The Information Asymmetry between Top Management and Rank-and-File Employees: Determinants and Consequences

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ABSTRACT:
In modern firms, information is widely dispersed but difficult to acquire by management due to agency and information costs, resulting in intra-firm information asymmetry. We compare management earnings forecasts with rank-and-file employees' business outlook (available on Glassdoor.com) to quantify this phenomenon and examine its determinants and consequences. We find that information asymmetry is lower when firms have more centralized organizational structure and effective internal controls; employees report higher satisfaction with the company/management and receive more stock options; and CEOs are more experienced and internally focused. We do not find that managers incorporate positive outlook in their forecasts even when they have strong incentives to disclose positive news, or that their personal trades reflect knowledge of outlook, alleviating the concern that managers choose to overlook employees' information in their forecasts. Finally, we find that consequences of high information asymmetry include poorer future firm performance and a higher likelihood of CEO turnover.

Keywords: Intra-firm information asymmetry; Top management; Rank-and-file employees; Social media.

I. INTRODUCTION

Researchers have long recognized that knowledge relevant to centralized decision making is widely distributed among employees, and that information costs and agency costs prevent this information from being fully used, resulting in intra-firm information asymmetry (Prendergast 1993; Stein 2002). Alleviating this information asymmetry is a major driver of organizational design (Hofmann and van Lent 2015) and an objective of various corporate initiatives.[1] Meanwhile, the difficulty of quantifying information asymmetry has prevented researchers from empirically assessing its significance and examining its determinants and consequences. In this study, we propose a new measure of intra-firm information asymmetry that has several appealing features, and use this measure to examine the determinants and the consequences of information asymmetry.

Adopting the perspective of top management, we partition the set of relevant information available to employees into information available *only* to employees, E, and information common to employees and management, C. We define information asymmetry as E/(E+C), and demonstrate that this ratio is equivalent to the slope coefficient in a regression of management forecast errors on employees' earnings forecasts (see Section II for details). Intuitively, managers face greater information asymmetry when the ratio of what they don't know, E, to employees' total information, E+C, is higher.

We measure managers' information using management earnings forecasts, similar to Gallemore and Labro (2015).[2] We use a novel database from a popular job site, Glassdoor.com,

[1] For example, many large companies operate internal prediction markets in order to extract employees' information on product demand, project completion time, and other aspects of the firm operations (Wolfers and Zitzewitz 2004; Dvorak 2008; Cowgill and Zitzewitz 2015).

[2] See Baik, Farber, and Lee (2011) and Lee, Matsunaga, and Park (2012) for evidence that managers have strong incentives to issue accurate forecasts.

to construct a measure of employees' information. On this site, current and former employees predict whether company performance in the next six months will "get better," "stay the same," or "get worse," which we code as +1, 0, and -1, respectively. Employee predictions have been shown to be incrementally useful in predicting future performance (Hales, Moon, and Swenson 2018; Huang, Li, and Markov 2019; Sheng 2018), and can, therefore, serve as a reasonable proxy for rank-and-file employees' information. We average current employees' predictions made within 30 days prior to the issuance of the management forecast to obtain our measure of employees' information ("employee outlook," henceforth).[3]

Our sample consists of 91,978 individual employee predictions and 11,686 annual management forecasts for 994 unique firms issued from May 2012 to September 2017. Controlling for known determinants of management forecast errors, we find a significantly positive association between employee outlook (*Outlook*) and management forecast errors, consistent with managers lacking full access to employees' information set. In terms of economic significance, one standard deviation increase in *Outlook* increases the management forecast error by 0.05 percentage points, which is equivalent to 51% of our sample mean forecast error.

An alternative explanation for these results is that management has access to employees' information but chooses not to use it in forecasting future earnings. We present two results inconsistent with this explanation. First, managers do not incorporate *positive* employee outlook in their forecasts even when they have strong economic incentives to do so—for example, when they work in firms with high financial distress, external financing needs, high product market competition, or high insider selling. Second, managers' personal trades are unrelated to

[3] We acknowledge that employees may not have strong incentives to provide accurate forecasts, but note that this biases against finding evidence of information asymmetry.

employee outlook, even though outlook is predictive of future return, and could, therefore, be used to improve trading performance.

To further validate our measure of information asymmetry and help understand its determinants, we derive a set of cross-sectional predictions. Drawing on prior work in managerial accounting (Feng, Li, and McVay 2009; Li, Minnis, Nagar, and Rajan 2014; Hofmann and van Lent 2015), we predict that information asymmetry is lower in firms with a more centralized structure, since centralization makes collecting and aggregating employees' information less costly; in firms with effective internal controls, since controls reduce information-processing errors and delays; and in firms with more employee stock options, since stock options incentivize employees to communicate private information to their superiors. Following Garrett, Hoitash, and Prawitt (2014), we predict that higher employee satisfaction increases employees' motivation and trust in management, resulting in greater information sharing and hence lower information asymmetry. Finally, we expect that more experienced and internally focused CEOs are generally more knowledgeable about firm operations and more engaged with company employees, which should facilitate the flow of information from their employees to them and, thus, lower information asymmetry. To test each of these predictions, we interact *Outlook* with an indicator variable equal to one when the value of a determinant is high (above the sample median for continuous determinants).

As predicted, we find that the coefficient on *Outlook* (our measure of information asymmetry) declines when firms are more centralized, have effective internal controls, or have greater employee stock options. Using employees' Glassdoor.com ratings of senior management, firm culture and values, compensation and benefits, and career opportunities to measure various aspects of employee satisfaction, we find that the coefficient on *Outlook* is lower when

employees are more satisfied in each area except for career opportunities. Additionally, the coefficient on *Outlook* is lower when the CEO is more experienced (measured by founder status or longer tenure) or internally focused (measured by lower participation in investor conferences).

The premise of all of our cross-sectional predictions is that information asymmetry, E/(E+C), decreases because more information flows from employees to management: i.e., an increase in C is matched by a decrease in E. Information asymmetry is, however, also reduced when an increase in C is not accompanied by a decrease in E. As an example, information asymmetry in companies with better internal controls may be lower due to increased information sharing by employees or increased production of common information. To discriminate between these two explanations, we test whether *Outlook* is a stronger predictor of future performance when information asymmetry is lower. Because the predictive ability of *Outlook* depends on employees' total information, (E+C), *Outlook* should predict future performance more strongly *only* when an increase in C is not matched by a decrease in E – under the information production hypothesis. We find that outlook's ability to predict future performance remain the same in almost all cases except when employee satisfaction is higher. We conclude that increased flow of information from employees to management, rather than increased acquisition of common information by management and employees, accounts for our results.

In our final analysis, we explore whether high information asymmetry leads to reduced firm performance and increased likelihood of management turnover. Implemented at the firm-level, our regression-based measure of information asymmetry results in substantial sample attrition, prompting a different measurement strategy. Specifically, we suggest that when information asymmetry is high, managers and employees are more likely to take opposite views of future performance: that is, when employee outlook is optimistic (pessimistic), the

management forecast is pessimistic (optimistic), manifesting in a positive (negative) management forecast error. We, therefore, first sort management forecast errors and outlook into quintiles, then create an indicator variable of high information asymmetry: one if both variables fall in the same extreme (i.e., largest or smallest) quintile in any of the previous three years, and zero otherwise. We observe that firms with high information asymmetry experience a decline in ROA (Tobin's Q) that is equivalent to 16 (10) percent of the sample mean. In addition, the likelihood of CEO turnover in these firms increases by 3.7 percentage points, representing an increase of 48 percent from the average turnover rate for firms without high information asymmetry. We conclude that intra-firm information asymmetry imposes significant costs on both shareholders and managers.[4]

Our primary contribution is toward quantifying an important organizational phenomenon—the information asymmetry between top managers and rank-and-file employees—and examining its determinants and consequences. To our knowledge, Chen, Martin, Roychowdhury, Wang, and Billett (2018) is the only study that directly examines intra-firm information asymmetry. We complement and extend their study in several ways. First, whereas Chen et al. (2018) study information asymmetry between top managers and a small number of employees at the very top of the organization, we study information asymmetry between top managers and a large number of employees in the middle or at the bottom of the organizational hierarchy. Second, while Chen et al. (2018) rely on individuals' trading behavior to identify their information sets, we rely on individuals' reporting behavior. Given that the influences on trading behavior are difficult to control for, there is value in pursuing an alternative identification strategy. Third, our notion of information asymmetry is distinct from theirs. In fact, Chen et al.'s

[4] The fact that information asymmetry exacts a high cost on managers alleviates the concern that managers have access to employees' information but choose not to use it.

notion of information asymmetry corresponds to our notion of information advantage.[5] Fourth, we examine a different set of information asymmetry determinants and consequences.

Our study also fits within a broader literature that explores how firms can increase the amount of information available to top managers (Feng et al. 2009; Dorantes, Peters, and Richardson 2013; Garrett et al. 2014; Ittner and Michels 2017, among others). While prior studies show that effective internal control contributes to management forecast accuracy (Feng et al. 2009) and trust in management improves financial reporting quality (Garrett et al. 2014), respectively, we present evidence that clarifies the mechanism through which these contributing factors operate. Specifically, more effective internal control and greater trust in management (proxied by greater employee satisfaction) broaden managers' information sets by encouraging the flow of information from the bottom to the top of the organizational hierarchy.

Our study significantly differs from prior studies that use Glassdoor.com data (e.g., Hales et al. 2018; Huang et al. 2019; Green, Huang, Wen, and Zhou 2019). Conceptually, we use employee social media disclosures to study the flow of information within the firm, while prior work uses these disclosures to study the flow of information from the firm to the capital market. Our findings that employee outlook predicts management forecast errors are consistent with Hales et al.'s (2018) findings that employee outlook predicts analyst forecast errors, but they cannot be inferred from the latter: As insiders, managers have greater access to employee information and deeper understanding of how employees drive firm value than analysts.[6]

[5] Please refer to Section II for more details.

[6] In untabulated analysis, we decompose the analyst forecast error into a component orthogonal to the management forecast error and a component correlated with it, and test whether our determinants of intra-firm information asymmetry explain analyst forecast error predictability for both components. Our theory of intra-firm information asymmetry predicts that our results hold for the component correlated with the management forecast errors but not to the orthogonal component, which is what we find. We conclude that analyst forecast error predictability, the subject of Hales et al. (2018) is conceptually and empirically different from management forecast error predictability, the subject of our study.

