

**Firm's Information Environment**  
**and**  
**Forward-Looking Disclosures in the MD&A**

Volkan Muslu <sup>a</sup>

Suresh Radhakrishnan <sup>a</sup>

K. R. Subramanyam <sup>b</sup>

Dongkuk Lim <sup>a</sup>

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**Abstract**

We examine the incentives and consequences of firms providing more forward-looking and non-forward-looking disclosures in the MD&A sections of their annual reports and document the following findings. First, firms that have earnings guidance or analyst coverage increase their forward-looking and non-forward-looking disclosures in the MD&A more than other firms do. Second, firms that miss earnings thresholds increase their forward-looking and non-forward-looking disclosures in the MD&A more than other firms do. Third, increases in forward-looking disclosures on average help investors to anticipate future earnings information, whereas increases in non-forward-looking disclosures do not. Fourth, increases in forward-looking disclosures do not help investors to anticipate future earnings information for firms that do not have any earnings guidance or analyst coverage, even though these are the firms where there is likely to be a dearth of forward-looking information. Fifth, increases in forward-looking disclosures help investors anticipate future earnings information for firms that miss earnings thresholds than other firms. Finally, forward-looking disclosures that relate to accounting information are incrementally informative over and above the general effect of forward-looking disclosures.

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<sup>a</sup> University of Texas at Dallas, <sup>b</sup> University of Southern California

## 1. Introduction

The Securities and Exchange Commission (SEC) requires company annual reports to include a Management Discussion and Analysis (MD&A) section, which will provide forward-looking information to investors. Hence, the MD&A is arguably one of the most important sections of the annual report for investors (Knutson 1993; Rogers and Grant 1997). However, the regulators have been critical of the quantity of forward-looking information relative to the non-forward-looking information in the MD&A (Tavcar 1998; SEC 2003, 2005). Accordingly, the objective of this study is to examine (1) whether firms with poor information environments provide more forward-looking and non-forward-looking information in the MD&A, and (2) whether more forward-looking and non-forward-looking information in the MD&A helps investors to better anticipate future earnings.

The quality of a company's information environment should affect the quality of the company's voluntary disclosures; in our case how the company explains past performance and how it provides prospective information (Ajinkiya and Gift 1984; Lang and Lundholm 1993). Therefore we examine the effect of company's following two information environment characteristics: (i) availability of supplemental corporate information, and (ii) attainment of earnings thresholds. First, we ask whether supplemental corporate information induces managers to provide more or less forward-looking and non-forward-looking MD&A disclosures. We divide companies into two groups: *dark companies* that have no analyst coverage or earnings guidance and *non-dark companies* that have either analyst coverage or earnings guidance (Lang and Lundholm 1993, 1996). For dark companies, the SEC filings are the sole medium of information flow to the capital markets, and therefore managers have strong incentives to provide information through the MD&A. Yet, dark companies can have large costs of disclosure,

potentially making the net benefit of MD&A disclosures negative. Second, we ask whether managers are motivated to make more MD&A disclosures when companies miss the three important earnings thresholds identified in the literature, i.e., positive earnings, positive changes in earnings, and consensus analyst forecasts (Degeorge et al. 1999; Brown and Caylor 2005). In their survey of CFOs, Graham et al. (2005) document managers' widespread perception that investors interpret missing earnings targets as a signal for uncertain future earnings. Accordingly, firms that miss thresholds are likely to provide more MD&A disclosures in order to explain past performance and guide investors on future performance. Yet, firms that miss the thresholds may suffer from negative investor scrutiny and increased risk of litigation, which may induce them to make less MD&A disclosures (Rogers and Van Buskirk 2009). We test these competing predictions as to whether MD&A disclosures and the above two information environment characteristics are substitutes or complements.

Empirically, we examine all 10-K reports electronically filed with the SEC between 1994 and 2007. Employing criteria from computer-science linguistics, we develop an algorithm to identify forward-looking and non-forward-looking MD&A sentences. We examine annual changes in forward-looking and non-forward-looking MD&A sentences rather than their respective levels, because the additional sentences are likely to reflect changes in the business model and earnings generating process and they will be relatively free of boilerplate information. Thus the changes in MD&A sentences will be powerful proxies to examine managers' disclosure incentives.<sup>1</sup> Overall, we find that non-dark firms and firms that miss earnings thresholds provide more forward-looking and non-forward-looking disclosures in the MD&A. In other words, the

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<sup>1</sup> By examining change instead of level of the number of sentences, we do not imply that repetitive sentences are uninformative. For example, even though a sentence about future sales trends is repeated every year, the information contained in the sentence may be updated. As such, in our sensitivity tests, we examine the level of forward-looking and non-forward-looking sentences, and find similar results.

MD&A disclosures act as *complements* to other corporate information provided through analyst coverage and managerial earnings guidance, and *substitutes* to beating earnings thresholds.

We next examine how the MD&A disclosures help investors anticipate future earnings. Specifically, we test how the MD&A disclosures help to incorporate future earnings information into current stock returns, using the methodology in Collins et al. (1994) (Lundholm and Myers 2002; Schleicher et al. 2007). For the whole sample, we find that the change in forward-looking sentences helps investors anticipate future earnings, yet the change in non-forward-looking MD&A sentences do not. When the sample is partitioned into dark and non-dark firms, we find, as expected, that investors anticipate more future earnings information for non-dark firms than for dark firms. More importantly, the change in forward-looking sentences helps investors to anticipate more future earnings information for non-dark firms but not for dark firms. When the sample is partitioned based on earnings thresholds, we find, as expected, that investors anticipate more future earnings information for firms that beat the thresholds than for firms that miss the thresholds. More importantly, the change in forward-looking sentences helps investors to anticipate more future earnings information in a similar fashion for the two groups of firms, suggesting that the relative informative effect of an additional forward-looking sentence is stronger for companies that miss the earnings thresholds. This finding is consistent with the survey evidence in Graham et al. (2005): Future earnings are less predictable and thus current stock prices can explain less of future earnings information for firms that miss earnings thresholds; yet, additional prospective disclosures are more helpful for these companies.

Finally, we explore what content of the forward-looking sentences helps investors to anticipate future earnings over and above the effect of changes in forward-looking sentences. For this purpose, we use keywords that refer to business operations, financing and accounting in the

forward-looking sentences. In particular, business operations keywords include references to sales trends, customers, suppliers and labor; financing keywords include references to equity and debt financing and capital structure; and accounting keywords include references to GAAP and FASB. We examine the accounting keywords separately because of the SAB 74 requirement that firms provide narratives on how impending accounting standards will impact reported earnings. We find that the change in accounting-related keywords helps investors to anticipate more future earnings information over and above the effect of the change in forward-looking sentences, whereas the change in operating and financing related keywords do not. This shows that accounting related sentences, which typically deal with the impact of new accounting standards on future earnings, are particularly helpful for investors to anticipate future earnings.

We extend prior literature in the following ways. First, we find that the availability of supplemental corporate information and firms' missing earnings thresholds are associated with increases in both forward-looking and non-forward-looking sentences in the MD&A. Second, we find that while the increase in forward-looking sentences helps investors to incorporate future earnings information into current stock prices, the increase in non-forward-looking sentences does not. This result stresses the usefulness of forward-looking disclosures over non-forward-looking disclosures. Third, the increase in forward-looking sentences does not help investors to anticipate more future earnings information for firms with no supplemental information. We believe this evidence speaks to the lack of net perceived benefits to providing prospective information for these companies. Fourth, we find that the increase in forward-looking disclosures help investors to anticipate future earnings better for firms that miss earnings thresholds than for firms that beat earnings thresholds. Our evidence suggests that the textual MD&A disclosures are not a categorical complement to the quality of a company's information environment. For

instance, firms that miss earnings thresholds can be regarded as firms in a poor information environment, but these firms provide higher levels of forward-looking disclosures, which are more informative than the forward-looking disclosures of other firms. Finally, we provide insights into the content of forward-looking statements and find that accounting-related forward-looking statements help investors to anticipate future earnings incrementally better.

## **2. Background and Related Literature**

### ***Importance of the MD&A Section***

Firms are required to include the MD&A section as part of their 10-K filings (SEC 1980); yet, the content of the MD&A is largely voluntary. In other words, the MD&A is a *quasi-mandatory* or *quasi-voluntary* disclosure setting. The SEC intends that the MD&A provide investors with an opportunity to see the company through the eyes of the management, and present past events and future trends in demand, events, commitments, plans and uncertainties that are likely to materially affect the company liquidity and future operations (SEC 1987, 1989, 2003). Even though the MD&A does not provide timely forward-looking information to shape users' expectations, it is likely to be a repository of all forward-looking information already communicated to users by the firm.<sup>2</sup> Arguably, the MD&A is an important component of the annual report (see Tavcar 1998); and users such as the sell-side analysts are known to use MD&A disclosures in preparing their reports (Knutson 1993; Rogers and Grant 1997; Clarkson et al. 1999). However, the SEC assesses MD&A's to be deficient in providing forward-looking

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<sup>2</sup> Explicit communication includes management guidance and forecasts. Implicit communication includes items mentioned in earnings announcement conference calls about forward-looking aspects of R&D and expansion strategies. Another important venue for firms to provide information are analyst-hosted, invitation only conferences which take place at company headquarters or other locations (see Schack, 2007; Groysberg, 2010).

information as against non-forward-looking information at several points in time (Garmonj 2007; Cole and Jones 2005).<sup>3</sup>

### *Literature on MD&A Disclosures*

Early studies have examined small samples to provide insights into the quality of MD&A disclosures. Pava and Epstein (1993) find that the MD&A's of 25 randomly selected firms mostly describe past performance. Bryan (1997) finds that forward-looking MD&A information is related with some measures of future performance. Barron et al. (1999) find that MD&A quality is associated with lower analysts' forecast error and lower forecast dispersion. Sun (2010) examines explanations for large inventory changes in the MD&A, and finds that such disclosures are associated with future profitability and sales growth.

Recent studies use computer-intensive techniques to study a large sample of MD&A's. Li (2010) uses a Bayesian machine-learning algorithm to assess the tone of forward-looking disclosures in the MD&A's between 1994 and 2007. Li finds that the optimistic tone of forward-looking MD&A sentences is positively associated with future earnings and also helps mitigate the mispricing of accruals. Feldman et al. (2010) find that the change in MD&A tone is positively associated with market reaction around the 10-K and 10-Q filings. Brown and Tucker (2011) show that companies that modify their MD&A sections more significantly exhibit larger stock price reactions around 10-K filings, but that analysts' revisions are not affected. Davis and Tama-Sweet (2011) find that the MD&A is more pessimistic than the earnings press release, suggesting that managers opportunistically provide information in the MD&A that is different than that provided in the earnings press release. Li (2008) finds that firms opportunistically

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<sup>3</sup> The SEC also conducted a targeted review of 359 companies representing 24 industries in 1988 and found 345 MD&A's to be deficient (SEC 1989). The SEC examined Fortune 500 companies' filings in 2002. More recently, in their general review of MD&A's, the SEC found deficiencies in forward-looking information as opposed to explanations of past results (SEC 2003).

obfuscate readability in the annual reports. Overall, these studies suggest that the MD&A disclosures provide useful information to investors, even if the information is opportunistically obfuscated. We extend the literature in three ways. First, we distinguish between forward-looking and non-forward-looking information contained in the MD&A. Second, we investigate what information environment characteristics of a company motivate the company to make more forward-looking and non-forward-looking MD&A disclosures. Third, we examine whether the MD&A disclosures help investors anticipate more future earnings information under different information environment characteristics.

### **3. Identifying Forward-looking Disclosures in MD&A Sections**

We develop a UNIX Perl code that, in sequence, (1) downloads all 10-K filings from the *SEC Edgar* database between years 1994 and 2007, (2) extracts the MD&A sections from the 10-K filings, (3) extracts forward-looking sentences from the MD&A sections, and (4) analyzes the content of forward-looking sentences. Appendix A details our procedure. For brevity, we summarize key aspects of our procedure below.

