The Effect of Disclosure on the Pay-Performance Relation

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Abstract

We examine whether greater transparency leads to improved evaluation and rewarding of management. We posit that disclosure improves board effectiveness at monitoring executives and in strengthening the link between pay and performance. We use management guidance as our primary empirical proxy for disclosure and document the following. First, we predict and find higher sensitivity of CEO compensation to performance (both accounting and stock returns) for firms that issue management guidance than for firms that do not. Second, in a sub-sample of firms that issue management guidance, we predict and find that the sensitivity of CEO compensation to performance is increasing in the frequency of management guidance events during the year and in the number of consecutive years that firms have issued management guidance (i.e., the pay-performance relation is increasing in the "degree" of disclosure). Our results are robust to tests that use conference calls as an alternative disclosure metric, multiple tests that address the potential endogeneity of management's decision to issue guidance (using a Heckman self-selection model, employing a matched-sample approach, and identifying a subsample of firms in which increased disclosure is likely to be exogenous), lead-lag tests, and tests that control for the information environment, the asymmetric sensitivity of compensation to positive and negative performance, and variations in investment opportunities.

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1. Introduction

We empirically examine whether greater transparency leads to improved evaluation and rewarding of management (i.e., monitoring). In particular, we study the effect of disclosure on the CEO pay-performance relation. We use management guidance as our primary proxy for disclosure but corroborate our results using conference calls as an alternative measure of disclosure. Our research question is important because improved monitoring represents a potential benefit of discretionary disclosure not well studied.

An important task for boards is to oversee executive compensation. The effectiveness of boards in carrying out this monitoring responsibility, however, is widely debated.[1] We argue that disclosure improves board effectiveness. First and as a general point, disclosure can improve transparency, which facilitates the monitoring of management and hence causes managers to act more in the interests of shareholders (e.g., Healy and Palepu 2001; Ball 2006). Such monitoring is potentially valuable since managers will not always act in the best interest of shareholders (Jensen and Meckling 1976).

Second, increased disclosure can allow external stakeholders, such as institutional investors, analysts, and the media, to develop their own independent and informed views on firms' decisions. These external stakeholders can pressure the board to act in the interests of shareholders. Although board members have fiduciary responsibilities to shareholders, members have incentives to support the CEO. Serving on a board can provide a salary or other compensation as well as prestige, valuable business, and social connections. Further, factors such as collegiality, team spirit, a natural desire to avoid conflict within the board, friendship, and

[1] Shleifer and Vishny (1997) discuss the controversial nature of board effectiveness and provide relevant references.

loyalty can also align board members with CEOs (e.g., Bebchuk and Fried 2005). Agency theories argue that pressures from external investors are necessary to encourage managers to pursue value-maximizing policies (e.g., Jensen 1986; Bushman and Smith 2003).

Third, increased disclosure can potentially improve the quality of boards' information sets. While boards will receive private information, the board depends largely on management for its information (*The Economist* 2001; Adams and Ferreira 2007; Johanson 2007). This information could be biased or distorted. The CEO has little incentive to provide information that could cause board members to revise downward their assessment of the CEO's talent or abilities. A publicly-disclosed signal will undergo more scrutiny by external stakeholders, and more care will be taken in the process of disseminating it.

The theoretical intuition for our prediction follows that of agency theory. Better information can lead to a better understanding of the relation between the manager's actions and performance, hence reducing noise in the estimated relation. Improved transparency can also allow stakeholders to more easily filter out the noise caused by factors unrelated to management's actions on performance, consistent with the "noise reduction" role of information (see, e.g., Banker and Datar 1989; Lambert 2001). Furthermore, disclosure can improve the precision of the performance signal. For example, the literature shows that voluntary disclosure by firms results in more informationally-efficient stock prices.[2] Thus, we predict that the pay-performance relation will be stronger for firms that provide guidance, our primary empirical proxy for higher disclosure.

The analysis in this study supports our prediction. First, in a regression of CEO compensation (salary plus bonus) on accounting and stock price performance, we document that the

[2] See, for example, Healy, Hutton, and Palepu (1999), Gelb and Zarowin (2002), Lundholm and Myers (2002), and Ettredge et al. (2005).

coefficients on both performance measures are higher for firms issuing guidance. These tests are in changes, which controls for potentially-correlated factors that do not change over time. Our results suggest that this difference is economically meaningful. Second, in a sub-sample of firms that issue management guidance, we further find that the pay-performance relation is stronger in the "degree" of disclosure. Specifically, the sensitivity of compensation to performance is increasing in the frequency of management guidance events during the year and in the number of consecutive years that firms have issued management guidance. Replicating our main tests using conference calls as an alternative measure of disclosure provides corroborating evidence.

Management guidance is a voluntary disclosure and hence it is possible that the decision to disclose is related to the compensation decision. We address the potential endogeneity of managements' decision to issue guidance in three ways. First, we use a Heckman self-selection model, in which the first stage predicts whether guidance was issued and the second stage estimates the pay-performance relation. Second, we use a matched-sample approach. Third, we study a subsample of firms in which the decision to disclose is likely unrelated to compensation (i.e., firms initiating disclosure immediately following the passage of Reg FD). Our results are robust to these tests.

We also investigate alternative explanations for our results. We show that our results hold in settings in which the disclosure decision more clearly precedes the compensation decision. For example, last year's disclosure strengthens this year's pay-performance relation. In contrast, next year's disclosure does not increase this year's pay-performance relation (i.e., we control for "reverse causality"). Our results are also robust to controls for the information environment, the asymmetric sensitivity of compensation to performance, and variations in investment opportunities.

Our study contributes to the literature that examines how agency problems can be mitigated through increased transparency (see Healy and Palepu 2001; Ball 2006). Several empirical studies relate better disclosure to better firm performance (e.g., Biddle and Hilary 2006; Hope and Thomas 2008). These papers implicitly assume that disclosure leads to better monitoring, which in turn leads to better performance. By focusing on the pay-performance relation, we establish a more direct link between disclosure and monitoring.

In addition, our study informs the current debate about the role of management guidance. Critics have called for an end to management guidance. They purport that such disclosures create incentives for firms to manage earnings upwards, distort earnings, or act myopically. Whether managers do so is an open question and the empirical evidence is mixed (e.g., Cheng, Subramanyam, and Zhang 2005; Houston, Lev, and Tucker 2008). We are *agnostic* about the costs of management guidance, and we do not suggest an equilibrium amount of management guidance. We simply point out that improved monitoring of CEOs represents a potential benefit that should be considered in analyses of management guidance.

In the next section we develop our hypothesis. In Section 3, we discuss the sample and present our primary tests and results. In Section 4, we provide tests that address the potential endogeneity in our main tests. Section 5 examines conference calls as an alternative measure of disclosure. In Section 6, we consider alternative explanations. Section 7 concludes.

2. Hypothesis Development

2.1. The role of disclosure in board monitoring of managers

Boards of directors are responsible for monitoring firm management. An important component of this governance responsibility is the board's ultimate oversight of executive

compensation matters.[3] The effectiveness of boards in carrying out this monitoring responsibility, however, is widely debated. In fact, a number of studies indicate that the pay-setting process has strayed far from the arm's-length model assumed in most economic models of pay arrangements.[4] In particular, studies find that managerial power leads to compensation schemes that weaken managers' incentives to increase firm value and that could even create incentives for managers to take actions that *reduce* long-term firm value (see also Jiraporn, Kim, and Davidson 2005; Hope and Thomas 2008). Bebchuk and Fried (2005) show that flawed compensation packages are widespread, persistent, and systematic.

One explanation for imperfect boards is that board members have economic incentives to support, rather than monitor, the CEO. Serving on a board can provide a salary or other compensation as well as valuable business and social connections. Inside board members often directly (or indirectly) report to the CEO. Outside board members are often recruited and nominated by management. Warther (1998) demonstrates that managerial power to remove board members could result in a passive board (see also Hermalin and Weisbach 1998). The CEO can also influence director compensation or other benefits such as the amount of business dealings the CEO's firm does with the director's firm. For instance, Brick, Palmon, and Wald (2006) find that higher CEO pay is correlated with higher board pay (including compensation committee member pay), and that this relation reflects insider cooperation rather than firm performance. Further, a variety of social and psychological factors align board members with CEOs, including: collegiality, team spirit, a natural desire to avoid conflict within the board, friendship, and loyalty (see, e.g., Bebchuk and Fried 2005). These incentives for boards to be

[3] Directors' responsibilities include establishing and overseeing the executive compensation policy, reviewing performance targets established under the company's incentive programs, and assessing techniques for monitoring and measuring performance (e.g., NYSE 2002; CICA 2003).

[4] Bebchuk and Fried (2003; 2004; 2005) summarize this view and the supporting literature. A special issue of *The Economist* ("Power Pay," January 20, 2007) discusses many practical examples.

"friendly" with management will offset the incentives to serve shareholders provided by boards' fiduciary obligations and financial incentives such as boards' stock ownership.

