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The Effect of Forward-looking MD&A Disclosures on Market Participants' Reactions to Earnings Surprises

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Abstract

This study examines whether forward-looking MD&A disclosures can accelerate investors' and analysts' comprehension of the future implications of previously announced earnings and thus mitigate market and analyst underreactions to previous earnings surprises following the submission of 10-Q/10-K filings. Our findings reveal that forward-looking MD&A disclosures trigger notable market and analyst responses to prior earnings announcements. Consequently, we find that such disclosures are associated with a significant reduction in post-earnings announcement drift and the serial correlation in analyst forecast errors after SEC filings. We also find that the mechanism by which forward-looking MD&A disclosures alleviate market and investor underreactions to prior earnings surprises centers around the fact that more forward-looking MD&A disclosures help inform more accurate expectations of future earnings.

Keywords: forward-looking MD&A disclosures, post-earnings announcement drift, analyst underreaction

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Data availability: Data used in this study are available from public sources identified in the study.

1. Introduction

The aim of this study is to investigate whether narrative forward-looking information in the Management Discussion and Analysis (MD&A) section of 10-K filings can reduce investor and analyst underreaction to current earnings surprises. While quantitative information in corporate reports has increased our understanding of financial markets, studies have shown that relying solely on quantitative factors may not fully explain the movement of stock prices. The MD&A section of a public firm's 10-K filing is mandatory and includes management's comments on the firm's present and future outlook. Prior research has suggested that MD&A narratives provide valuable information to external equity investors, and that MD&A disclosures are informative for market participants, furthering their understanding of a company's financial performance and future prospects. However, it is still unclear how forward-looking MD&A disclosures can impact market efficiency in terms of mitigating investor and analyst underreaction to current earnings surprises.

This study employs the Brav and Heaton's (2002) rational learning model within a Bayesian framework to investigate whether forward-looking MD&A disclosures (FLDs) can enhance the reactions of investors and analysts to earnings surprises. Brav and Heaton's (2002) model posits that investors grapple with uncertainty when determining if there has been a fundamental shift in the investment's payoff structure. In situations where a structural shift has just occurred, investors tend to assign lower weights to the information signals, appearing to underweight (and thus underreact to) the shift because of the incorporation of the uncertainty surrounding the shift's existence in their estimates. Section 2 delves deeper into the concept of fully Bayesian investors who also give less weight to the signals characterized by higher information uncertainty, reflecting lower precision or quality. As this uncertainty is gradually resolved, investors will start assigning more weight to the original signal information, leading to subsequent adjustments in asset prices. This phenomenon, known as 'rational learning', highlights how investors appropriately modify their estimates of the valuation parameter associated with the payoff structure in response to new information.

Forward-looking MD&A disclosures (FLDs) may offer a means for managers to convey private information concerning expectations of future performance for the firm. This communication could assist market participants in addressing the challenge of determining whether a structural shift has indeed occurred in the earnings process. In turn, this would reduce the uncertainty associated with prior announced earnings and improve their precision, enabling investors and analysts to better grasp the implications of current earnings surprises for future earnings. Consequently, such improvements could lead to a reduction in the underreaction of investors and analysts to current earnings surprises.

Our study provides evidence that forward-looking MD&A disclosures can improve the reaction of analysts and investors to the future implications of currently announced earnings,

leading to a reduction in post-earnings announcement drift and the serial correlation in analyst forecast errors. The findings rule out self-selection of forward-looking MD&A disclosures as a factor, indicating that it is the disclosures themselves that are responsible for this effect.