We define sentences as the unit of analysis instead of words or text lines, because a sentence is the smallest integral unit of text that conveys an idea (Ivers 1991).<sup>4</sup> Accordingly, we parse the MD&A sections into sentences. We identify a sentence as forward-looking if it includes either: (a) keywords that imply future (such as “...*next year*”); (b) conjugation of verbs that imply future (such as “*the company plans to...*”); or (c) numerical reference to future years (such as “... *in 2006*” in a 2004 filing). The criteria and keyword lists were recursively developed based both on computer-science linguistics for identifying future-related sentences (Wang and Lin 2004) and on our reading of 100 randomly selected 10-K filings. We include forward-

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<sup>4</sup> Our results are similar when we use the number of words as our unit of analysis.

looking sentences with a wide range of content and do not restrict it to earnings-related information.<sup>5</sup> To mitigate the effect of outliers influencing our results, we delete firm-year observations that are in the top and bottom half percent of the empirical distribution of the annual change in forward-looking sentences.<sup>6</sup> Finally, we identify the operations, financing, and accounting content of the forward-looking sentences, again using a list of customized keywords. We consider all sentences in the MD&A that are not identified as forward-looking sentences as non-forward-looking. As such non-forward-looking sentences contain not only narratives on past performance and trends, but also risk statements and boilerplate statements.

We validate our methodology using randomly-selected 50 annual reports by comparing forward-looking sentences identified by our program with those that are identified by MBA students. We find a significant overlap of about 75% between the two groups of forward-looking sentences. Appendix B reports the details of this validation test.

### ***Descriptive Statistics***

Table 1, Panel A presents descriptive statistics for our final sample of 29,919 10-K filings from 4,591 unique firms between the years 1994 and 2007. On average, a 10-K filing has 1,565 sentences, 283 of which are in the MD&A section. On average, there are 36 forward-looking sentences and 246 non-forward-looking sentences in the MD&A section; 12.6% (87.4%) of the MD&A sentences on average are forward-looking sentences (non-forward-looking sentences).<sup>7</sup>

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<sup>5</sup> Loughran and McDonald (2011) shows that generic word lists may not be appropriate for accounting and finance contexts (also see Li 2010 and Henry and Leone 2010). Our customized keyword list is developed by our reading of the MD&As. In sensitivity analyses, we also use the keyword list developed and used in Schleicher et al. (2007) and obtain results that are similar to those with our customized keyword list.

<sup>6</sup> We obtain similar results when we delete firm-year observations in the top and bottom one percent.

<sup>7</sup> We find a moderate variation in forward-looking disclosures across 48 Fama-French industries. Shipbuilding and railroad equipment and candy and soda industry groups exhibit the highest changes in forward-looking sentences (15.8% and 15.3%, respectively), whereas shipping containers and agriculture industry groups exhibit the lowest changes (6.6% and 5.0%, respectively). We control for industry effects in our analyses.

#### **4. Forward-looking and Non-forward-looking Disclosures and Information Environment**

In this section, we examine our first research question of whether firms with differing information environment characteristics provide different levels of forward-looking sentences (hereafter, FLS) and non-forward-looking sentences (hereafter, NFLS) in the MD&A. We consider two aspects of firms' information environment: the availability of supplemental corporate information and the attainment of earnings thresholds.

##### ***Availability of Supplemental Corporate Information***

We examine whether MD&A disclosures and supplemental corporate information through sell-side equity analysts and corporate earnings guidance are complements or substitutes. We refer to firms that do not have any supplemental information as *dark firms*. For dark firms, MD&A is the primary medium for the largely voluntary corporate disclosures about past results and future performance.

Compared to non-dark firms, dark firms could provide more or less FLS and NFLS. On the one hand, firms could be dark because the costs of supplemental disclosures outweigh the benefits. For example, dark firms could be smaller than their non-dark counterparts, and may find little value in disseminating information either through earnings guidance or MD&A. Similarly, analysts may find little benefit net of the information processing costs for covering small firms. Under this view, MD&A disclosures and supplemental information are complements; dark firms will provide less prospective and non-prospective information in the MD&A. On the other hand, dark firms may provide extensive disclosures in the MD&A, which is the firms' primary medium of disclosure. For non-dark firms, the supplemental disclosures in the form of managerial guidance and analyst coverage could provide sufficient information to the capital market thus obviating the need for MD&A disclosures. Under this view, MD&A

disclosures and supplemental information are substitutes; dark firms will provide more prospective and non-prospective information in the MD&A.

For the empirical tests, we consider annual change in FLS and NFLS, because MD&A disclosures are known to be sticky (Brown and Tucker, 2011) and additional MD&A sentences will represent changes in the firms' business model. For example, a firm that is planning to expand operations overseas or introduce new product lines will add narratives on how initial set-up will proceed (for example, Microsoft discusses their prospective release of operating systems and other products in the year preceding the releases). A firm that acquired another company will add narratives on how the acquisition will proceed (for example, AOL discusses its merger with Time Warner in the MD&A section). As such, the additional MD&A sentences are likely to indicate a business changes that structurally change the earnings generating process. Another reason to consider the change in FLS and NFLS is to mitigate the measurement noise due to repetitive boilerplate statements.

Under the complementarity (substitution) argument, we expect dark companies to have smaller (larger) changes in MD&A sentences. These arguments are summarized in hypothesis H1, which is stated in null form.

*H1: Dark and non-dark firms have similar changes in forward-looking and non-forward-looking sentences in the MD&A, ceteris paribus.*

### ***Missing and Beating Earnings Thresholds***

Missing/beating earnings thresholds have been shown to be important signals of performance. Burgstahler and Dichev (1997) and Degeorge et al. (1999) show that that firms consider the following three earnings targets: zero, last year's earnings, and analysts' consensus

earnings forecasts. In their survey paper, Graham et al. (2005) find that CFOs consider these earnings thresholds sacrosanct because of their perception that investors interpret missing earnings thresholds as evidence of hidden problems at the firm and low predictability of future performance.<sup>8</sup>

The MD&A is likely to be an important channel for firms to explain why earnings thresholds were not met, especially if there are structural changes in the firms' business model. This is potentially because negative performance is less persistent and less value relevant than positive performance, increasing investors' informational need about changes in firms' business model (Schleicher et al. 2007). Accordingly, we predict that firms that miss earnings thresholds are likely to provide more explanation about their past results as well as future prospects in their MD&A. Likewise, firms that beat the earnings thresholds will have less incentive to explain their results as well as future prospects in their MD&As. Under this view, MD&A disclosures and information about attainment of earnings thresholds are substitutes. On the other hand, companies that miss thresholds experience increased investor scrutiny and increased threat of litigation (Field et al. 2005). This in turn could deter companies to provide detailed forward-looking and non-forward-looking disclosures in the MD&A after the negative earnings announcements (Rogers and Van Buskirk 2009). Under this view, MD&A disclosures and information about attainment of earnings thresholds are complements.

Under the complementarity (substitution) argument, we expect companies that miss earnings thresholds to exhibit smaller (larger) changes in MD&A sentences. These arguments are summarized in hypothesis H2, which is stated in null form.

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<sup>8</sup> Brown and Caylor (2005) find that among the three thresholds consensus forecasts has become more important in recent years.

*H2: Compared to firms that beat earnings thresholds, firms that miss earnings thresholds show similar annual changes in forward-looking and non-forward-looking sentences in the MD&A, ceteris paribus.*

## **Results**

We investigate H1 and H2 by extending Li's (2008) model, which explains determinants of the level of annual report disclosures. In particular, we estimate the following OLS model:

$$\begin{aligned} \Delta\text{LOG(FLS)} \text{ or } \Delta\text{LOG(NFLS)} = & a_0 + a_1 \text{ DARK SCORE} + a_2 \text{ BEAT SCORE} + a_3 \text{ AGE} + a_4 \\ & \text{LOG(SIZE)} + a_5 \text{ BM} + a_6 \text{ SI} + a_7 \text{ RET\_VOL} + a_8 \text{ NI\_VOL} + a_9 \text{ LOG(BSEG)} \\ & + a_{10} \text{ LOG(GSEG)} + a_{11} \text{ LOG(NITEMS)} + a_{12} \text{ SEO} + a_{13} \text{ M\&A} + a_{14} \Delta\text{LOG(SIZE)} \\ & + a_{15} \Delta\text{BM} + a_{16} \Delta\text{SI} + a_{17} \Delta\text{RET\_VOL} + a_{18} \Delta\text{NI\_VOL} + a_{19} \Delta\text{LOG(BSEG)} \\ & + a_{20} \Delta\text{LOG(GSEG)} + a_{21} \Delta\text{LOG(NITEMS)} + a_{22} \Delta\text{SEO} + a_{23} \Delta\text{M\&A} \\ & + \sum \theta \text{ Industry and year indicators} + \varepsilon \end{aligned} \quad (1)$$

To test our hypotheses, we add two key variables to Li's model. *Dark Score* takes values 0, 1, and 2, increasing with the lack of corporate information before the 10-K filing. It is the sum of the following two indicator variables: *NoGuidance*, which is 1 if there is no managerial guidance during the fiscal year and 0 otherwise; and *NoForecast*, which is 1 if there are no analyst forecasts during the fiscal year and 0 otherwise. *Beat Score* takes values 0, 1, 2, and 3, increasing with the number of earnings thresholds the company beats for the fiscal year. It is the sum of the following three indicator variables: *BeatZero*, *BeatLYEarnings*, and *BeatConsensus*, which are 1 if company earnings is greater than zero, last year's earnings, and analyst consensus forecast, respectively, and 0 otherwise. All variables relate to the fiscal year  $t$  of the 10-K filing, and are defined in Appendix C. Since our dependent variables are change variables, we use both levels and changes of the explanatory variables in Eq. (1).  $\Delta$  denotes change between years  $t-1$  and  $t$ .

Table 1 Panel B reports descriptive statistics on the regression variables and components of *Dark Score* and *Beat Score*. *NoGuidance* and *NoForecast* have averages of 0.624 and 0.335 respectively, indicating that roughly two thirds of sample firms do not issue managerial guidance

and one third of firms are not followed by analysts. *BeatZero*, *BeatLYEarnings*, and *BeatConsensus* have averages of 0.716, 0.617, and 0.394 respectively, indicating that firms beat zero earnings threshold 71.6%, last year's earnings threshold 61.7%, and analysts' consensus 39.4% of the time. Consequently, average *Dark Score* is 0.959 and average *Beat Score* is 1.726.

The Panel also presents descriptive statistics across *Dark Score* and *Beat Score* partitions. Relative to *non-dark firms* (defined as those with *Dark Score* equal to 0 or 1), *dark firms* (defined as those with *Dark Score* equal to 2) are more likely to miss earnings thresholds: Average *BeatZero* and *BeatLYEarnings* are 0.762 and 0.631 for non-dark firms, and 0.599 and 0.579 for dark firms, respectively. Similarly, relative to firms that miss earnings thresholds (defined as those with *Beat Score* equal to 0 or 1, hereafter *miss companies*), firms that beat earnings thresholds (defined as those with *Beat Score* equal to 2 or 3, hereafter *beat companies*) are more likely to be non-dark; miss companies have an average *Dark Score* of 1.204 and beat companies have an average *Dark Score* of 0.807.<sup>9</sup> Thus, dark firms have poor information environment not only because of unavailability of supplemental information, but also because of missing earnings thresholds.

Table 1, Panel B also reports mean and median values of explanatory variables of Eq. (1) for the full sample and across *Dark Score* and *Beat Score* partitions. Relative to non-dark firms, dark firms have smaller size, higher book-to-market ratios, higher volatility in returns and earnings, fewer business and geographical segments, fewer reported financial variables, and less frequent seasoned equity offerings (SEO) and merger and acquisition activities (M&A). Relative to miss firms, beat firms are older and larger, and have lower book-to-market ratios, lower incidences of special items, lower volatility in returns and earnings, fewer business segments,

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<sup>9</sup> Note that because dark firms by definition miss the analyst consensus forecasts, firms are considered beat companies if they beat two out of the three thresholds.

fewer financial items reported, and more frequent incidents of SEO and M&A. The difference in firm characteristics across dark/non-dark and miss/beat firms is similar when firm characteristic variables are measured in changes instead of levels, indicating the need to explain the effect of both levels and changes in the determinants of changes in MD&A sentences.

Table 1, Panel B presents descriptive statistics for FLS and NFLS as well as changes in FLS and NFLS across dark versus non-dark firms and beat versus miss firms. FLS, NFLS, and the changes in FLS and NFLS are lower for dark firms than for non-dark firms; and the change in FLS for beat firms is lower than that of miss firms. Given the difference in firm characteristics discussed above across dark and non-dark firms as well as beat and miss firms, drawing conclusions based on the univariate comparisons is not appropriate.