Another explanation for imperfect boards is that the information board members receive could be biased or distorted. The board depends largely on management for its information (*The Economist* 2001; Adams and Ferreira 2007; Johanson 2007). Certainly, boards should have access to private information beyond that provided by public disclosures. The CEO, however, has little incentive to provide information that could cause board members to revise downward their assessment of the CEO's talent or abilities. For instance, boards likely have access to internally-generated budgets. But, managerial accounting scholars commonly observe that budgets are often conservatively biased (i.e., budgets have slack) because employees who provide the information know that it will also be used to evaluate their performance, and hence affect their compensation (e.g., Zimmerman 2006, 272; Hilton 2008, 376).[5]

The focus of our study is on the role of disclosure in improving board effectiveness. We provide three rationales for this relation. First, extant research argues in general that financial disclosures are an important means of monitoring managers to make them more accountable (e.g., Bushman and Smith 2001; Watts and Zimmerman 1986). Healy and Palepu (2001) discuss how disclosures can reduce agency costs by providing principals with an effective monitoring tool. Specifically, better disclosures improve the monitor's ability to relate managerial decisions to firm performance (Lombardo and Pagano 2002; Hope and Thomas 2008). Similarly, Ball (2006) argues that increased transparency causes managers to act more in the interests of shareholders.

[5] A recent *Wall Street Journal* article (Lublin 2008) discusses how some pay panels are "amassing a wider array of objective data," and provides an example of pay panels that asked a consultant to "compare management predictions of future financial performance with investment analysts' outlook for those companies." These boards' actions are consistent with them receiving insufficient information from management to properly execute their monitoring role.

Second, increased disclosure can allow external stakeholders, such as institutional investors, analysts, and the media, to develop their own independent and informed views on firms' decisions. Board members care about their public reputation, which could be threatened if external stakeholders were to criticize them for poor decisions (Bebchuk and Fried 2005). In essence, disclosure helps in the "monitoring of the monitors," and hence can be effective in countering the disincentive to monitor associated with boards who are CEO friendly. Hartzell and Starks (2003) find that institutional ownership concentration is positively related to the strength of the pay-performance relation, suggesting that institutions monitor CEO compensation structures.[6]

Regulators also view disclosure as a critical way to bring shareholders and others more directly into the compensation process. Starting in 1992, the SEC required the compensation committee to disclose its specific rationale for the executive compensation paid, as well as for the relationship of the compensation paid to the company's performance. The SEC believed these disclosures would "bring shareholders into the compensation committee or board meeting room and permit them to see and understand the specific decisions made through the eyes of the directors" (Mobley 2005, 119). Similarly, beginning with 2007 filings, U.S. corporations must include a "Compensation Disclosure and Analysis" (CD&A) section. The intent behind the CD&A is to "provide investors access to clear explanations of executive compensation and the philosophy that underlies compensation." (Dalton and Dalton 2008, 85).[7]

[6] A number of empirical studies provide indirect evidence of how firm disclosure can be used by outsiders to monitor the activities of managers, including Bens and Monahan (2004), Biddle and Hilary (2006), Frederickson and Hillary (2006), Khurana, Pereira, and Martin (2006), Biddle, Hilary, and Verdi (2008), and Hope and Thomas (2008).

[7] Home Depot provides an example of how shareholders pressure the board to effectively monitor and discipline managers. With its stock appreciating at a slower rate than its rivals, dissident shareholders at Home Depot launched a proxy fight to create an independent committee to evaluate management and study strategic alternatives. At the same time, corporate governance experts called into question the size of the CEO's pay package and analysts began to question his stewardship in the face of a dramatic housing downturn. This eventually led to the CEO's ouster (*Financial Times*, December 19, 2006; *The Economist*, January 7, 2007). More generally, there have been many

Third, increased disclosure has the potential to improve the quality of boards' information set (e.g., Adams and Ferreira 2007).[8] A publicly-disclosed signal will undergo more scrutiny by external stakeholders, such as regulators, investors, and the media. Firms are more careful in the collecting and handling of this public information, with lawyers, auditors, and investor-relation managers all potentially playing a role in the dissemination process. As a result, publicly-disclosed information could be less biased and more credible than information privately disclosed to the board.[9]

2.2. The role of disclosure in setting the pay-performance relation

The theoretical intuition for our hypothesis follows that of agency theory. When it is prohibitively costly or not possible for the principal to fully observe the agent's actions, imperfect information is used to alleviate the moral hazard problem (Holmström 1979). The principal will set pay to be a positive function of observed performance. As well, the intensity of the pay-performance relation will increase in the strength of, and decrease in the noise in, the relation between the agent's action and the performance signal (e.g., Banker and Datar 1989). Another explanation for this prediction is that if the principal can more confidently estimate the agent's unobservable action given the observable performance signal, then the principal will tie pay more strongly to performance.

The mechanism underlying our prediction that disclosure increases the pay-performance relation could work in three ways as follows. First, theoretical models typically assume that the

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cases of "say on pay" pressures by shareholders and other outsiders (see, e.g., *Wall Street Journal*, February 27, 2008, A2; *National Post*, February 29, 2008, FP1; *The Economist* special issue on pay issues, January 20, 2007).

[8] In a detailed longitudinal case study of a large corporation, Johanson (2007) finds that the board of directors relies heavily on public disclosures. He concludes that public disclosures are a more important source of information for the board than internal information.

[9] In discussing the new CD&A rules, the SEC Chairman (Cox 2006) argues that public disclosures can help in internal decision making: "By improving the total mix of information available to the marketplace, we can help shareholders *and compensation committees of Boards of Directors* to assess the information themselves, and reach their own conclusions" (emphasis added).

principal knows the specific function between the agent's action and the firm's performance and that the agent's actions are limited to one dimension (e.g., effort). In practice, the true function between performance and the multiple dimensions of the CEO's actions (e.g., effort, optimal investments, hiring, firing, motivating subordinates, communicating with diverse groups of stakeholders, etc.) is complex, and unlikely to be known with certainty. The error between the expected function and the true function represents a source of additional noise in the relation between the CEO's actions and the firm's performance. Better disclosure allows for more accurate estimation of this relation. Supporting this contention, Hermalin (1993) posits that better information leads to stronger inferences about CEO effectiveness from the observable performance signal. It follows that with better information, when evaluating the CEO, more weight is placed on the performance signal.

Second, improved disclosure should facilitate the filtering out of noise in the performance signal caused by factors unrelated to management's actions on performance (e.g., Banker and Datar 1989; Lambert 2001). Third, disclosure should improve the precision of the performance signal. The literature shows that voluntary disclosure results in more informationally-efficient stock prices (e.g., Healy, Hutton, and Palepu 1999; Gelb and Zarowin 2002; Lundholm and Myers 2002; Ettredge et al. 2005). Healy and Palepu (2001) outline how compensation contracts that are a function of stock price are more efficient when disclosure leads to stock prices that are more precise estimates of firm values.

2.3. Management guidance as important firm-provided disclosures

In this study, we use management guidance as our primary proxy for increased disclosure. Other studies, such as King, Pownall, and Waymire (1990), Coller and Yohn (1997), and Rogers

and Van Buskirk (2008), also use guidance as a direct measure of a firm's disclosure policy.[10]

Management guidance is voluntary, and usually includes, among other things, a forecast about a firm's expected earnings. Research shows that firms issue guidance to align the market's expectations with their own earnings assessments (King, Pownall, and Waymire 1990; Ajinkya and Gift 1984). In other words, managers use guidance to mitigate information asymmetry between investors and managers as suggested by theory (Coller and Yohn 1997; Marquardt and Wiedman 1998; Dye 2001; Verrecchia 2001). Guidance also preempts litigation concerns, and potentially influences managers' reputations for transparent and accurate reporting (Skinner 1994, 1997; Hirst et al. 2008; Graham, Harvey, and Rajgopal 2005).

In addition to a forecast, management guidance typically includes additional qualitative disclosures. As some specific examples, Hutton, Miller, and Skinner (2003) show that management forecasts are accompanied by other disclosures, such as verifiable forward-looking statements and qualitative discussions, about two thirds of the time. Baginski, Hassell, and Kimbrough (2004) find that about three quarters of management forecasts include a discussion and explanation for the forecasted performance. Baginski et al. (2004) show that management forecasts are accompanied by disclosures that link the forecasted performance with both internal management actions (e.g., new products, prices, strategies, and capital investments) and external issues (e.g., input prices, legal actions, and exchange rates). Baginski et al. (2004) argue that these attributions potentially aid investors by confirming known relations between attributions and performance or identifying additional causes of performance.[11] Hence, guidance could improve the pay-performance relation by allowing stakeholders to more easily observe and estimate, as well as filter out the noise in, the relation between the CEO's actions and firm

[10] Hirst, Koonce, and Venkataraman (2008) review the literature on management forecasts as a disclosure proxy.
[11] See also Waymire (1984), Hoskin, Hughes, and Ricks (1986), Han and Wild (1991), and Baginski, Hassell, and Hillison (2000).

performance. Note that because management guidance often contains more than just earnings forecasts per se, realized earnings will not subsume the information provided by guidance.

Prior research concludes that the credibility of management forecasts compares with that of audited financial information. For example, Pownall and Waymire (1989) find that the market reaction to unexpected management forecasts is similar in magnitude to the reaction to unexpected earnings announcements. Pownall, Wasley, and Waymire (1993) document that management forecasts affect stock prices, and in particular that such forecasts remain informative even after controlling for other disclosure types.[12] Given these strong capital market effects, management guidance could lead to more information impounded in prices, and hence a higher expected pay-performance relation.

3. Tests and Results

3.1. Empirical model

Our empirical model follows that used in the extant compensation literature. Lambert and Larcker (1987) and Core (2002) suggest the following specification for tests of the pay-performance relation:

$$Pay_t = E_{t-1}[Pay_t] + \beta\ Unexpected\ Performance_t + \varepsilon_t. \quad (1)$$

Including expected pay controls for a variety of factors that could affect compensation, such as firm size, CEO age, and corporate governance. Using last year's pay as the expectation about this year's pay, and placing it on the left-hand side, leads to:

$$Pay_t - Pay_{t-1} = \gamma_0 + \beta\ Unexpected\ Performance_t + \varepsilon_t. \quad (2)$$

[12] In addition, management forecasts are more accurate than contemporaneous analysts' forecasts (Houston et al. 2008; Hassell and Jennings 1986). Hassell, Jennings, and Lasser (1988) find that financial analysts decrease their forecast errors more rapidly for firms that issue management forecasts than for a control group of firms that do not.