The rest of the paper is organized as follows. In Section II, we discuss our theory and measurement of information asymmetry. In Section III, we describe our data and provide descriptive statistics. In Section IV, we present the results of our empirical analyses. We conclude in Section V.

II. THEORY AND MEASUREMENT

Organizational theory posits that knowledge relevant to centralized decision making is widely distributed among employees across different hierarchies, and that information costs and agency costs prevent this information from being fully used (Aghion and Tirole 1997). For example, soft information possessed by rank-and-file employees, by nature, cannot be credibly communicated and transferred (Stein 2002). Furthermore, employees may choose to withhold or distort information due to career concerns or distrust in management (Prendergast 1993; Garrett et al. 2014), and top managers may not seek employees' information or may disregard it as unimportant. Finally, organizational factors such as decentralization and ineffective internal information systems may impede the flow of information from rank-and-file employees to top management (Feng et al. 2009).

With the notable exception of Chen et al. (2018), prior literature has not quantified the extent to which information available to company employees remains unused by top managers, which has prevented researchers from addressing basic questions about the significance, determinants, and consequences of this type of information asymmetry. In this section, we define and operationalize the notion of information asymmetry, and discuss our framework in the context of prior literature.

Information Asymmetry: Definition and Measurement

We assume that earnings information can be represented as the sum of N independently distributed standard normal variables: $\delta^{m}_{i\in\{1,\ldots,M\}}$ observed only by the manager, $\delta^{e}_{i\in\{1,\ldots,E\}}$ only by the employees, $\delta^{c}_{i\in\{1,\ldots,C\}}$ by both, and $\delta^{r}_{i\in\{1,\ldots,R\}}$ by neither, with $N = M + E + C + R$.[7] From the manager's perspective, information asymmetry can be defined intuitively as E: the amount of information observed by the employees but not by the manager. Because E is likely to be smaller (larger) when employees possess less (more) information in total, we scale E by employees' total information, $E + C$. From the employees' perspective, information asymmetry can be defined as $M/(M + C)$. Because the focus of our study is on decision making at the top of the organization, we use "intra-firm information asymmetry" and "information asymmetry" solely in reference to the information asymmetry faced by the top manager.

Our measure of information asymmetry, $E/(E + C)$, is equivalent to the slope coefficient from a regression of management forecast errors on employees' earnings forecasts. Specifically, a rational manager forecasts earnings as $\sum_{i=1}^{M}\delta_i^m + \sum_{i=1}^{C}\delta_i^c$, resulting in a forecast error of $\sum_{i=1}^{E}\delta_i^e + \sum_{i=1}^{R}\delta_i^r$, while rational employees forecast earnings as $\sum_{i=1}^{E}\delta_i^e + \sum_{i=1}^{C}\delta_i^c$. The covariance between the management forecast error and the employees' forecast is $COV(\sum_{i=1}^{E}\delta_i^e + \sum_{i=1}^{R}\delta_i^r, \sum_{i=1}^{E}\delta_i^e + \sum_{i=1}^{C}\delta_i^c) = E$, and the variance of the employees' forecast is $E + C$.

Information asymmetry is reduced when (1) the manager observes elements of δ^e (reducing E and increasing C) or (2) the manager and the employees observe elements of δ^r (reducing R and increasing C). We interpret (1) as employees sharing more information with managers or managers more actively seeking and using employees' information, and (2) as

[7] Hong and Stein (1999) similarly define information as the sum of independently distributed standard normal variables.

increased production of information due to, for example, increased investment in information technology. We note that only (2) predicts an increased ability of employees' forecasts to predict future earnings.[8]

Our framework clarifies that a reduction in information asymmetry implies increased management forecast accuracy but not vice versa. For example, if a manager observes elements of δ^r, i.e., if she acquires information orthogonal to employees' information (increasing M and reducing R), her earnings forecast accuracy would increase but information asymmetry, $E/(E + C)$, would remain the same. In other words, reducing information asymmetry is just one way of improving a firm's internal information environment (Gallemore and Labro 2015).[9]

Measuring Managers' and Employees' Information

We use management earnings forecasts to measure managers' information. In assuming that information available to top managers is reflected in their forecasts, we rely on prior work that shows managers have strong economic incentives to issue accurate forecasts.[10] Specifically, a manager who issues more accurate forecasts is viewed by market participants as a more capable forecaster and manager (Trueman 1986; Baik, Farber, and Lee 2011), and less likely to lose her job when company performance is poor (Lee, Matsunaga, and Park 2012). In Section IV, we address the possibility that strategic considerations and cognitive biases affect the extent to which information possessed by managers is reflected in their forecasts.

We use employee outlook from Glassdoor.com to measure employees' information. Several features of Glassdoor suggest that outlook reasonably accurately represents employee

[8] The reason is that employees' ability to predict future earnings depends on their information set, E+C.
[9] Gallemore and Labro (2015) define the quality of a firm's internal information environment "in terms of the accessibility, usefulness, reliability, accuracy, quantity, and signal-to-noise ratio of the data and knowledge collected, generated, and consumed within an organization." In our setting, M+E+C represents information available within the organization, while M+C represents information available to the manager.
[10] Gallemore and Labro (2015) use management forecasts to measure a firm's internal information environment, effectively assuming that management forecasts reflect all internal information.

beliefs about future performance. First, reviews are anonymous, allowing employees to express their views without fear of employer retaliation. Second, Glassdoor's "give to get" policy, which grants employees access to valuable information about other employers only if they review their current or former employers, encourages reviews from individuals who would otherwise tend not to contribute. Third, Glassdoor identify and remove employee reviews that appear to have been incentivized by employers. Consistent with the idea that employee outlook incorporates valuable information about future performance, several studies find that it predicts future accounting and market performance (Hales et al. 2018; Huang et al. 2019; Sheng 2018).

Determinants and Consequences of Information Asymmetry

We explore the roles of firm-, employee-, and CEO-level factors in alleviating information asymmetry. We briefly motivate each factor, deferring discussion on measurement until Section IV.

We suggest that information asymmetry is likely to be lower in firms with centralized organizational structure, because they collect more information from employees to support centralized decision making; in firms with effective internal controls, because they experience smaller losses and shorter delays in information flows; and in firms that grant more employee stock options, because stock options incentivize employees to work harder and to reveal information to management. Information asymmetry is also likely to be lower when employees express higher satisfaction with the company. Higher satisfaction indicates greater trust in management, which is conducive to information sharing (Garrett et al. 2014). Finally, firms with more experienced and internally focused CEOs are likely to have lower information asymmetry because the overlap between a bounded rational CEO's information set and employees'

information sets is likely to be increasing in the CEO's knowledge of the company and its employees, and in the extent of her internal interactions.

Potential consequences of higher information asymmetry include lower company performance and higher likelihood of CEO turnover. Specifically, a CEO's failure to incorporate employee information in her decision making may hinder company performance, which could prompt the board of directors to replace the CEO. To our knowledge, a direct link between information asymmetry and firm performance and CEO career outcomes has not been established in prior work. Establishing such a link would help establish intra-firm information asymmetry as a critical factor in shaping the quality of the information used in centralized decision making, and contribute much-needed large-sample evidence on the consequences of intra-information asymmetry.

Differences from Prior Studies

Prior studies find that effective management controls, including SOX 404 internal controls, enterprise systems, and risk-based forecasting and planning processes improve management forecast accuracy (Feng et al. 2009; Dorantes et al. 2013; Ittner and Michels 2017). However, these studies do not clarify whether these management practices ameliorate information asymmetry. As the discussion earlier in Section II makes it clear, a reduction in information asymmetry is sufficient but not necessary for accuracy to improve.

Ke, Li, Ling and Zhang (2019) find that social connections within the top management team are associated with higher management forecast accuracy, consistent with social connections fostering information sharing at the top of the organization. Garrett et al. (2014) find that employees' trust in management is associated with higher financial reporting quality, consistent with trust improving information sharing. Social connections and trust in management

may, however, enhance forecast accuracy and financial reporting quality by encouraging not only information sharing but also information production in general. In our paper, we test whether trust in management reduces information asymmetry by encouraging information sharing.

Chen et al. (2018) suggest that the quantity of information possessed by top managers and divisional managers can be inferred from their trading profits, and show that a trading profit–based measure of information asymmetry is negatively (positively) associated with management forecast quality (error-driven accounting restatements). Our study complements Chen et al. (2018) in several ways. First, while Chen et al. (2018) study information asymmetry only between top managers and *divisional managers* (who often directly report to the CEO and can be viewed as members of the extended top management team), we study information asymmetry between top managers and employees in the middle and at the bottom of the organizational hierarchy.[11] Second, our approach of inferring individuals' information from their forecasts complements Chen et al.'s (2018) approach of inferring individuals' information from their trading profits.[12] Third, our notion of information asymmetry is distinct from theirs. In Chen et al. (2018), the trading profits of divisional managers and the trading profits of top managers reflect their private information: $(E + C)$ and $(M + C)$, respectively. Thus, Chen et al.'s notion of information asymmetry corresponds to our notion of information advantage, $(E - M)$.[13]

[11] Only 1% of the employees in our sample have job titles that include words suggestive of a top management position: "president," "executive," "chief … officer," "division manager," or "divisional manager." Furthermore, applying Chen et al.'s definition, we find that the number of divisional managers in a firm-year is only 3.5; in contrast, the average number of employees providing a review is 65.

[12] Both approaches have their own limitations. Biases and strategic considerations may drive a wedge between what employees and managers know and what they choose to report (this study), while concerns about insider trading litigation and liquidity shocks may drive a wedge between what managers know and their trading profits (Chen et al. 2018).

[13] As another illustration: when the manager acquires information orthogonal to employees' information (i.e., the manager observes elements of δ_r but the employees do not), her trades become more profitable than employees' trades. This results in lower information asymmetry, as defined in Chen et al. (2018) but not in our study.