Table 2 reports results of Eq. (1) in two separate models that use as dependent variables annual changes in logarithm of forward-looking sentences,  $\Delta\text{LOG}(\text{FLS})$ , and non-forward-looking sentences,  $\Delta\text{LOG}(\text{NFLS})$ . To mitigate the effect of outliers, we delete observations with studentized residuals greater than two in absolute value. The standard errors are adjusted for heteroskedasticity and within-company dependence. In the last column, we report significance levels in coefficient estimate differences across the models. Since the annual changes in FLS and NFLS for a company are simultaneously determined, the difference tests use seemingly unrelated regression estimation, which allows for the error terms in the models to be correlated for the same observation.<sup>10</sup>

The results indicate that both annual changes in FLS and NFLS decrease with the *Dark Score* and *Beat Score*. In other words, dark firms increase FLS and NFLS less than non-dark firms, consistent with the complementarity between MD&A disclosures and other corporate

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<sup>10</sup> We find that the correlation coefficient in the error terms of regressions with FLS and NFLS as dependent variables is 0.42.

information. The changes between FLS and NFLS across dark/non-dark partition are statistically similar. Beat firms increase FLS and NFLS less than miss firms, consistent with substitutability between MD&A disclosures and beating earnings thresholds.<sup>11</sup> FLS increases at a significantly faster rate than NFLS for miss firms.

In terms of economic significance, holding everything else at their mean values, firms with neither managerial guidance nor analyst following (*Dark Score*=2) increase their FLS by 1.6% less than firms with both managerial guidance and analyst following (*Dark Score*=0). This is a significant effect, considering the average annual change of 10.2% in FLS in the sample. At the same time, holding everything else at their mean, dark firms increase their NFLS by 1.0% less than firms with both managerial guidance and analyst following, a slightly less significant effect considering the average annual change of 8.7% in NFLS. The coefficient estimates on *Dark Score* are not statistically significantly different across changes in FLS and NFLS.

Firms that beat all the three earnings thresholds (*Beat Score*=3) increase their FLS by 5.7% less than firms that miss all the thresholds (*Beat Score*=0). Similarly, firms that beat all the thresholds increase their NFLS by 4.2% less than firms that miss all the thresholds. These effects are economically significant, considering the average annual changes of 10.2% and 8.7% in FLS and NFLS, respectively. The coefficient estimates on *Beat Score* are statistically significantly different at 10%. Overall, these results suggest that beat firms make less non-forward-looking disclosures and even lesser forward-looking disclosures, compared to miss firms.

In untabulated tests, we partition *Dark Score* and *Beat Score* into their components. We find that change in forward-looking sentences is negatively associated with *NoGuidance*, *BeatLYEarnings*, and *BeatConsensus*; and change in non-forward-looking sentences is

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<sup>11</sup> Untabulated tests show that the negative coefficient estimates on *Dark Score* and *Beat Score* are stronger for the years after 2001. In the context of Reg FD, this finding suggests that information incentives of MD&A disclosures are stronger in the absence of companies' reduced private communication with analysts and investors.

negatively associated with *NoForecast*, *BeatZero*, *BeatLYEarnings*, and *BeatConsensus*. In terms of difference between the coefficient estimates in the two models, companies increase FLS more than NFLS when they provide managerial guidance, when analysts do not issue forecasts, and when companies miss last year's earnings.

The effect of other firm characteristics are in line with previous literature and similar across the two models. For instance, both FLS and NFLS increase more when firms are older and larger, and when firms report less volatile earnings, more financial items, M&A activity, and greater number of business and geographical segments. However, we note some differences across changes in FLS and NFLS: FLS increases significantly more than NFLS when firms are older, when firms report new special items, and when firm size, B/M ratio, return volatility, and the number of reported business and geographical segments increase for the year.

### ***Robustness Tests***

By examining changes instead of levels in the number of sentences, we strive to examine disclosures related to changes in the company's earnings generating process and also to reduce measurement errors due to repetitive sentences. By this choice, we do not imply that repetitive sentences do not provide new information on future earnings. In untabulated tests, we find that *Dark Score* and *Beat Score* are also negatively correlated with the level of FLS and NFLS.

Our paper uses a customized approach in defining forward-looking sentences, as detailed in Appendix A. Specifically we analyze 10-K reports and build our own procedure, which searches for a set of forward-looking keywords and references to subsequent years, to arrive at a well-specified and powerful method for identifying forward-looking sentences. To assess the reliability of our approach, we check our procedure with other approaches used in prior literature. Hussainey and Walker (2009) and Hussainey et al. (2003) use the QSR N6 text

analysis software and identify a list of 35 forward-looking keywords.  $\Delta\text{LOG}(\text{FLS})$  derived using QSR keywords and our algorithm exhibit a correlation coefficient of 0.88. Similarly,  $\Delta\text{LOG}(\text{NFLS})$  derived using the QSR keywords and our algorithm have a correlation coefficient of 0.89. We obtain very similar results when we estimate Eq. (1) and (2) with  $\Delta\text{LOG}(\text{FLS})$  and  $\Delta\text{LOG}(\text{NFLS})$  using the QSR keywords.

Untabulated tests also show that inclusion of the levels and changes of net income, accruals, and returns to Eq. (1)—as in Li (2010)—provides similar results.

## **5. Information Content of MD&A Disclosures**

In this section, we examine the information content of MD&A disclosures by testing whether change in FLS and NFLS in the MD&A help to incorporate future earnings into current stock returns. We then examine how this relation varies for firms with or without supplementary corporate information and for those that miss or beat earnings thresholds. Given that MD&A disclosures may be subsumed by other more timely disclosures that company makes throughout the year, our tests focus on the association between the MD&A disclosures and company stock returns during the year of the 10-K filing (not on the short-term returns around the 10-K filing).

### ***Forward-looking and Non-forward-looking MD&A Disclosures and Future Earnings Response Coefficients***

Future earnings response coefficients measure the strength of the relation between current stock prices and future earnings (Collins, Kothari, Shanken and Sloan 1994, hereafter CKSS). Lundholm and Myers (2002) and Gelb and Zarowin (2002) relate general disclosure quality (proxied by AIMR ratings) with future earnings response coefficient. Similarly, Hussainey et al. (2003) develop a computer-intensive procedure to identify forward-looking earnings sentences in

a sample of UK annual reports.<sup>12</sup> They find that forward-looking earnings sentences help to incorporate future earnings into current stock prices. Schleicher et al. (2007) find that forward-looking earnings sentences in the UK help to incorporate future earnings into current stock prices more so for loss firms than for profit firms. Hussainey and Walker (2009) find that forward-looking earnings sentences and dividends are partly substitutive in their role of helping incorporate future earnings into current stock prices. These findings are consistent with the informativeness perspective of voluntary disclosures, which predicts that managers disclose value relevant information.

Early signaling models argue that firms disclose all value-relevant information to mitigate the adverse selection problem (Grossman and Hart 1980; Grossman 1981; Milgrom 1981; Ajinkiya and Gift 1984). Similarly, another strand of literature argues that managers disclose information to meet the markets' demand for information (Lang and Lundholm 1996; McNichols 1989).<sup>13</sup> Based on the above findings, we expect the relation between current stock prices and future earnings to be stronger for firms with more forward-looking statements than for non-forward-looking statements. This expectation is stated in the following hypothesis.

*H3: The future earnings response coefficient is more strongly associated with changes in forward-looking sentences than changes in non-forward-looking sentences, ceteris paribus.*

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<sup>12</sup> Hussainey et al. (2003) first use a list of keywords to identify forward-looking sentences in the annual report. They then classify the forward-looking sentences by intersecting them with topics covered in analyst reports and those that relate to the income statement. As such, their forward-looking statements identify exclusively narratives on earnings components. We find a high level of correlation between their identification method and ours.

<sup>13</sup> The alternative opportunistic perspective suggests that managers disclose positive news to the market to “hype” the stock especially prior to extracting rents (Lang and Lundholm 2000; Aboody and Kazsnik 2000). Consistent with this perspective, Li (2008) argues that managers opportunistically use narrative disclosures in the MD&A to obfuscate poor performance. Kothari et al. (2009) show that managers ‘leak’ good news in a timely fashion but withhold bad news based on managerial career concerns. Another alternative perspective suggests that forward-looking MD&A disclosures may also be pure noise: see the SEC’s arguments discussed in Section 2.

CKSS (1994) regress current returns on current and future earnings and show that current returns anticipate information about future earnings. Similar to prior literature on the information content of disclosures, we use this model to test H3. We augment the CKSS model by including proxies for annual change in FLS and NFLS in MD&A. We estimate the following regression:

$$\begin{aligned}
RET_t = & b_0 + b_1 NI_{t-1} + b_2 NI_t + b_3 NI_{[t+1, t+3]} + b_4 RET_{[t+1, t+3]} + b_5 \Delta LOG(FLS)_t \\
& + b_6 \Delta LOG(FLS)_t * NI_{t-1} + b_7 \Delta LOG(FLS)_t * NI_t + b_8 \Delta LOG(FLS)_t * NI_{[t+1, t+3]} \\
& + b_9 \Delta LOG(FLS)_t * RET_{[t+1, t+3]} + b_{10} LOG(NFLS)_t + b_{11} \Delta LOG(NFLS)_t * NI_{t-1} \\
& + b_{12} \Delta LOG(NFLS)_t * NI_t + b_{13} \Delta LOG(NFLS)_t * NI_{[t+1, t+3]} \\
& + b_{14} \Delta LOG(NFLS)_t * RET_{[t+1, t+3]} + \sum \theta \text{ Industry and year indicators}_t + \varepsilon_t
\end{aligned} \tag{2}$$

where  $RET_t$  is the buy-and-hold stock return for the year ending 30 days after the 10-K filing of fiscal year  $t$ .  $RET_{[t+1, t+3]}$  is the buy-and-hold stock return for the three years ending 30 days after the 10-K filing of fiscal year  $t+3$ .  $NI_t$  is the earnings before extraordinary items in fiscal year  $t$  deflated by market value of equity at the beginning of the fiscal year  $t$ ,  $NI_{[t+1, t+3]}$  is the cumulative earnings before extraordinary items in years  $t+1$  to  $t+3$ , deflated by market value of equity at the beginning of fiscal year  $t$ . To mitigate the effect of outliers,  $NI_t$  is winsorized at -1 and +1, and  $NI_{[t+1, t+3]}$  is winsorized at -3 and +3. Given the data requirements for earnings and stock returns for years between  $t-1$  and  $t+3$ , the sample size drops to 23,651 from 29,919.

Table 3, Panel A presents descriptive statistics of variables in Eq. (2) not reported earlier.  $RET_t$  and  $RET_{[t+1, t+3]}$  exhibit a skewed distribution with means of 13.1% and 27.4%, and medians of -0.5% and -3.5% respectively.  $NI_t$  exhibits a less skewed distribution with a mean of -0.9% and a median of 4.1%. Table 3, Panel B presents the results of Eq. (2) in three models: Model (1) with the interactions of earnings with  $\Delta LOG(FLS)_t$  only, Model (2) with interactions with  $\Delta LOG(NFLS)_t$  only, and Model (3) with interactions with both  $\Delta LOG(FLS)_t$  and  $\Delta LOG(NFLS)_t$ . To mitigate the effect of outliers, we delete observations with studentized

residuals greater than two in absolute value.<sup>14</sup> The standard errors are adjusted for heteroskedasticity and within-company dependence. The coefficient estimates for  $NI_{[t+1, t+3]}$  are stable at 0.242 across all the models, suggesting that roughly a quarter of future earnings information is incorporated into current stock prices. The coefficient estimate for  $\Delta\text{LOG}(\text{FLS})_t * NI_{[t+1, t+3]}$  is 0.072 in Model (1). That is, everything else equal, if forward-looking sentences increase by 37.9% (75<sup>th</sup> percentile of the sample) instead of -13.4% (25<sup>th</sup> percentile of the sample), future earnings information incorporated into current stock prices increases by 0.037 ( $=0.072*(37.9\%+13.4\%)$ ). This represents an improvement of about 15% ( $=0.037/0.242$ ) more future earnings information in current stock prices.

