figure 3—and broader time trends, such as the rising emphasis on non-financial performance, which simultaneously influence information quality and executive incentive contracts. While we highlight this temporal pattern as it reflects a major shift in the business environment, our core inferences rely on specifications with year fixed effects to mitigate endogeneity concerns.

selection are endogenous firm choices, the estimated coefficients suggest a meaningful economic association between the two.[15] Specifically, within a given firm, a one standard deviation increase in internal information quality is associated with an increase in the number of performance metrics equal to 12.205% of the within-firm standard deviation of that variable, and an increase in contract dissimilarity equal to 12.033% of its within-firm standard deviation. Based on between-firm variation, the corresponding increases are 14.689% and 13.781%, respectively.

We acknowledge that if some correlated omitted variable simultaneously affects firms' internal information quality and the propensity for boards to alter their executives' pay packages, then these estimates may be biased and need not reflect the effect of internal information quality on performance metric selection. To sharpen our inferences, we therefore turn to a quasi-experimental design that examines how performance metric selection responds to two exogenous shocks to firms' internal information environment (see Section 5 for details). Before doing so, however, we first explore settings in which more tailored or complex performance metrics are likely to be demanded, as predicted by Hypothesis 2. This allows us to test whether internal information quality plays a differential facilitating or constraining role in enabling more tailored performance metric structures when such complexity is needed.

4.2. Internal information quality and performance metric selection—cross-sectional variation

In the next subsections, we test Hypothesis 2 by examining whether the relation between internal information quality and performance metric selection varies across firm settings with differing demands for tailored performance metrics. Specifically, we analyze three types of settings in which such demand is likely to arise: (1) firms characterized by greater

[15] To interpret the magnitude of these association, we follow Mummolo and Peterson (2018), Mitton (2024), and Breuer and deHaan (2024), and express effect sizes relative to the within-fixed-effects standard deviation of the dependent variable. Specifically, we multiply the estimated coefficient on *IIQ* by the standard deviation of *IIQ* after removing fixed effects, and scale this product by the standard deviation of the dependent variable (also net of fixed effects).

organizational complexity; (2) firms for which internal information is easier to process and act upon; and (3) firms facing heightened external environmental and social pressures. These factors are conceptually distinct from those that directly influence the quality of firms' internal information environment. Rather, they determine the demand or need for more customized metrics: for instance, by increasing the complexity of the firm's operations, the interpretability of relevant information, or the external pressures to address specific stakeholder concerns.

In order to test these predictions, we first construct variables for each cross-sectional factor. Second, we partition the sample into observations with relatively low and high values of each variable. Third, we estimate Eq. (2) separately for each subsample, which allows the coefficients on all variables and fixed effects to vary across the two groups of firms. Fourth, we test whether the differences in the coefficients between the subsamples are nonzero and in the predicted direction. Below we discuss each test in turn.

4.2.1. Cross-sectional variation in organizational complexity

We examine whether the relation between firms' internal information quality and details of CEOs' incentive contracts varies with organizational complexity. We measure organizational complexity using *Segments* and *σReturns*, with larger values of each measure corresponding to greater organizational complexity. *Segments* is the number of business segments the firm operates in (with data coming from Compustat Segments). *σReturns* is the firm's idiosyncratic stock return volatility, defined as the standard deviation of the firm's annualized returns that are unexplained by the Carhart (1997) four-factor model estimated over a rolling 60-month period (with data coming from CRSP and Fama-French Portfolios and Factors).

Table 5 presents the results from examining whether the relation between internal information quality and details of CEOs' incentive contracts varies with organizational complexity. Panel A presents the results after partitioning on *Segments*, and Panel B presents

the results after partitioning on *σReturns*. Across both panels, we find that the coefficient on *IIQ* is economically and statistically larger for firms with greater organizational complexity—those with more business segments or higher idiosyncratic return volatility—relative to their less complex counterparts. These results are consistent with our prediction that internal information quality plays a more prominent role in enabling tailored performance metric design in more complex organizational settings. As such, when complexity increases the demand for more tailored contracts, limited internal information quality constrains the board's ability to identify and implement appropriate metrics—highlighting its role as a friction for executive incentive-compensation design.

4.2.2. Cross-sectional variation in ease of internal information processing

Next, we examine whether the relation between firms' internal information quality and details of CEOs' incentive contracts varies with ease of internal information processing. We measure ease of internal information processing using *Board Experience* and *Comovement*, with larger values of each measure corresponding to greater ease of internal information processing. *Board Experience* is the fraction of board members that sits on at least three other boards (with data coming from BoardEx). *Comovement* is the correlation between quarterly stock returns and earnings per share estimated over a 20-quarter period (with data coming from Compustat Quarterly), which makes processing of multiple metrics easier for the board.

Table 6 presents the results from examining whether the relation between internal information quality and details of CEOs' incentive contracts varies with ease of internal information processing. Panel A presents the results after partitioning on *Board Experience*, and Panel B presents the results after partitioning on *Comovement*. Across both panels, we find that the coefficient on *IIQ* is in general economically and statistically larger for firms with greater ease of internal information processing—those with more experienced boards and greater performance comovement—relative to their counterparts with less processing capacity.

These findings are consistent with our prediction that internal information quality is more likely to influence performance metric design when boards are better equipped to process and use that information. This suggests that even if high-quality information is available from the firm's internal information system, its value for contract design depends on the board's capacity to absorb and apply it, underscoring how internal information quality operates as a friction for executive incentive-compensation design in the absence of sufficient processing ability.

4.2.3. Cross-sectional variation in external environmental and social pressure

We examine whether the relation between firms' internal information quality and details of CEOs' incentive contracts varies with external environmental and social pressure. We measure external environmental and social pressure using *E-Risk* and *S-Risk*, with larger values of each measure corresponding to greater external pressure. *E-Risk* and *S-Risk* are, respectively, the firm's environmental and social reputation risk (with data coming from RepRisk).[16]

Table 7 presents the results from examining whether the relation between internal information quality and details of CEOs' incentive contracts varies with external environmental and social pressure. Panel A presents the results after partitioning on *E-Risk*, and Panel B presents the results after partitioning on *S-Risk*. In Panel A, we find no statistically significant difference in the coefficient on *IIQ* when comparing firms with high versus low environmental reputation risk, although the coefficients for the low-pressure subsample are generally smaller in magnitude without statistical significance. In contrast, Panel B shows that the coefficient on *IIQ* is statistically and economically larger for firms facing higher social reputation risk. These results suggest that internal information quality plays a more prominent role in influencing performance metric selection in settings where firms are under greater social pressure, but less

[16] The RepRisk Index is a proprietary algorithm developed by RepRisk that dynamically captures and quantifies a company's or project's reputational risk exposure to ESG issues (RepRisk 2023). The index is performance-based and has been used in previous work to proxy for firms' ESG performance. See, for instance, Li and Wu (2020) and Gantchev, Giannetti and Li (2021).

so in settings where firms are under environmental pressure. The finding that stronger associations arise primarily when external pressures heighten the demand for tailored incentives suggests that internal information quality constrains firms' capacity to adjust performance metrics in response—supporting its role as a friction for executive incentive-compensation design.

5. Quasi-experimental tests and results

Our results to this point lend themselves to at least three possible interpretations. First, high-quality internal information environments help boards to design more tailored and effective executive compensation packages.[17] Second, the causal direction could run in reverse—changes to executives' incentive contracts might prompt improvements in the firm's internal information systems. Third, both internal information quality and performance metric selection may be jointly determined by an unobserved factor, reflecting the endogenous nature of both choices. We believe that distinguishing between the scenarios provides greater insights into the relation between internal information quality and performance metric selection.

For that aim, we now examine the relation between internal information quality and performance metric selection using two shocks to firms' internal information environment. The goal of these analyses is not to achieve full causal identification, but rather to leverage plausibly exogenous variation that enhances the credibility of our empirical design. While we acknowledge that firms invest in internal reporting systems for a range of reasons beyond regulatory changes, these shocks offer a useful setting to explore the facilitating role of internal information systems in shaping performance metric selection. Specifically, the accounting

[17] This causal interpretation does not need to assume an exogenous change in internal information quality as the starting point of the entire causal chain. In most cases, firms' strategic policy decisions or external pressures will trigger changes in internal information systems, which in turn affect the design of incentive contracts. The distinction of this causal interpretation from the correlated omitted variable concern is that firms' strategic policy decisions causally affect performance metric selection *through* internal information quality in the former but not in the latter, while being a crucial factor in both scenarios.

standards we study are major and require firms to upgrade their internal reporting infrastructure and collect data that may have previously been considered too costly or unnecessary. As a result, the marginal cost of defining, collecting, validating, and implementing performance metrics declines, even if firms had no explicit intention to adjust their incentive contracts.

The two regulatory events we analyze are the announcements of Accounting Standards Update (ASU) No. 2014-09—Revenue from Contracts with Customers (codified as ASC 606)—and ASU No. 2016-02—Leases (codified as ASC 842). ASC 606 applies to firms that enter into contracts with customers to transfer goods or services or non-financial assets not covered by other standards (e.g., insurance or leases) (FASB 2014).[18] ASC 842 requires firms to recognize on the balance sheet the assets and liabilities arising from lease contracts (FASB 2016).