III. DATA AND DESCRIPTIVE STATISTICS

Sample Selection and Key Variable Definitions

Launched in 2008, Glassdoor.com is a website where current and former employees anonymously review companies and their management. An employee review includes an overall company rating; optional ratings of senior management, career opportunities, compensation and benefits, work/life balance, culture and values; approval of the company CEO; and whether the employee would recommend the company to a friend. Since May 2012, reviewers have also had the option to assess company outlook over the next six months by selecting one of three options: "get better," "stay the same," or "get worse."

We obtain data directly from Glassdoor for the period from May 2012 to September 2017. In this period, there are more than 1 million reviews of 6,790 public firms that include an assessment of outlook. Merging these data with the Compustat universe (using both ticker symbols and company names) reduces the sample to 928,725 reviews of 5,200 unique firms; 506,691 of these reviews are by current employees.

We obtain management forecasts of earnings per share and the corresponding actuals from the I/B/E/S Guidance database. We focus on annual earnings forecasts because they are more prevalent than quarterly forecasts, and we exclude forecasts issued after the end of the year because they are considered pre-announcements. When a manager issues a range forecast, we use the midpoint to estimate her earnings expectation.[14] We define management forecast error as

[14] Ciconte, Kirk, and Tucker (2014) suggest that the upper bound of range forecasts is closer to managers' true expectations than the midpoint in recent years. Therefore, in untabulated analysis, we use the upper bound of range forecasts to compute management forecast error and find robust results.

actual minus forecast, and scale by price to reduce heteroscedasticity. There are 24,609 management forecast errors for 5,495 firm-years.

One empirical challenge in using management forecasts and employee outlook to measure differences in information sets between the two groups is that forecasts and outlook are issued at different times. If we match a management forecast to employee outlook provided during the 30 days period prior to the forecast issuance date, our tests are biased against documenting information asymmetry, because information available only to company employees during this period may become available to the manager through other sources on the forecast issuance date. If we match a forecast and outlook in the same calendar month, our tests would be biased in favor of documenting information asymmetry, because outlook issued in the days after a management forecast may benefit from the arrival of new information. We measure *Outlook* as the average of individual employee outlook provided within 30 days prior to the forecast issuance date; in untabulated analysis, we find that our results hold when *Outlook* is the average of individual employee outlook over the month of the management forecast.[15]

We find matched outlook for 11,937 management earnings forecasts from 3,630 firm-years. Requiring Compustat, CRSP, and I/B/E/S information to measure control variables reduces our sample to 11,686 management forecast-outlook pairs for 3,520 firm-years.

Summary Statistics

Table 1 reports descriptive statistics for our sample data.[16] The mean (median) management forecast error is 0.0010 (0.0015), suggesting that management, on average, issues

[15] In untabulated analyses, we also average individual employee outlook issued in the preceding 60 days or 90 days and find similar results. On one hand, expanding this window increases timing bias; on the other hand, it yields a more accurate measure of employees' information by averaging a larger number of individual predictions, and increases sample size by relaxing the matching criterion.

[16] To mitigate the influences of outliers in the data, we winsorize the top and bottom one percent of all continuous variables except *Outlook*.

lowball forecasts in order to report a positive earnings surprise. The mean (median) *Outlook* is 0.31 (0.33), indicating that, on average, employees expect firm performance to improve.[17] *Outlook* varies substantially, increasing from 0 at the first quartile to 0.8 at the third quartile. Our sample firms are large (mean market capitalization of 17.3 billion), well capitalized (mean market-to-book ratio of 4.7), and profitable (mean return on assets of 6.2%).

IV. EMPIRICAL RESULTS

Estimating Information Asymmetry

We estimate the following model:

$$MFE_{i,t+1} = \beta_0 + \beta_1 Outlook_{i,t} + \beta_2 Controls_{i,t} + \sum Industry\ FE + \sum Time\ FE + \varepsilon_{i,t+1} \quad (1)$$

where *MFE* is management forecast error, measured as actual earnings per share for year t+1 minus management earnings forecast for year t+1, scaled by the closing price at the end of fiscal year t, and *Outlook* is the average value of outlook assessments provided by current employees within 30 days prior to the issuance date of the management forecast. Control variables, measured in year *t*, include standard firm characteristics such as market value of equity (*LogMVE*), market-to-book ratio (*MTB*), and leverage ratio (*Leverage*); performance-related variables such as return on assets (*ROA*), sales growth (*SalesGrowth*), incidence of loss (*Loss*), level of accruals (*TAcc*), and stock returns (*Return*); and measures of uncertainty such as earnings volatility (*StdROA*) and return volatility (*StdRet*). We also include litigation risk (*LitiRisk*) because greater litigation risk may deter managers from issuing optimistic forecasts (Francis, Philbrick, and Schipper 1994); analyst coverage (*Analyst*) because greater analyst coverage brings more public scrutiny of management disclosure (Lang and Lundholm 1996); and

[17] Our sample firms indeed experience an improvement in performance, as indicated by a positive change in ROA.

forecast horizon (*Horizon*) because forecasts with longer horizons are more likely to be optimistic (Ajinkya, Bhojraj, and Sengupta 2005). Finally, we include Chen et al. (2018)'s trading-based measure of information asymmetry between divisional managers and top managers (*DIFRET*) because it has also been shown to affect management forecast error.[18] We provide detailed variable definitions in the Appendix.

In Table 2, we present results from the estimation of three specifications: (1) control variables excluded, (2) control variables except *DIFRET* included, and (3) all control variables included. We observe that the coefficient estimates on *Outlook* are positive and statistically significant in all specifications. In terms of economic significance, a one-standard-deviation increase in *Outlook* in specification (2) is associated with an increase of *MFE* by 0.0005, which is about 51% of sample mean *MFE*.[19] These findings are consistent with the information asymmetry hypothesis, which asserts that managers do not have full access to employees' information.[20]

Turning to control variables, we generally confirm prior findings that management forecasts are predictable based on available information due to strategic considerations or behavioral biases. For example, *Horizon* is negatively associated with forecast error, consistent with managers' strategy of issuing more optimistic forecasts first and walking down their estimates later (Richardson, Teoh, and Wysocki 2004). The significant coefficients on *ROA* and *TAcc* suggest that managers do not efficiently incorporate publicly available information in their forecasts, probably due to their behavioral biases (Gong, Li, and Hong 2009).

[18] Chen et al. (2018) examine conglomerates and require trade information available for at least three top managers and three divisional managers. This requirement reduces our sample size by more than half. This is why we do not include DIFRET in every specification.
[19] As a reference, the economic effect of outlook is comparable to that of accruals (Gong et al., 2009), and is about half the effect of earnings volatility, a key determinant of management forecast error.
[20] Because employee outlook information on Glassdoor.com is publicly available, our results also imply that managers fail to acquire this information from Glassdoor.

The above results raise the natural concern that managers may have full access to employees' information but (1) choose not to use it for strategic reasons or (2) use it inefficiently due to behavioral biases. To address (1), we conduct a battery of tests in the following subsection; to address (2), we rely on our determinants analyses in the subsection after next.

Strategic Choice to Overlook Employees' Information

As suggested above, our finding of a positive slope coefficient on *Outlook* is also consistent with managers having full access to employees' information but choosing not to incorporate it in their forecasts. We address this explanation in two ways.

Subsample Analysis

Prior research identifies several incentives for optimistic disclosure: financial distress (Frost 1997; Koch 2002), external financing needs (Frankel, McNichols, and Wilson 1995; Lang and Lundholm 2000), product market competition (Newman and Sansing 1993), and insider trading (Noe 1999; Aboody and Kasznik, 2000). The strategic choice explanation predicts that when managers have strong incentives to provide optimistic disclosure, they will incorporate good news information provided to them by their subordinates. To test this prediction, we regress management forecast error on *positive* employee outlook in subsamples of high financial distress, high external financing, high industry competition (measured by low product market concentration), and high insider selling. As shown in Table 3, the coefficients on *Outlook* are significantly positive in all four subsamples, inconsistent with the strategic choice hypothesis.

Trade Analysis

Because rational managers who have access to employees' information should use this information to trade more profitably, we examine whether managers' non-routine trades in their own company stocks reflect knowledge of employee outlook.[21]

We regress trades by top managers (chairman, vice chairman, CEO, CFO, or COO) (*MgmTrade*) on the average of employee outlook issued within 30 days prior to the trades (*Outlook*).[22] Control variables include firm size (*LogMVE*); measures of current performance such as return on assets (*ROA*), total accruals (*TAcc*), and accounting loss (*Loss*) (Beneish and Vargus 2002); and trading multiples such as past stock returns (*Return*), market-to-book ratio (*MTB*), earnings-price ratio (*EP*) , and sales growth (*SalesGrowth*) (Rozeff and Zaman 1998; Piotroski and Roulstone 2005).

We report results in Column (1) of Table 4. The coefficient on *Outlook* is negative and insignificant, suggesting that the managers' trades are driven by information that is largely orthogonal to the employees' information. That is, absent strategic considerations, information available to employees remains unused by top managers, consistent with managers lacking access to it.

In column (2), we report results from a regression of post-trade 30-day size-adjusted return (*AbnRet*) on *MgmTrade*, *Outlook*, and a comprehensive set of control variables: R&D expense (*R&D*), stock return volatility (*StdRet*), analyst coverage (*Analyst*), stock liquidity (*ShareTurnover*), litigation risk (*LitiRisk*), and timing of trade relative to the earnings announcement (*Window*) (Aboody and Lev 2000; Frankel and Li 2004; Huddart, Ke, and Shi

[21] See Sheng (2018) and Huang et al. (2019) for evidence that employee outlook predicts future stock returns.
[22] The classification of top managers is consistent with that of Chen et al. (2018). Our inference is unchanged when we use trades made by CEOs and CFOs only.

2007; Brochet 2010; Jagolinzer, Larcker, and Taylor 2011).[23] We find that *Outlook* and *MgmTrade* are incrementally useful in predicting future returns. One standard deviation increase in *MgmTrade* (*Outlook*) is associated with 16 (27) basis point increase in future return.

We conclude while management trades are already profitable, managers would have made even better trading decisions had they acted based on information embedded in employee outlook. The fact that they did not alleviates the concern that strategic considerations explain why management forecasts do not incorporate information embedded in outlook.