The coefficient for  $\Delta\text{LOG}(\text{NFLS})_t * NI_{[t+1, t+3]}$  in Model (2) is positive at 0.069 and significant at 10%. However, under Model (3), when Eq. (2) is estimated using interactions of  $NI_{[t+1, t+3]}$  with both FLS and NFLS, the interaction of  $\Delta\text{LOG}(\text{FLS})_t$  with continues to be statistically significant, whereas the interaction of  $\Delta\text{LOG}(\text{NFLS})_t$  is not statistically significant at conventional levels. Overall, the results is consistent with hypothesis H3, that forward-looking sentences in the MD&A helps to incorporate future earnings information into current stock prices, while non-forward looking sentences in the MD&A does not.<sup>15</sup>

### ***Dark and Non-dark firms, MD&A Disclosures and Future Earnings Response Coefficient***

Ayers and Freeman (2003) hypothesize and find that analyst research helps to incorporate more future earnings information into current stock prices. In essence, firms with supplemental information are more likely to have higher forward earnings response coefficient, FERCs.

Therefore, we expect FERC for non-dark firms to be higher than that of dark firms. We extend

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<sup>14</sup> Alternatively, we winsorize returns at 0.5%, 1% and 5% of the empirical distribution and obtain similar results.

<sup>15</sup> In untabulated tests, we observe similar results when we use the QSR procedure to identify FLS. In untabulated tests, we also observe that forward-looking sentences help investors anticipate future earnings information significantly more strongly after 2001. In the context of Reg FD, this finding suggests that MD&A disclosures are more relevant in the absence of companies' reduced private communication with analysts and investors.

Ayers and Freeman's (2003) insight by examining whether FLS help to anticipate future earnings for dark firms more than for non-dark firms.

In Section 4, we document that that dark firms provide fewer FLS than non-dark firms do. On the one hand, FLS for dark firms are expected to be more helpful in incorporating future earnings information into current stock prices, given that the primary source of public financial information is the statutory financial statements for dark firms. Under this view, we expect to find the coefficient for  $\Delta\text{LOG(FLS)}_t * \text{NI}_{[t+1, t+3]}$  to be higher for dark firms than for non-dark firms. On the other hand, the lack of financial intermediaries to interpret the information contained in forward-looking sentences could lead to less of such information being incorporated into current stock prices. In sum, how well forward-looking sentences in the MD&A help investors anticipate future performance for dark firms as compared for non-dark firms is an empirical question. To investigate, we estimate Eq. (2) separately for dark and non-dark firms.

Table 4, Panel A presents descriptive statistics for returns and earnings across dark and non-dark firms. Dark firms are less profitable in general and have more skewed return distributions, suggesting that investors are more uncertain about future performance. Table 4, Panel B presents results of Eq. (2) separately for dark and non-dark firms. The coefficient estimate for  $\text{NI}_{[t+1, t+3]}$  is significantly larger for non-dark firms than for dark firms (0.366 versus 0.102), suggesting that current prices of firms with managerial guidance or analyst forecasts incorporate more of future earnings information for a unit change in FLS. About 37% of the future earnings is incorporated into current stock returns for non-dark firms, whereas only 10% of the future earnings is incorporated for dark firms. More importantly, the coefficient estimate for  $\Delta\text{LOG(FLS)}_t * \text{NI}_{[t+1, t+3]}$  is 0.107 and statistically significant for non-dark firms and 0.007 and not statistically significant for dark firms. The coefficient estimates are also statistically

significant, suggesting that firms with poor information environment as characterized by the non-availability of supplemental information have less forward-looking information incorporated into stock prices, and the quasi-mandatory disclosures do not alleviate the poor information environment. We do not expect non-forward-looking MD&A disclosures to help bring future forward for both dark and non-dark firms. Consistent with our prediction, we do not find statistically significant coefficient estimates for  $\Delta\text{LOG}(\text{NFLS})_t * \text{NI}_{[t+1, t+3]}$  for both dark and non-dark companies.<sup>16</sup>

Overall, our finding that forward-looking disclosures help incorporate future earnings information into stock prices is driven by non-dark firms. If FLS increase by 37.9% (75<sup>th</sup> percentile) instead of -13.4% (25<sup>th</sup> percentile), future earnings information incorporated into current stock prices increases by 0.055 ( $=0.107*(37.9\%+13.4\%)$ ) for non-dark firms. This represents an improvement of about 15% ( $=0.055/0.366$ ) in information content of current stock prices on future earnings.

In untabulated analyses, we divide non-dark companies into three groups based on the source of supplemental information, i.e., those with managerial guidance, those with analyst coverage, and those with both sources. We find that changes in FLS are significantly more effective in bringing the future forward for companies with analyst coverage and no managerial guidance.

### ***Earnings Thresholds, MD&A Disclosures and Future Earnings Response Coefficient***

Section 4 shows that firms that miss earnings thresholds exhibit greater increases in FLS. In this section, we explore whether the changes in FLS are more useful for firms that miss or

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<sup>16</sup> Given their smaller size, dark firms are more likely to be non-accelerated filers than non-dark firms. Given that our return period ends one month after the 10-K filings, earnings announcements for the first quarter of the next year may more frequently coincide with the current year's return window for dark firms. In untabulated tests, we remove observations where next fiscal year's earnings announcements coincide with the current year return window, and find similar results to those that are reported.

beat the earnings thresholds. Based on Schleicher et al.'s (2007) findings for loss firms, we expect to find that FLS helps to incorporate more future earnings information for firms that miss earnings thresholds than firms that beat earnings thresholds. We perform this analysis for non-dark firms, reducing the sample size to 17,241 from 23,651.

Table 5, Panel A presents descriptive statistics for returns and earnings for *miss* and *beat* firms. Not surprisingly, miss firms have lower stock returns and earnings. The miss firms have lower earnings, yet higher stock returns than the beat firms, in the subsequent three years. Table 5, Panel B presents results of Eq. (2) separately for miss and beat firms. The coefficient estimates for  $NI_{[t+1, t+3]}$  are significantly larger for beat firms than for miss firms (0.473 versus 0.130), suggesting that current prices of beat firms incorporate more future earnings information than for miss firms. The coefficient estimates are significantly different, consistent with the survey evidence in Graham et al. (2005) that future earnings are less predictable for firms that miss earnings thresholds and consequently less of future earnings information is incorporated into current stock prices.

The coefficient estimates for  $\Delta \text{LOG}(\text{FLS})_t * NI_{[t+1, t+3]}$  are 0.152 and 0.107 for miss and beat firms, respectively. These estimates are statistically indifferent, indicating that changes in forward-looking disclosures help incorporate future earnings information into current stock prices for firms that both groups of firms. If FLS increases by 37.9% (75<sup>th</sup> percentile in the sample) instead of -13.4% (25<sup>th</sup> percentile), future earnings incorporated into stock prices increases by 0.078 ( $=0.152*(37.9\%+13.4\%)$ ) for miss firms and 0.055 ( $=0.107*(37.9\%+13.4\%)$ ) for beat firms. This represents an improvement of about 60% ( $=0.078/0.130$ ) for miss firms versus 12% ( $=0.055/0.473$ ) for beat firms. While the coefficient estimates are not significantly different from each other, miss firms, which are shown to make more forward-looking

disclosures, seem to help investors to more strongly incorporate future earnings information into current stock prices.

In untabulated tests, we regroup firms based on whether they beat at least one (versus two) thresholds with similar results. In other words, forward-looking disclosures for firms that miss all three earnings thresholds, which constitute about 10% of our sample, strongly helps to incorporate future earnings into current stock prices and thus, alleviate the poor information environment.

When we include dark companies in untabulated tests, we find that coefficient on  $\Delta \text{LOG}(\text{FLS})_t * \text{NI}_{[t+1, t+3]}$  continue to be significant, both go down, for both miss and beat firms. This is consistent with forward-looking disclosures not mitigating the poor information environment for dark companies, in general.

In untabulated tests, we also find that firms that have missed thresholds in the current year as well as in the ensuing year (*Miss-Miss* firms), provide more FLS and NFLS than firms who have missed thresholds in the current year and beat thresholds in the ensuing year (*Miss-Beat* firms). Furthermore, we find that future earnings are not (are) positively associated with current returns for Miss-Miss firms (Miss-Beat firms), whereas the interaction of changes in forward-looking disclosures with earnings are positively associated with current returns in both groups of companies. This indicates that the forward-looking MD&A disclosures are especially informative when future earnings information is “bad”.

## **6. Content of the Forward-looking Disclosures and Future Earnings Response Coefficient**

We examine whether the content of the forward-looking MD&A disclosures that describe corporate operations, financing and accounting is *incrementally* informative about

future earnings than the forward-looking sentences themselves. For this purpose, we count keywords (listed in Appendix A) that refer to activities related to business operations, financing, and accounting in the forward-looking sentences. Business operations keywords (OPERW) include 140 unique references to performance, competition, customers, suppliers, labor, investments, and economy; financing related keywords (FINANW) include 29 unique references to equity and debt financing and capital structure; and accounting keywords (ACCTGW) include 10 unique references to GAAP and FASB. We examine the accounting related keywords separately because of the SAB 74 requirement that firms provide narratives on how impending accounting requirements and standards will impact reported earnings.

Table 6, Panel A presents descriptive statistics of keywords and changes in keywords for the sample. An annual report, on average, includes 62 operating keywords (OPERW), 17 financing keywords (FINANW), and 3 accounting keywords (ACCTGW) in the forward-looking sentences. These disclosures represent annual increases of 13.7% for operating keywords,  $\Delta\text{LOG}(\text{OPERW})$ , 12.6% for financing keywords,  $\Delta\text{LOG}(\text{FINANW})$ , and 15.0% for accounting keywords,  $\Delta\text{LOG}(\text{ACCTGW})$ . These increases are significantly larger than  $\Delta\text{LOG}(\text{FLS})$ , suggesting that operating, financing, and accounting content per forward-looking sentence increases over time.

We extend Eq. (2) by including the interactions of content,  $\Delta\text{LOG}(\text{OPERW})$ ,  $\Delta\text{LOG}(\text{FINANW})$ , and  $\Delta\text{LOG}(\text{ACCTGW})$ , with earnings and returns. Table 6, Panel B provides the regression results for Eq. (2) extended with the interactions all three content characteristics together (Model 1) and separately for only  $\Delta\text{LOG}(\text{OPERW})$  (Model 2),  $\Delta\text{LOG}(\text{FINANW})$  (Model 3), and  $\Delta\text{LOG}(\text{ACCTGW})$  (Model 4). The coefficient estimates for  $\Delta\text{LOG}(\text{OPERW})$  in Models 1 and 2 are insignificant. Similarly, the coefficient estimates for  $\Delta\text{LOG}(\text{FINANW})$  in

Models 1 and 3 are insignificant. The coefficient estimates for  $\Delta\text{LOG}(\text{ACCTGW})$  in Models 1 and 4 are positive and significant. Overall, while the change in accounting-related keywords helps to incorporate future earnings information into current stock prices over and above the change in forward-looking MD&A sentences, the change in operating and financing related keywords do not. This shows that accounting related forward-looking sentences that typically deal with major impacts of new accounting standards on future earnings is helpful in incorporating future earnings. Untabulated tests show that the significant incremental effect of accounting forward-looking keywords is driven by non-dark firms and beat firms.

## 7. Conclusion

We use computer-intensive techniques to examine the association between changes in forward-looking and non-forward-looking sentences in the MD&A and two important aspects of a company's information environment, namely availability of supplemental corporate information as well as attainment of earnings thresholds. Firms that have no analyst coverage or managerial earnings guidance are considered *dark firms*, and others *non-dark firms*. Firms who beat at least two of the three earnings thresholds are considered *beat firms*, and others *miss firms*. We find that dark firms and beat firms exhibit lower annual increases in both forward-looking and non-forward-looking sentences in the MD&A. In other words, the MD&A disclosures act as *complements* to other corporate information provided through analyst coverage and managerial earnings guidance, and *substitutes* to beating earnings thresholds. We also find that companies increase their forward-looking disclosures at a significantly faster rate than their non-forward-looking disclosures when they miss the thresholds. In terms of information content of these additional MD&A disclosures, increases in forward-looking sentences help investors to

anticipate future earnings; in other words, future earnings response coefficient (FERC) using the methodology in Collins et al. (1994) increases. However, conditional on increases in forward-looking sentences, increases in non-forward-looking sentences do not incrementally help investors to anticipate future earnings.

Consistent with a rich information environment for non-dark firms, we find that FERC is higher for non-dark firms than for dark firms. Furthermore, FERC significantly increases in response to increases in forward-looking sentences for non-dark firms, but not for dark firms. This suggests that firms with a poor information environment as characterized by the non-availability of supplemental corporate information make less forward-looking disclosures; their stock prices incorporate less forward-looking information; and increases in forward-looking disclosures do not help to mitigate the poor information environment.