The coefficient β represents the pay-performance relation and is expected to be positive. From our hypothesis, we expect β to be greater for firms that have higher levels of disclosure (i.e., issue management guidance). To test this notion we estimate separate coefficients for firms that issue and do not issue management guidance by interacting a management guidance indicator variable (*Guidance*) with *Unexpected Performance*.

$$Pay_t - Pay_{t-1} = \gamma_0 + \beta_1 Unexpected\ Performance_t + \beta_2 Unexpected\ Performance_t \times Guidance_t + \beta_3 Guidance_t + \varepsilon_t. \quad (3)$$

Specifically, we estimate various specifications of the following regression test using the full sample of firms (both firms that issue and do not issue guidance):

$$\Delta ln(Comp)_{it} = a_0 + a_1 \Delta ROA_{it} + a_2 \Delta ROA_{it} \times Guidance_{it} + a_3 Ret_{it} + a_4 Ret_{it} \times Guidance_{it} + a_5 Guidance_{it} + \varepsilon_{it}. \quad (4)$$

Comp is the CEO's cash compensation, measured as the sum of salary and bonus. The symbol Δ refers to the change in the variable from last year and *ln( )* is the natural logarithm of the variable. *ROA* is net income before extraordinary items scaled by lagged total assets. *Ret* is the one-year return to shareholders during the fiscal year adjusted for the value-weighted return on a market portfolio from CRSP.[13] *Guidance* equals one for firms that issue a management earnings forecast, and zero otherwise. We do not distinguish between qualitative or quantitative or between quarterly or annual forecasts.[14] The subscripts *i* and *t* denote the firm and fiscal year, respectively. All variables are defined in the Appendix.[15]

[13] We obtain similar results (not tabulated) if we use raw (i.e., unadjusted) stock returns and when we use other commonly-used expectation adjustments for returns.

[14] As a sensitivity test, we re-estimate our tests excluding management guidance that occurs after the fiscal year ends but before the annual earnings are announced. These "earnings warnings" are less likely to be associated with improved disclosure and are more likely to be associated with the simple objective of lowering expectations. For example, Rogers (2005) finds that longer-horizon management forecasts are more effective at reducing information asymmetry. Results from these tests are similar to our main tests and all inferences remain unchanged.

[15] In untabulated sensitivity analyses, similar results obtain when we include CEO fixed effects to control for differences in CEO characteristics, such as risk tolerance.

Our focus on cash compensation (i.e., CEO salary plus bonus) is consistent with much of the literature (e.g., Clinch and Magliolo 1993; Hayes and Schaefer 2000; Bushman and Smith 2001; Comprix and Muller 2006; Leone, Wu, and Zimmerman 2006). As Bushman, Engel, and Smith (2006) point out, it is possible that cash compensation may serve different purposes than equity instruments.[16] Cash compensation could be used to reward effort while equity could be used to align incentives (Core and Guay 1999),[17] promote risk taking (Guay 1999), retain executives (Ittner, Lambert, and Larcker 2003), etc.[18]

Equation (4) tests whether the CEO pay-performance relation is increasing in the *existence* of management disclosure. We next examine whether the pay-performance relation is increasing in the *degree* of disclosure. Following Ajinkya, Bhojraj, and Sengupta (2005), our first proxy for the degree of disclosure is the frequency of forecasts issued (i.e., management guidance events) in a given year. All else equal, we expect that more disclosures lead to higher levels of transparency. Our second proxy captures whether firms' "commitment" to disclose matters. For example, following theoretical work by Diamond and Verrecchia (1991) and Baiman and Verrecchia (1996), Leuz and Verrecchia (2000) emphasize the commitment by a firm to increase disclosure. Indeed, only a fraction of the firms issuing guidance in our sample consistently do so. This leads one to question to what extent the issuance of guidance can be useful in monitoring managers, when it is somewhat sporadic. While it is not possible for managers to ex ante commit

[16] Studies generally find empirical evidence in support of agency theory predictions when cash compensation is used but not when total compensation (i.e., CEO salary plus bonus plus changes in the CEO's equity portfolio value) is used to measure compensation (see, e.g., Baber, Kang, and Kumar 1998; Core, Guay, and Verrecchia 2003).

[17] However, this view is not necessarily universally shared. For example, Palmon, Bar-Yosef, Chen, and Venezia (2008) discuss how stock option grants can be used to reward effort.

[18] Core et al. (2003) provide additional reasons to explain why cash pay supports but total compensation fails to support standard agency model predictions. Hayes and Schaefer (2000, 278) provide support for the focus on salary and bonus with the following arguments: "We are interested in the incentives provided by the board's ability to reward CEOs.…Thus, for our purposes it is appropriate to examine only those instruments over which the board has direct control. Hence, salary plus bonus is probably a more appropriate measure than total CEO pay-related wealth."

to issuing guidance, we use the number of consecutive years that firms have issued management guidance as a proxy for an implicit commitment to disclose.

To test whether the degree of disclosure matters, we estimate the following two equations within the sample of guidance-issuing firms:

$$\Delta ln(Comp)_{it} = a_0 + a_1 \Delta ROA_{it} + a_2 \Delta ROA_{it} \times ln(Guide\_Frequency)_{it} + a_3 Ret_{it} + a_4 Ret_{it} \times ln(Guide\_Frequency)_{it} + a_5 ln(Guide\_Frequency)_{it} + \varepsilon_{it}. \quad (5)$$

$$\Delta ln(Comp)_{it} = a_0 + a_1 \Delta ROA_{it} + a_2 \Delta ROA_{it} \times ln(Guide\_Consistency)_{it} + a_3 Ret_{it} + a_4 Ret_{it} \times ln(Guide\_Consistency)_{it} + a_5 ln(Guide\_Consistency)_{it} + \varepsilon_{it}. \quad (6)$$

Guide_Frequency is the number of management forecasts issued by the firm during year *t*. *Guide_Consistency* is the number of consecutive years in which the firm has provided a forecast, including the current year.

When estimating equations (4) to (6), following Core, Guay, and Verrecchia (2003), we also include year effects. We also include industry effects (i.e., two-digit SIC codes) to control for cross-industry differences, such as in the CEO's tasks. In addition, because the estimations of these equations are likely to suffer from time-series dependence, we estimate the model as a panel and cluster the standard errors at the firm level. Significance levels are based on one-tailed tests where there is a prediction of the coefficient's sign and based on two-tailed tests otherwise.

3.2. Sample

Our sample is based on the intersection of the Compustat Executive Compensation (ExecuComp), Compustat Annual Industrial, CRSP, and First Call databases for 1997 through 2005. Table 1, Panel A describes our sample selection procedure. From ExecuComp we require non-missing cash compensation data for the CEO. We also require that the CEO hold that position for all of the indicated fiscal year. From Compustat, we require annual earnings before extraordinary items and total assets. We exclude firms that change their fiscal year-ends in a

given year.[19] We obtain return data from CRSP.[20] Last, to reduce the effects of extreme observations, we delete firm-year observations in the top and bottom one percent of the distribution for $\Delta ln(Comp)$, ΔROA, and RET.[21] This results in a sample size of 9,014 firm-year observations for the years 1998-2005. The number of unique firms in our sample is 1,969.

Panel B of Table 1 shows the distribution of our sample by year and by whether the firm issued a forecast that year. For 5,731 firm years, firms issue a forecast and for 3,283 firm years, firms do not. The total number of observations per year is similar across time. The actual number of firms issuing guidance is highest immediately following passage of Reg FD, which was introduced in October 2000 and prohibits the selective disclosure of information by firms. Heflin, Subramanyam, and Zhang (2003) and Bailey et al. (2003) find an increase in forecast issuance following Reg FD. After peaking in the years 2001 and 2002, the number of firms issuing management guidance decreases modestly.

3.3. Descriptive statistics

Table 2 reports descriptive statistics about the variables used in our analysis separately for the sub-samples of 5,731 guidance and 3,283 non-guidance firm years. All differences between the guidance and non-guidance groups are statistically significant at the 5% (two-sided) level for both parametric (*t*-test) and non-parametric (Wilcoxon) tests, with the exceptions of *Loss*, $var(\Delta ROA)$, and *Leverage*.

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[19] Inferences are unaffected if we do not require that the CEO hold the position for the entire year or if we retain firms that change their fiscal year-ends.

[20] Like Feng and Koch (2008), we limit the sample to firms on the First Call Analyst database because the First Call Company Issued Guidelines ("CIG") database provides the best coverage of guidance for the firms that are also covered by First Call sell-side analysts. If First Call covers the firm as evidenced by their collection of the firm's analyst forecasts but reports no guidance for the firm, then it is more likely that the firm truly did not issue any guidance. This reduces the potential error associated with mis-classifying firms not included in the CIG database as non disclosers. To the extent that First Call chooses which firms to cover, this potential selection bias will not affect our inferences because all the firms in our sample were selected by First Call for coverage.

[21] As an alternative method to control for outliers, in untabulated analysis, we eliminate observations with a Cook's D value greater than 4/n, where n is the number of observations in the sample. Inferences are unchanged.