Information Asymmetry Determinants

In this section, we explore the roles of various firm-, employee-, and CEO-related factors in alleviating information asymmetry. We generalize equation (1) by interacting $Outlook_{i,t}$ with $Factor_{i,t}$, where *Factor* indicates a proxy for a firm-, employee-, or CEO-related factor.

Organizational Factors

We predict that intra-firm information asymmetry is lower in more centralized firms, firms with effective internal controls, and firms with more employee stock options. To measure centralization, we obtain the first factor from the principal component analysis of the number of business segments, the number of geographic segments, and the number of employees (Garrett et al., 2014).[24] We define *Centralization* as an indicator variable equal to one if the factor is below the sample median, and zero otherwise. Similarly, *NoICW* is an indicator variable equal to one if a firm does not disclose an internal weakness in the fiscal year, and zero otherwise; and

[23] We exclude these additional control variables in Column (1) because they influence the volume of buy and sell trades in the same direction and because the dependent variable is signed trading volume. Our results are largely unchanged when these variables are included.

[24] Our principal component analysis reveals that a single factor adequately explains the variation in these three variables.

EmpStockOptionD is an indicator variable equal to one if non-executive employee stock options scaled by the number of shares outstanding is above the sample median, and zero otherwise.

Panel A of Table 5 reports descriptive statistics. Our sample firms have, on average, 2.6 business segments, 3.4 geographic segments, and 35,766 employees; 96.4% of them disclose no internal control weakness. Regression results, shown in Panel B of Table 5, are consistent with our predictions. Specifically, the coefficients on the interaction terms between *Outlook* and *Centralization*, between *Outlook* and *NoICW*, and between *Outlook* and *EmpStockOptionD* are all significantly negative. The economic magnitudes are nontrivial: for example, one standard deviation increase in *Outlook* increases the management forecast error for firms with low employee stock options by an extra 0.04 percentage points relative to firms with high employee stock options, equivalent to 41% of our sample mean forecast error.

Employee Satisfaction

We predict that intra-firm information asymmetry decreases with employee satisfaction. We consider four types of employee satisfaction, as reported on Glassdoor.com: satisfaction with (1) senior management, (2) corporate culture and values, (3) compensation and benefits, and (4) career opportunities.[25] Each metric is on a five-point scale, with five being "most satisfied" and one being "least satisfied." We average individual employee satisfaction measures provided in the 30-day period prior to the issuance of a management forecast to construct a measure of employee satisfaction (similar to how we measure *Outlook*).

Panel A of Table 6 describes the distributions of these variables. The mean rating ranges from 2.97 (satisfaction with senior management) to 3.35 (satisfaction with compensation and benefits), whereas the median rating ranges from 3.00 (satisfaction with senior management) to

[25] We do not consider employee ratings of work/life balance because it is unclear how work/life balance affects intra-firm information asymmetry.

3.42 (satisfaction with culture and values). On average, employees appear to be content with their management and company.

Panel B presents the regression results. Each proxy for a specific aspect of employee satisfaction—*SeniorMgmt*, *Culture*, *Compensation*, or *CareerOpp*—is measured as an indicator variable equal to one if the average rating is above the sample median. We find that the interaction terms between *Outlook* and employee satisfaction proxies in Columns (1) to (3) are significantly negative, suggesting that information asymmetry is lower when employees are more satisfied with senior management, culture and values, and compensation and benefits. The coefficient on the interaction term *Outlook*×*CareerOpp* in Column (4) is negative but insignificant. We conduct principal component analysis to construct an overall satisfaction score based on all four aspects of employee satisfaction,[26] and create an indicator variable, *SatisfFactor*, that is equal to one if the score is above the sample median. In Column (5), we find that the interaction term between *Outlook* and *SatisfFactor* loads significantly negative (-0.0007, t = 3.16). The overall results are consistent with our prediction that employee satisfaction encourages information sharing by employees and therefore reduces information asymmetry.

CEO Experience and Internal Focus

Our last prediction is that information asymmetry is lower when managers have greater firm experience, or are more engaged with company employees. We measure CEO experience with the firm using CEO founder status and tenure. Lacking a direct measure of interactions with employees, we propose that the frequency of a CEO's interactions with employees is inversely related to her frequency of interactions with outsiders, as proxied by investor conference participation. Accordingly, we construct three indicator variables: *FounderCEO* is one if the

[26] In the principal component analysis, only the first factor identified has an eigenvalue greater than one, suggesting that this single factor adequately explains the variation in our four employee satisfaction ratings.

CEO is a founder of the company, and zero otherwise; *CEOTenure* is one if the number of years the CEO has worked for the company is longer than the sample median, and zero otherwise; and *InternalOrientedCEO* is one if the number of investor conferences the CEO attends in a year is less than our sample median, and zero otherwise. Panel A of Table 7 shows that in our sample, 18.5% of the CEOs are founders; the mean (median) CEO tenure is 7.4 (5.3) years; the mean (median) number of conferences attended by a CEO in a year is 6.9 (6).

We report regression results in Panel B of Table 7. The coefficients on *Outlook*×*FounderCEO* and *Outlook*×*CEOTenure* in Columns (1) and (2) are significantly negative, consistent with our prediction that founder CEOs and CEOs with longer tenure gather and incorporate more employee information in their earnings forecasts.[27] The coefficient on *Outlook*×*InternalOrientedCEO* in Column (3) is also significantly negative, consistent with the notion that CEOs who have fewer interactions with outsiders are more internally focused and, therefore, obtain more information from their employees.

In conclusion, the above results that information asymmetry is explained by various firm-, employee-, and CEO-related factors are consistent with organizational theory; and they also alleviate the concern that our information asymmetry measure reflects solely inefficient use of employees' information due to managers' cognitive biases.

Information Sharing versus Information Production

As we demonstrate in Section 2.1, information asymmetry is reduced when (1) managers observe elements of δ^e or (2) both managers and employees observe elements of δ^r. Our discussion emphasizes the first channel, but many of our variables could operate through the second channel. For example, information asymmetry in firms with effective controls may be

[27] Although *Outlook* + *Outlook*×*CEOFounder* and *Outlook* + *Outlook*×*CEOTenure* are negative, they are statistically insignificant.

lower because (1) employees' information is transmitted to top managers with a smaller loss or shorter delay *or* (2) more information (previously unavailable to management and employees) is produced and made available to all. Firms that award more employee stock options may have lower information asymmetry because (1) employees share more information with their superiors *or* (2) more information production takes place in these firms. For brevity we refer to (1) as information sharing and (2) as information production.

If a factor moderates information asymmetry through the information production channel, then the ability of outlook to predict future performance should be greater when the factor is equal to one. We test this prediction by estimating the following model:

$$ROA_{i,t+1} = \beta_0 + \beta_1 Outlook_{i,t} + \beta_2 Factor_{i,t} + \beta_3 Outlook_{i,t} \times Factor_{i,t} + \beta_4 Controls_{i,t} + \sum Industry\ FE + \sum Time\ FE + \varepsilon_{i,t+1} \quad (2)$$

where *ROA* is the average return on assets in year t+1, *Outlook* is the average of outlook provided by current employees during fiscal year t, and *Factors* are organizational-, firm-, or CEO-level determinants of information asymmetry, as defined earlier. The firm-level determinants, *SeniorMgmt*, *Culture*, *Compensation*, *CareerOpp*, and *SatisfFactor*, are constructed by averaging employee outlook over year *t*.[28] Control variables are the same as in Model (1), except that forecast horizon is excluded.

Panels A, B, and C of Table 8 present results when *Outlook* is interacted with firm characteristics, employee satisfaction, and CEO attributes, respectively. With the exception of *Outlook*×*SeniorMgmt* and *Outlook*×*Culture*, both significantly positive, these interaction terms are statistically insignificant. These results indicate that, except for employee satisfaction with

[28] Other determinants of information asymmetry, such as *Centralization*, are already at the firm-year level.

senior management and firm culture, our determinants of information asymmetry work via the information sharing channel.[29]

Consequences of Information Asymmetry

To examine the consequences of intra-firm information asymmetry, we develop a simple firm-year specific measure of information asymmetry as follows. We propose that when information asymmetry is high, managers and employees are more likely to take opposite views of future performance: that is, when employee outlook is optimistic (pessimistic), the management forecast is pessimistic (optimistic), leading to a positive (negative) management forecast error. To identify variation in information asymmetry, we first sort management forecast errors and outlook into quintiles, then create an indicator variable, *HighInfoAsym*, equal to one if both variables fall in the same extreme (i.e., largest or smallest) quintile in any of the previous three years, and zero otherwise. An alternative approach for measuring firm-year information asymmetry is to estimate firm-specific regressions of management forecast errors on *Outlook*. We do not use this approach because it leads to substantial sample attrition and noisy estimates.[30]

Future Performance Analysis

We predict that firms with higher information asymmetry between top management and employees have lower future performance. We test this prediction by estimating the following model:

$$Performance_{i,t} = \beta_0 + \beta_1 HighInfoAsym_{i,t-3,t-1} + \beta_2 Controls_{i,t-3,t-1} + \sum Industry\ FE + \sum Time\ FE + \varepsilon_{i,t} \quad (3)$$

[29] For the cases of employee ratings of senior management and firm culture, it is possible that employee outlook has greater predictive ability because managers share more information with employees (i.e., C increases but M+C stays the same) and not because more information becomes available to both managers and employees (i.e., M+C increases). We assess this possibility in untabulated analysis and find that management forecast accuracy increases with employee ratings of senior management and of firm culture and values; this suggests that more information is available to managers (i.e., M+C increases).

[30] When we require 3 (5) observations to estimate firm-level regressions of management forecast errors on Outlook, the sample size is reduced by 25% (40%).

where *Performance* is return on assets (*ROA*) or Tobin's Q (*TobinQ*) in year *t*, *HighInfoAsym* is information asymmetry indicator, as defined above, and *Controls* is a vector of control variables, each calculated as a three-year average. We control for management forecast accuracy (*MFAccuracy*) because of its association with investment efficiency (Goodman et al. 2014); employee satisfaction (*EmpOverallSatisf*) because it affects firm performance (Edmans 2011); and *Outlook* because it predicts performance (Hales et al. 2018). Additional control variables include market value of equity (*LogMVE*), leverage ratio (*Leverage*), return on assets (*ROA*), sales growth (*SalesGrowth*), tangible assets (*Tangible*), R&D expenses (*R&D*), return volatility (*StdRet*), and institutional ownership (*InstOwn*).