Consistent with a rich information environment for beat firms, we find that FERC is significantly higher for beat firms than for miss firms. Furthermore, FERC significantly increases in response to increases in forward-looking sentences in a statistically similar fashion for beat and miss firms. This suggests that an additional forward-looking sentence helps to incorporate relatively more future earnings information into current stock prices for miss firms than beat firms. This finding provides support for firms' disclosure decisions that are consistent with the survey evidence in Graham et al. (2005): While future earnings are less predictable for firms that miss earnings thresholds and thus less of future earnings information is incorporated into current stock prices, additional disclosures pertaining to future earnings improve investors' ability to anticipate future earnings.

In addition, we find that the while the change in accounting-related keywords helps to incorporate future earnings information into current stock prices over and above the change in

forward-looking sentences, the change in operating and financing related keywords do not. This shows that accounting related forward-looking sentences that typically deal with the major impact of accounting regulations on future earnings is helpful for investors to anticipate future earnings.

Overall, the forward-looking disclosures in the MD&A help investors anticipate future earnings, especially for firms with analyst coverage and managerial earnings guidance and firms that miss earnings thresholds. These findings are a first-step in associating the information content of forward-looking statements in the MD&A with different aspects of the firm's information environment.

## Appendix A Identifying forward-looking disclosures

### Step 1: Obtaining electronic 10-K filings

We download 10-K filings (annual reports) for fiscal years between 1994 and 2007 from the *SEC Edgar* website. Prior to 2002, firms filed their 10-K filings to the SEC Edgar system in the ASCII-code text format. After 2002, firms post their annual reports in various formats, such as text, html, or pdf formats. Since the Perl code handles only ASCII-code text files most accurately, we supplement our post-2002 sample annual reports obtained from the *10-K Wizard* database in rich text format. We use the TextPipe Software to convert the rich text formatted files from *10-K Wizard* to the ASCII-code text formatted files. We then match the CIK of the Edgar filings with the GVKEY identifier in WRDS to obtain the required financial and stock market related data.<sup>17</sup>

### Step 2: Extracting the MD&A sections from the 10-K filings

For each 10-K filing, we identify and extract the Management's Discussion and Analysis (MD&A) section using two iterations. In the first iteration, our program searches for a sub-text starting with the phrase (or a variation of) "Item 7 Management" as the beginning of a line and ending with the phrase (or a variation of) "Item 8" as the beginning of another line. The variations used for this iteration are provided below:

#### *The first iteration:*

- 1) Identify a line starting with "I(i)tem 7(.) M(m)anagement" with tabs or spaces between the words,
- 2) Identify a following line starting with "I(i)tem 8(.)" with tabs or spaces between the words,
- 3) If the number of lines between identified "Item 7 Management" and "Item 8" pair are fewer than 60, then the algorithm keeps searching for another pair.

We impose the 60-line restriction, because in our audit of our test sample of 100 10-K filings, we found that in some occasions the Perl code extracted the "Table of Contents" or only executive summary of the MD&A sections.<sup>18</sup> The first iteration extracts the MD&A sections for 87% of our sample.

Our perusal of the 10-K filings that did not parse the MD&A section using the first iteration reveals that the ending phrase of "Item 8" did not appear in these cases. For these 10-K filings, we thus use a second iteration, which searches for a sub-text starting with the phrase (or a variation of) "Management's Discussion and Analysis" as the beginning of a line and ending

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<sup>17</sup> Li (2010) considers MD&A's from both 10-Q and 10-K filings. We restrict our attention to 10-K filings for three reasons. First, the annual reporting frequency is a more suitable frequency for the CKSS tests. Second, internal audit committees are required to review the 10-K MD&A filings, rendering them more reliable. Third, our reading of forward-looking statements indicates that forward-looking statements in 10-K filings are more comprehensive both qualitatively and quantitatively than those in 10-Q filings.

<sup>18</sup> Even though the 60-line requirement is *ad hoc*, having no such requirement is not appropriate. Our requirement may filter out the genuine MD&A's with fewer than 60 lines. However, such 10-K filings with very short or non-existent MD&A sections are atypical. For instance, Loughran and McDonald (2011) more conservatively use 250-line requirement.

with phrases (or a variation of) “Financial Statements” or “(Consolidated) Statement of Cash Flows” as the beginning of another line:

***The second iteration:***

- 1) Identify a line starting with “M(m)anagement(’s) D(d)iscussion” with tabs or spaces between the words,
- 2) Identify a following line starting with “S(s)tatement of C(c)ash F(f)lows” with tabs or spaces between the words, or “C(c)onsolidated S(s)tatement of C(c)ash F(f)lows” with tabs or spaces between the words,
- 3) If the number of lines between the identified “Management’s Discussion” and “Statement of Cash Flows” or “Consolidated Statement of Cash Flows” are fewer than 60, then the algorithm keeps searching for another pair.

The second iteration keeps the 60-line requirement between the starting and ending phrases. The second iteration extracts MD&A sections for an additional 5% of the sample. An out-of-sample check of 100 random 10-K filings shows that the MD&A sections were extracted appropriately. Our subsequent analyses exclude 10-K filings whose MD&A sections are not extracted by the two iterations (8% of the sample). A perusal of some of these annual reports shows that their MD&A content are presented in other sections of the annual report such as “Company Background” or “Results of Operations”.

**Step 3: Extracting forward-looking disclosures from the MD&A section**

We tag a sentence in the MD&A as “*forward-looking*” using three searches:

- 1) The first search tags an MD&A sentence as forward-looking if the sentence includes any of the following: (1) keywords “will” or “future”, both which connote the future; (2) one-to-one word combinations of the following adjectives: “next”, “subsequent”, “following”, “upcoming”, “incoming”, and “coming” with the following time indicators: “month”, “quarter”, “year”, “fiscal”, and “period”. Overall, the first search tags a sentence as forward-looking, if the sentence includes one or more of the following keywords: “will”, “future”, “next fiscal”, “next month”, “next period”, “next quarter”, “next year”, “incoming fiscal”, “incoming month”, “incoming period”, “incoming quarter”, “incoming year”, “coming fiscal”, “coming month”, “coming period”, “coming quarter”, “coming year”, “upcoming fiscal”, “upcoming month”, “upcoming period”, “upcoming quarter”, “upcoming year”, “subsequent fiscal”, “subsequent month”, “subsequent period”, “subsequent quarter”, “subsequent year”, “following fiscal”, “following month”, “following period”, “following quarter”, and “following year”. For instance: “*This will result in the Company expensing \$13,043 in fiscal 2006, which would previously have been presented in a proforma footnote disclosure.*” from CostCo Inc. FY 2005 AR.

Additionally, sentences with keywords “shall”, “should”, “can”, “could”, “may”, or “might” are not tagged as forward-looking, even though they imply the future. The reason is that these keywords are frequently associated with legal language and uninformative boilerplate disclosures that may not have any real forward-looking connotations (Li 2010). Our excluding such boilerplate language from being classified as forward-looking is consistent with the SEC’s concern that firms often provide non-informative boilerplate disclosures in MD&A (SEC 2003).

2) The second search tags a sentence as forward-looking if the sentence includes any conjugations of the following verbs: “aim”, “anticipate”, “assume”, “commit”, “estimate”, “expect”, “forecast”, “foresee”, “hope”, “intend”, “plan”, “project”, “seek”, and “target”. For each verb, we use the following list of the conjugations (the verb “expect” is used as template for brevity): "we expect", " and expect ", " but expect ", " do not expect ", "company expects", "corporation expects", " firm expects", "management expects", " and expects", " but expects", "does not expect", " is expected", " are expected", " not expected", " is expecting", " are expecting", " not expecting", "normally expect ", "normally expects", "currently expect ", "currently expects", " also expect ", " also expects". As in the first criterion, the use of such an extensive list of conjugations, versus a simple keyword search of verbs alone, helps reduce the likelihood of erroneously capturing noun forms of some verbs (particularly those of “plan”, “project”, and “estimate”), which frequently have no forward-looking connotation. For instance, “...*In addition, our pharmacy departments accept payments for prescription drugs through our customers’ health benefit plans...*” from Wal-Mart Stores Inc. FY 2005 AR.

3) The third search tags a sentence as forward-looking if the sentence includes a reference to a year that comes after the year of filing (such as “2002” in a company’s 10-K filing in year prior to 2002). The program avoids tagging as forward-looking phrases the genuine use of numbers or percentages, whose nominal value occasionally falls within the search range. Any use of characters in-between or before or after the digits (such as “\$”, “%”, “,”) disqualifies the number to be tagged as year.

#### Example of keyword versus sentence based intensity measure

Consider the following sentence from Lehman Brothers FY 2005 annual report:

*“We expect that corporate profitability will remain resilient, and we are looking for corporate earnings to increase by 8% to 10% in 2006.”*

A keyword-based algorithm would report three hits for “*expect*”, “*will*” and “*2006*”, whereas our sentence-based algorithm treats this sentence as one forward-looking sentence. The reasoning of our algorithm is that (a) there is a single message in the sentence, and (b) the sentence could be rewritten without any loss of content as “*We expect to keep a resilient profitability...*”

Nevertheless, the sentence-based approach leaves out the intensity of forward-looking information within the sentence. The keyword “*2006*” in the above sentence arguably provides incremental information, which the sentence-based approach does not capture. A sensitivity analysis shows that our results are qualitatively similar if we use the keyword-based algorithm.

#### **Step 4: Analyzing the content of forward-looking disclosures**

##### ***Content of forward-looking disclosures***

Within the forward-looking sentences, we count operation-related, finance-related, and accounting related keywords.

1) Operation related keywords (*OPERW*): “performance”, “perform”, “sales”, “revenue”, “earnings”, “income”, “profit”, “loss”, “expense”, “EBT”, “EBIT”, “EBITDA”, “depreciation”, “amortization”, “administrative”, “research”, “develop”, “R&D”, “cost of sales”, “cost of goods

sold”, “COGS”, “tax”, “impairment”, “margin”, “goodwill”, “working capital”, “receivable”, “payable”, “inventory”, “materials”, “supplies”, “bad debt”, “doubtful account”, “allowance”, “collect”, “accrual”, “operating cash flow”, “cash flow from operations”, “cash flow from operating”, “free cash flow”, “bankruptcy”, “Chapter 7”, and “Chapter 11”;

“operations”, “operating”, “operational”, “product”, “service”, “technology”, “project”, “contract”, “overhead”, “vendor”, “supplier”, “consumer”, “customer”, “client”, “marketing”, “order”, “backlog”, “advertising”, “commission”, “import”, “export”, “freight”, “transportation”, “utilities”, “energy”, “power”, “compete”, “competitive”, “demand”, “supply”, “market”, “business”, “segment”, “unit”, “subsidy”, “industry”, “license”, “patent”, “outsource”, and “promotion”;

“invest”, “expand”, “dispose”, “asset sale”, “asset purchase”, “spend”, “capital expenditure”, “acquire”, “develop”, “construct”, “install”, “capacity”, “relocate”, “remodel”, “refresh”, “overhaul”, “upgrade”, “maintain”, “repair”, “open”, “close”, “write-off”, “PP&E”, “subsidiary”, “joint venture”, “JV”, and “partner”;

“compensation”, “salary”, “bonus”, “grant”, “award”, “pension”, “retirement”, “health care”, “employee”, “labor”, “union”, “director”, “chairman”, “president”, “director”, “CEO”, “CFO”, “COO”, “CIO”, “manager”, “executive”, and “worker”;

“economic”, “world”, “country”, “population”, “environment”, “government”, and “inflation”.

2) Finance-related keywords (*FINANW*): “finance”, “financing”, “financial”, “liquid”, “borrow”, “covenant”, “debt”, “debenture”, “principal”, “creditor”, “liability”, “equity”, “capital resource”, “loan”, “line of credit”, “leverage”, “fund”, “repurchase”, “stock purchase”, “share purchase”, “commercial paper”, “bank credit”, “pay interest”, “principal”, “swap”, “lease”, “hedge”, “dividend”, and “interest”.

3) Accounting-related keywords (*ACCTGW*): “accounting”, “GAAP”, “FAS”, “SFAS”, “FASB”, “SEC”, “contingency”, “record”, “impairment test”, and “financial statement”.