We focus on these two standards for three reasons. First, both ASC 606 and ASC 842 are among the most complex accounting standards introduced in the past decade, and their implementation likely required substantial overhauls of firms' financial reporting systems. In fact, ASC 606 was formally deferred due to stakeholders' concerns about the time and resources needed for successful implementation. As the Financial Accounting Standards Board ("FASB") (2015) stated: "*Respondents noted that providing sufficient time for implementation of the guidance in Update 2014-09 is critical to its success*." These arguments are also echoed by, for instance, Gallemore and Labro (2015), Shroff (2017), Cheng et al. (2018), Heitzman and Huang (2019), and Roh (2025) who document that such standards often entail upgrades to internal information systems. Second, both standards were announced well in advance of their effective dates, providing firms with a clear window to invest in and improve internal

[18] Anecdotal evidence exists such as that from Autodesk, Inc., which noted that, likely in response to ASC 606, the firm "adopted new performance metrics for their bonus and equity plans that align with the key drivers of success during the business model transition and reflect the health of the business during the transition." See, for instance, page 27 in their first proxy statement after the effective date of the ASU 2014-09 (Autodesk Inc 2017). This example highlights how regulatory-induced improvements in internal reporting systems can lead to substantive changes in performance metric design.

information systems.[19] By focusing on the timing of these announcements (including the deferred date for ASC 606), we leverage plausibly exogenous variation in firms' internal information upgrades during the interim periods. Third, this shock-based research design aligns with a growing literature that uses regulatory changes in accounting standards to study the quality of firms' internal information environments (e.g., Gallemore and Labro 2015; Shroff 2017; Cheng et al. 2018; Heitzman and Huang 2019; Roh 2025).[20] As such, it enhances the credibility and external validity of our empirical approach.

To implement a test, we apply a non-staggered continuous difference-in-differences design layered on top of Eq. (2) (Atanasov and Black 2016, pp. 253-254). Although the announcements occur at the same time for every firm (i.e., the shocks are "non-staggered"), the ultimate impact of the changes in accounting standards likely varies in magnitude across firms (i.e., the treatment is "continuous"), namely in proportion with reliance on the accounting standard. For example, the impact of ASC 606 and ASC 842 is likely small if a firm does not have complex contracts with customers and has no operating lease arrangements, respectively. Therefore, for each shock, we estimate the degree to which firms are affected by the change in

[19] The FASB initially issued ASU 2014-09 on May 28, 2014, with an effective date for annual reporting periods beginning after December 15, 2016 (for public firms). However, in response to stakeholder concerns, the FASB (2015) formally deferred the effective date in August 2015, pushing implementation to annual reporting periods beginning after December 15, 2017—and creating ASU 2015-14 (i.e., deferral of ASU 2014-09 "Revenue from Contracts with Customers"). ASU 2016-02 was issued in February 2016, with the effective date for public firms being December 15, 2018.

[20] The intuitive scope of the increase in internal information environments due to changes in accounting standards is narrowly around the topic of the updated standard itself. For example, if the lease accounting standard changes, managers understand more about their lease arrangements and make better leasing decisions (Roh 2025). However, prior studies also suggest that such changes in accounting standards have broader consequences on firms' operations such as investment decisions (Shroff 2017; Cheng et al. 2018) as firms that learn more about one aspect of their business understands more about the opportunities and constraints of other aspects of their business. Shroff (2017) states that "some changes in GAAP require managers to collect and process additional information to comply with the new rule, which changes their information set and subsequent decisions," and Cheng et al. (2018) state that "due to changes in external reporting, managers must collect more information to comply with the new standards. Through this process, managers likely obtain new information, and this new information helps them make better corporate decisions." In that vein, for example, the new revenue recognition standard may allow firms to better understand the timing of future cash flows from their bundled products, which will define the internal funding availability for investment decisions that are not directly related to the new revenue recognition standard. Shroff (2017) suggests a similar example: "For example, if the adoption of SFAS 106 (postretirement benefits) informed managers that they underestimated the cost of employees, this information is likely to cause a downward revision in NPV estimates of projects, turning some previously positive NPV projects into negative NPV projects. Any such revision in NPV estimates is likely to decrease investment."

accounting standards ("treatment intensity"). Because firms may also make real changes in response to these announcements (e.g., relocating their business segments or altering their reliance on leases), we compute a static firm-level treatment intensity measure over the pre-event period. The event window spans four years before and after the announcement of each standard, allowing us to compare pre- and post-period trends across firms with different *ex-ante* levels of exposure.

For ASU 2015-14 (i.e., the deferral of ASU 2014-09, Revenue from Contracts with Customers), we measure treatment intensity as the number of unique customers disclosed in the firm's 10-K filing. The rationale is that ASC 606 has a greater impact on firms with complex customer contracts involving enforceable rights and obligations, particularly when those firms maintain relationships with multiple large customers.[21] To capture this, we rely on firms' mandated disclosures under SEC Regulation S-K, which require the identification of customers accounting for more than 10% of consolidated sales revenue. For ASU 2016-02 (i.e., Leases), we define treatment intensity as the total capitalized amount of operating lease obligations, reflecting the extent to which a firm relies on operating lease arrangements. To account for differences in firm scale, we normalize each treatment intensity measure by firm size. In both cases, we restrict the sample to firms with complete data across the full event window to ensure consistency in estimating treatment effects.

To address concerns about nonparallel trends and further align with the guidance of Atanasov and Black (2016, pp. 258-259), we augment our continuous difference-in-differences

[21] This treatment intensity is intended to capture a particular type of exposure: the presence of concentrated, large-scale contractual relationships (that are observable). Firms with one or more major customers are more likely to engage in bespoke contractual arrangements, including customized performance obligations, negotiated delivery schedules, and tailored pricing structures. Under the new regulation, such firms are more likely to face non-trivial implementation challenges, as they must reassess and disaggregate revenue across these individualized contracts. These complexities often require significant changes to internal systems to enable contract-level tracking, performance monitoring, and forecasting. However, we recognize that this treatment intensity may not fully capture the breadth of firm-level exposure to ASC 606 as there may be multiple dimensions of treatment intensity relevant to the revenue recognition standard (e.g., firms with many smaller customers may face implementation challenges due to variation in bundled offerings across customers).

design by incorporating entropy balancing.[22] This approach ensures that observable covariates are well balanced between relatively "more treated" and "less treated" firms. Specifically, for each shock, we split firms into two groups based the median value of treatment intensity. We then implement entropy balancing to match the first moment of the covariates used in Eq. (2) between the two groups, using data from the pre-event period. These weights are held fixed throughout the analysis, producing covariate balance across treated and control firms. After balancing, all observable differences between the two groups are statistically insignificant.

Using this setup, we perform two analyses for each accounting standard announcement. First, we directly examine changes in internal information quality around the announcements. Second, we examine changes in the details of CEOs' incentive contracts around the announcements. We tabulate results from these tests in Tables 7 and 8, with the two tables presenting, respectively, results for ASU 2015-14 and ASU 2016-02.

Regarding the first analysis, Table 7 Panel A shows that the coefficient on *Post* × *Treatment* is positive and statistically significant. This finding indicates that firms affected by ASU 2015-14 see improvements in their internal information environment. We find similar results for ASU 2016-02 in Table 8 Panel A. Consistent with prior literature, these findings suggest that firms' internal information environment improve if they are affected by changes in accounting standards (e.g., Gallemore and Labro 2015; Shroff 2017; Cheng et al. 2018; Heitzman and Huang 2019; Roh 2025). More importantly for our analysis, these results establish a basis for examining whether and how incentive contract design changes following improvements in internal information quality.

Regarding these changes, we first examine our main proxies—*Number of Metrics* and *Metrics Dissimilarity*—alongside their disaggregated financial and non-financial components

[22] In unreported analyses, we find similar inferences even without incorporating entropy balancing, suggesting our results are not sensitive to this adjustment.

to provide additional granularity. Results for ASU 2015-14 and ASU 2016-02 are in Tables 7 and 8 Panels B and C, respectively. Broadly, we find that the coefficient on *Post* × *Treatment* is positive and statistically significant in specifications focused on financial performance metrics. This pattern suggests that affected firms increased both the number of financial metrics and the dissimilarity of their contracts along financial dimensions relative to their industry peers. These findings are consistent with the notion that, as firms upgrade their internal reporting systems in preparation for the new accounting standards, they also identify new performance dimensions to incorporate into executive incentive contracts, mainly in financial aspects given the financial focus on the accounting standards. One exception is ASU 2015-14, for which we also find evidence that firms increase the dissimilarity of their contracts along non-financial dimensions relative to their industry peers. This suggests that the internal reporting upgrades prompted by the accounting standard may have also enhanced firms' ability to define or track non-financial performance dimensions, enabling greater customization in incentive design beyond purely financial metrics.

To provide more insight into how these accounting standards affect performance metric selection, we examine firms' use of specific performance metric categories in greater detail. Specifically, in Tables 7 and 8 Panel D, we examine changes in the inclusion of various performance metric types following the accounting standards. Two patterns emerge from the data. First, consistent with the notion that both standards pertain to core accounting topics, affected firms increase their use of accounting-based performance metrics. Second, we find suggestive evidence that these additions are offset by a decline in the use of non-GAAP performance metrics, indicating a shift in emphasis toward standardized accounting measures, which improved in quality due to the new accounting standards. We also find that firms affected by ASU 2015-14 (Revenue from Contracts with Customers) are more likely to implement revenue-based metrics, while those affected by ASU 2016-02 (Leases) are more likely to

introduce EPS-based performance metrics, largely consistent with the central focus of the respective accounting standard.

Overall, the shock-based analyses support the interpretation that internal information quality acts as a constraint on performance metric design. Firms more affected by accounting standards improve their internal information environments and adjust incentive contracts—particularly by increasing financial metrics aligned with the nature of the reform. These patterns suggest that when firms are compelled to upgrade reporting infrastructure, the marginal cost of implementing tailored metrics declines, enabling boards to design more customized incentive contracts.

6. Additional empirical tests and results

Thus far, the findings suggest that internal information quality acts as a significant factor in the selection of performance metrics for CEO incentive contracts. This evidence raises three additional questions, which we examine in this section. First, could the relation between internal information quality and performance metric selection be driven by correlated omitted variables? Second, in which types of performance metrics does internal information quality play a larger role? And third, what potential impact does higher internal information quality have, if any?