Table 3 reports correlations among the variables used in the multivariate tests. Spearman (Pearson) correlations are reported above (below) the diagonal. The table indicates that both performance measures are significantly positively correlated with $\Delta ln(Comp)$.

3.4. Results

Table 4 provides the results of estimating equation (4). Columns (1) to (3) present the results for the benchmark model in which we include the performance variables but not the management disclosure variables. The coefficients on ΔROA and *Ret* are positive and statistically significant. For example, in column (3) when both performance variables are included in the model, the ΔROA coefficient is 0.993 (*t*-statistic = 14.20) and the *Ret* coefficient is 0.189 (*t*-statistic = 19.83). Columns (4) to (6) present the results with the management guidance indicator variable. We find a significantly positive coefficient when *Guidance* is interacted with each of ΔROA and *Ret*. Our main results are reported in column (6) which shows that the respective coefficients are 0.339 and 0.069, both significant at the 1% level. In other words, the pay-performance relation is strengthened in the presence of management guidance, our primary empirical proxy for increased disclosure.[22]

In terms of economic significance, using the column (6) results, the non-guidance firms have a ΔROA coefficient of 0.727, while guidance firms have an incremental ΔROA coefficient of 0.339. This implies that guidance firms' compensation-accounting performance sensitivity is approximately 47% (i.e., 0.339/0.727) higher than for non-guidance firms. A similar calculation shows that the compensation-return performance sensitivity is approximately 47% higher for guidance firms.

[22] While not our main variable of interest, we note that the coefficient on *Guidance* (not interacted) is negative. The prediction of this coefficient is ambiguous (e.g., Hartzell and Starks 2003). On one hand, agency theory predicts that higher pay-performance sensitivity is associated with higher expected pay. On the other hand, if CEOs are awarded excessive compensation on average, increased monitoring associated with management guidance should lead to reduced executive pay.

Our tests for whether the degree of disclosure matters are presented in Table 5. The number of observations is smaller because we restrict this analysis to firms with guidance. Columns (1) to (3) present the results of including guidance frequency in the model. The coefficients on *Guide_Frequency* interacted with each of Δ*ROA* and *Ret* are positive and statistically significant at the 1% level. The results of including the number of consecutive guidance years are presented in columns (4) to (6). The coefficients on *Guide_Consistency* interacted with each of Δ*ROA* and *Ret* are also positive, albeit at lower levels of statistical significance. In column (4), when *Guide_Consistency* is interacted with only Δ*ROA*, the coefficient is significant at the 10% level. In column (5), the coefficient on the interaction of *Guide_Consistency* and *Ret* is significant at the 1% level. However, when both performance measures are interacted with *Guide_Consistency*, while the *Ret* interaction remains significant (at the 1% level), the Δ*ROA* interaction is no longer significant. These results imply that the pay-performance relation is increasing in management guidance frequency and modestly increasing in the number of consecutive years with guidance. More importantly, these results provide support for the idea that the pay-performance relation is increasing in the degree of disclosure.

4. Additional Analyses to Address Potential Endogeneity

Because issuing guidance is voluntary, our above tests are subject to endogeneity. We address this potential issue in three ways. First, we use a Heckman self-selection model. Second, we use a matched-sample design. Third, we take advantage of the external shock to management guidance generated by the passage of Reg FD to identify a subsample of firms in which increased disclosure is likely to be exogenous to the pay-performance relation. We discuss each approach in turn.

4.1. Heckman self-selection model

We follow Heckman (1979) and model the decision to disclose in a first-stage equation. Our first-stage model follows Ajinkya et al. (2005) and includes some additional controls:

$$\begin{aligned} Guidance_{it} = {} & a_0 + a_1\, ln(MV)_{it} + a_2\, Institution_{it} + a_3\, ln(Coverage)_{it} \\ & + a_4\, ln(NumShareholders)_{it} + a_5\, Litigate_{it} + a_6\, Leverage_{it} \\ & + a_7\, Book\text{-}Market_{it} + a_8\, Loss_{it} + a_9\, News_{it} + a_{10}\, Beta_{it} \\ & + a_{11}\, Var(\Delta ROA)_{it} + a_{12}\, R\&D_{it} + a_{13}\, ln(TradingVolume)_{it} \\ & + a_{14}\, Reg\ FD_t + a_{15}\, ln(CEOTenure)_{it} + a_{16}\, CompProp_{it} \\ & + a_{17}\, ln(Wealth)_{it} + a_{18}\, NumMtgs_{it} + \varepsilon_{it}. \end{aligned} \quad (7)$$

MV is the firm's equity market value measured at the beginning of the year. *Institution* is the percentage of the firm's common equity held by institutional investors (data from Thomson Financial). *Coverage* is the number of First Call analysts that issue earnings forecasts for the firm during the fiscal year. *NumShareholders* is the number of common shareholders from Compustat. *Litigate* is an indicator variable that equals one for all firms in the biotechnology, computers, electronics, and retail industries, and equals zero otherwise. *Leverage* is total debt divided by total assets. *Book-Market* is the ratio of book value to market value of equity for the firm. *Loss* is an indicator variable that equals one if the firm reported losses in the current period, and equals zero otherwise. *News* is an indicator variable that equals one if reported annual earnings per share (excluding extraordinary items) exceeds the first analyst forecast of annual earnings per share as reported on First Call, and equals zero otherwise. *Beta* is the equity beta for the fiscal period, calculated in yearly regressions of daily firm returns on daily market-wide (S&P 500) returns. Following Core et al. (2003), we define *Var(*Δ*ROA)* as the historical annual variance of Δ*ROA* for the ten years prior to and excluding year *t*; to do so we require at least six years of Δ*ROA* data. *R&D* is research and development expense scaled by sales, and is set equal to zero for firms with missing research and development expense. *TradingVolume* is the total number of shares traded during the fiscal year. *Reg FD* is an indicator variable that equals one

for years 2000 and beyond, and equals zero otherwise. *CEOTenure* is the difference in years between the current year and the year the CEO became CEO according to ExecuComp. We include three variables that proxy for better corporate governance. *CompProp* is the ratio of CEO stock price-based compensation to total compensation and *Wealth* is the value ($M) of shares held by the CEO, both following Nagar et al. (2003). *NumMtgs* is the number of board meetings during year *t*, according to ExecuComp. Note that requiring data to calculate these explanatory variables reduces the size of our sample to 5,873 observations.

In the second stage, we estimate our equation (4) model augmented with the Inverse Mills ratio (*InvMills*) from the first-stage model:

$$\Delta ln(Comp)_{it} = a_0 + a_1 \Delta ROA_{it} + a_2 \Delta ROA_{it} \times Guidance_{it} + a_3 Ret_{it} + a_4 Ret_{it} \times Guidance_{it} + a_5 Guidance_{it} + a_6 InvMills_{it} + \varepsilon_{it}. \quad (8)$$

Table 6, Panel A presents the results of estimating equation (7). Most of the coefficients on the explanatory variables are statistically significant, and if significant obtain the expected directions. An exception is the case of *ln(MV)* in which the coefficient value is negative and significant whereas Ajinkya et al. (2005) report a positive and significant coefficient. Panel B, column (1) present the results of estimating equation (8). The coefficient on the Inverse Mills ratio is statistically significant, consistent with self-selection affecting the change in compensation. The coefficients on *Guidance* interacted with performance remain positive and statistically significant. [23]

4.2. Matched sample

We also employ a matched-sample design. Heckman, Ichimura, and Todd (1997; 1998) provide theoretical support for matching as an econometric technique for addressing

[23] Inferences are unaffected if we include the interaction of the Inverse Mills variable in the regression (results not tabulated).

endogeneity. For each disclosing firm, we match it with a non-disclosing firm in the same year and in the same Fama and French (1997) industry, and we minimize the distance between the sizes of the disclosing and non-disclosing firms. Thus, we attempt to include firms that have similar incentives to issue guidance. These matching criteria further limit the size of our sample. The matched sample consists of 1,845 matched firm-year pairs of disclosers and non-disclosers, or 3,690 firm-year observations. Note that each non-disclosing firm-year observation is uniquely matched to one disclosing firm. Table 6, Panel B, Column (2) presents the results of estimating equation (4) for the matched sample. The coefficients on *Guidance* interacted with the performance measures are positive and statistically significant, corroborating those of the Table 4 full-sample tests above. The other coefficients of this regression also have signs and magnitudes consistent with the above results.

4.3. Increased guidance associated with Reg FD

We identify 84 firms with available data that initiate guidance in the year 2001, the year after the passage of Reg FD in 2000. This change in guidance is likely to be exogenous to the pay-performance relation. We re-estimate our equation (4) model for these firms, for the years 2001 and 2000, the years in which they provide and did not provide guidance, respectively. Column (3) of Table 6, Panel B shows that the coefficients on the interaction of *Guidance* with the performance measures are both positive and statistically significant (at the 5% level).

As a control, we estimate the same tests (results not tabulated) for a subsample of 109 firms that provide no guidance over the same period and create a pseudo "guidance" variable that equals one if the year is 2001. As expected, there is no evidence of an increase in the pay-performance relation for these firms.

In sum, our results are robust to controls for endogeneity using a Heckman self-selection model, a matched-pair design, and a subsample of firms experiencing an exogenous Reg FD-associated increase in disclosure.