## Appendix B Validating the Computer Methodology

In order to check the validity of the procedure detailed in Appendix A, we extract 50 MD&A sections from the sample randomly and manually identify forward-looking sentences. For this purpose, we ask four MBA students to read the MD&As, roughly 12 per student and to identify forward-looking sentences, which—based on their judgment—provide current and potential investors with useful prospective information. Independently, we also identify forward-looking sentences from the same 50 MD&As. In our reading, we attempted to identify the sentences based only on the information content—not on what we think the Perl code will generate. The output of the MBA students, who have no knowledge of the Perl algorithm, provides an unbiased verification. Yet, their output is subject to human processing errors such as the time and effort spent, and fatigue among others. Accordingly, we observe considerable variation on the average level of errors of individual students. Our output may be biased despite our efforts of being objective because of our prior knowledge of the Perl algorithm, yet our output is arguably less subject to human processing errors because of our experience with the company annual reports.

On average, the Perl program identifies an average of 25.5 forward-looking sentences per MD&A in this sample. In comparison, the students (we) identify 22.2 (23.8) sentences as forward-looking. We compare the output of the Perl program, students, and our manual reading on a sentence-by-sentence basis. On average, 18.1 sentences of the students' output are identical to those identified by the Perl output; 4.1 sentences are identified by students as forward-looking but not by the Perl code (which we denote Type 1 errors); and 7.4 sentences are identified by Perl code as forward-looking but not by the students (which we denote Type 2 errors). Similarly, 21.7 sentences of our output are identical to those in the Perl output; 2.1 sentences identified by us as forward-looking but not by the Perl code (Type 1); and 3.7 sentences are identified by Perl code as forward-looking but not by us (Type 2). Below are descriptive statistics of Type 1 and Type 2 errors about the readings of MBA students and us.

	Mean	Q1	Q2	Q3
MBA reading				
% Type 1	22.0%	7.4%	12.3%	27.2%
% Type 2	25.2%	10.0%	22.6%	36.7%
Our reading				
% Type 1	11.1%	0.0%	6.3%	15.3%
% Type 2	14.9%	8.3%	13.5%	21.4%

%Type 1 is defined as the number of Type 1 error sentences (i.e., sentences identified by us, but not by Perl) divided by the number of sentences in the Perl output, and %Type 2 is defined as the number of Type 2 error sentences (i.e., sentences identified by Perl, but not by us) divided by the number of sentences in the Perl output. The error rates show that the computer program and human reading of forward-looking sentences overlap significantly. Moreover, both Type 1 and Type 2 errors are symmetrically distributed, which indicates that computer program potentially is noisy and is reasonably unbiased: that is, the computer program does not have only Type 1 or only Type 2 errors.

A closer examination of Type 1 and 2 errors show that most of the errors are due to our objective of having both a well-specified and powerful sample by balancing potential Type 1 and 2 errors. Examples of representative Type 1 errors include the following cases:

i) Even if a sentence includes forward-looking information about the year of filing, the Perl program omits the sentence (in order to reduce Type 2 errors, i.e., in order not to erroneously include cases where past information about the filing year is disclosed): “... *cash on hand, funds generated from operations and other available debt facilities are sufficient to fund operating cash requirements and capital expenditures through fiscal 2002.*” *FY 2001 annual report filed in year 2002.*

ii) We require the forward-looking keyword “will” to be preceded and succeeded by space character “ “. This requirement is because we would like to reduce Type 2 errors (i.e., to exclude the common use of “goodwill” and other possible combinations as forward-looking phrases.) If “will” appears at the start of the text line, Perl program observes no preceding space character, and thus misses the sentence

iii) Typos, double spaces, and tabs between the words in the specified forward-looking phrases result in omission of the forward-looking sentence.

The most frequent Type 2 errors include sentences with forward-looking keywords that readers do not usually assess as providing value-relevant prospective information. For example:

*“When used herein, including this Management's Discussion and Analysis, the words "believes," "anticipates," "plans," "expects" and similar expressions are intended to identify forward-looking statements.”*

*“We undertake no obligation to update publicly any forward-looking statements, whether as a result of new information, future events or otherwise.”*

*“This results in a deferred future tax benefit.”*

Most importantly, the errors do not appear to be systematic. The fundamental characteristics (total assets, sales, B/M) of firms with low Type 1 and 2 errors are not significantly different from those with high Type 1 and 2 errors. We conclude that the Perl algorithm is well specified and powerful, and the measurement errors are unlikely to change our results.

**Appendix C**  
**Variable definitions**

Annual report disclosures	
ARS	The number of sentences in a company's annuals report.
MDAS	The number of sentences in the Management Discussion and Analysis (MD&A) section (Items 7 and 7A) of a company's annuals report.
FLS	The number of forward-looking sentences in the MD&A section of the annual report (Appendix A describes in detail how forward-looking sentences in the MD&A sections are identified.)
NFLS	The number of non-forward-looking sentences in the MD&A section of the annual report, defined as MDAS-FLS.
OPERW	The number of operating-related keywords, which are listed in Appendix C, in the forward-looking sentences.
FINANW	The number of financing-related keywords, which are listed in Appendix C, in the forward-looking sentences.
ACCTGW	The number of accounting-related keywords, which are listed in Appendix C, in the forward-looking sentences.
Financials	
RET	Buy-and-hold stock return for the 12 months ending 30 days after the 10-K filing.
NI	Earnings before extraordinary items (ib) during the fiscal year $t$ divided by the market value of equity at the beginning of the fiscal year, winsorized at +1 and -1. For computation of NI for different time periods (i.e., $t-1$ , $[t+1, t+3]$ ), earnings before extraordinary items are deflated by the market value of equity at the beginning of the fiscal year $t$ .
AGE	The number of years between the current year and the year of the company's first appearance in Compustat database (1980 is used as the base year).
LOG(SIZE)	The logarithm of market value of equity in millions of dollars, measured as 1 plus outstanding common shares (Compustat data item csho) multiplied by fiscal year-end share price (prcc f).
BM	Book value of assets (at) divided by market value of assets (the sum of market value of equity (csho* prcc f) and book value of total liabilities (lt).
SI	Indicator that equals 1 if the sum of unusual or non-recurring income statement items (spi) divided by sales (sale) is greater than 1% and 0 otherwise.
RET_VOL	Standard deviation of monthly returns during the fiscal year.
NI_VOL	Standard deviation of earnings deflated by beginning-of-year market capitalization during the last five fiscal years.
LOG(BSEG)	The logarithm of 1 plus number of business segments according to Compustat segments database.
LOG(GSEG)	The logarithm of 1 plus number of geographical segments according to Compustat segments database.
LOG(NITEMS)	The logarithm of 1 plus number of non-missing numerical items on the Compustat database.
SEO	Indicator that equals 1 if the firm has seasoned equity offering during the fiscal year according to SDC Global New Issues database and 0 otherwise.
M&A	Indicator that takes the value of 1 if the "Acquisition – Sale contribution" (aqc) divided by sales is greater than 1%, or the value of acquisitions (aqc) divided by total assets is greater than 2% and 0 otherwise.

Information environment partitioning variables	
Dark (Non-dark)	Indicator that equals 1 (0) if a company does not have any managerial earnings guidance and analyst following, and 0 (1) otherwise.
NoGuidance	Indicator that equals 1 if the company has issued no managerial guidance during the fiscal year, and 0 otherwise.
NoForecast	Indicator that equals 1 if no analyst has issued earnings forecast during the fiscal year for the upcoming year.
Dark Score	A variable that takes values 0, 1, and 2, increasing with the lack of corporate information before the 10-K filing. It is calculated as NoGuidance+NoForecast.
Beat (Miss)	Indicator if a company beats (misses) at least two out of three earnings thresholds for fiscal year $t$ . It equals 1 (0) if the sum of BeatZero, BeatLYearnings, BeatConsensus is greater than or equal to 2 and 0 (1) otherwise.
BeatZero	Indicator that equals 1 if Earnings before extraordinary items (ib) is greater than 0 and 0 otherwise.
BeatLYearnings	Indicator that equals 1 if Earnings before extraordinary items (ib) is greater than that of last years and 0 otherwise.
BeatConsensus	Indicator that equals 1 if the company earnings is greater or equal to the analysts' forecast consensus calculated before the fiscal year end and 0 otherwise.
Beat Score	A variable that takes values 0, 1, 2, and 3, increasing with the number of annual earnings thresholds the company beats for the fiscal year. It is calculated as BeatZero + BeatLYearnings + BeatConsensus.

All financial variables relate to the fiscal year of the 10-K filing, unless otherwise stated.  $\Delta$  denotes annual change.

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**TABLE 1**  
**Forward-looking and Non-forward looking disclosures in the MD&A**

**Panel A: Summary statistics**

	Mean	Std	Min	Q1	Q2	Q3	Max
Annual report sentences (ARS)	1,565	935	245	982	1,352	1,877	15,786
MD&A sentences (MDAS)	283	171	23	160	249	361	2,476
Forward-looking sentences (FLS)	36	27	0	17	30	48	326
Non-forward-looking sentences (NFLS)	246	150	16	140	218	314	2,165
$\Delta\text{LOG}(\text{ARS})$	0.039	0.426	-2.613	-0.156	0.040	0.231	2.841
$\Delta\text{LOG}(\text{MDAS})$	0.088	0.285	-2.595	-0.040	0.073	0.208	2.872
$\Delta\text{LOG}(\text{FLS})$	0.102	0.495	-3.871	-0.134	0.087	0.336	4.111
$\Delta\text{LOG}(\text{NFLS})$	0.087	0.279	-2.663	-0.036	0.074	0.201	2.898

**Panel B: Descriptive statistics of explanatory variables**

	Full sample		NON-DARK		DARK		MISS		BEAT	
	Mean	Median	Mean	Median	Mean	Median	p-value	Mean	Median	p-value
DARK SCORE	0.959	1.000	0.555	1.000	2.000	2.000	NR	1.204	1.000	0.00
<i>NoGuidance</i>	0.624	1.000	0.479	0.000	1.000	1.000	NR	0.699	1.000	0.00
<i>NoForecast</i>	0.335	0.000	0.076	0.000	1.000	1.000	NR	0.505	0.000	0.00
BEAT SCORE	1.726	2.000	1.939	2.000	1.178	1.000	0.00	0.626	2.411	NR
<i>BeatZero</i>	0.716	1.000	0.762	1.000	0.599	1.000	0.00	0.321	0.962	NR
<i>BeatLYEarnings</i>	0.617	1.000	0.631	1.000	0.579	1.000	0.00	0.196	0.878	NR
<i>BeatConsensus</i>	0.394	0.000	0.547	1.000	0.000	0.000	0.00	0.109	0.571	NR
AGE	11.554	10.000	11.598	10.000	11.441	10.000	0.09	10.698	11.000	0.00
LOG(SIZE)	5.743	5.719	6.323	6.267	4.249	4.083	0.00	4.926	6.251	0.00
BM	0.702	0.708	0.668	0.669	0.788	0.829	0.00	0.749	0.672	0.00
SI	0.301	0.000	0.301	0.000	0.299	0.000	0.64	0.454	0.000	0.00
RET_VOL	0.142	0.115	0.134	0.110	0.165	0.127	0.00	0.180	0.099	0.00
NI_VOL	0.094	0.044	0.078	0.037	0.137	0.072	0.00	0.128	0.073	0.00
LOG(BSEG)	1.468	1.386	1.506	1.386	1.369	1.386	0.00	1.506	1.386	0.00
LOG(GSEG)	1.362	1.386	1.455	1.386	1.123	1.386	0.00	1.359	1.364	0.73
LOG(NITEMS)	5.579	5.602	5.599	5.620	5.528	5.549	0.00	5.593	5.570	0.00
SEO	0.073	0.000	0.090	0.000	0.031	0.000	0.00	0.049	0.000	0.00
M&A	0.214	0.000	0.246	0.000	0.131	0.000	0.00	0.182	0.000	0.00
ΔLOG(SIZE)	0.074	0.093	0.085	0.103	0.044	0.063	0.00	-0.137	0.175	0.00
ΔBM	-0.009	-0.004	-0.004	-0.003	-0.019	-0.008	0.00	0.015	-0.011	0.00
ΔSI	-0.006	0.000	-0.004	0.000	-0.010	0.000	0.31	0.092	0.000	0.00
ΔRET_VOL	-0.007	-0.005	-0.009	-0.005	-0.003	-0.003	0.00	-0.003	-0.009	0.00