6.1. Correlated omitted variables

A valid concern in any study without a randomized controlled trial—and especially in the executive compensation setting where incentive structures are endogenously determined—is the possibility of correlated omitted variable bias. This challenge motivates our quasi-experimental approach (see Section 5 for details), which leverages accounting standards that plausibly introduce exogenous variation in firms' internal information environments. While these regulatory shocks offer grounds for identification, it remains possible that unobserved

factors—such as strategic shifts, external stakeholder pressures, or organizational culture—could also influence incentive contract design. Even if such factors play a role, however, they do not contradict our central hypothesis that internal information quality acts as a friction or enabler that affects the board's ability to implement more tailored performance metrics.

Nevertheless, to address the possibility that strategic initiatives are a correlated omitted variable that *fully* explains the relation between internal information quality and performance metric selection, we conduct an additional analysis using newly appointed external CEOs as a proxy for firm-level strategic shifts. Following the management literature's interpretation that the appointment of an external CEO is likely to coincide with strategic redirection (e.g., Helmich and Brown 1972; Miller 1991; Wiersema and Bantel 1992; Zhang and Rajagopalan 2010), we use new appointments of external CEOs as a proxy for firm-level strategic shifts.

As shown in Table 9, external CEO appointments explain little of the variation in performance metric choices and, importantly, its inclusion does not diminish the observed relation between internal information quality and contract design.[23] While no single test can rule out all omitted variables, our cumulative evidence suggests that explaining the full pattern of results would require an unobserved factor that (1) is jointly related to internal information quality and performance metric selection; (2) differentially affects firms with greater demand for tailored incentives; (3) aligns with the effects of ASC 606 and ASC 842; and (4) operates independently of external CEO hiring.

6.2. In which types of performance metrics does internal information quality play a role?

Our main hypothesis is that improved internal information quality reduces processing costs associated with performance metrics. This reduction, in turn, allows boards to incorporate

[23] In untabulated analyses, we also include an interaction term between internal information quality and the indicator for newly appointed external CEOs to test whether the association between *IIQ* and performance metric selection varies with strategic turnover. The coefficient on the interaction term is statistically insignificant in both specifications, suggesting that the relation between *IIQ* and contract design is not meaningfully different in periods of strategic transition.

a wider range of performance metrics into executives' incentive contracts. In this subsection, we examine whether internal information quality has a stronger association with financial or non-financial performance metrics. We do not have a strong *ex-ante* prediction as to which type of metric should be more closely linked to internal information quality. Our composite proxy is designed to capture the overall quality of a firm's internal information environment—one that should support both financial and non-financial performance monitoring. As such, we do not interpret a stronger association in either domain as inherently more supportive of our hypothesis. Nevertheless, it is interesting to examine if there is a differential pattern.

It is plausible that internal information quality is more critical for non-financial performance metrics, which may lack long-standing institutional familiarity among executives, directors, and investors. Conversely, the association may be stronger for financial metrics, given their higher reporting frequency and the sustained monitoring focus they receive from boards, analysts, and shareholders. We therefore approach the analysis empirically, seeking to shed light on the relative role of internal information quality in supporting different types of performance metrics.

To do so, we re-estimate Eq. (2) for our main proxies—*Number of Metrics* and *Metrics Dissimilarity*—alongside their disaggregated financial and non-financial components to provide additional granularity. We use both our composite internal information quality measure and its seven individual proxies (see Section 3.3 for details). This approach also allows us to assess construct validity and ensure that our results are not specific to any one measure but instead reflect the broader theoretical construct.

Results are in Table 10, with each cell presenting results from one estimation. Across specifications focused on non-financial performance metrics, most internal information quality proxies load positively and significantly, suggesting that information quality is particularly useful for implementing non-financial metrics. These findings are consistent with the idea that

non-financial metrics may be less standardized or familiar and thus overall require greater informational infrastructure. The finding that individual proxies that have a financial nature (e.g., forecast accuracy) exhibit results mostly in the non-financial aspect likely suggests that the proxy is capturing a broader improvement in the firm's overall internal information system that also has a non-financial dimension. Alternatively, however, the proxy could solely capture financial improvement of the internal information system, while the better understanding of the firm's future financial performance still affects the assessment of non-financial (e.g., ESG) investments, similar to how an accounting standard change having a broader impact through providing better cash flow implications (Shroff 2017; Cheng et al. 2018). A notable exception to this pattern is the speed of earnings announcements (*EA Speed*), which is more strongly associated with financial performance metrics. This result suggests that the timeliness of earnings disclosure may reflect internal processes particularly relevant for tracking financial outcomes.

6.3. What potential impact does higher internal information quality have, if any?

The evidence that internal information quality seems to act as a significant factor in the selection of performance metrics for CEO incentive contracts suggests that firms with higher internal information quality may derive benefits from more tailored compensation structures. We therefore hypothesize that internal information quality enhances contract efficiency by enabling the use of a broader and more customized set of performance metrics, which, in turn, supports improved organizational outcomes. To test this hypothesis, we examine whether the breadth and dissimilarity of performance metrics are associated with future profitability—and whether these associations depend on the quality of a firm's internal information. Specifically, we estimate the relation between future profitability, internal information quality, and both the number and dissimilarity of financial and non-financial performance metrics using the following specification:

$$[ROA_{it+n}] = \beta_1 \cdot IIQ_{it} + [Financial\ Metrics_{it}] + \beta_2 \cdot IIQ_{it} + [Non\text{-}Financial\ Metrics_{it}] + \beta_3 \cdot [Financial\ Metrics_{it}] + \beta_4 \cdot [Non\text{-}Financial\ Metrics_{it}] + \beta_5 \cdot IIQ_{it} + \mathbf{\Phi} \cdot X_{it} + \mathbf{T} \cdot \tau_i + \mathbf{\Omega} \cdot \xi_t + \varepsilon_{it+n}, \quad (3)$$

where $n \in \{1, 2, 3\}$, $[ROA_{it+n}]$ is firm i's return on assets in percentage points from year t to $t+n$, [*Financial Metrics*] is either *Number of Financial Metrics* or *Financial Metrics Dissimilarity*, and [*Non-Financial Metrics*] is either *Number of Non-Financial Metrics* or *Non-Financial Metrics Dissimilarity*. To ease the interpretation of the coefficient estimates, we use decile ranks of *IIQ*, [*Financial Metrics*], and [*Non-Financial Metrics*] scaled to range from zero to one. As a result, β_1 and β_2 capture how the impact of the highest levels of contract complexity on profitability changes when moving from firm-years with the lowest internal information quality to firm-years with the highest levels of internal information quality.

Table 11 presents the results for one-, two-, and three-year ahead profitability, with the two panels presenting, respectively, results for the number of performance metrics and the dissimilarity of the focal CEO's incentive contract relative to industry peers. Across both panels, we find that non-financial metrics—when used in conjunction with high internal information quality—are positively associated with future profitability, while their standalone use is negatively associated with performance. These findings reinforce our earlier results from Table 10 and suggest that non-financial metrics are beneficial only when internal information systems are strong enough to support their effective implementation.

Overall, these findings provide suggestive evidence that the breadth and variety of performance metrics are not by themselves desirable but are only useful when employed in the right context through higher internal information quality, rather than other factors such as external pressures from compensation consultants (Albuquerque et al. 2025). We emphasize, however, that these results are correlational and should not be interpreted as causal evidence.

7. Summary and conclusion

In this study, we examine the relation between firms' internal information quality and performance metric selection for CEO incentive contracts. Specifically, we test the hypothesis that the quality of a firm's internal information is a friction in boards' performance metric selection. Our main finding is that boards enlarge the set of performance metrics and also incorporate metrics that are more dissimilar to what industry peers use when the firm's internal information quality is higher. We also find that this positive relation between internal information quality and the breadth and variety of performance metrics is stronger in settings with differing demands for tailored performance metrics: (1) firms characterized by greater organizational complexity; (2) firms for which internal information is easier to process and act upon; and (3) firms facing heightened external environmental and social pressures.

Collectively, these findings are consistent with our hypothesis that internal information quality is a binding friction in boards' performance metric selection. Results from two shock-based analyses in which we examine changes in internal information quality that are likely induced by plausibly exogenous shifts in two financial accounting standards further support this interpretation. In a similar vein, we show that a broader and more dissimilar set of metrics—particularly non-financial metrics—is positively associated with future profitability when used in conjunction with high internal information quality.

Our study's findings are particularly relevant in light of the growing prevalence of performance-vested equity grants and the shifting focus away from cash bonuses in the incentive literature. A key takeaway from our study is that improving internal information systems can serve as a strategic lever, enabling boards to construct more effective, context-specific incentive contracts. Future research can build on these insights by identifying which types of information system improvements are most effective for supporting tailored and value-enhancing CEO pay structures.