In Panel A of Table 9, we show that our sample firms enjoy high profits (mean ROA of 0.05) and high market valuation (mean Tobin's Q of 2.26); about 16% of them are classified as having high information asymmetry. In Panel B of Table 9, we find that the coefficients on *HighInfoAsym* are significantly negative in all specifications, consistent with our prediction that higher information asymmetry is associated with poorer future accounting performance and lower firm valuations.[31] In terms of economic magnitude (based on specifications 3 and 4), compared with other firms, firms with high asymmetry have lower *ROA* (*TobinQ*) by 0.008 (0.231), equivalent to 16% (10%) of the sample mean. Similar to prior work, we find that management forecast accuracy, employee overall rating, and employee outlook are positively associated with future firm value.

CEO Turnover Analysis

To examine whether information asymmetry leads to a higher likelihood of CEO turnover, we estimate the following model:

[31] The results in Tables 9 and 10 are robust to including the trading-based measure of information asymmetry between divisional managers and top managers (*DIFRET*) from Chen et al. (2018).

$$CEOTurnover_{i,t} = \beta_0 + \beta_1 HighInfoAsym_{i,t-3,t-1} + \beta_2 Controls_{i,t-3,t-1} + \sum Industry\ FE + \sum Time\ FE + \varepsilon_{i,t} \quad (4)$$

where *CEOTurnover* equals one if there is a CEO turnover in year t, and zero otherwise, *HighInfoAsym* is information asymmetry indicator, as defined above, and *Controls* is a vector of control variables, each calculated as a three-year average. Following Lee et al. (2012), we control for past accounting and market performance, sales, earnings volatility and return volatility, institutional ownership, as well as CEO age, tenure, and power. We also control for management forecast accuracy, shown to affect management turnover (Lee et al. 2012), and employee satisfaction and employee outlook, because they may affect CEO turnover by affecting firm performance (Edmans 2011; Hales et al. 2018).

Panel A of Table 10 describes the sample analyzed in the management turnover analysis. The probability that a CEO experience turnover in a given year is 0.10 (mean *CEOTurnover*). Average CEO age (tenure) is 56 (7.4) years; 56% of the CEOs also serve as chairman of the board.

Panel B of Table 10 reports regression results. We find that the coefficients on *HighInfoAsym* are significantly positive in all specifications, corroborating our prediction that higher information asymmetry is associated with a higher likelihood of future CEO turnover. In terms of economic magnitude, using the coefficients in specification (4), the likelihood of CEO turnover in firms with high information asymmetry exceeds the likelihood of CEO turnover in firms with low information asymmetry by 3.7 percentage points, approximately, 50% increase in the turnover likelihood. Consistent with prior work, we find that future CEO turnover is

negatively associated with past firm performance, CEO ownership, and employee satisfaction; and positively associated with earnings volatility, CEO age, and CEO tenure.[32]

V. CONCLUSION

Intra-firm information asymmetry, especially between top management and rank-and-file employees, is notoriously difficult to measure, so much so that its existence, determinants, and consequences have largely remained unexamined in archival work. In this study, we introduce an intuitive empirical measure of information asymmetry: the slope coefficient in a regression of management earnings forecast errors on employee outlook, predictions of future performance available on Glassdoor.com, and report stylized facts about its determinants and consequences. In particular, intra-firm information asymmetry is alleviated by organizational factors such as centralized decision making, effective internal controls, and the use of stock options; employee satisfaction; and CEO experience and internal engagement. Its consequences include reduced firm performance and increased likelihood of CEO turnover.

Our study has two major limitations. First, our sample only includes firms that issue management forecasts and are reviewed by current employees, and our results may not generalize to firms without these attribute. Second, our measures of employees' and management's information sets, employee outlook and management forecasts respectively, are admittedly noisy. We view our results as helpful in quantifying and understanding an important organizational phenomenon rather than definitive.

[32] We do not find a significant association between CEO turnover and management forecast accuracy, perhaps because our sample period of 2012-2017 is different from the sample period of 1996-2006 in Lee et al. (2012).

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APPENDIX: Variable Definitions

Variable	Definition
Outlook	The average assessment of business outlook made by current employees within 30 days prior to the issuance date of management forecast. We code "getting better" as 1, "staying the same" as 0, and "getting worse" as -1. Data source: Glassdoor
MFE	Management forecast error, measured as the actual earnings per share for year t+1 minus the management earnings forecast for year t+1, scaled by the closing price at the end of year t. Data source: I/B/E/S Guidance
LogMVE	The natural logarithm of market value of equity (prcc_f × csho). Data source: Compustat
MTB	Market-to-book ratio, measured as market value of equity divided by the book value of equity (ceq). Data source: Compustat
Leverage	Leverage ratio, calculated as long-term debt divided by total assets (dltt/at). Data source: Compustat
ROA	Return on asset, measured as income before extraordinary items (ib) divided by total assets at the beginning of the quarter (at). Data source: Compustat
SalesGrowth	Sales growth, measured as sales in year t minus sales in year t-1, divided by sales in year t-1. Data source: Compustat
Loss	An indicator variable equal to one if earnings before extraordinary items are negative (ib), and zero otherwise. Data source: Compustat
TAcc	Total accruals, measured as the difference between earnings (ib) and operating cash flows (oancf-xidoc), scaled by beginning total assets (ib). Data source: Compustat
Return	Cumulative stock return over the fiscal year t. Data source: CRSP
StdROA	Standard deviation of return on assets during the past five years. Data source: Compustat
StdRet	Standard deviation of daily stock returns over the fiscal year t. Data source: CRSP
LitiRisk	Litigation risk, measured as an indicator variable equal to one for litigious industries including Bio-Technology (SIC 2833 to 2836), Computer Hardware (SIC 3570 to 3577), Electronics (SIC 3600 to 3674), Retailing (SIC 5200 to 5961), and Computer Software (SIC 7370 to 7374), and zero otherwise. Data source: Compustat
Analyst	The natural logarithm of the number of analysts following the company. Data source: I/B/E/S
Horizon	Management forecast horizon, measured as the difference between fiscal year end of forecasting year and forecast issuance date, scaled by 365. Data source: I/B/E/S Guidance
DIFRET	The difference of insider trading profits between divisional managers and top managers as defined in Chen et al. (2018). Trading profit of

	divisional (top) managers is measured as the average cumulative size-adjusted abnormal return over the period of six months from the transaction date for all divisional (top) managers' opportunistic open market insider trades during the recent three fiscal years. For open market sale transactions, we take the opposite sign when calculating the abnormal return. Data source: Thomason Financial/CRSP
Variables used in managerial incentive and insider trade analysis	
Financial Distress	Altman's Z score, computed as (1.2 × working capital/total assets + 1.4 × retained earnings/total assets + 3.3 × operating income/total assets + 0.6 × market value of equity/total liabilities + sales/total assets). Data source: Compustat
External Financing	The sum of equity and debt financing scaled by lagged total assets, where equity financing equals cash proceeds from the sale of common and preferred stock minus cash payments for the purchase of common and preferred stock and cash payments for dividends, and net debt issuance equals cash proceeds from the issuance of long-term debt minus cash payments for long-term debt reductions and the net changes in current debt. Data source: Compustat
Industry Concentration	Industry concentration, measured by the Herfindahl-Hirschman index, calculated as the sum of the squares of the market shares of the firms' sales within each four-digit SIC industry. Data source: Compustat
Insider Selling	Net abnormal sales made by top managers (including chairman, vice chairman, CEO, CFO, and COO), measured as the net sales (i.e., number of shares sold minus number of shares purchased) made during the 30-day period following the management earnings forecast date, minus the net sales made during the 90-day period before management earnings forecast date, scaled by the number of shares outstanding. Data source: Thomson Financial
MgmTrade	Insider trades made by top managers (including chairman, vice chairman, CEO, CFO, and COO), measured as the number of shares purchased or sold scaled by the number of shares outstanding and then ranked into deciles and transformed to range from zero to one. We exclude routine trades as defined in Cohen, Malloy, and Pomorski (2012) and take the opposite sign when calculating the number of shares sold. Data source: Thomson Financial
AbnRet	Abnormal stock returns, measured as the cumulative 30-day size adjusted stock return following the insider trade. Data source: CRSP
EP	Earnings-price ratio, measured as earnings per share divided by stock price per share at the end of the fiscal year. Data source: Compustat
ShareTurnover	Share turnover, measured as trading volume divided by the number of shares outstanding. Data source: CRSP
Window	An indicator variable equal to one if the insider trade occurs within 30 days following an earnings announcement. Data source: Thomson Financial
Variables used in cross-sectional analysis	
Centralization	An indicator variable equal to one if the firm decentralization score is below the median, zero otherwise. The decentralization score is computed as the first factor of principal component analysis based on

	the number of business segments, the number of geographic segments, and the number of employees. Data source: Compustat
NoICW	An indicator variable equal to one if the firm discloses no internal control weakness, zero otherwise. Data source: AuditAnalytics
EmpStockOptionD	An indicator variable equal to one if the number of rank-and-file employee stock option is above sample median, and zero otherwise. Rank-and-file employee stock option is calculated as total employee stock options minus stock options owned by top executives, scaled by the number of shares outstanding. Data source: Compustat and ExecuComp
Compensation	An indicator variable equal to one if the average of the five-point scale ratings of compensation and benefits by current employees within 30 days prior to the issuance date of management forecast is above sample median, zero otherwise. Data source: Glassdoor
CareerOppor	An indicator variable equal to one if the average of the five-point scale ratings of career opportunities by current employees within 30 days prior to the issuance date of management forecast is above sample median, zero otherwise. Data source: Glassdoor
SatisfFactor	An indicator variable equal to one if the factor calculated based on senior management, culture and values, compensation and benefits, and career opportunities made by current employees within 30 days prior to the issuance date of management forecast is above sample median, and zero otherwise. Data source: Glassdoor
FounderCEO	An indicator variable equal to one if the CEO is a founder of the company, zero otherwise. Data source: https://site.warrington.ufl.edu/ritter/files/2018/04/FoundingDates.pdf and ExecuComp
CEOTenure	An indicator variable equal to one if the CEO tenure is above sample median, zero otherwise. CEO tenure is measured as the number of years the CEO has been in office. Data source: ExecuComp
InternalOrientedCEO	An indicator variable equal to one if the number of investor conferences the CEO attends is below sample median, and zero otherwise. Data source: Bloomberg Corporate Events Database.
Variables used in future performance and turnover analysis	
HighInfoAsym	High information asymmetry, measured as an indicator variable equal to one if management forecast error is in the most positive (negative) quintile and employee outlook is in the most favorable (unfavorable) quintile in any of the past three years, zero otherwise. Data source: I/B/E/S Guidance and Glassdoor
TobinQ	Market value of assets divided by book value of assets. Data source: Compustat
Tangible	Net property, plant, and equipment, scaled by beginning assets. Data source: Compustat