5. Conference Calls as an Alternative Measure of Disclosure

In this section, we replicate our main tests using an alternative disclosure metric: conference calls. A number of studies use conference calls to study firms' voluntary disclosure decisions.[24] Corroborating evidence based on conference calls increases the generalizeability of our guidance-based results. In addition, conference-call evidence mitigates the possibility that our guidance-based measures are capturing some factor other than disclosure, and that this other factor is driving our results.[25]

We re-estimate our main tests for whether the strength of the pay-performance relation is increasing in the occurrence and the degree of disclosure (i.e., equations (4) to (6)) substituting analogous conference-call measures for the guidance-based measures. In addition, like management guidance, conference calls are voluntary and it is possible that the decision to have conference calls is related to the compensation decision. Thus, we also estimate Heckman self-selection tests (i.e., equations (7) and (8)) but predict conference-call instead of management-guidance occurrence. *Conference Call* equals one for firms that hold a conference call, and zero otherwise.

[24] See, e.g., Frankel et al. (1999), Bowen et al. (2002), Bushee et al. (2003), Bushee et al. (2004), Rogers and Van Buskirk (2008).

[25] To provide comprehensive coverage of conference call activity, like Rogers and Van Buskirk (2008), we combine conference call data from First Call and Best Calls. The First Call dataset includes conference call dates starting in the first quarter of 1995 and ending in the first quarter of 2003. Best Calls starts providing coverage in 1999 and continues until our sample period ends in 2005. Our conference call sample is restricted to the years of our study, 1998 to 2005. For 7,517 (1,497) firm-years in our sample, firms hold at least one conference call (no conference calls) during the year. The number of conference call firm-years is similar across time while the percentage of firms holding at least one conference call during a year increases over time, following a similar pattern as our management guidance data.

The results of these tests are presented in Table 7. Column (1) shows that the coefficient on *Conference Call* interacted with ΔROA is positive and statistically significant, as expected, while the coefficient on *Conference Call* interacted with *Ret* is not significant. In column (2) of Table 7 we present the second-stage results when we include the Inverse Mills ratio from the selection model into our tests. The coefficients on *Conference Call* interacted with both performance measures are positive and statistically significant, as expected. These conference call results thus provide additional corroborating evidence that disclosure strengthens the pay-performance relation.

6. Alternative Explanations

We discuss several alternative explanations in turn.

6.1. Timing of disclosure and compensation decisions ("reverse causality")

To strengthen the interpretation of our results that disclosure leads to a stronger pay-performance relation, we investigate whether we obtain our results in settings in which the disclosure decision more clearly precedes the compensation decision. The results of these tests are presented in Table 8, Panel A.

First, we consider only the bonus part of compensation. If salary is mostly set at the beginning of the year and bonus is determined mainly at the end of the year, then the disclosure decision could affect the bonus-performance relation more so than the salary-performance relation. Column (1) shows the results of estimating equation (4) using the change in the logarithm of bonus as the dependent variable. The coefficients on disclosure interacted with the two performance measures are positive and statistically significant.

Second, we estimate equation (4) but augment it with an interaction of *this year's* performance with *last year's* decision to disclose (i.e., an indicator variable equal to one if the

firm issues management guidance in the previous year). Column (2) shows these results. The coefficients on last year's disclosure interacted with the two performance measures are both positive and statistically significant. Column (3) provides the results when we further incorporate *next year's* disclosure decision into the regression. The coefficients on next year's disclosure interacted with the two performance measures are not statistically significant. These results suggest that last year's disclosure decision affects this year's pay-performance relation but next year's disclosure decision does not.

Overall, these results show that when the disclosure decision leads the compensation decision, we continue to find results that support our main empirical findings. Although these results cannot definitively prove causality, the evidence is certainly consistent with management guidance causing the pay-performance relation to strengthen.

6.2. Information environment

More information from a wide variety of sources, not necessarily from voluntary firm disclosures, could also lead to higher transparency, and hence a stronger pay-performance relation. We use firm size (e.g., Schaefer 1998), analyst coverage (e.g., Brennan and Subramanyam 1995), and institutional ownership (e.g., Hartzell and Starks 2003) as proxies for the information environment.

Table 8, Panel B presents the results of estimating the following regression:

$$\begin{aligned}\Delta ln(Comp)_{it} = {} & a_0 + a_1 \Delta ROA_{it} + a_2 \Delta ROA_{it} \times Guidance_{it} + a_3 \Delta ROA_{it} \times ln(MV)_{it} \\ & + a_4 \Delta ROA_{it} \times ln(Coverage)_{it} + a_5 \Delta ROA_{it} \times Institution_{it} + a_6 Ret_{it} \\ & + a_7 Ret_{it} \times Guidance_{it} + a_8 Ret_{it} \times ln(MV)_{it} + a_9 Guidance_{it} \\ & + a_{10} ln(MV)_{it} + a_{11} ln(Coverage)_{it} + a_{12} Institution_{it} + \varepsilon_{it}. \end{aligned} \quad (9)$$

The coefficients of firm-size interacted with the performance variables as well as the coefficients of institutional ownership interacted with the performance variables are all positive and statistically significant, consistent with expectations. The coefficient on analyst coverage

interacted with ΔROA is not significant, while the coefficient on analyst coverage interacted with *Ret* is negative and statistically significant.[26] The coefficients on *Guidance* interacted with the two performance variables remain positive and statistically significant. We conclude that our results are not attributable to the information environment as an alternative explanation.

6.3. Asymmetric sensitivity of compensation to performance

To test potential asymmetric response to poor and good performance (e.g., Skinner 1994; Gaver and Gaver 1998; Miller 2002; Hope 2003), we partition our sample in three ways: below and above the median change in ROA; below and above the median returns; and, negative and positive ROA. Table 8, Panel C shows the results of estimating equation (4), our main test, separately for each of the six subsamples. The coefficients on the interaction of guidance with performance are all positive, and statistically significant in most cases, as expected.[27]

6.4. Investment opportunities

The literature has studied the effects of investment opportunities on the pay-performance relation (e.g., Lambert and Larcker 1987; Baber et al. 1996 Core et al. 2003) In addition to the book-to-market ratio, leverage and firm age are also related to firms' investment opportunities (Leone et al. 2006). We test whether our results are sensitive to including these three variables by estimating:

[26] The three information-environment proxies are highly correlated. For example, from Table 3, the Pearson correlation between firm size and analyst coverage is 0.69. In untabulated analysis, when we include each information environment proxy separately each obtains the expected positive sign.

[27] In a related idea, Leone et al. (2006) show that cash compensation is more sensitive to negative than to positive stock returns. They argue that their results are consistent with boards exercising discretion to reduce costly ex-post settling up in cash compensation paid to CEOs. To test whether our results are sensitive to this asymmetric sensitivity to bad news, we create an indicator variable that equals one if *Ret* is negative and zero otherwise. We then estimate (results not tabulated) equation (4) augmented with the indicator variable and an interaction of this indicator variable with both performance measures. The coefficients on the interaction of guidance and the two performance variables remain positive and statistically significant as expected.

$$\begin{aligned}\Delta ln(Comp)_{it} = {} & a_0 + a_1 \Delta ROA_{it} + a_2 \Delta ROA_{it} \times Guidance_{it} + a_3 \Delta ROA_{it} \times Book\text{-}Market_{it} \\ & + a_4 \Delta ROA_{it} \times Leverage_{it} + a_5 \Delta ROA_{it} \times FirmAge_{it} + a_6 Ret_{it} \\ & + a_7 Ret_{it} \times Guidance_{it} + a_8 Ret_{it} \times Book\text{-}Market_{it} \\ & + a_9 Ret_{it} \times Leverage_{it} + a_{10} Ret_{it} \times FirmAge_{it} + a_{11} Guidance_{it} \\ & + a_{12} Book\text{-}Market_{it} + a_{13} Leverage_{it} + a_{14} FirmAge_{it} + \varepsilon_{it}. \end{aligned} \quad (11)$$

Table 8, Panel D shows that the pay-performance relation continues to be stronger for firms that issue guidance.[28] Hence, these additional control variables have little effect on our results.

7. Conclusion

We examine whether greater transparency leads to improved evaluation and rewarding of management. We posit that disclosure improves board effectiveness at monitoring executive compensation. Consistent with this assertion, we predict and find higher sensitivity of cash compensation to performance – both accounting and stock returns – for firms that issue management guidance, our primary empirical proxy for higher disclosure. In a sub-sample of firms that issue guidance, we predict and find that the sensitivity of compensation to performance is increasing in the frequency of management guidance events during the year and in the number of consecutive years that firms have issued management guidance. The results are robust to a wide variety of alternative tests.

Our analysis contributes to the literature in several ways. First, we examine how agency problems can be mitigated through greater disclosure. Several empirical studies relate better disclosure to better firm performance and implicitly assume that disclosure leads to better monitoring, which in turn leads to better performance. By focusing on the pay-performance relation, we establish a more direct link between disclosure and monitoring. Second, we contribute to the limited literature on disclosure and corporate governance. These papers focus

[28] The prediction for the interaction of firm age and performance is ambiguous. On one hand, older firms on average have richer information environments, so firm age could proxy for the information environment, which based on the analysis above is expected to strengthen the pay-performance relation. On the other hand, younger firms should have greater investment opportunities, which could lead to an expectation that firm age is negatively related to the pay-performance relation. Our results are more consistent with the former explanation.

on incentives or the determinants to disclose, while our paper is about the effects of disclosure. Third, our study informs the current debate about the role of issuing guidance. Critics have called for an end to management guidance, purporting that such disclosure creates incentives for firms to manage earnings upwards, distort earnings, or act myopically. We are agnostic about the costs of management guidance and do not suggest an equilibrium amount of guidance. We simply point out that improved monitoring of CEOs represents a potential benefit that should be considered in analyses of management guidance.