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Appendix A. Variable definitions

Variable	Description
Number of Metrics	The number of performance metrics in the CEO's incentive contract. Data come from ISS Incentive Lab.
Number of Financial Metrics	The number of financial performance metrics in the CEO's incentive contract. Financial performance metrics are those in the following categories: (1) accounting; (2) activity-related; (3) balance sheet-related; (4) cash flow; (5) earnings-related; (6) economic value; (7) investment ratios; (8) market-related; (9) revenue-related; (10) solvency-related; and (11) stock price. Data come from ISS Incentive Lab.
Number of Non-Financial Metrics	The number of non-financial performance metrics in the CEO's incentive contract. Non-financial performance metrics are those in the following categories: (1) CSR; (2) environmental; (3) non-financial; (4) social; and (5) other. Data come from ISS Incentive Lab.
Metrics Dissimilarity	The dissimilarity of the focal CEO's incentive contract relative to industry peer CEOs' incentive contracts. For each industry-year defined using the Fama and French (1997) 48 industry groups, we first calculate the average number of performance metrics used in each of 16 performance categories across all firms. We then compute contract dissimilarity as the sum of absolute differences between the focal CEO's contract and the industry-year average, taken across all 16 categories. Data come from ISS Incentive Lab and Compustat.
Financial Metrics Dissimilarity	The dissimilarity of the focal CEO's incentive contract relative to industry peer CEOs' incentive contracts, calculated only using the 11 financial performance categories.
Non-Financial Metrics Dissimilarity	The dissimilarity of the focal CEO's incentive contract relative to industry peer CEOs' incentive contracts, calculated only using the 5 non-financial performance categories.
Number of Accounting Metrics	The number of accounting-based performance metrics in the CEO's incentive contract. Data come from ISS Incentive Lab.
Number of Non-GAAP Metrics	The number of non-GAAP-based performance metrics in the CEO's incentive contract. Data come from ISS Incentive Lab.
Number of Revenue Metrics	The number of revenue-based performance metrics in the CEO's incentive contract. Data come from ISS Incentive Lab.
Number of EPS Metrics	The number of EPS-based performance metrics in the CEO's incentive contract. Data come from ISS Incentive Lab.
IIQ	Internal information quality index, computed as the first principal component of the following variables: *Forecast Accuracy*, *EA Speed*, *Audit Simplicity*, *No SOX404 Weakness*, *No Restatement*, *Environmental Initiatives*, and *ESG Reporting Scope*. This variable explains 24.906% of the total variance across all seven measures, with its eigenvalue exceeding 1 at $0.249 \times 7 \approx 1.743$. See data sources below.

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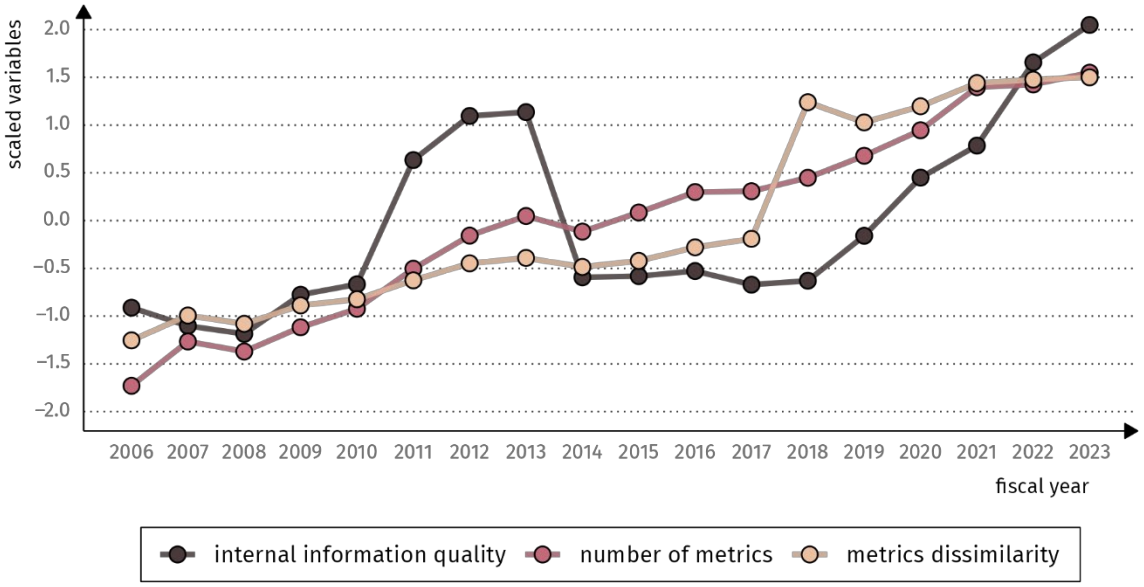
Variable	Description
Forecast Accuracy	Average of the absolute difference between management's quarterly estimate of earnings per share and the firm's quarterly realized earnings per share, computed over the past twelve quarters. This variable is multiplied by negative one, such that larger values correspond to higher internal information quality (Gallemore and Labro 2015). To retain as many observations as possible, we set *Forecast Accuracy* to zero when the firm does not provide a forecast about earnings. Data come from I/B/E/S.
EA Speed	Number of days between the end of the fiscal year and the firm's earnings announcement (Gallemore and Labro 2015). To ease the interpretation of this variable, we divide it by 365 and multiply it by negative one such that larger values correspond to greater faster earnings announcements. Data come from Compustat.
Audit Simplicity	Total audit fees scaled by annual revenue. To ease the interpretation of this variable, we multiply it by negative one such that larger values correspond to less audit-intensive firms. Data come from Audit Analytics Audit Fees.
No SOX404 Weakness	An indicator equal to one if the firm did not report a Section 404 material weakness in any of the past three years, zero otherwise (Gallemore and Labro 2015). Data come from Audit Analytics SOX404 Internal Controls.
No Restatement	An indicator equal to one if the firm had no restatement in any of the past three years, zero otherwise, zero otherwise (Gallemore and Labro 2015). Data come from Audit Analytics Financial Restatements.
Environmental Initiatives	An indicator equal to one if the firm reports making proactive environmental investments or expenditures to reduce future risks or increase future opportunities, zero otherwise. Data come from LSEG ESG (formerly known as Refinitiv and ASSET4).
ESG Reporting Scope	An indicator equal to one if the firm's environmental and social reporting covers all of its global activities, based on (1) number of employees, (2) group revenue, or (3) number of group operations, zero otherwise. Data come from LSEG ESG (formerly known as Refinitiv and ASSET4).
Delta	Sensitivity of the risk-neutral value of the CEO's portfolio of stock and stock options to a 1% change in the price of the underlying stock (Core and Guay 2002). Because this variable is skewed, we use the natural logarithm of one plus the raw value in our analyses. Data come from ExecuComp and CRSP.
Vega	Sensitivity of the risk-neutral value of the CEO's portfolio of stock options to a 0.01 change in the volatility of the underlying stock (Core and Guay 2002). Because this variable is skewed, we use the natural logarithm of one plus the raw value in our analyses. Data come from ExecuComp and CRSP.
Age	The CEO's age. Because this variable is skewed, we use the natural logarithm of one plus the raw value in our analyses. Data come from ExecuComp.
Tenure	Number of years the CEO has held his/her office. Because this variable is skewed, we use the natural logarithm of one plus the raw value in our analyses. Data come from ExecuComp.

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Variable	Description
Number of Rivals	Number of product market rivals, as identified by Hoberg and Phillips (2010, 2016). Because this variable is skewed, we use the natural logarithm of one plus the raw value in our analyses. Data come from Hoberg-Phillips Data Library.
Rival Similarity	Median similarity to the firm's product market rivals, as identified by Hoberg and Phillips (2010, 2016). Data come from Hoberg-Phillips Data Library.
Sales	Annual revenue. Because this variable is skewed, we use the natural logarithm of one plus the raw value in our analyses. Data come from Compustat.
Book-to-Market	Ratio of book value of total assets to the firm's market value. Data come from Compustat.
Leverage	Book value of total long-term debt, scaled by total assets. Data come from Compustat.
Sales Growth	Growth in annual revenue over the prior year. Data come from Compustat.
Cash	Cash and cash equivalents balance, scaled by total assets. Data come from Compustat.
CEO Duality	An indicator equal to one if the CEO is also the Chairman of the Board, zero otherwise. Data come from BoardEx.
Board Size	Number of board members. Because this variable is skewed, we use the natural logarithm of one plus the raw value in our analyses. Data come from BoardEx.
Board Independence	Fraction of board members that is independent. Data come from BoardEx.
Board Experience	Fraction of board members that sits on three or more other boards. Data come from BoardEx.
Segments	Number of business segments. Data come from Compustat Segments.
σReturns	Idiosyncratic stock return volatility, defined as the standard deviation of the firm's annualized returns that are unexplained by the Carhart (1997) four-factor model estimated over a rolling 60-month period. Data come from CRSP and Fama-French Portfolios and Factors.
Comovement	Correlation between quarterly stock returns and earnings per share estimated over a 20-quarter period. Data come from Compustat Quarterly.
E-Risk	Environmental reputation risk. Data come from RepRisk and are available until 2020.
S-Risk	Social reputation risk. Data come from RepRisk and are available until 2020.
New External CEO	An indicator equal to one if the firm appointed a new CEO hired from outside the firm, zero otherwise. Data come from BoardEx.
ROA	Income scaled by total assets over the period *t* until the subscripted period.

This table presents variable definitions.

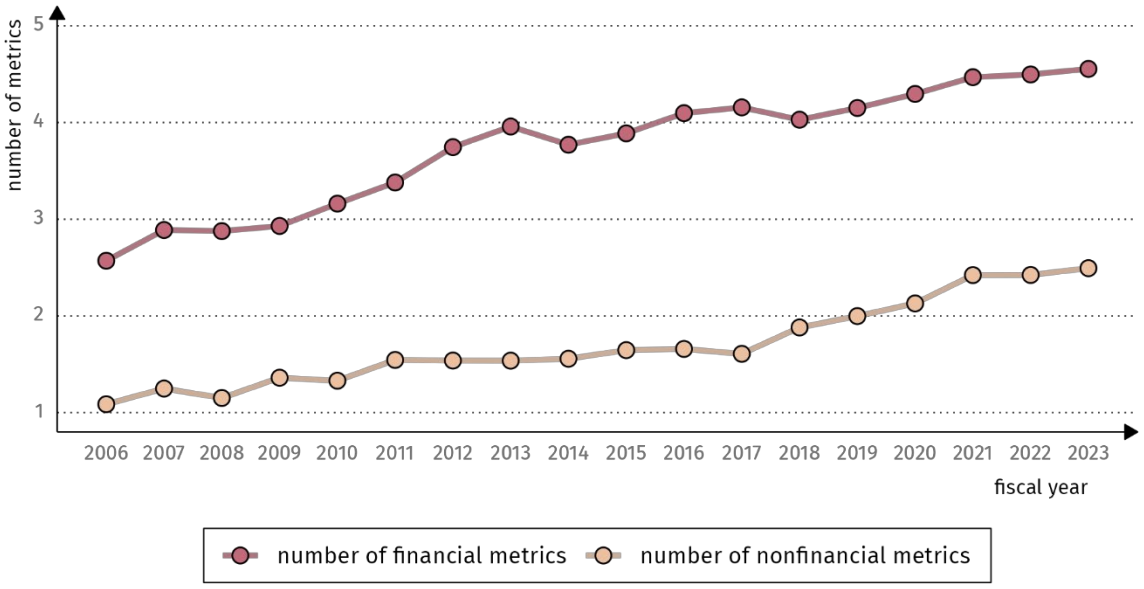
Figure 1. Internal information quality and performance metric selection over time