R&D	Research and development expense (xrd), scaled by beginning sales. Data source: Compustat
InstOwn	Institutional ownership, measured as the percentage of shares owned by institutional investors. Data source: Thomson Financial
MFAccuracy	The absolute value of the difference between the management forecasted EPS and the actual EPS scaled by the stock price at the beginning of the fiscal year, multiplied by -1. Data source: I/B/E/S Guidance
EmpOverallSatisf	Employee overall satisfaction, measured by the five-point scale overall ratings provided by current employee reviewers. Data source: Glassdoor
CEOTurnover	An indicator variable equal to one if the CEO experiences a turnover in the fiscal year. Data source: Thomson Financial
ROE	Return on equity, measured as earnings before extraordinary items (ib) scaled by equity (ceq). Data source: Compustat
CAR	Cumulative market-adjusted abnormal return in a fiscal year. Data source: CRSP
LogSales	The natural logarithm of sales. Data source: Compustat
CEOAge	The current CEO's age. Data source: ExecuComp
CEOAge65	An indicator variable equal to one if the age of the CEO is more than 65 years old, zero otherwise. Data source: ExecuComp
Tenure	The number of years the CEO has been in office. Data source: ExecuComp
CEOOwnership	The number of stocks owned by CEO, scaled by the number of shares outstanding. Data source: ExecuComp
CEOChairDurality	An indicator variable equal to one if the CEO is also the chairman of the board, zero otherwise. Data source: ExecuComp

TABLE 1
Descriptive Statistics: Main Variables

	N	Mean	STD	P25	Median	P75
MFE	11,686	0.0010	0.0103	0.0000	0.0015	0.0041
Outlook	11,686	0.3084	0.5627	0.0000	0.3333	0.8000
LogMVE	11,686	8.6779	1.5192	7.6014	8.6592	9.7500
MTB	11,686	4.7495	7.8155	1.9093	3.0567	5.1210
Leverage	11,686	0.2346	0.1695	0.1027	0.2276	0.3354
ROA	11,686	0.0623	0.0728	0.0293	0.0595	0.0956
SalesGrowth	11,686	0.0750	0.1473	0.0008	0.0516	0.1216
Loss	11,686	0.0954	0.2938	0.0000	0.0000	0.0000
TAcc	11,686	-0.0574	0.0578	-0.0785	-0.0485	-0.0257
Return	11,686	0.1676	0.3066	-0.0164	0.1467	0.3191
StdROA	11,686	0.0366	0.0504	0.0111	0.0207	0.0384
StdRet	11,686	0.0180	0.0072	0.0130	0.0164	0.0214
LitiRisk	11,686	0.3691	0.4826	0.0000	0.0000	1.0000
Analyst	11,686	2.5290	0.6351	2.1972	2.6391	2.9957
Horizon	11,686	0.5787	0.3455	0.3589	0.5836	0.8438

This table reports descriptive statistics for the main variables. All variables are winsorized at 1% and 99% percentiles. Variable definitions are provided in the Appendix.

TABLE 2
Information Asymmetry Estimation: Baseline Results

	Dependent variable: MFE_{t+1}		
	(1)	(2)	(3)
Outlook	**0.0010*** **	**0.0009*** **	**0.0006** **
	(3.34)	(3.48)	(2.33)
DIFRET			0.0034
			(1.15)
LogMVE		0.0001	-0.0003
		(0.76)	(1.07)
MTB		0.0000	0.0000
		(0.44)	(0.50)
Leverage		-0.0008	-0.0005
		(0.37)	(0.22)
ROA		-0.0055***	-0.0030
		(2.59)	(0.56)
SalesGrowth		-0.0027	-0.004**
		(1.40)	(2.07)
Loss		-0.0006	0.0004
		(0.77)	(0.42)
TAcc		-0.0087**	-0.0058
		(2.08)	(0.84)
Return		0.0015	0.0017
		(1.57)	(0.96)
StdROA		0.0220***	0.0183*
		(5.60)	(1.67)
StdRet		-0.1134**	-0.0233
		(2.12)	(0.25)
LitiRisk		-0.0001	0.0000
		(0.09)	(0.05)
Analyst		0.0002	0.0007
		(0.39)	(1.16)
Horizon		-0.0038***	-0.0029***
		(4.98)	(3.00)
Industry/Time FE	Yes	Yes	Yes
Observations	11,686	11,686	4,490
Adjusted R^2	0.026	0.05	0.073

This table presents coefficient estimates and t-statistics (in parentheses) from OLS regressions of management forecast errors on employee outlook. See the Appendix for variable definitions. Industry fixed effects are based on the Fama-French 48 industry classification. Standard errors are clustered by firm and year. Significance at the 10%, 5%, and 1% level is denoted with *, **, and ***, respectively.

TABLE 3
Information Asymmetry Estimation: Subsample Analysis

	Dependent variable: MFE_{t+1}			
	Subsample:			
	High Financial Distress	High External Financing	High Industry Competition	High Insider Selling
	(1)	(2)	(3)	(4)
Outlook	**0.0010****	**0.0011*****	**0.0008*****	**0.0003***
	(2.44)	(4.45)	(2.80)	(1.87)
LogMVE	0.0005	0.0003	0.0002	0.0000
	(1.15)	(1.48)	(0.52)	(0.06)
MTB	0.0000**	0.0000	0.0000	0.00040
	(1.96)	(1.26)	(1.03)	(0.07)
Leverage	0.0012	0.0002	-0.0011	0.0004
	(0.39)	(0.08)	(0.43)	(0.35)
ROA	-0.0165**	-0.0035	-0.0086**	-0.0051**
	(2.12)	(1.02)	(2.43)	(2.23)
SalesGrowth	-0.0047***	-0.0038***	-0.0036***	-0.0033***
	(3.91)	(2.73)	(4.10)	(2.93)
Loss	0.0008	0.0002	0.0003	-0.0009
	(0.49)	(0.11)	(0.22)	(1.57)
TAcc	0.0104	-0.0016	0.0031	-0.0002
	(1.03)	(0.37)	(0.78)	(0.57)
Return	0.0030***	0.0023***	0.0012	0.0014***
	(3.57)	(5.87)	(1.5)	(2.59)
StdROA	0.0250***	0.0203***	0.0240***	0.0157***
	(3.36)	(5.12)	(6.00)	(5.02)
StdRet	0.0595	0.0032	-0.0052	0.0085
	(0.79)	(0.07)	(0.13)	(0.38)
LitiRisk	0.0004	0.0015**	-0.0001	0.0005
	(0.44)	(2.44)	(0.07)	(0.76)
Analyst	0.0005	0.0003	0.0002	0.0002
	(0.61)	(0.60)	(0.42)	(0.29)
Horizon	-0.0037***	-0.0021***	-0.0009	-0.0014***
	(3.33)	(2.98)	(0.97)	(2.59)
Industry/Time FE	Yes	Yes	Yes	Yes
Observations	3,229	4,854	3,750	5,151
Adjusted R^2	0.111	0.076	0.075	0.067

This table presents coefficient estimates and t-statistics (in parenthesis) from OLS regressions of management forecast error on employee outlook when employee outlook is positive and managers have incentives to incorporate good news in their forecasts. The high financial distress subsample includes observations with Z-score above the sample median; the high external financing subsample includes observations with firm equity and debt issuance above the sample median; the high industry competition subsample includes observations with the Herfindahl-Hirschman index below the sample median; and the high insider selling subsample includes observations with abnormal selling by top managers above the sample median. All control variables, including fixed affects, are the same as in Table 2, and detailed variable definitions appear in the Appendix. Standard errors are clustered by firm and year. Significance at the 10%, 5%, and 1% level is denoted with *, **, and ***, respectively.

TABLE 4
Management Trade Analysis

	Dependent variable:	
	MgmTrade	***AbnRet***
	(1)	(2)
Outlook	**-0.0146**	**0.0060****
	(1.17)	(2.00)
MgmTrade		**0.0049***
		(1.78)
LogMVE	0.0801***	0.0006
	(12.10)	(0.27)
ROA	0.0993	-0.0082
	(1.28)	(0.51)
TAcc	-0.0916	-0.0009
	(0.84)	(0.03)
Loss	0.0885**	0.0008
	(2.04)	(0.20)
Return	-0.0315*	-0.0097***
	(1.75)	(2.89)
MTB	-0.0014*	0.0005**
	(1.78)	(2.29)
EP	-0.1858	-0.0033
	(0.77)	(0.08)
SalesGrowth	-0.0452	-0.0166*
	(1.03)	(1.73)
R&D		0.0015
		(0.33)
StdRet		-0.8054***
		(2.90)
Analyst		-0.0056
		(1.42)
ShareTurnover		0.0132***
		(4.88)
LitiRisk		-0.0076**
		(2.03)
Window		0.0006
		(0.15)
Industry/Time FE	Yes	Yes
Observations	13,006	13,006
Adjusted R^2	0.183	0.028

This table examines the relation between insider trades, employee outlook, and future stock returns. *MgmTrade* is the number of shares purchased or sold by top managers scaled by the number of shares outstanding and then ranked into deciles and transformed to range from zero to one. We exclude routine trades and take the opposite sign when calculating the number of shares sold. *Outlook* is the average employee outlook made by current employees within 30 days prior to the manager trading date. *AbnRet* is abnormal future return, measured as the cumulative 30-day size-adjusted stock return following the trade. Detailed variable definitions are in the Appendix. Fama-French 48 industry fixed effects and year fixed effects are included. t-statistics are reported in parentheses. Standard errors are clustered by firm and year. Significance at the 10%, 5%, and 1% level is denoted with *, **, and ***, respectively.