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APPENDIX
Variable Definitions

Variable		Definition
Beta	=	equity beta for the fiscal period, calculated in yearly regressions of daily firm returns on daily market-wide (S&P 500) returns.
Book-Market	=	ratio of book value to market value of equity for the firm.
CEO Tenure	=	the difference in years between the current year and the year the CEO became CEO, according to ExecuComp.
Comp	=	CEO cash compensation, measured as the sum of salary and bonus.
CompProp	=	ratio of CEO stock price-based compensation to total compensation.
Conference Call	=	indicator variable that equals one if the firms holds a conference call, and zero otherwise.
Coverage	=	number of First Call analysts that issue earnings forecasts for the firm during the fiscal year.
FirmAge	=	fiscal year of the observation minus the year the firm first appeared on CRSP.
Guidance	=	indicator variable that equals one if the firms issues a management earnings forecast, and zero otherwise.
Guide_Consistency	=	number of consecutive years in which the firm has provided a forecast, including the current year.
Guide_Frequency	=	number of management earnings forecasts issued by the firm during the year.
Institution	=	percentage of the firm's common equity held by institutional investors.
InvMills	=	Inverse Mills ratio from the first stage of a model that predicts whether firms issue management guidance.
Leverage	=	total debt (i.e., total long-term plus debt in current liabilities) divided by total assets.
Litigate	=	indicator variable that equals one for all firms in the biotechnology (SIC codes 2833-2836), R&D services (8731-8734), programming (7371-7379), computers (3570-3577), electronics (3600-3674) and retail (5200-5961) industries, and zero otherwise, as in Ajinkya et al. (2005).
Loss	=	indicator variable that equals one if the firm reports a loss in the current period, and zero otherwise.
MV	=	equity market value (in $ millions) measured at the beginning of the year.
News	=	indicator variable that equals one if current EPS is greater than the first analyst forecast of annual earnings per share as reported on First Call, and zero otherwise.
NumMtgs	=	number of board meetings during the year, according to ExecuComp.
NumShareholders	=	number of common shareholders, according to Compustat.
Reg FD	=	indicator variable that equals one for years 2000 and later, and zero otherwise.
R&D	=	research and development expense scaled by sales, and is set equal to zero for firms with missing research and development expense.

APPENDIX (Continued)
Variable Definitions

Ret	=	annual total raw return to shareholders during the fiscal year adjusted for the value-weighted return on a market portfolio from CRSP.
ROA	=	net income before extraordinary items divided by lagged total assets.
TradingVolume	=	total number of shares (000's) traded during the fiscal year.
Var(Ret)	=	historical annual variance of *Ret* for the ten years prior to and excluding year *t* and is calculated only for firms with at least six years of *Ret* data.
*Var(*Δ*ROA)*	=	historical annual variance of Δ*ROA* for the ten years prior to and excluding year *t* and is calculated only for firms with at least six years of Δ*ROA* data.
Wealth	=	value ($M) of shares held by the CEO.
Δ	=	symbol for change in the variable.
ln( )	=	the natural logarithm of a variable.

TABLE 1
Sample Selection

This table summarizes the process used to select our sample (Panel A), and the breakdown of our sample by whether the firm issued management guidance and by year (Panel B).

Panel A: Sample selection procedure

Criteria	Number of Observations
Total CEO-year observations in ExecuComp for which the CEO was in office for all of the year and there was no change in fiscal year	12,973
Less:	
Observations with insufficient data to calculate change in total cash compensation	2,486
Observations that could not be matched with CRSP	410
Observations with insufficient data on Compustat	84
Observations where the absolute value of the change in log (cash compensation) exceeds 2	46
Observations where the firm-year is not in the First Call Analyst database	411
Remove firms with top/bottom 1% of $\Delta ln(Comp)$, *Ret*, and ΔROA	522
Total observations in full sample from 1998 to 2005	9,014

Panel B: Distribution of observations by year

Year	Guidance Firms	Non-Guidance Firms	Total
1998	530	525	1,055
1999	552	506	1,058
2000	625	467	1,092
2001	849	295	1,144
2002	843	339	1,182
2003	817	355	1,172
2004	794	388	1,182
2005	721	408	1,129
Total	5,731	3,283	9,014

TABLE 2
Descriptive Statistics

This table provides descriptive statistics for the 9,014 firm-years in our sample (see Table 1 for sample selection procedure). All differences between the management guidance and non-guidance firms are statistically significant at the 5% level for both parametric (*t*-test) and non-parametric (Wilcoxon) tests, with the exceptions of *Loss*, *var(ΔROA)* and *Leverage*, which are not significantly different. A firm is classified as a management-guidance firm if the management issues an earnings forecast during the year, and is classified as a non-guidance firm otherwise. Variables are defined in the Appendix.

	Guidance Firm Years				Non-Guidance Firm Years			
Variable	*N*	Mean	STD	Median	*N*	Mean	STD	Median
Comp	5,731	1,616	1,737	1,155	3,283	1,484	1,755	1,000
Δln(Comp)	5,731	0.07	0.36	0.07	3,283	0.11	0.31	0.08
ROA	5,731	0.06	0.10	0.05	3,283	0.05	0.11	0.04
ΔROA	5,731	-0.008	0.069	-0.004	3,283	0.003	0.066	0.001
Ret	5,731	0.07	0.43	0.01	3,283	0.11	0.47	0.02
MV	5,724	7,898	25,402	1,642	3,280	5,558	17,488	1,235
Institution	5,205	0.67	0.18	0.70	2,975	0.62	0.20	0.63
Coverage	5,731	10.78	6.59	9.00	3,283	9.06	6.88	7.00
NumShareholders	5,572	1.63	1.94	1.69	3,114	1.42	1.80	1.36
Litigate	5,731	0.29	0.45	0.00	3,283	0.19	0.40	0.00
Book-Market	5,664	0.51	0.39	0.43	3,226	0.53	0.40	0.46
Loss	5,731	0.13	0.34	0.00	3,283	0.14	0.34	0.00
News	5,731	0.47	0.50	0.00	3,283	0.53	0.50	1.00
Beta	5,619	0.96	0.51	0.89	3,210	0.89	0.53	0.80
Reg FD	5,731	0.81	0.39	1.00	3,283	0.69	0.46	1.00
Var(Ret)	4,787	0.43	2.17	0.12	2,790	0.32	1.09	0.11
Var(ΔROA)	4,787	0.04	0.87	0.001	2,790	0.03	0.54	0.001
R&D	5,731	0.04	0.28	0.00	3,283	0.08	1.28	0.00
TradingVolume	5,666	2,821	7,758	962	3,247	1,814	6,638	524
CEO Tenure	5,487	7.35	6.97	5.00	3,045	8.59	8.31	6.00
CompProp	5,702	44.99	28.24	48.05	3,265	38.77	28.38	40.70
Wealth	5,731	90.46	960.05	0.59	3,283	152.49	2,006.01	1.60
NumMtgs	5,547	7.27	2.99	7.00	3,163	6.82	2.87	6.00
Leverage	5,710	0.23	0.17	0.23	3,276	0.23	0.20	0.21
FirmAge	5,615	23.7	19.5	17.0	3,168	22.9	17.2	19.0
Guide_Frequency	5,731	3.36	2.25	3.00	3,283	0.00	0.00	0.00
Guide_Consistency	5,731	3.56	2.31	3.00	3,283	0.00	0.00	0.00

TABLE 3
Correlations

This table reports correlations for the variables in our sample (see Table 1 for sample selection procedure). Spearman (Pearson) correlations are reported in the upper (lower) diagonal. Variables are defined in the Appendix. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively.

	Δln(Comp)	*ΔROA*	*Ret*	*ln(MV)*	*ln(Coverage)*	*Book-Market*	*Leverage*	*FirmAge*	*Guidance*
Δln(Comp)		0.35***	0.29***	0.01	0.05***	-0.12***	0.01	0.02*	-0.05***
ΔROA	0.27***		0.26***	0.02	0.04***	-0.13***	-0.05***	0.05***	-0.07***
Ret	0.25***	0.19***		-0.04***	0.02**	-0.27***	-0.06***	-0.02*	-0.03***
ln(MV)	-0.01	0.01	-0.09***		0.72***	-0.36***	0.08***	0.29***	0.10***
ln(Coverage)	0.04***	0.02**	0.00	0.69***		-0.29***	0.00	0.07***	0.15***
Book-Market	-0.11***	-0.09***	-0.25***	-0.36***	-0.28***		0.16***	0.06***	-0.03**
Leverage	0.00	-0.01	-0.06***	0.05***	-0.01	0.12***		0.20***	0.04***
FirmAge	0.02**	0.05***	-0.05***	0.35***	0.09***	-0.01	0.17***		-0.01
Guidance	-0.06***	-0.07***	-0.04***	0.10***	0.18***	-0.03**	0.01	0.02*	

TABLE 4
Management Guidance Issuance and the Pay-Performance Relation

This table reports the test results of the difference in pay-performance sensitivity for firms that issue and do not issue management guidance. The sample includes all firms. We estimate various specifications of the following:

$$\Delta ln(Comp)_{it} = a_0 + a_1 \Delta ROA_{it} + a_2 \Delta ROA_{it} \times Guidance_{it} + a_3 Ret_{it} + a_4 Ret_{it} \times Guidance_{it} + a_5 Guidance_{it} + \varepsilon_{it}.$$

Year and industry fixed effects are included for each model but not tabulated. We estimate each model as a panel and cluster the standard errors at the firm level. Coefficient *t*-statistics are in parentheses. Significance levels are based on one-tailed tests where there is a prediction for the sign of the coefficient and based on two-tailed tests otherwise. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in the Appendix.