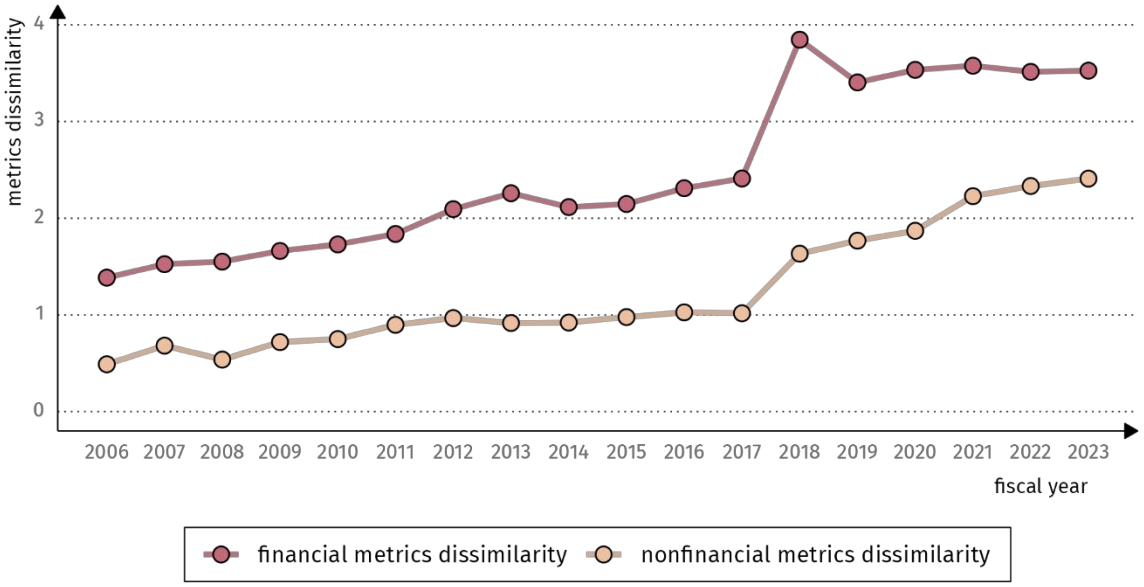
This figure illustrates the evolution of the average values of firms' internal information quality, the number of performance metrics and the dissimilarity of the focal CEO's incentive contract relative to industry peers over time. We standardize all three variables using *z*-transformations to ensure they are comparable in the plot. Appendix A defines all variables.

Figure 2. Performance metric selection over time—by type

Panel A. Number of performance metrics

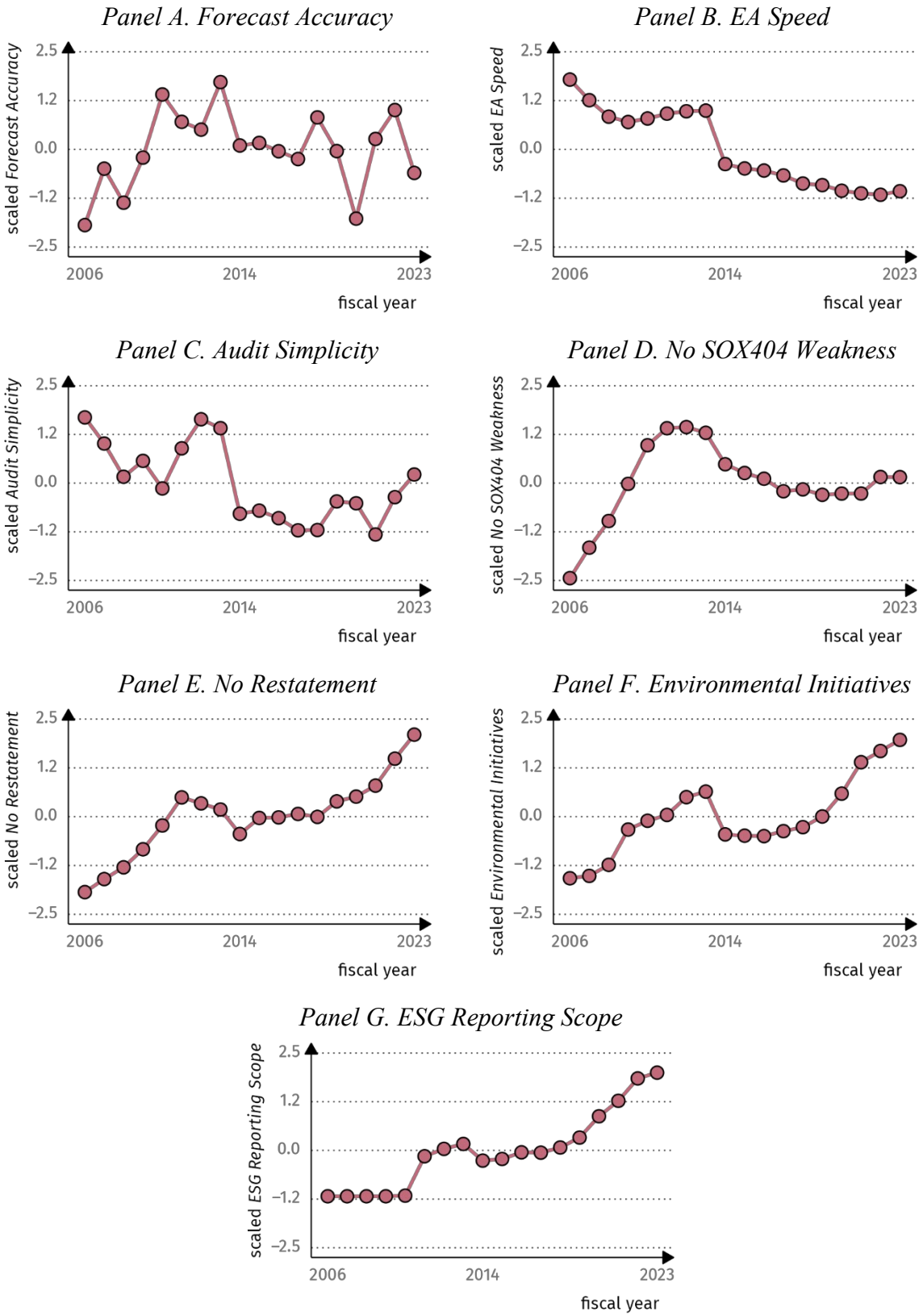


Panel B. Dissimilarity of performance metrics



This figure illustrates the evolution of the average values of firms' number of performance metrics and the dissimilarity of the focal CEO's incentive contract relative to industry peers over time, separately for financial and non-financial performance metrics. Appendix A defines all variables.

Figure 3. Internal information quality over time—by type



This figure illustrates the evolution of the average values of the seven proxies underlying firms' internal information quality over time. We standardize all seven variables using *z*-transformations to ensure they are comparable in the plot. Appendix A defines all variables.

Table 1. Summary statistics

	Mean	Std. Dev.	10th	25th	50th	75th	90th
Number of Metrics	5.670	4.433	1.000	3.000	5.000	7.000	10.000
Number of Financial Metrics	3.882	2.707	1.000	2.000	4.000	5.000	7.000
Number of Non-Financial Metrics	1.788	2.961	0.000	0.000	1.000	2.000	5.000
Metrics Dissimilarity	4.441	3.734	1.152	2.286	3.806	5.714	8.220
Financial Metrics Dissimilarity	2.644	2.203	0.444	1.263	2.286	3.474	5.000
Non-Financial Metrics Dissimilarity	1.350	2.422	0.000	0.000	0.625	1.860	3.587
IIQ	0.004	0.974	–1.084	–0.511	0.005	0.512	1.209
Forecast Accuracy	–0.111	0.318	–0.337	0.000	0.000	0.000	0.000
EA Speed	–0.112	0.036	–0.158	–0.142	–0.109	–0.081	–0.067
Audit Simplicity	–0.191	0.203	–0.395	–0.231	–0.129	–0.073	–0.040
No SOX404 Weakness	0.960	0.147	1.000	1.000	1.000	1.000	1.000
No Restatement	0.907	0.202	0.667	1.000	1.000	1.000	1.000
Environmental Initiatives	0.091	0.287	0.000	0.000	0.000	0.000	0.000
ESG Reporting Scope	0.298	0.457	0.000	0.000	0.000	1.000	1.000
Delta	5.482	1.627	3.539	4.462	5.485	6.498	7.427
Vega	2.904	2.430	0.000	0.000	3.438	5.015	5.941
Age	4.054	0.120	3.892	3.989	4.060	4.127	4.190
Tenure	2.340	0.686	1.386	1.946	2.398	2.773	3.219
Number of Rivals	3.391	1.565	1.386	2.197	3.296	4.522	5.835
Rival Similarity	0.027	0.029	0.004	0.011	0.018	0.030	0.064
Sales	7.800	1.507	5.903	6.788	7.800	8.881	9.847
Book-to-Market	0.633	0.279	0.266	0.417	0.626	0.846	0.986
Leverage	0.243	0.217	0.001	0.069	0.213	0.350	0.503
Sales Growth	0.156	2.083	–0.105	–0.009	0.065	0.158	0.313
Cash	0.152	0.173	0.012	0.033	0.090	0.204	0.383
CEO Duality	0.409	0.492	0.000	0.000	0.000	1.000	1.000
Board Size	2.345	0.226	2.079	2.197	2.398	2.485	2.639
Board Independence	0.714	0.139	0.538	0.615	0.700	0.857	0.889
Board Experience	0.065	0.098	0.000	0.000	0.000	0.111	0.200

This table presents summary statistics for the variables used in our main analysis. Appendix A defines all variables.