TABLE 5
Firm-level Information Asymmetry Determinants

Panel A: Descriptive Statistics

	N	Mean	STD	25th	50th	75th
No. of Business Segments	8,610	2.5995	1.6291	1	2	4
No. of Geographic Segments	8,610	3.3976	2.4117	1	3	5
No. of Employees	8,610	35.766	60.615	5.558	13.500	37.300
NoICW	11,399	0.9639	0.1864	1	1	1
EmpStockOption	9,774	0.0360	0.0320	0.0113	0.0300	0.0513

Panel B: Regression Analysis

	Dependent variable: MFE_{t+1}		
	(1)	(2)	(3)
Outlook	0.0011**	0.0056**	0.0011***
	(2.32)	(2.48)	(3.59)
Centralization	0.0012 ***		
	(2.64)		
Outlook×Centralization	**-0.0004****		
	(2.22)		
NoICW		0.0068***	
		(2.92)	
Outlook×NoICW		**-0.0046***	
		(1.74)	
EmpStockOptionD			0.0001
			(0.31)
Outlook×EmpStockOptionD			**-0.0007****
			(2.43)
Controls	Yes	Yes	Yes
Industry/Time FE	Yes	Yes	Yes
Observations	8,610	11,399	9,774
Adjusted R^2	0.075	0.031	0.054

This table examines whether information asymmetry depends on organizational factors such as centralized organizational structure, effective internal controls, and employee stock options. *Centralization* is an indicator variable equal to one when the first factor derived from principal component analysis based on the number of business segments, geographic segments, and employees is below the sample median. *NoICW* is an indicator variable equal to one if the firm discloses no internal control weakness. *EmpStockOptionD* is an indicator variable equal to one when the number of rank-and-file employee stock option is above the sample median. Panel A reports descriptive statistics. *No. of Business Segments* is the number of business segments. *No. of Geographic Segments* is the number of geographic segments. *No. of Employees* is the number of employees (in thousands). Panel B presents OLS regression results. All control variables are the same as in Table 2, and detailed variable definitions appear in the Appendix. Fama-French 48 industry fixed effects and year fixed effects are included. t-statistics are reported in parentheses. Standard errors are clustered by firm and year. Significance at the 10%, 5%, and 1% level is denoted with *, **, and ***, respectively.

TABLE 6
Employee Satisfaction as an Information Asymmetry Determinant

Panel A: Descriptive Statistics

	N	Mean	STD	25th	50th	75th
SeniorMgmt_Rating	11,629	2.9734	0.9938	2.3333	3.0000	3.6667
Culture_Rating	11,629	3.3373	1.0187	2.7857	3.4167	4.0000
Compensation_Rating	11,633	3.3528	0.8792	2.9853	3.4000	4.0000
CareerOppor_Rating	11,631	3.1538	0.9374	2.6000	3.1111	3.8333

Panel B: Regression Analysis

	Dependent variable: MFE_{t+1}				
	(1)	(2)	(3)	(4)	(5)
Outlook	0.0010***	0.0007***	0.0005***	0.0006***	0.0010***
	(6.05)	(3.82)	(3.76)	(4.89)	(6.42)
SeniorMgmt	0.0007*				
	(1.88)				
Outlook×SeniorMgmt	**-0.0009*** **				
	(10.15)				
Culture		0.0001			
		(0.59)			
Outlook×Culture		**-0.0005****			
		(2.04)			
Compensation			0.0002**		
			(2.37)		
Outlook×Compensation			**-0.0003****		
			(2.00)		
CareerOpp				0.0000	
				(0.03)	
Outlook×CareerOpp				**-0.0002**	
				(1.18)	
SatisfFactor					0.0003
					(0.85)
Outlook×SatisfFactor					**-0.0007*****
					(3.16)
Controls	Yes	Yes	Yes	Yes	Yes
Industry/Time FE	Yes	Yes	Yes	Yes	Yes
Observations	11,629	11,629	11,633	11,631	11,092
Adjusted R^2	0.054	0.054	0.050	0.051	0.053

This table examines whether information asymmetry depends on employee satisfaction. *SeniorMgmt*, *Culture*, *Compensation*, and *CareerOpp* are indicator variables equal to one if the employee ratings of senior management, culture and values, compensation and benefits, and career opportunities are above the sample median respectively, and zero otherwise. *SatisfFactor* is an indicator variable equal to one if the factor calculated based on the principal component analysis of senior management, culture and values,

compensation and benefits, and career opportunities is above the sample median, and zero otherwise. Panel A presents the descriptive statistics of average employee ratings of senior management (*SeniorMgmt_Rating*), of culture and values (*Culture_Rating*), of compensation and benefits (*Compensation_Rating*), and of career opportunities (*CareerOppor_Rating*) within 30 days prior to the management forecast issuance date. Panel B presents the regression results. All control variables are the same as in Table 2, and detailed variable definitions appear in the Appendix. Fama-French 48 industry fixed effects and year fixed effects are included. t-statistics are reported in parentheses. Standard errors are clustered by firm and year. Significance at the 10%, 5%, and 1% level is denoted with *, **, and ***, respectively.

TABLE 7
CEO-Level Information Asymmetry Determinants

Panel A: Descriptive Statistics

	N	Mean	STD	P25	Median	P75
FounderCEO	5,056	0.1847	0.3881	0	0	0
CEOTenure_year	9,471	7.3680	6.7203	2.6356	5.2521	9.8521
No. of Conferences	9,202	6.8935	5.1808	3	6	9

Panel B: Regression Results

	Dependent variable: MFE_{t+1}		
	(1)	(2)	(3)
Outlook	0.0014*	0.0014***	0.0008***
	(1.71)	(3.32)	(3.62)
FounderCEO	0.0017		
	(1.39)		
Outlook×FounderCEO	**-0.0029****		
	(2.01)		
CEOTenure		0.0001	
		(0.18)	
Outlook×CEOTenure		**-0.0017*****	
		(2.97)	
InternalOrientedCEO			0.0001
			(0.49)
Outlook×InternalOrientedCEO			**-0.0005*****
			(3.03)
Controls	Yes	Yes	Yes
Industry/Time FE	Yes	Yes	Yes
Observations	5,056	9,471	9,202
Adjusted R^2	0.062	0.065	0.067

This table examines whether information asymmetry depends on CEO experience (measured by founder status and tenure) and internal engagement (measured by investor conference participation). *FounderCEO* is an indicator variable equal to one if the CEO is a founder of the company, and zero otherwise. *CEOTenure* is an indicator variable equal to one if the CEO tenure is above the sample median, and zero otherwise. *InternalOrientedCEO* is an indicator variable equal to one if the number of conferences the CEO attends is below the sample median, and zero otherwise. Panel A presents descriptive statistics. *CEOTenure_year* is the number of years the CEO has been in office. *No. of Conferences* is the number of investor conferences the CEO has attended in the current year. All control variables are the same as in Table 2, and detailed variable definitions appear in the Appendix. Fama-French 48 industry fixed effects and year fixed effects are included. t-statistics are reported in parentheses. Standard errors are clustered by firm and year. Significance at the 10%, 5%, and 1% level is denoted with *, **, and ***, respectively.

TABLE 8
Predicting Future Earnings with Employee Outlook

Panel A: Interacting Outlook with Firm-Level Determinants

	Dependent variable: ROA_{t+1}		
	(1)	(2)	(3)
Outlook	0.0413***	0.0230***	0.0198***
	(3.34)	(9.11)	(4.65)
Centralization	0.0039		
	(0.81)		
Outlook×Centralization	**-0.0025**		
	(0.45)		
NoICW		0.0202***	
		(3.35)	
Outlook×NoICW		**-0.0200**	
		(1.46)	
EmpStockOptionD			-0.0016
			(0.46)
Outlook×EmpStockOptionD			**0.0046**
			(1.13)
Controls	Yes	Yes	Yes
Industry/Time FE	Yes	Yes	Yes
Observations	3,390	2,583	2,768
Adjusted R^2	0.639	0.622	0.528

Panel B: Interacting Outlook with Employee Satisfaction

	Dependent variable: ROA_{t+1}				
	(1)	(2)	(3)	(4)	(5)
Outlook	0.0115***	0.0127***	0.0258***	0.0274***	0.0158***
	(7.85)	(10.94)	(8.07)	(10.18)	(11.26)
SeniorMgmt	0.0005				
	(0.33)				
Outlook×SeniorMgmt	**0.0045****				
	(2.05)				
Culture		-0.0026			
		(1.43)			
Outlook×Culture		**0.0065*****			
		(3.60)			
Compensation			-0.0042		
			(0.95)		
Outlook×Compensation			**-0.0081**		
			(1.06)		
CareerOpp				0.0020	

				(0.67)	
Outlook×CareerOpp				**-0.0043**	
				(0.73)	
SatisfFactor					-0.0020
					(1.53)
Outlook×SatisfFactor					**0.0018**
					(0.84)
Controls	Yes	Yes	Yes	Yes	Yes
Industry/Time FE	Yes	Yes	Yes	Yes	Yes
Observations	3,449	3,461	3,471	3,462	3,435
Adjusted R^2	0.607	0.604	0.606	0.605	0.607

Panel C: Interacting Outlook with CEO-Level Determinants

	Dependent variable: *ROA$_{t+1}$*		
	(1)	(2)	(3)
Outlook	0.0194***	0.0181***	0.0139***
	(4.94)	(3.64)	(3.52)
FounderCEO	0.0105***		
	(3.00)		
Outlook×FounderCEO	**-0.0121**		
	(1.26)		
CEOTenure		0.0037	
		(1.31)	
Outlook×CEOTenure		**-0.0042**	
		(0.69)	
InternalOrientedCEO			0.0018
			(0.59)
Outlook×InternalOrientedCEO			**0.0102**
			(1.36)
Controls	Yes	Yes	Yes
Industry/Time FE	Yes	Yes	Yes
Observations	1,553	2,776	2,678
Adjusted R^2	0.621	0.603	0.573

This table examines whether the ability of employee outlook to predict future earnings varies with the information asymmetry determinants examined in Tables 5, 6, and 7. *ROA* is average return on assets in year t+1. *Outlook* is the average employee outlook made by current employees over the fiscal year t. In Panels A and C, the information asymmetry determinants are defined exactly the same as in Tables 5 and 7. In Panel B, *SeniorMgmt*, *Culture*, *Compensation*, and *CareerOpp* are indicator variables that equal one if the average employee ratings of senior management, culture and values, compensation and benefits, and career opportunities, respectively, over the fiscal year t is above the sample median, and zero otherwise. *SatisfFactor* is an indicator variable equal to one if the factor calculated based on employee ratings of senior management, culture and values, compensation and benefits, and career opportunities

during the fiscal year t is above the sample median, and zero otherwise. All variables control variables are the same as in Table 2, except that we exclude *Horizon*. See the Appendix for variable definitions. Fama-French 48 industry fixed effects and year fixed effects are included. t-statistics are reported in parentheses. Standard errors are clustered by firm and year. Significance at the 10%, 5%, and 1% level is denoted with *, **, and ***, respectively.