	Predicted Sign	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	?	0.046 (1.43)	0.068* (1.91)	0.076** (2.25)	0.057* (1.78)	0.082** (2.29)	0.085** (2.53)
ΔROA	+	1.267*** (18.19)		0.993*** (14.20)	0.912*** (8.66)		0.727*** (6.92)
$\Delta ROA \times Guidance$	+				0.525*** (4.01)		0.339*** (2.96)
Ret	+		0.226*** (23.86)	0.189*** (19.83)		0.170*** (12.71)	0.146*** (10.81)
Ret × *Guidance*	+					0.089*** (5.23)	0.069*** (4.02)
Guidance	?				-0.028*** (-4.24)	-0.033*** (-4.91)	-0.023*** (-3.53)
Year & Industry Effects		Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs.		9,014	9,014	9,014	9,014	9,014	9,014
Adj. R^2		9.08%	10.57%	14.11%	9.46%	11.00%	14.54%

TABLE 5
Frequency and Consistency of Management Guidance and the Pay-Performance Relation

This table reports the test results of the difference in pay-performance sensitivity for firms that issue management guidance more frequently during the year (i.e., guidance frequency) and over a larger number of consecutive years (i.e., guidance consistency). The sample includes only firms that issue management guidance. We estimate various specifications of the following:

$$\Delta ln(Comp)_{it} = a_0 + a_1 \Delta ROA_{it} + a_2 \Delta ROA_{it} \times ln(Guide\_Frequency)_{it} + a_3 Ret_{it} + a_4 Ret_{it} \times ln(Guide\_Frequency)_{it} + a_5 ln(Guide\_Frequency)_{it} + \varepsilon_{it}.$$

$$\Delta ln(Comp)_{it} = a_0 + a_1 \Delta ROA_{it} + a_2 \Delta ROA_{it} \times ln(Guide\_Consistency)_{it} + a_3 Ret_{it} + a_4 Ret_{it} \times ln(Guide\_Consistency)_{it} + a_5 ln(Guide\_Consistency)_{it} + \varepsilon_{it}.$$

Year and industry fixed effects are included for each model but not tabulated. We estimate each model as a panel and cluster the standard errors at the firm level. Coefficient *t*-statistics are in parentheses. Significance levels are based on one-tailed tests where there is a prediction for the sign of the coefficient and based on two-tailed tests otherwise. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in the Appendix.

	Predicted Sign	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	?	0.049***	0.074***	0.081***	0.021	0.042***	0.056***
		(3.20)	(4.86)	(5.41)	(1.38)	(2.73)	(3.74)
ΔROA	+	0.613***		0.561***	1.095***		0.930***
		(2.89)		(2.58)	(5.13)		(4.36)
$\Delta ROA \times ln(Guide\_Frequency)$	+	0.653***		0.411***			
		(4.08)		(2.57)			
$\Delta ROA \times ln(Guide\_Consistency)$	+				0.267*		0.122
					(1.63)		(0.74)
Ret	+		0.088***	0.086***		0.148***	0.133***
			(2.95)	(2.91)		(4.70)	(4.28)
$Ret \times ln(Guide\_Frequency)$	+		0.146***	0.110***			
			(6.21)	(4.76)			
$Ret \times ln(Guide\_Consistency)$	+					0.096***	0.071***
						(3.94)	(2.93)
$ln(Guide\_Frequency)$	?	-0.000	-0.015	-0.009			
		(-0.04)	(-1.59)	(-0.91)			
$ln(Guide\_Consistency)$	?				0.028***	0.019**	0.018**
					(3.24)	(2.20)	(2.13)
Year & Industry Effects		Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs.		5,731	5,731	5,731	5,731	5,731	5,731
Adj. R^2		10.33%	12.65%	16.59%	10.15%	12.35%	16.23%

TABLE 6
Additional Analyses to Address Potential Endogeneity
(Table description is below.)

Panel A: First-stage model predicting whether firms issue management guidance

	Predicted Sign	Coefficient (Standard error)
Intercept	?	-1.700*** (0.23)
ln(MV)	+	-0.117*** (0.02)
Institution	+	0.709*** (0.11)
ln(Coverage)	+	0.143*** (0.04)
ln(NumShareholders)	+	0.035*** (0.01)
Litigate	?	0.356*** (0.05)
Leverage	?	0.570*** (0.11)
Book-Market	+	-0.029 (0.05)
Loss	–	-0.206*** (0.07)
News	–	-0.216*** (0.04)
Beta	–	-0.102*** (0.04)
Var(ΔROA)	–	0.001 (0.02)
R&D	–	-0.713*** (0.18)
ln(TradingVolume)	?	0.137*** (0.02)
Reg FD	+	0.345*** (0.04)
ln(CEOTenure)	?	-0.067*** (0.02)
CompProp	+	0.001 (0.00)
ln(Wealth)	+	-0.004 (0.01)
NumMtgs	+	0.022*** (0.01)
No. of Obs.		5,873
Log-Likelihood		564.21
% Concordant		67.3

TABLE 6 (Continued)

Panel B: Pay-performance relation

	Predicted Sign	Controls for Self-Selection (1)	Matched Sample (2)	Initiate Guidance Post Reg FD (3)
Intercept	?	0.078***	0.093***	0.089**
		(4.29)	(6.77)	(2.51)
ΔROA	+	0.843***	0.776***	0.049
		(5.61)	(5.38)	(0.10)
$\Delta ROA \times Guidance$	+	0.511***	0.379**	1.427**
		(2.72)	(1.84)	(2.01)
Ret	+	0.160***	0.158***	0.069*
		(8.44)	(8.61)	(1.64)
Ret × *Guidance*	+	0.069***	0.050**	0.170**
		(2.98)	(1.96)	(1.67)
Guidance	?	-0.030***	-0.034***	-0.125***
		(-3.53)	(-3.32)	(-2.67)
InvMills	?	0.021		
		(1.45)		
Year & Industry Effects		Yes	Yes	No
No. of Obs.		5,873	3,690	168
Adj. R^2		15.83%	13.35%	24.47%

This table reports the results of tests that address the potential endogeneity of management's decision to disclose. Panel A presents the results of estimating the following first-stage logistic model that predicts whether management issues guidance:

$$Guidance_{it} = a_0 + a_1\, ln(MV)_{it} + a_2\, Institution_{it} + a_3\, ln(Coverage)_{it} + a_4\, ln(NumShareholders)_{it} + a_5\, Litigate_{it} + a_6\, Leverage_{it} + a_7\, Book\text{-}Market_{it} + a_8\, Loss_{it} + a_9\, News_{it} + a_{10}\, Beta_{it} + a_{11}\, Var(\Delta ROA)_{it} + a_{12}\, R\&D_{it} + a_{13}\, ln(TradingVolume)_{it} + a_{14}\, Reg\ FD_t + a_{15}\, ln(CEOTenure)_{it} + a_{16}\, CompProp_{it} + a_{17}\, ln(Wealth)_{it} + a_{18}\, NumMtgs_{it} + \varepsilon_{it}.$$

The sample includes all firms with sufficient data to calculate the independent variables. Coefficient standard errors are in parentheses. Panel B, column (1) presents the results of the following second-stage model, which controls for self-selection by augmenting equation (4) with the Inverse Mills ratio:

$$\Delta ln(Comp)_{it} = a_0 + a_1 \Delta ROA_{it} + a_2 \Delta ROA_{it} \times Guidance_{it} + a_3\, Ret_{it} + a_4\, Ret_{it} \times Guidance_{it} + a_5\, Guidance_{it} + a_6\, InvMills_{it} + \varepsilon_{it}.$$

Panel B, column (2) presents the results of estimating equation (4) for a matched sample of firms. Disclosing firms are matched with non-disclosing firms based on year, industry membership, and size. The sample excludes disclosing firms that fail to match to a non-disclosing firm and vice versa. Panel B, column (3) present the results of estimating equation (4) for 84 firms that initiate guidance in 2001, the year following the passage of Reg FD. The sample is restricted to the years 2000 and 2001.

For Panel B, year and industry fixed effects are included where indicated for each model but not tabulated. We estimate each model as a panel and cluster the standard errors at the firm level. Coefficient *t*-statistics are in parentheses. Significance levels are based on one-tailed tests where there is a prediction for the sign of the coefficient and based on two-tailed tests otherwise. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in the Appendix.

TABLE 7
Re-Estimation of Main Tests Using Conference Call Measures

This table reports the results of replicating the main tests using conference calls as a proxy for disclosure. Column (1) reports the results of estimating equations(4), using conference call measures that are defined analogously to the respective guidance-based disclosure measures. The sample for column (1) test includes all firms, conference-call and non-conference-call holding firm years. Column (2) presents the results of a second-stage model from a Heckman self-selection test. The first-stage model (not tabulated) predicts conference call occurrence and includes the same set of independent variables used in equation (7) to predict management guidance occurrence. The sample includes all firms with sufficient data to calculate the independent variables. Year and industry fixed effects are included for each model but not tabulated. We estimate each model as a panel and cluster the standard errors at the firm level. Coefficient *t*-statistics are in parentheses. Significance levels are based on one-tailed tests where there is a prediction for the sign of the coefficient and based on two-tailed tests otherwise. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in the Appendix.