Table 1, Panel B continued

	Full sample		NON-DARK		DARK		MISS		BEAT		
	Mean	Median	Mean	Median	Mean	Median	p	Mean	Median	p	
$\Delta$ NI_VOL	0.000	0.000	-0.002	0.000	<	0.005	0.000	0.007	>	-0.004	0.000
	0.000	0.000	0.000	0.000		0.000	0.000	0.001		-0.001	0.000
$\Delta$ LOG(BSEG)	0.068	0.068	0.070	0.063		0.063	0.07	0.077		0.063	0.000
	0.000	0.000	0.000	0.000		0.000	0.000	0.000		0.000	0.79
$\Delta$ LOG(GSEG)	0.047	0.047	0.059	0.015	>	0.015	0.000	0.048		0.046	0.68
	0.000	0.000	0.000	0.000		0.000	0.000	0.000		0.000	0.01
$\Delta$ LOG(NITEMS)	0.023	0.023	0.023	0.020		0.020	0.000	0.026	>	0.021	0.000
	0.017	0.017	0.017	0.017		0.017	0.68	0.021		0.015	0.000
$\Delta$ SEO	0.002	0.002	0.003	0.001		0.001	0.69	-0.009	<	0.009	0.000
	0.000	0.000	0.000	0.000		0.000	0.62	0.000		0.000	0.000
$\Delta$ M&A	0.001	0.001	0.001	0.000		0.000	0.86	-0.010	<	0.008	0.000
	0.000	0.000	0.000	0.000		0.000	0.89	0.000		0.000	0.000
FLS	36	36	39	28		28	0.00	38		35	0.00
	30	30	33	22		22	0.00	31		29	0.00
NFLS	246	246	265	199		199	0.00	235		254	0.00
	218	218	238	171		171	0.00	207		226	0.00
$\Delta$ LOG(FLS)	0.102	0.102	0.102	0.103		0.103	0.89	0.120		0.091	0.00
	0.087	0.087	0.089	0.083		0.083	0.70	0.105		0.078	0.00
$\Delta$ LOG(NFLS)	0.087	0.087	0.088	0.083		0.083	0.13	0.105		0.075	0.00
	0.074	0.074	0.076	0.067		0.067	0.00	0.092		0.064	0.00
N	29,919	29,919	21,546	8,373		8,373		11,475		18,444	

**Notes to Table 1**

Our sample consists of 29,919 annual reports electronically filed between years 1994 and 2007 as part of the 10-K filing requirement to the SEC/EDGAR system. For an annual report to be included in the sample, we require non-missing financial information in CRSP and COMPUSTAT databases and last year's figures to compute changes. Panel A presents summary statistics for the annual report and the MD&A. Panel B presents descriptive statistics for variables used in empirical analyses. *Dark firms* are firms with no managerial guidance and analyst following; all other firms are categorized as *non-dark* firms. *Beat firms* are firms that beat two of three earnings thresholds identified in DeGeorge et al. (1999) (i.e., zero earnings, last year's earnings, and analyst's consensus forecasts); all other firms are categorized as *miss firms*. Appendix C provides definitions for all variables.  $\Delta$  denotes annual change.

**TABLE 2**  
**Changes in forward-looking and non-forward-looking sentences and information environment**

	Dependent variable		Difference p-value
	$\Delta\text{LOG}(\text{FLS})$	$\Delta\text{LOG}(\text{NFLS})$	
DARK SCORE	-0.008 (-2.96)	-0.005 (-3.13)	0.29
BEAT SCORE	-0.019 (-8.01)	< -0.014 (-10.98)	0.06
AGE	0.002 (7.36)	> 0.001 (5.80)	0.00
LOG(SIZE)	0.003 (2.26)	0.002 (2.55)	0.51
BM	0.002 (0.26)	-0.006 (-1.29)	0.23
SI	-0.033 (-6.16)	< -0.002 (-0.74)	0.00
RET_VOL	-0.055 (-2.10)	< 0.020 (1.21)	0.00
NI_VOL	-0.064 (-4.13)	-0.064 (-6.17)	0.43
LOG(BSEG)	0.000 (0.09)	< 0.004 (2.61)	0.10
LOG(GSEG)	-0.006 (-2.54)	< -0.002 (-1.74)	0.01
LOG(NITEMS)	0.169 (5.62)	0.084 (4.74)	0.33
SEO	0.012 (1.28)	0.014 (2.53)	0.75
M&A	0.025 (4.36)	< 0.036 (10.61)	0.06
$\Delta\text{LOG}(\text{SIZE})$	0.009 (1.94)	> -0.004 (-1.65)	0.00
$\Delta\text{BM}$	0.036 (3.42)	> 0.013 (2.64)	0.00
$\Delta\text{SI}$	0.031 (7.02)	> 0.013 (5.24)	0.00
$\Delta\text{RET\_VOL}$	0.057 (2.65)	> 0.019 (1.53)	0.03
$\Delta\text{NI\_VOL}$	0.038 (1.18)	0.038 (1.91)	0.69
$\Delta\text{LOG}(\text{BSEG})$	0.023 (3.80)	> 0.011 (3.32)	0.06
$\Delta\text{LOG}(\text{GSEG})$	0.026 (5.02)	> 0.007 (2.54)	0.00
$\Delta\text{LOG}(\text{NITEMS})$	0.024 (0.88)	0.004 (0.27)	0.30
$\Delta\text{SEO}$	-0.007 (-0.99)	0.000 (-0.08)	0.11
$\Delta\text{M\&A}$	-0.003 (-0.54)	-0.008 (-2.93)	0.35

Table 2 continued

Year, industry indicators	Yes	Yes
N	29,919	29,919
Adjusted R <sup>2</sup>	33.7%	15.9%

**Notes to Table 2**

The table provides regression estimates and t-values (in parentheses) for the two models where annual changes in forward-looking sentences and non-forward-looking sentences are regressed separately on *Dark Score*, *Beat Score*, company financials, and changes in company financials. Observations with studentized residuals greater than two in absolute value are deleted from the final tests. The t-values are based on standard errors that are adjusted for heteroskedasticity and within-company dependence. The p-values in the last column compare the coefficient estimates between the two models using a seemingly unrelated regression, which adjusts for dependence in observations. Appendix C provides variable definitions.  $\Delta$  denotes annual change.

**TABLE 3**  
**Future earnings response coefficient and change in forward-looking and non-forward-looking MD&A sentences**

**Panel A: Descriptive statistics**

	N	Mean	Std	Min	Q1	Q2	Q3	Max
$RET_t$	23,651	0.131	0.791	-0.977	-0.247	-0.005	0.298	22.640
$RET_{[t+1, t+3]}$	23,651	0.274	1.441	-0.998	-0.411	-0.035	0.507	45.943
$NI_{t-1}$	23,651	-0.009	0.194	-1.000	-0.007	0.041	0.069	1.000
$NI_t$	23,651	0.011	0.176	-1.000	-0.007	0.048	0.081	1.000
$NI_{[t+1, t+3]}$	23,651	0.123	0.518	-3.000	-0.031	0.160	0.307	3.000

**Panel B: Regression model**

	Dependent variable: $RET_t$		
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
$NI_{t-1}$	-0.635 (-20.94)	-0.639 (-20.02)	-0.637 (-20.57)
$NI_t$	0.556 (17.49)	0.540 (16.34)	0.556 (16.93)
$NI_{[t+1, t+3]}$	0.242 (19.35)	0.239 (18.90)	0.242 (18.81)
$RET_{[t+1, t+3]}$	-0.050 (-16.02)	-0.051 (-15.19)	-0.048 (-15.03)
$\Delta\text{LOG}(\text{FLS})_t$	-0.039 (-5.71)		-0.021 (-2.47)
$\Delta\text{LOG}(\text{FLS})_t * NI_{t-1}$	0.151 (2.31)		0.212 (2.54)
$\Delta\text{LOG}(\text{FLS})_t * NI_t$	0.072 (1.27)		0.013 (0.18)
$\Delta\text{LOG}(\text{FLS})_t * NI_{[t+1, t+3]}$	0.072 (3.42)		0.075 (3.00)
$\Delta\text{LOG}(\text{FLS})_t * RET_{[t+1, t+3]}$	0.026 (5.14)		0.033 (5.97)
$\Delta\text{LOG}(\text{NFLS})_t$		-0.075 (-6.63)	-0.047 (-3.53)
$\Delta\text{LOG}(\text{NFLS})_t * NI_{t-1}$		0.101 (0.94)	-0.147 (-1.10)
$\Delta\text{LOG}(\text{NFLS})_t * NI_t$		0.145 (1.38)	0.122 (0.93)
$\Delta\text{LOG}(\text{NFLS})_t * NI_{[t+1, t+3]}$		0.069 (1.92)	-0.026 (-0.60)
$\Delta\text{LOG}(\text{NFLS})_t * RET_{[t+1, t+3]}$		0.018 (1.94)	-0.020 (-2.02)
Year, industry indicators	Yes	Yes	Yes
Adjusted R <sup>2</sup>	21.3%	20.8%	21.3%

### Notes to Table 3

Panel A provides descriptive statistics for changes in forward-looking sentences, changes in non-forward-looking sentences, buy-and-hold stock returns for the year  $t$ , which ends one month after filing date of the 10-K for the fiscal year  $t$ , cumulative buy-and-hold stock returns for fiscal years from  $t+1$  to  $t+3$ , earnings for fiscal years  $t-1$  and  $t$ , and cumulative earnings for fiscal years  $t+1$  to  $t+3$ . The sample includes 23,651 observations.

Panel B provides regression estimates and t-values (in parentheses) where buy-and-hold returns for fiscal year  $t$  are regressed on past, current, and future earnings, future returns, and interaction of these variables with changes in forward-looking sentences and non-forward-looking sentences. Outliers with studentized residuals greater than two in absolute value are deleted from the final tests. The t-values are based on standard errors that are adjusted for heteroskedasticity and within-company dependence. Appendix C provides variable definitions.  $\Delta$  denotes annual change.

**TABLE 4**  
**Future earnings response coefficient and change in forward-looking and non-forward-looking MD&A sentences for dark and non-dark firms**

**Panel A: Descriptive statistics across dark partitioning**

	NON-DARK	DARK	Difference, p-value
	Mean Median	Mean Median	
RET <sub>t</sub>	0.127	0.140	0.25
	0.004	-0.036	0.00
RET <sub>[t+1, t+3]</sub>	0.252	0.334	0.00
	-0.022	-0.069	0.00
NI <sub>t-1</sub>	0.007	-0.051	0.00
	0.043	0.034	0.00
NI <sub>t</sub>	0.022	-0.018	0.00
	0.050	0.040	0.00
NI <sub>[t+1, t+3]</sub>	0.141	0.075	0.00
	0.163	0.145	0.00
N	17,241	6,410	

**Panel B: Regression model across dark partitioning**

	Dependent variable: RET <sub>t</sub>		Difference, p-value
	NON-DARK Coefficient (t-value)	DARK Coefficient (t-value)	
NI <sub>t-1</sub>	-0.941 (-20.47)	-0.355 (-8.28)	0.00
NI <sub>t</sub>	0.539 (11.20)	0.488 (10.64)	0.45
NI <sub>[t+1, t+3]</sub>	0.366 (21.20)	0.102 (5.75)	0.00
RET <sub>[t+1, t+3]</sub>	-0.063 (-13.09)	-0.030 (-7.24)	0.00
ΔLOG(FLS) <sub>t</sub>	-0.035 (-3.25)	-0.002 (-0.12)	0.06
ΔLOG(FLS) <sub>t</sub> * NI <sub>t-1</sub>	0.317 (2.52)	0.146 (1.34)	0.28
ΔLOG(FLS) <sub>t</sub> * NI <sub>t</sub>	-0.036 (-0.34)	0.011 (0.11)	0.71
ΔLOG(FLS) <sub>t</sub> * NI <sub>[t+1, t+3]</sub>	0.107 (3.09)	0.007 (0.18)	0.04
ΔLOG(FLS) <sub>t</sub> * RET <sub>[t+1, t+3]</sub>	0.034 (4.47)	0.029 (4.12)	0.61
ΔLOG(NFLS) <sub>t</sub>	-0.038 (-2.27)	-0.074 (-2.97)	0.22
ΔLOG(NFLS) <sub>t</sub> * NI <sub>t-1</sub>	0.027 (0.13)	-0.070 (-0.40)	0.76
ΔLOG(NFLS) <sub>t</sub> * NI <sub>t</sub>	0.255 (1.42)	0.050 (0.27)	0.39

Table 4, Panel B continued

$\Delta\text{LOG(NFLS)}_t * \text{NI}_{[t+1, t+3]}$	-0.087 (-1.40)	0.069 (1.17)	0.06
$\Delta\text{LOG(NFLS)}_t * \text{RET}_{[t+1, t+3]}$	-0.020 (-1.36)	-0.026 (-2.01)	0.77
Year, industry indicators	Yes	Yes	
N	17,241	6,410	
Adjusted R <sup>2</sup>	24.8%	18.1%	

**Notes to Table 4**

Across non-dark and dark firms, Panel A provides descriptive statistics on changes in forward-looking sentences, changes in non-forward-looking sentences, buy-and-hold stock returns for the year  $t$ , which is defined to end one month after the 10-K filing date for the fiscal year  $t$ , cumulative buy-and-hold stock returns for the fiscal years from  $t+1$  to  $t+3$ , earnings for fiscal years  $t-1$  and  $t$ , and cumulative earnings for fiscal years  $t+1$  to  $t+3$ .