Table 2. Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1)		0.60	0.25	–0.06	–0.07	0.05	–0.02	0.09	0.09	0.19	0.09	0.15	–0.05	–0.11	–0.03	0.21	0.13	0.12
(2)	0.83		0.19	–0.09	–0.24	0.10	0.02	0.08	0.08	0.09	0.10	0.14	0.00	–0.10	–0.06	0.10	0.17	0.07
(3)	0.22	0.18		0.21	0.10	0.08	0.22	–0.03	0.02	0.63	0.00	0.15	–0.03	–0.12	0.09	0.41	–0.16	0.12
(4)	–0.03	–0.05	0.21		0.50	0.18	0.37	0.02	–0.01	0.34	–0.34	0.02	0.13	0.10	0.31	0.13	–0.29	0.06
(5)	–0.09	–0.19	0.06	0.45		–0.02	0.11	0.01	–0.02	0.27	–0.12	–0.01	–0.07	0.08	0.18	0.15	–0.23	0.06
(6)	0.05	0.08	0.08	0.18	–0.03		0.31	0.02	0.04	0.09	0.07	0.01	–0.03	–0.06	0.24	0.06	0.01	–0.02
(7)	0.00	0.02	0.21	0.39	0.10	0.32		0.00	0.02	0.17	0.00	–0.03	–0.02	–0.07	0.24	0.12	–0.08	–0.02
(8)	0.11	0.09	–0.05	0.01	0.01	0.02	0.00		0.67	–0.12	0.18	–0.14	0.07	0.06	–0.01	0.05	–0.01	0.02
(9)	0.09	0.07	–0.03	–0.05	–0.04	0.04	0.01	0.60		–0.06	0.22	–0.07	0.04	–0.03	0.01	0.09	–0.02	0.02
(10)	0.17	0.10	0.64	0.32	0.23	0.09	0.17	–0.14	–0.18		0.07	0.29	–0.07	–0.15	0.13	0.50	–0.32	0.21
(11)	0.08	0.07	0.01	–0.33	–0.11	0.07	–0.01	0.18	0.22	0.08		0.06	–0.22	–0.36	0.03	0.16	0.13	0.04
(12)	0.08	0.09	0.11	0.02	–0.01	0.01	–0.04	–0.09	–0.10	0.24	0.01		–0.07	–0.31	–0.01	0.13	0.01	0.17
(13)	0.00	0.00	–0.07	–0.01	–0.01	–0.01	–0.04	0.05	0.06	–0.07	–0.04	–0.01		0.04	–0.02	–0.09	–0.03	–0.02
(14)	–0.08	–0.06	–0.17	0.08	0.05	–0.06	–0.08	0.18	0.05	–0.24	–0.32	–0.08			–0.06	–0.18	–0.06	–0.05
(15)	0.00	–0.02	0.10	0.30	0.17	0.24	0.24	–0.01	0.02	0.13	0.02	–0.03	–0.01	–0.07		0.08	–0.06	0.03
(16)	0.17	0.09	0.37	0.12	0.14	0.05	0.10	0.07	0.12	0.47	0.14	0.09	–0.04	–0.17	0.07		–0.05	0.18
(17)	0.06	0.10	–0.14	–0.28	–0.22	0.01	–0.07	0.01	0.07	–0.30	0.12	–0.01	0.01	–0.04	–0.06	–0.04		0.00
(18)	0.09	0.06	0.08	0.03	0.04	–0.02	–0.01	0.04	0.01	0.16	0.04	0.13	0.01	–0.01	0.02	0.11	0.02	

Legend: (1) *Number of Metrics*; (2) *Metrics Dissimilarity*; (3) *IIQ*; (4) *Delta*; (5) *Vega*; (6) *Age*; (7) *Tenure*; (8) *Number of Rivals*; (9) *Rival Similarity*; (10) *Sales*; (11) *Book-to-Market*; (12) *Leverage*; (13) *Sales Growth*; (14) *Cash*; (15) *CEO Duality*; (16) *Board Size*; (17) *Board Independence*; and (18) *Board Experience*.

This table presents a correlation matrix for the variables used in our main analysis. Spearman correlation coefficients appear above the diagonal, and Pearson correlation coefficients appear below it. Appendix A defines all variables.

Table 3. Internal information quality and performance metric selection

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable:					
Variable	*Number of Metrics*$_{t+1}$			*Metrics Dissimilarity*$_{t+1}$		
IIQ	0.677***	0.719***	0.244***	0.535***	0.664***	0.182***
	(0.078)	(0.077)	(0.073)	(0.060)	(0.066)	(0.060)
Delta	–0.061	–0.038	–0.029	0.039	–0.014	–0.011
	(0.059)	(0.045)	(0.043)	(0.048)	(0.042)	(0.037)
Vega	–0.165***	–0.199***	–0.029	–0.284***	–0.264***	–0.034
	(0.029)	(0.025)	(0.028)	(0.023)	(0.023)	(0.025)
Age	1.241**	1.722***	0.339	1.631***	2.285***	0.550
	(0.500)	(0.544)	(0.499)	(0.387)	(0.485)	(0.404)
Tenure	–0.261***	–0.031	–0.033	–0.086	0.013	0.016
	(0.084)	(0.105)	(0.098)	(0.065)	(0.096)	(0.085)
Number of Rivals	0.080	0.020	0.164**	–0.053	–0.112	0.087
	(0.054)	(0.076)	(0.070)	(0.039)	(0.070)	(0.061)
Rival Similarity	7.231**	4.858**	3.976*	0.591	2.403	1.828
	(2.885)	(1.973)	(2.047)	(2.073)	(1.654)	(1.564)
Sales	0.447***	0.590***	–0.068	0.260***	0.759***	–0.115
	(0.069)	(0.103)	(0.110)	(0.053)	(0.088)	(0.085)
Book-to-Market	–0.120	0.081	0.402*	–0.050	0.110	0.447**
	(0.260)	(0.253)	(0.242)	(0.192)	(0.248)	(0.226)
Leverage	0.555	1.385***	–0.634*	0.583**	1.949***	–0.599**
	(0.358)	(0.329)	(0.323)	(0.245)	(0.294)	(0.268)
Sales Growth	0.005	–0.031*	–0.019	0.004	–0.027***	–0.016**
	(0.010)	(0.016)	(0.014)	(0.008)	(0.009)	(0.008)
Cash	–0.853	0.126	–0.293	–0.173	–0.229	–0.462
	(0.583)	(0.613)	(0.596)	(0.414)	(0.571)	(0.548)
CEO Duality	–0.063	–0.192*	0.274***	–0.223**	–0.319***	0.243***
	(0.133)	(0.100)	(0.099)	(0.102)	(0.093)	(0.086)
Board Size	0.878***	–0.094	0.335	0.082	–0.062	0.244
	(0.297)	(0.372)	(0.358)	(0.218)	(0.352)	(0.329)
Board Independence	2.692***	2.681***	–0.893**	2.555***	2.204***	–0.912**
	(0.407)	(0.386)	(0.452)	(0.302)	(0.340)	(0.374)
Board Experience	0.326	–0.357	–0.081	–0.371	–0.255	–0.039
	(0.663)	(0.615)	(0.573)	(0.495)	(0.553)	(0.470)
Fixed effects	industry	firm	firm, year	industry	firm	firm, year
Observations	20,409	20,409	20,409	20,409	20,409	20,409
Adjusted R^2	15.248%	47.503%	50.426%	15.131%	37.846%	45.572%

This table presents results from estimating the relation between internal information quality and details of CEOs' incentive contracts. Columns (1) through (3) present results for the number of performance metrics (*Number of Metrics*), with the three columns presenting, respectively, results from specifications with industry, firm, and firm and year fixed effects. Columns (4) through (6) present analogous results for the dissimilarity of the focal CEO's incentive contract relative to industry peers (*Metrics Dissimilarity*). For brevity, we do not report their coefficient estimates and standard errors of the various fixed effects. Standard errors are in parentheses and are adjusted for within-cluster correlation at the level of treatment (i.e., firm). *, **, and *** denote that the coefficient is significantly different from zero at, respectively, two-tailed probability levels of 10%, 5%, and 1%. Appendix A defines all variables.

Table 4. Internal information quality and performance metric selection—cross-sectional variation in organizational complexity

Panel A. Number of business segments

	(1)	(2)	(3)	(4)
Subsample—split by *Segments*	Low	High	Low	High
			Dependent variable:	
Variable	*Number of Metrics*$_{t+1}$		*Metrics Dissimilarity*$_{t+1}$	
IIQ	0.145*	0.497***	0.116*	0.348***
	(0.081)	(0.159)	(0.066)	(0.130)
Controls	yes	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year	firm, year
Observations	15,202	5,179	15,202	5,179
Adjusted R^2	52.479%	49.215%	48.531%	41.084%
Difference in *IIQ*	0.351**		0.232*	

Panel B. Idiosyncratic stock return-volatility

	(1)	(2)	(3)	(4)
Subsample—split by *σReturns*	Low	High	Low	High
			Dependent variable:	
Variable	*Number of Metrics*$_{t+1}$		*Metrics Dissimilarity*$_{t+1}$	
IIQ	0.127	0.337***	0.093	0.288***
	(0.102)	(0.108)	(0.088)	(0.087)
Controls	yes	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year	firm, year
Observations	9,809	9,808	9,809	9,808
Adjusted R^2	51.048%	51.842%	46.780%	44.496%
Difference in *IIQ*	0.210*		0.195*	

This table presents results from examining whether the within-firm relation between internal information quality and details of CEOs' incentive contracts varies with organizational complexity. We estimate the regression models separately for subsamples split by the median value of the cross-sectional variables, allowing all coefficients and fixed effects to vary across the two subsamples. We test for signed differences in the coefficient estimates between the two subsamples using *Z*-tests and report the results at the bottom of each panel. The regression models also include firm and year effects and *Delta*, *Vega*, *Age*, *Tenure*, *Number of Rivals*, *Rival Similarity*, *Sales*, *Book-to-Market*, *Leverage*, *Sales Growth*, *Cash*, *CEO Duality*, *Board Size*, *Board Independence*, and *Board Experience*; for brevity, we do not report their coefficient estimates and standard errors. Standard errors are in parentheses and are adjusted for within-cluster correlation at the level of treatment (i.e., firm). *, **, and *** denote that the coefficient is significantly different from zero at, respectively, two-tailed probability levels of 10%, 5%, and 1%. Appendix A defines all variables.