TABLE 9
Information Asymmetry and Future Performance

Panel A: Descriptive Statistics

	N	Mean	STD	25th	50th	75th
ROA	2,673	0.0506	0.0806	0.0227	0.0515	0.0890
TobinQ	2,673	2.2574	1.2781	1.3756	1.8268	2.6878
HighInfoAsym	2,673	0.1620	0.3685	0.0000	0.0000	0.0000
LogMVE	2,673	8.3075	1.5193	7.2068	8.2104	9.3362
Leverage	2,673	0.2181	0.1688	0.0824	0.2047	0.3143
SalesGrowth	2,673	0.0766	0.1220	0.0056	0.0559	0.1266
Tangible	2,673	0.2191	0.2055	0.0712	0.1425	0.2942
R&D	2,673	0.0270	0.0465	0.0000	0.0019	0.0338
StdRet	2,673	0.0192	0.0072	0.0140	0.0177	0.0230
InstOwn	2,673	0.7085	0.1660	0.6106	0.7355	0.8228
MFAccuracy	2,673	-0.0083	-0.0145	-0.0022	-0.0042	-0.0083
EmpOverallSatisf	2,673	3.2916	0.7312	2.8810	3.3333	3.7647
Outlook	2,673	0.2699	0.4366	0.0000	0.2861	0.5542

Panel B: Regression Analysis

	Dependent variable:			
	ROA_t	$TobinQ_t$	ROA_t	$TobinQ_t$
	(1)	(2)	(3)	(4)
$HighInfoAsym_{t-3,t-1}$	**-0.0084***	**-0.2422*****	**-0.0081***	**-0.2305*****
	(1.83)	(3.27)	(1.79)	(3.08)
$LogMVE_{t-3, t-1}$	0.0041***	0.0775**	0.0041***	0.0789**
	(3.25)	(2.35)	(3.27)	(2.39)
$Leverage_{t-3, t-1}$	0.0070	0.3218	0.0072	0.3346
	(0.76)	(1.34)	(0.80)	(1.39)
$ROA_{t-3, t-1}$	0.6862***	6.5833***	0.6833***	6.4544***
	(23.13)	(8.58)	(23.01)	(8.34)
$SalesGrowth_{t-3, t-1}$	-0.0073	1.3994***	-0.0101	1.2706***
	(0.49)	(4.75)	(0.66)	(4.32)
$Tangible_{t-3, t-1}$	0.0142	0.3331	0.0136	0.3036
	(1.53)	(1.39)	(1.44)	(1.25)
$R\&D_{t-3, t-1}$	0.0122	12.4798***	0.0095	12.3563***
	(0.22)	(8.37)	(0.17)	(8.36)
$StdRet_{t-3, t-1}$	-1.1792***	5.9556	-1.1623***	6.7117
	(3.32)	(0.85)	(3.26)	(0.96)
$InstOwn_{t-3, t-1}$	0.0015	0.1027	0.0011	0.0819
	(0.16)	(0.46)	(0.11)	(0.37)
$MFAccuracy_{t-3, t-1}$	-0.1356	4.7611**	-0.1347	4.8000**
	(0.90)	(2.46)	(0.90)	(2.45)

EmpOverallSatisf$_{t-3, t-1}$	0.0034*	0.1777***	0.0015	0.0935*
	(1.75)	(3.96)	(0.58)	(1.68)
Outlook$_{t-3, t-1}$			0.0048	0.2155**
			(1.07)	(2.44)
Industry/Time FE	Yes	Yes	Yes	Yes
Observations	2,673	2,673	2,673	2,673
Adjusted R^2	0.522	0.433	0.522	0.435

This table examines the relation between information asymmetry and future performance. *HighInfoAsym* is an indicator variable equal to one if management forecast error is in the most positive (negative) quintile and employee outlook is in the most favorable (unfavorable) quintile in any of the past three years, and zero otherwise. *ROA* is the return on assets in the current year. *TobinQ* is Tobin's Q in the current year. Panel A presents descriptive statistics. Panel B presents OLS regression results. All control variables are calculated as the average over the past three years. See the Appendix for variable definitions. Industry fixed effects are based on the Fama-French 48 industry classification. t-statistics are reported in parentheses. Standard errors are clustered by firm. Significance at the 10%, 5%, and 1% level is denoted with *, **, and ***, respectively.

TABLE 10
Information Asymmetry and Future CEO Turnover

Panel A: Descriptive Statistics

	N	Mean	STD	25th	50th	75th
CEOTurnover	1,561	0.1044	0.3059	0	0	0
HighInfoAsym	1,561	0.1585	0.3653	0	0	0
ROE	1,561	0.0502	0.0493	0.0402	0.0556	0.0700
CAR	1,561	0.0522	0.1617	-0.0437	0.0400	0.1376
LogSales	1,561	8.2253	1.4604	7.2462	8.1990	9.2301
StdROA	1,561	0.0344	0.0388	0.0125	0.0214	0.0396
StdRet	1,561	0.0176	0.0061	0.0131	0.0165	0.0208
InstOwn	1,561	0.7234	0.1519	0.6304	0.7441	0.8256
MFAccuracy	1,561	-0.0079	-0.0138	-0.0022	-0.0040	-0.0083
Age	1,561	56.3822	6.5172	52	56	60
Age65	1,561	0.0909	0.2876	0	0	0
Tenure	1,561	7.3680	6.7203	2.6356	5.2521	9.8520
CEOOwnership	1,561	0.0138	0.0354	0.0008	0.0024	0.0076
CEOChairDuality	1,561	0.5608	0.4964	0	1	1
EmpOverallSatisf	1,561	3.2660	0.7761	2.8333	3.3333	3.7736
Outlook	1,561	0.2379	0.4636	0	0.2564	0.5338

Panel B: Regression Analysis

	Dependent variable: $CEOTurnover_t$			
	(1)	(2)	(3)	(4)
$\boldsymbol{HighInfoAsym_{t-3,\,t-1}}$	**0.4208****	**0.5092****	**0.4329****	**0.4365****
	(2.07)	(2.38)	(2.00)	(2.03)
$ROE_{t-3,\,t-1}$	-3.6065**	-4.0334***	-3.8825***	-3.9406***
	(2.39)	(2.80)	(2.73)	(2.74)
$CAR_{t-3,\,t-1}$	-1.8301***	-1.9159***	-1.9035***	-1.9229***
	(3.03)	(2.89)	(2.86)	(2.80)
$LogSales_{t-3,\,t-1}$	0.0622	0.0617	0.0798	0.0813
	(0.94)	(0.87)	(1.14)	(1.15)
$StdROA_{t-3,\,t-1}$	4.0700*	4.6110*	4.9247**	4.8839**
	(1.91)	(1.81)	(2.03)	(2.04)
$StdRET_{t-3,\,t-1}$	-4.0479	12.7947	10.0446	10.1881
	(0.22)	(0.66)	(0.51)	(0.52)
$InstOwn_{t-3,\,t-1}$	0.4329	0.2240	0.3091	0.3057
	(0.75)	(0.37)	(0.52)	(0.52)
$MFAccuracy_{t-3,\,t-1}$	-2.0259	3.4375	3.3444	3.2837
	(0.32)	(0.50)	(0.50)	(0.49)
$CEOAge_{\,t-3,\,t-1}$		0.0537***	0.0520***	0.0522***
		(3.34)	(3.19)	(3.21)

CEOAge65$_{t-3, t-1}$		0.6800***	0.7206***	0.7210***
		(2.68)	(2.85)	(2.85)
Tenure$_{t-3, t-1}$		0.0001***	0.0001***	0.0001***
		(3.27)	(3.34)	(3.34)
CEOOwnership$_{t-3, t-1}$		-13.0557***	-12.9732**	-12.9637**
		(2.65)	(2.50)	(2.50)
CEOChairDuality$_{t-3, t-1}$		-0.0963	-0.0957	-0.0975
		(0.50)	(0.49)	(0.50)
EmpOverallSatisf$_{t-3, t-1}$			-0.2928***	-0.3142**
			(2.82)	(2.21)
Outlook$_{t-3, t-1}$				0.0538
				(0.22)
Industry/Time FE	Yes	Yes	Yes	Yes
Observations	1,561	1,561	1,561	1,561
Adjusted R^2	0.065	0.109	0.114	0.114

This table examines the relation between information asymmetry and future CEO turnover. *HighInfoAsym* is an indicator variable equal to one if management forecast error is in the most positive (negative) quintile and employee outlook is in the most favorable (unfavorable) quintile in any of the past three years, and zero otherwise. *CEOTurnover* is an indicator equal to one if the firm experiences a CEO turnover in the current year, and zero otherwise. Panel A presents descriptive statistics. Panel B presents logistic regression results. All control variables are calculated as the average over the past three years, except that *CEOAge65* and *CEOChairDuality* are equal to one if they take the value of one in any of the past three years. See the Appendix for variable definitions. Industry fixed effects are based on the Fama-French 48 industry classification. t-statistics are reported in parentheses. Standard errors are clustered by firm. Significance at the 10%, 5%, and 1% level is denoted with *, **, and ***, respectively.