	Predict. Sign	(1)	(2)
Intercept	?	0.080***	0.0704***
		(8.35)	(3.38)
ΔROA	+	0.683***	0.799***
		(4.53)	(3.76)
$\Delta ROA \times$ *Conference Call*	+	0.367**	0.451**
		(2.19)	(1.89)
Ret	+	0.183***	0.170***
		(9.20)	(6.48)
Ret × *Conference Call*	+	0.007	0.042*
		(0.30)	(1.49)
Conference Call	?	-0.006	-0.002
		(-0.78)	(-0.18)
InvMills	?		0.014
			(0.60)
Year & Industry Effects		Yes	Yes
No. of Obs.		9,014	5,889
Adj. R^2		13.69%	15.42%

TABLE 8
Alternative Explanations

This table investigates alternative explanations for our Table 4 result that the pay-performance sensitivity is stronger for firms that issue management guidance. The sample includes all firms with available data.

In panel A, we examine the timing of disclosure and compensation decisions. Column (1) shows the results of estimating equation (4) using the change in the logarithm of bonus as the dependent variable. Column (2) shows the results of estimating equation (4) but augmenting it with an interaction of this year's performance with last year's decision to disclose. Column (3) provides the results when we further incorporate next year's disclosure decision into the regression.

In panel B, we include variables that proxy for the information environment. We estimate:

$$\begin{aligned}\Delta ln(Comp)_{it} = {} & a_0 + a_1 \Delta ROA_{it} + a_2 \Delta ROA_{it} \times Guidance_{it} + a_3 \Delta ROA_{it} \times ln(MV)_{it} + a_4 \Delta ROA_{it} \times ln(Coverage)_{it} \\ & + a_5 \Delta ROA_{it} \times Institution_{it} + a_6 Ret_{it} + a_7 Ret_{it} \times Guidance_{it} + a_8 Ret_{it} \times ln(MV)_{it} + a_9 Guidance_{it} \\ & + a_{10} ln(MV)_{it} + a_{11} ln(Coverage)_{it} + a_{12} Institution_{it} + \varepsilon_{it}.\end{aligned}$$

In Panel C, we include variables that proxy for noise in our performance variables. We estimate:

$$\begin{aligned}\Delta ln(Comp)_{it} = {} & a_0 + a_1 \Delta ROA_{it} + a_2 \Delta ROA_{it} \times Guidance_{it} + a_3 \Delta ROA_{it} \times [Var(\Delta ROA)/Var(Ret)]_{it} + a_4 Ret_{it} \\ & + a_5 Ret_{it} \times Guidance_{it} + a_6 Ret_{it} \times [Var(\Delta ROA)/Var(Ret]_{it} + a_7 Guidance_{it} \\ & + a_8 [Var(\Delta ROA)/Var(Ret)]_{it} + \varepsilon_{it}.\end{aligned}$$

In Panel D, we test for whether our results are robust to an asymmetric sensitivity of compensation to performance. We partition our sample in three ways: below and above the median change in ROA; below and above the median returns; and, negative and positive ROA. We estimate equation (4), our main test, separately for each of the six subsamples.

In Panel E, we include other variables related to firms' investment opportunities that have been shown to affect the pay-performance relation. We estimate:

$$\begin{aligned}\Delta ln(Comp)_{it} = {} & a_0 + a_1 \Delta ROA_{it} + a_2 \Delta ROA_{it} \times Guidance_{it} + a_3 \Delta ROA_{it} \times Book\text{-}Market_{it} + a_4 \Delta ROA_{it} \times Leverage_{it} \\ & + a_5 \Delta ROA_{it} \times FirmAge_{it} + a_6 Ret_{it} + a_7 Ret_{it} \times Guidance_{it} + a_8 Ret_{it} \times Book\text{-}Market_{it} \\ & + a_9 Ret_{it} \times Leverage_{it} + a_{10} Ret_{it} \times FirmAge_{it} + a_{11} Guidance_{it} + a_{12} Book\text{-}Market_{it} \\ & + a_{13} Leverage_{it} + a_{14} FirmAge_{it} + \varepsilon_{it}.\end{aligned}$$

Year and industry fixed effects are included for each model but not tabulated. We estimate each model as a panel and cluster the standard errors at the firm level. Coefficient *t*-statistics are in parentheses. Significance levels are based on one-tailed tests where there is a prediction for the sign of the coefficient and based on two-tailed tests otherwise. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in the Appendix.

TABLE 8 (Continued)

Panel A: Timing of disclosure and compensation decision

	Predicted Sign	Dependent Variable Δ*ln(Bonus)* (1)	Δ*ln(Comp)* (2)	Δ*ln(Comp)* (3)
Intercept	?	-0.001 (-0.01)	0.085*** (9.66)	0.080*** (9.19)
Δ*ROA*	+	9.072*** (6.01)	0.636*** (5.95)	0.612*** (5.30)
Δ*ROA* × *Guidance*	+	2.805* (1.45)	0.285** (2.09)	0.257** (1.78)
Δ*ROA* × *Guidance Last Year*	+		0.282** (2.19)	0.264** (2.01)
Δ*ROA* × *Guidance Next Year*	+			0.077 (0.53)
Ret	+	1.401*** (7.63)	0.135*** (9.71)	0.135*** (8.57)
Ret × *Guidance*	+	0.835*** (3.47)	0.057*** (3.14)	0.057*** (3.01)
Ret × *Guidance Last Year*	+		0.030** (1.72)	0.031** (1.74)
Ret × *Guidance Next Year*	+			-0.002 (-0.09)
Guidance	?	-0.381*** (-4.03)	-0.038*** (-4.60)	-0.045*** (-4.75)
Guidance Last Year	?		0.032*** (3.67)	0.028*** (3.18)
Guidance Next Year	?			0.017** (1.98)
Year & Industry Effects		Yes	Yes	Yes
No. of Obs.		9,014	9,014	9,014
Adj. R^2		7.31%	14.34%	14.38%

TABLE 8 (Continued)

Panel B: Information environment

	Predicted Sign	
Intercept	**?**	0.105*** (5.72)
Δ*ROA*	**+**	-0.601* (-1.80)
Δ*ROA* × *Guidance*	**+**	0.287** (2.17)
Δ*ROA* × *ln(MV)*	**+**	0.094* (1.54)
Δ*ROA* × *ln(Coverage)*	**+**	-0.075 (-0.63)
Δ*ROA* × *Institution*	**+**	1.508*** (4.94)
Ret	**+**	-0.053 (-1.15)
Ret × *Guidance*	**+**	0.066*** (3.76)
Ret × *ln(MV)*	**+**	0.031*** (4.00)
Ret × *ln(Coverage)*	**+**	-0.036** (-2.26)
Ret × *Institution*	**+**	0.083** (1.86)
Guidance	**?**	-0.025*** (-3.64)
ln(MV)	**?**	-0.008*** (-3.13)
ln(Coverage)	**?**	0.022*** (4.33)
Institution	**?**	-0.002*** (-0.15)
Year & Industry Effects		Yes
No. of Obs.		8,171
Adj. R^2		15.00%

TABLE 8 (Continued)

Panel C: Asymmetric sensitivity of compensation to performance

		ΔROA		*Ret*		*ROA*	
	Predicted Sign	< median (1)	> median (2)	< median (3)	> median (4)	< 0 (5)	> 0 (6)
Intercept	**?**	0.039*** (3.00)	0.145*** (11.36)	0.099*** (6.78)	0.125*** (7.25)	0.057* (1.85)	0.089*** (9.74)
ΔROA	**+**	0.252** (1.75)	0.193* (1.28)	0.633*** (4.45)	0.769*** (5.43)	0.338*** (2.52)	0.975*** (6.54)
ΔROA × *Guidance*	**+**	0.386** (2.11)	0.330* (1.60)	0.175 (1.05)	0.674*** (3.45)	0.258* (1.39)	0.556*** (3.03)
Ret	**+**	0.136*** (7.34)	0.127*** (7.14)	0.208*** (4.74)	0.083*** (4.40)	0.105*** (3.54)	0.150*** (10.27)
Ret × *Guidance*	**+**	0.090*** (3.76)	0.042** (1.88)	0.104** (1.89)	0.043** (1.86)	0.062* (1.51)	0.068*** (3.72)
Guidance	**?**	-0.016 (-1.40)	-0.020* (-1.85)	-0.013 (-0.81)	-0.017 (-1.36)	-0.017 (-0.77)	-0.028*** (-4.04)
Year & Industry Effects		Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs.		4,507	4,507	4,508	4,506	1,176	7,838
Adj. R^2		9.18%	6.19%	8.95%	11.92%	10.55%	14.39%

TABLE 8 (Continued)

Panel D: Investment opportunities

	Predicted Sign	
Intercept	**?**	0.089***
		(8.37)
Δ*ROA*	**+**	0.239*
		(1.51)
Δ*ROA* × *Guidance*	**+**	0.440***
		(3.27)
Δ*ROA* × *Book-Market*	**?**	0.184
		(0.93)
Δ*ROA* × *Leverage*	**?**	0.395
		(1.05)
Δ*ROA* × *FirmAge*	**?**	0.022***
		(4.21)
Ret	**+**	0.103***
		(5.67)
Ret × *Guidance*	**+**	0.060***
		(3.60)
Ret × *Book-Market*	**?**	-0.013
		(-1.05)
Ret × *Leverage*	**?**	1.224**
		(2.26)
Ret × *FirmAge*	**?**	0.002***
		(2.87)
Guidance	**?**	-0.020***
		(-3.10)
Book-Market	**?**	-0.023***
		(2.60)
Leverage	**?**	0.056***
		(3.16)
FirmAge	**?**	0.000
		(1.24)
Year & Industry Effects		Yes
No. of Obs.		8,602
Adj. R^2		15.44%