Across non-dark and dark firms, Panel B provides regression estimates and t-values (in parentheses), where buy-and hold returns for year  $t$  are regressed on past, current, and future earnings, future returns, and interaction of these variables with changes in forward-looking sentences and non-forward-looking sentences. Outliers that have studentized residuals greater than two in absolute value are deleted from the final tests. The  $t$ -values are based on standard errors that are adjusted for heteroskedasticity and within-company dependence. Using a seemingly unrelated regression, the last column compares coefficient estimates between the two models, adjusting for within-firm dependence. Appendix C provides definitions for all variables.  $\Delta$  denotes annual change.

**TABLE 5**  
**Partitions based on missing/beating earnings thresholds**

**Panel A: Descriptive statistics across missing/beating earnings thresholds**

	MISS	BEAT	Difference, p-value
	Mean Median	Mean Median	
RET <sub>t</sub>	-0.004 -0.145	0.183 0.052	0.00 0.00
RET <sub>[t+1, t+3]</sub>	0.330 -0.040	0.218 -0.018	0.00 0.01
NI <sub>t-1</sub>	-0.034 0.022	0.025 0.047	0.00 0.00
NI <sub>t</sub>	-0.086 -0.029	0.068 0.063	0.00 0.00
NI <sub>[t+1, t+3]</sub>	-0.061 0.005	0.227 0.205	0.00 0.00
N	5,163	12,078	

**Panel B: Regression model across missing/beating earnings thresholds**

	Dependent variable: RET <sub>t</sub>		
	MISS Coefficient (t-value)	BEAT Coefficient (t-value)	Difference, p-value
NI <sub>t-1</sub>	-0.478 (-7.35)	-0.976 (-16.03)	0.00
NI <sub>t</sub>	0.021 (0.32)	0.896 (9.90)	0.00
NI <sub>[t+1, t+3]</sub>	0.130 (4.88)	0.473 (22.95)	0.00
RET <sub>[t+1, t+3]</sub>	-0.040 (-6.61)	-0.081 (-14.58)	0.00
ΔLOG(FLS) <sub>t</sub>	-0.028 (-1.36)	-0.036 (-2.27)	0.72
ΔLOG(FLS) <sub>t</sub> * NI <sub>t-1</sub>	0.123 (0.58)	0.481 (3.15)	0.17
ΔLOG(FLS) <sub>t</sub> * NI <sub>t</sub>	0.042 (0.28)	-0.227 (-1.29)	0.25
ΔLOG(FLS) <sub>t</sub> * NI <sub>[t+1, t+3]</sub>	0.152 (2.77)	0.107 (2.50)	0.53
ΔLOG(FLS) <sub>t</sub> * RET <sub>[t+1, t+3]</sub>	0.013 (1.36)	0.036 (3.66)	0.11
ΔLOG(NFLS) <sub>t</sub>	-0.047 (-1.47)	-0.015 (-0.56)	0.43
ΔLOG(NFLS) <sub>t</sub> * NI <sub>t-1</sub>	0.204 (0.67)	-0.898 (-3.09)	0.01
ΔLOG(NFLS) <sub>t</sub> * NI <sub>t</sub>	0.056 (0.22)	0.736 (2.15)	0.10

Table 5, Panel B continued

$\Delta \text{LOG(NFLS)}_t * \text{NI}_{[t+1, t+3]}$	-0.149 (-1.44)	-0.072 (-0.87)	0.56
$\Delta \text{LOG(NFLS)}_t * \text{RET}_{[t+1, t+3]}$	-0.012 (-0.60)	-0.027 (-1.33)	0.61
Year, industry indicators	Yes	Yes	
N	5,163	12,078	
Adjusted R <sup>2</sup>	14.1%	31.7%	

**Notes to Table 5**

Across firms that miss/beat earnings thresholds separately, Panel A provides descriptive statistics on changes in forward-looking sentences, changes in non-forward-looking sentences, buy-and-hold stock returns for the year  $t$ , which ends one month after the 10-K filing date for the fiscal year  $t$ , cumulative buy-and-hold stock returns for the years from  $t+1$  to  $t+3$ , earnings for fiscal years  $t-1$  and  $t$ , and cumulative earnings for fiscal years  $t+1$  to  $t+3$ . The sample consists of only firms that have either managerial guidance or analyst following.

Across firms that miss/beat earnings thresholds separately, Panel B provides regression estimates and t-values (in parentheses) where buy-and hold returns for year  $t$  are regressed on past, current, and future earnings, future returns, and interaction of these variables with changes in forward-looking sentences and non-forward-looking sentences. Outliers that have studentized residuals greater than two in absolute value are deleted from the final tests. The t-values are based on standard errors that are adjusted for heteroskedasticity and within-company dependence. Using a seemingly unrelated regression, the last column compares coefficient estimates between the two models, adjusting for within-firm dependence. Appendix C provides definitions for all variables.  $\Delta$  denotes annual change.

**TABLE 6**  
**Content of forward-looking disclosures**

**Panel A: Summary statistics across for the content of forward-looking disclosures**

	N	Mean	Std	Min	Q1	Q2	Q3	Max
OPERW <sub>t</sub>	23,651	62	58	0	22	44	81	655
FINANW <sub>t</sub>	23,651	17	15	0	7	13	22	180
ACCTGW <sub>t</sub>	23,651	3	4	0	0	2	5	45
$\Delta\text{LOG}(\text{OPERW})_t$	23,651	0.137	0.606	-4.190	-0.143	0.114	0.414	4.522
$\Delta\text{LOG}(\text{FINANW})_t$	23,651	0.126	0.533	-3.219	-0.154	0.095	0.405	3.784
$\Delta\text{LOG}(\text{ACCTGW})_t$	23,651	0.150	0.760	-2.890	-0.223	0.000	0.693	3.219

**Panel B: CKSS model with content of forward-looking disclosures**

	Dependent variable: RET <sub>t</sub>			
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
NI <sub>t-1</sub>	-0.641 (-20.43)	-0.621 (-19.98)	-0.640 (-20.51)	-0.637 (-20.63)
NI <sub>t</sub>	0.540 (16.01)	0.553 (16.90)	0.552 (16.69)	0.542 (16.20)
NI <sub>[t+1, t+3]</sub>	0.239 (18.64)	0.241 (18.88)	0.239 (18.69)	0.237 (18.49)
RET <sub>[t+1, t+3]</sub>	-0.048 (-15.10)	-0.048 (-15.00)	-0.046 (-14.90)	-0.049 (-15.18)
$\Delta\text{LOG}(\text{FLS})_t$	-0.026 (-1.72)	-0.048 (-3.54)	-0.009 (-0.9)	-0.013 (-1.46)
$\Delta\text{LOG}(\text{FLS})_t * \text{NI}_{t-1}$	0.313 (2.03)	0.485 (3.81)	0.183 (1.75)	0.069 (0.74)
$\Delta\text{LOG}(\text{FLS})_t * \text{NI}_t$	-0.128 (-0.94)	-0.012 (-0.1)	-0.026 (-0.29)	-0.015 (-0.19)
$\Delta\text{LOG}(\text{FLS})_t * \text{NI}_{[t+1, t+3]}$	0.131 (2.72)	0.141 (3.24)	0.080 (2.58)	0.057 (2.08)
$\Delta\text{LOG}(\text{FLS})_t * \text{RET}_{[t+1, t+3]}$	0.041 (4.72)	0.036 (4.30)	0.037 (5.69)	0.033 (5.28)
$\Delta\text{LOG}(\text{NFLS})_t$	-0.048 (-3.68)	-0.049 (-3.72)	-0.045 (-3.42)	-0.048 (-3.58)
$\Delta\text{LOG}(\text{NFLS})_t * \text{NI}_{t-1}$	-0.080 (-0.59)	-0.136 (-1.01)	-0.115 (-0.84)	-0.114 (-0.85)
$\Delta\text{LOG}(\text{NFLS})_t * \text{NI}_t$	0.118 (0.92)	0.119 (0.92)	0.124 (0.93)	0.150 (1.16)
$\Delta\text{LOG}(\text{NFLS})_t * \text{NI}_{[t+1, t+3]}$	-0.016 (-0.36)	-0.015 (-0.35)	-0.028 (-0.65)	-0.024 (-0.55)
$\Delta\text{LOG}(\text{NFLS})_t * \text{RET}_{[t+1, t+3]}$	-0.020 (-1.93)	-0.018 (-1.81)	-0.019 (-1.90)	-0.021 (-2.05)
$\Delta\text{LOG}(\text{OPERW})_t$	0.025 (2.44)	0.028 (2.65)		
$\Delta\text{LOG}(\text{OPERW})_t * \text{NI}_{t-1}$	-0.274 (-2.95)	-0.276 (-3.06)		

Table 6 continued

$\Delta\text{LOG}(\text{OPERW})_t * \text{NI}_t$	0.070 (0.77)	0.023 (0.25)		
$\Delta\text{LOG}(\text{OPERW})_t * \text{NI}_{[t+1, t+3]}$	-0.073 (-2.10)	-0.069 (-1.98)		
$\Delta\text{LOG}(\text{OPERW})_t * \text{RET}_{[t+1, t+3]}$	-0.006 (-0.85)	-0.004 (-0.50)		
$\Delta\text{LOG}(\text{FINANW})_t$	-0.017 (-2.15)		-0.017 (-2.19)	
$\Delta\text{LOG}(\text{FINANW})_t * \text{NI}_{t-1}$	0.038 (0.54)		0.019 (0.27)	
$\Delta\text{LOG}(\text{FINANW})_t * \text{NI}_t$	0.038 (0.56)		0.050 (0.75)	
$\Delta\text{LOG}(\text{FINANW})_t * \text{NI}_{[t+1, t+3]}$	-0.003 (-0.13)		-0.003 (-0.15)	
$\Delta\text{LOG}(\text{FINANW})_t * \text{RET}_{[t+1, t+3]}$	-0.008 (-1.31)		-0.009 (-1.46)	
$\Delta\text{LOG}(\text{ACCTGW})_t$	-0.011 (-2.25)			-0.012 (-2.55)
$\Delta\text{LOG}(\text{ACCTGW})_t * \text{NI}_{t-1}$	0.151 (3.95)			0.145 (3.80)
$\Delta\text{LOG}(\text{ACCTGW})_t * \text{NI}_t$	0.013 (0.33)			0.015 (0.37)
$\Delta\text{LOG}(\text{ACCTGW})_t * \text{NI}_{[t+1, t+3]}$	0.041 (2.88)			0.047 (3.24)
$\Delta\text{LOG}(\text{ACCTGW})_t * \text{RET}_{[t+1, t+3]}$	-0.002 (-0.46)			-0.002 (-0.55)
Year, industry indicators	Yes	Yes	Yes	Yes
N	23,651	23,651	23,651	23,651
Adjusted R <sup>2</sup>	21.6%	21.4%	21.2%	21.6%

### Notes to Table 6

Panel A provides descriptive statistics of the levels and the annual changes in logarithm of the number of operating keywords (OPERW), financial keywords (FINANW), and accounting keywords (ACCTGW) in the forward-looking sentences. Appendix A provides the list of operating, financial, and accounting keywords.

Panel B provides regression estimates and t-values (in parentheses) where buy-and hold returns for fiscal year  $t$  are regressed on past, current, and future earnings, future returns, and interaction of these variables with changes in forward-looking sentences, non-forward-looking sentences, and changes in the logarithm of OPERW, FINANW, and ACCTGW. Outliers that have studentized residuals greater than two in absolute value are deleted from the final tests. The t-values are based on standard errors that are adjusted for heteroskedasticity and within-company dependence. Appendix C provides definitions for all variables.  $\Delta$  denotes annual change.