Table 5. Internal information quality and performance metric selection—cross-sectional variation in ease of internal information processing

Panel A. Experienced boards

Subsample—split by *Board Experience*	(1) Low	(2) High	(3) Low	(4) High
	Dependent variable:			
Variable	*Number of Metrics*$_{t+1}$		*Metrics Dissimilarity*$_{t+1}$	
IIQ	0.098	0.386***	0.117	0.241**
	(0.091)	(0.123)	(0.073)	(0.100)
Controls	yes	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year	firm, year
Observations	11,863	8,546	11,863	8,546
Adjusted R^2	48.450%	52.864%	43.176%	48.863%
Difference in *IIQ*	0.288**		0.125	

Panel B. Comovement between financial performance metrics

Subsample—split by *Comovement*	(1) Low	(2) High	(3) Low	(4) High
	Dependent variable:			
Variable	*Number of Metrics*$_{t+1}$		*Metrics Dissimilarity*$_{t+1}$	
IIQ	0.048	0.438***	0.037	0.343***
	(0.105)	(0.098)	(0.088)	(0.079)
Controls	yes	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year	firm, year
Observations	9,808	9,807	9,808	9,807
Adjusted R^2	49.812%	54.182%	43.315%	50.797%
Difference in *IIQ*	0.390***		0.306***	

This table presents results from examining whether the within-firm relation between internal information quality and details of CEOs' incentive contracts varies with ease of internal information processing. We estimate the regression models separately for subsamples split by the median value of the cross-sectional variables, allowing all coefficients and fixed effects to vary across the two subsamples. We test for signed differences in the coefficient estimates between the two subsamples using *Z*-tests and report the results at the bottom of each panel. The regression models also include firm and year effects and *Delta*, *Vega*, *Age*, *Tenure*, *Number of Rivals*, *Rival Similarity*, *Sales*, *Book-to-Market*, *Leverage*, *Sales Growth*, *Cash*, *CEO Duality*, *Board Size*, *Board Independence*, and *Board Experience*; for brevity, we do not report their coefficient estimates and standard errors. Standard errors are in parentheses and are adjusted for within-cluster correlation at the level of treatment (i.e., firm). *, **, and *** denote that the coefficient is significantly different from zero at, respectively, two-tailed probability levels of 10%, 5%, and 1%. Appendix A defines all variables.

Table 6. Internal information quality and performance metric selection—cross-sectional variation in external environmental and social pressure

Panel A. Environmental reputation risk

	(1)	(2)	(3)	(4)
Subsample—split by *E-Risk*	Low	High	Low	High
			Dependent variable:	
Variable	*Number of Metrics*$_{t+1}$		*Metrics Dissimilarity*$_{t+1}$	
IIQ	0.159	0.359**	0.163*	0.360***
	(0.108)	(0.166)	(0.088)	(0.135)
Controls	yes	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year	firm, year
Observations	9,140	4,257	9,140	4,257
Adjusted R^2	44.397%	48.559%	39.867%	42.175%
Difference in *IIQ*	0.199		0.197	

Panel B. Social reputation risk

	(1)	(2)	(3)	(4)
Subsample—split by *S-Risk*	Low	High	Low	High
			Dependent variable:	
Variable	*Number of Metrics*$_{t+1}$		*Metrics Dissimilarity*$_{t+1}$	
IIQ	0.098	0.375***	0.090	0.356***
	(0.138)	(0.136)	(0.117)	(0.109)
Controls	yes	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year	firm, year
Observations	7,182	6,215	7,182	6,215
Adjusted R^2	44.562%	49.609%	38.820%	43.030%
Difference in *IIQ*	0.277*		0.266**	

This table presents results from examining whether the within-firm relation between internal information quality and details of CEOs' incentive contracts varies with external environmental and social pressure. We estimate the regression models separately for subsamples split by the median value of the cross-sectional variables, allowing all coefficients and fixed effects to vary across the two subsamples. We test for signed differences in the coefficient estimates between the two subsamples using *Z*-tests and report the results at the bottom of each panel. The regression models also include firm and year effects and *Delta*, *Vega*, *Age*, *Tenure*, *Number of Rivals*, *Rival Similarity*, *Sales*, *Book-to-Market*, *Leverage*, *Sales Growth*, *Cash*, *CEO Duality*, *Board Size*, *Board Independence*, and *Board Experience*; for brevity, we do not report their coefficient estimates and standard errors. The sample size in these cross-sectional analyses differs from the preceding analyses because reputation risk data is only available until 2020. Standard errors are in parentheses and are adjusted for within-cluster correlation at the level of treatment (i.e., firm). *, **, and *** denote that the coefficient is significantly different from zero at, respectively, two-tailed probability levels of 10%, 5%, and 1%. Appendix A defines all variables.

Table 7. Internal information quality and performance metric selection—ASU 2015-14

Panel A. Changes in internal information quality around ASU 2015-14

	(1)
	Dependent variable:
Variable	IIQ_t
Post × Treatment	0.515***
	(0.137)
Controls	yes
Fixed effects	firm, year
Observations	4,238
Adjusted R^2	86.787%

Panel B. Changes in the number of performance metrics around ASU 2015-14

	(1)	(2)	(3)
		Dependent variable:	
	Number of	*Number of*	*Number of*
Variable	*Metrics*$_{t+1}$	*Financial Metrics*$_{t+1}$	*Non-Financial Metrics*$_{t+1}$
Post × Treatment	0.700	1.309***	–0.612
	(0.641)	(0.368)	(0.425)
Controls	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year
Observations	4,238	4,238	4,238
Adjusted R^2	57.505%	54.561%	59.984%

Panel C. Changes in the dissimilarity of performance metrics around ASU 2015-14

	(1)	(2)	(3)
		Dependent variable:	
	Metrics	*Financial Metrics*	*Non-Financial Metrics*
Variable	*Dissimilarity*$_{t+1}$	*Dissimilarity*$_{t+1}$	*Dissimilarity*$_{t+1}$
Post × Treatment	1.361***	1.604***	3.237***
	(0.481)	(0.344)	(0.363)
Controls	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year
Observations	4,238	4,238	4,238
Adjusted R^2	47.861%	41.336%	49.636%

Panel D. Changes in the use of specific performance metric categories around ASU 2015-14

	(1)	(2)	(3)
		Dependent variable:	
	Number of Accounting	*Number of Non-GAAP*	*Number of Revenue*
Variable	*Metrics*$_{t+1}$	*Metrics*$_{t+1}$	*Metrics*$_{t+1}$
Post × Treatment	1.591***	–0.175**	1.879***
	(0.412)	(0.073)	(0.143)
Controls	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year
Observations	4,238	4,238	4,238
Adjusted R^2	54.221%	35.765%	69.425%

This table presents results from a non-staggered, continuous difference-in-differences design estimating the effects of ASU 2015-14 (i.e., deferral of ASU 2014-09 "Revenue from Contracts with Customers") on firms' internal information quality and performance metric selection. Panels A through D present, respectively, results for internal information quality, the number

of performance metrics, the dissimilarity of the focal CEO's incentive contract relative to industry peers, and changes in the use of specific performance metric categories following the accounting standard. For Panels B and C, we present results both pooled and separately for financial and non-financial performance metrics. The estimation window spans four years before and after each event. We construct a static firm-level treatment intensity measure and entropy balance firms based on all control variables using data from the pre-event period. *Post* is an indicator variable equal to one for fiscal periods beginning after the announcement date of ASU 2015-14 on July 9, 2015, and zero otherwise. *Treatment* is the number of unique customers disclosed in the firm's 10-K, scaled by firm size. The regression models also include firm and year effects and *Delta*, *Vega*, *Age*, *Tenure*, *Number of Rivals*, *Rival Similarity*, *Sales*, *Book-to-Market*, *Leverage*, *Sales Growth*, *Cash*, *CEO Duality*, *Board Size*, *Board Independence*, and *Board Experience*; for brevity, we do not report their coefficient estimates and standard errors. Standard errors are in parentheses and are adjusted for within-cluster correlation at the level of treatment (i.e., firm). *, **, and *** denote that the coefficient is significantly different from zero at, respectively, two-tailed probability levels of 10%, 5%, and 1%. Appendix A defines all variables.

Table 8. Internal information quality and performance metric selection—ASU 2016-02

Panel A. Changes in internal information quality around ASU 2016-02

	(1)
	Dependent variable:
Variable	IIQ_t
Post × Treatment	0.046*
	(0.024)
Controls	yes
Fixed effects	firm, year
Observations	4,228
Adjusted R^2	86.134%

Panel B. Changes in the number of performance metrics around ASU 2016-02

	(1)	(2)	(3)
		Dependent variable:	
	Number of	*Number of*	*Number of*
Variable	*Metrics*$_{t+1}$	*Financial Metrics*$_{t+1}$	*Non-Financial Metrics*$_{t+1}$
Post × Treatment	0.224	0.184***	0.039
	(0.154)	(0.069)	(0.125)
Controls	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year
Observations	4,228	4,228	4,228
Adjusted R^2	55.586%	54.615%	53.966%

Panel C. Changes in the dissimilarity of performance metrics around ASU 2016-02

	(1)	(2)	(3)
		Dependent variable:	
	Metrics	*Financial Metrics*	*Non-Financial Metrics*
Variable	*Dissimilarity*$_{t+1}$	*Dissimilarity*$_{t+1}$	*Dissimilarity*$_{t+1}$
Post × Treatment	0.120	0.198**	0.070
	(0.126)	(0.080)	(0.113)
Controls	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year
Observations	4,228	4,228	4,228
Adjusted R^2	46.150%	42.540%	44.981%

Panel D. Changes in the use of specific performance metric categories around ASU 2016-02

	(1)	(2)	(3)
		Dependent variable:	
	Number of Accounting	*Number of Non-GAAP*	*Number of EPS*
Variable	*Metrics*$_{t+1}$	*Metrics*$_{t+1}$	*Metrics*$_{t+1}$
Post × Treatment	0.254***	–0.028**	0.068**
	(0.081)	(0.013)	(0.027)
Controls	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year
Observations	4,228	4,228	4,228
Adjusted R^2	56.541%	34.148%	58.346%

This table presents results from a non-staggered, continuous difference-in-differences design estimating the effects of ASU 2016-02 ("Leases") on firms' internal information quality and performance metric selection. Panels A through D present, respectively, results for internal information quality, the number of performance metrics, the dissimilarity of the focal CEO's

incentive contract relative to industry peers, and changes in the use of specific performance metric categories following the accounting standard. For Panels B and C, we present results both pooled and separately for financial and non-financial performance metrics. The estimation window spans four years before and after each event. We construct a static firm-level treatment intensity measure and entropy balance firms based on all control variables using data from the pre-event period. *Post* is an indicator variable equal to one for fiscal periods beginning after the announcement date of ASU 2016-02 on February 25, 2016, and zero otherwise. *Treatment* is the total capitalized amount of operating lease obligations, scaled by firm size. The regression models also include firm and year effects and *Delta*, *Vega*, *Age*, *Tenure*, *Number of Rivals*, *Rival Similarity*, *Sales*, *Book-to-Market*, *Leverage*, *Sales Growth*, *Cash*, *CEO Duality*, *Board Size*, *Board Independence*, and *Board Experience*; for brevity, we do not report their coefficient estimates and standard errors. Standard errors are in parentheses and are adjusted for within-cluster correlation at the level of treatment (i.e., firm). *, **, and *** denote that the coefficient is significantly different from zero at, respectively, two-tailed probability levels of 10%, 5%, and 1%. Appendix A defines all variables.

Table 9. Internal information quality and performance metric selection—strategic shifts

	(1)	(2)
	Dependent variable:	
Variable	*Number of Metrics*$_{t+1}$	*Metrics Dissimilarity*$_{t+1}$
New External CEO	–0.220	0.037
	(0.170)	(0.140)
IIQ	0.243***	0.182***
	(0.073)	(0.060)
Controls	yes	yes
Fixed effects	firm, year	firm, year
Observations	20,409	20,409
Adjusted R^2	50.431%	45.572%

This table presents results from estimating the relation between strategic shifts, proxied by newly appointed CEOs hired from outside the firm, and details of CEOs' incentive contracts. Columns (1) and (2) present, respectively, results for the number of performance metrics and the dissimilarity of the focal CEO's incentive contract relative to industry peers. The regression models also include firm and year effects and *Delta*, *Vega*, *Age*, *Tenure*, *Number of Rivals*, *Rival Similarity*, *Sales*, *Book-to-Market*, *Leverage*, *Sales Growth*, *Cash*, *CEO Duality*, *Board Size*, *Board Independence*, and *Board Experience*; for brevity, we do not report their coefficient estimates and standard errors. Standard errors are in parentheses and are adjusted for within-cluster correlation at the level of treatment (i.e., firm). *, **, and *** denote that the coefficient is significantly different from zero at, respectively, two-tailed probability levels of 10%, 5%, and 1%. Appendix A defines all variables.

Table 10. Internal information quality and performance metric selection—financial versus non-financial performance metrics

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable:			Dependent variable:		
Variable	*Number of Metrics*$_{t+1}$	*Number of Financial Metrics*$_{t+1}$	*Number of Non-Financial Metrics*$_{t+1}$	*Metrics Dissimilarity*$_{t+1}$	*Financial Metrics Dissimilarity*$_{t+1}$	*Non-Financial Metrics Dissimilarity*$_{t+1}$
IIQ	0.244***	0.048	0.196***	0.182***	0.043	0.172***
	(0.073)	(0.046)	(0.052)	(0.060)	(0.037)	(0.041)
Forecast Accuracy	0.357**	0.065	0.292**	0.214*	0.073	0.181*
	(0.164)	(0.097)	(0.116)	(0.126)	(0.076)	(0.095)
EA Speed	1.696	4.476**	–2.780	3.752	5.031***	–1.310
	(3.533)	(1.815)	(3.057)	(2.815)	(1.495)	(2.404)
Audit Simplicity	0.710*	–0.137	0.846***	0.300	–0.134	0.583***
	(0.398)	(0.234)	(0.284)	(0.302)	(0.189)	(0.214)
No SOX404 Weakness	0.409*	0.105	0.304**	0.221	0.136	0.233**
	(0.212)	(0.145)	(0.139)	(0.179)	(0.121)	(0.107)
No Restatement	0.230	–0.042	0.271	0.214	–0.023	0.214
	(0.224)	(0.139)	(0.169)	(0.184)	(0.112)	(0.138)
Environmental Initiatives	0.378*	–0.088	0.467**	0.262	–0.107	0.427***
	(0.205)	(0.117)	(0.182)	(0.166)	(0.091)	(0.142)
ESG Reporting Scope	0.254*	0.112	0.142*	0.184	0.073	0.127*
	(0.130)	(0.078)	(0.082)	(0.115)	(0.067)	(0.072)
Controls	yes	yes	yes	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year	firm, year	firm, year	firm, year
Observations	20,409	20,409	20,409	20,409	20,409	20,409
Average adjusted R^2	50.387%	48.881%	49.793%	45.542%	41.770%	43.692%

This table presents results from examining the robustness of the relation between internal information quality and details of CEOs' incentive contracts, using all proxies for internal information quality. Each cell refers to one estimation. The regression models also include firm and year effects and *Delta*, *Vega*, *Age*, *Tenure*, *Number of Rivals*, *Rival Similarity*, *Sales*, *Book-to-Market*, *Leverage*, *Sales Growth*, *Cash*, *CEO Duality*, *Board Size*, *Board Independence*, and *Board Experience*; for brevity, we do not report their coefficient estimates and standard errors. Standard errors are in parentheses and are adjusted for within-cluster correlation at the level of treatment (i.e., firm). *, **, and *** denote that the coefficient is significantly different from zero at, respectively, two-tailed probability levels of 10%, 5%, and 1%. Appendix A defines all variables.

Table 11. Internal information quality, performance metric selection, and future profitability

Panel A. Number of performance metrics and future profitability

	(1)	(2)	(3)
		Dependent variable:	
Variable	ROA_{t+1}	ROA_{t+2}	ROA_{t+3}
Number of Non-Financial Metrics	–2.577***	–2.391***	–2.011***
	(0.598)	(0.626)	(0.567)
IIQ × *Number of Non-Financial Metrics*	2.756***	2.498***	2.050**
	(0.858)	(0.940)	(0.888)
Number of Financial Metrics	0.921*	0.525	0.346
	(0.532)	(0.673)	(0.638)
IIQ × *Number of Financial Metrics*	–1.073	–0.769	–0.401
	(0.865)	(1.016)	(0.956)
IIQ	0.086	–0.388	–0.469
	(0.688)	(0.830)	(0.786)
Controls	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year
Observations	19,915	19,915	19,915
Adjusted R^2	51.703%	57.696%	62.889%

Panel B. Dissimilarity of performance metrics and future profitability

	(1)	(2)	(3)
		Dependent variable:	
Variable	ROA_{t+1}	ROA_{t+2}	ROA_{t+3}
Non-Financial Metrics Dissimilarity	–0.157**	–0.185***	–0.171***
	(0.062)	(0.066)	(0.061)
IIQ × *Non-Financial Metrics Dissimilarity*	0.197**	0.248***	0.234***
	(0.083)	(0.091)	(0.085)
Financial Metrics Dissimilarity	0.272	0.406	0.484
	(0.496)	(0.599)	(0.553)
IIQ × *Financial Metrics Dissimilarity*	–0.133	–0.348	–0.436
	(0.771)	(0.903)	(0.846)
IIQ	–0.050	–0.646	–0.642
	(0.645)	(0.794)	(0.748)
Controls	yes	yes	yes
Fixed effects	firm, year	firm, year	firm, year
Observations	19,915	19,915	19,915
Adjusted R^2	51.624%	57.662%	62.872%

This table presents results from examining whether the relation between details of CEOs' incentive contracts and firms' future profitability varies with internal information quality. Panels A and B present, respectively, results for the number of performance metrics and the dissimilarity of the focal CEO's incentive contract relative to industry peers. The regression models also include firm and year effects and *Delta*, *Vega*, *Age*, *Tenure*, *Number of Rivals*, *Rival Similarity*, *Sales*, *Book-to-Market*, *Leverage*, *Sales Growth*, *Cash*, *CEO Duality*, *Board Size*, *Board Independence*, and *Board Experience*; for brevity, we do not report their coefficient estimates and standard errors. Standard errors are in parentheses and are adjusted for within-cluster correlation at the level of treatment (i.e., firm). *, **, and *** denote that the coefficient is significantly different from zero at, respectively, two-tailed probability levels of 10%, 5%, and 1%. Appendix A defines all variables.