Additional tests were conducted to confirm the findings. Firstly, it was found that these disclosures reduce abnormal returns to earnings surprises in the quarter following the announcement, up to t+4, indicating that they help market participants form more accurate expectations of future earnings based on current earnings surprises. Secondly, we discovered that the financial verifiability of forward-looking MD&A disclosures is an important factor in determining their usefulness, as there is a more significant reduction in market and analyst underreaction to earnings surprises when they are more verifiable than when they are not. Thirdly, the findings suggest that forward-looking MD&A disclosures by rival peer firms also have a positive impact on mitigating investor and analyst underreaction to earnings surprises, indicating that such disclosures have a spillover effect for information efficiency. Fourthly, we found that in addition to the quantity of forward-looking MD&A disclosures, the unsigned tone of the MD&A section is crucial in helping investors and analysts extract information about upcoming earnings and reduce their underreaction to current earnings surprises. Finally, to facilitate understanding of the results in the context of annual earnings announcements, regression tests and analyst serious correlation analyses were rerun for annual earnings announcements. The impact of forward-looking MD&A disclosures on mitigating both investor and analyst underreaction to earnings surprises was more pronounced in the annual reporting context compared to the quarterly reporting context.

This study makes three significant contributions to the existing literature on MD&A disclosures and post-earnings announcement drift (PEAD). Firstly, prior research has generated inconsistent findings regarding the information content of MD&A disclosures, whereas our findings clarify the usefulness of MD&A disclosures in terms of reducing the delayed stock market response to unexpected earnings. Secondly, this study sheds light on how verifiable quantitative information influences perceptions of credibility for both investors and analysts. It also examines whether such perceptions are justified by the acceleration of stock market's and analysts' responses to the future implications of current earnings signals. Thirdly, our work enriches the literature on PEAD and presents evidence that forward-looking MD&A disclosures can assist market participants in making better judgments about the transitory or permanent shocks of past earnings signals.

The remainder of the paper is organized as follows. The next section reviews the related literature. Section 3 discusses the development of the hypotheses, Section 4 presents the definitions of the main variables, and describes sample selection and the descriptive statistics, while the empirical results are explained in Section 5. A discussion of robust test is presented in Section 6 and supplementary tests in Section 7. Some conclusions are offered in Section 8.

2. Theoretical Framework and Literature Review

2.1 Theoretical framework

The structural uncertainty model developed by Brav and Heaton (2002) used by Chordia and Shivakumar (2005) and Shin (2006) is adopted in this study. Within this framework, fully Bayesian investors grapple with uncertainty surrounding potential shifts in the investment's payoff structure. These investors tend to assign lower weight to information signals received shortly after a structural shift occurs. This cautious approach stems from their uncertainty regarding whether a genuine change has taken place. Moreover, fully Bayesian investors assign less importance to signals characterized by higher information uncertainty, which signifies lower precision or quality.

As this uncertainty gradually dissipates, investors gradually increase their reliance on the content of the original signal, leading to subsequent shifts in the asset prices. The abnormal returns resulting from these price adjustments diminish as the uncertainty gets resolved. This phenomenon is termed "rational learning." It denotes the investors' appropriate adjustment of their valuation parameter estimates in response to new information.

The argument centers on the idea that forward-looking MD&A disclosures play a crucial role in assisting rational Bayesian investors and analysts in managing the uncertainty associated with previously announced earnings. These disclosures enable investors and analysts to bolster their confidence in prior earnings announcements, leading to reduced PEAD and lower serial correlation in analysts' forecasts.

2.2 The information content of the MD&A and forward-looking disclosures

In the accounting literature, there exist two distinct streams of research concerning the value relevance of corporate disclosures. The first kind encompasses a substantial body of work that investigates the impact of conventional quantitative factors on stock pricing. The second kind, relatively smaller in size, focuses on assessing the valuation of qualitative disclosures. However, it should be noted that within a typical corporate report, it is the textual narrative that constitutes the majority of the disclosure, accounting for an average of 80% of the content of the annual report, while the remainder comprises numerical data and quantitative representations (Miller 2010; Li, Lundholm, and Minnis 2013; Bochkay and Levine 2019; Siano and Wysocki 2021). The clarity of this significant textual portion of the mandatory disclosure plays a pivotal role in comprehending and interpreting the information presented in the report. Furthermore, it has been revealed in the accounting literature that managers rely heavily on qualitative disclosures (Hutton, Miller, and Skinner 2003; Cole and Jones 2004; Sun 2010; Hoberg and Phillips 2016; Loughran and McDonald 2016). Thus, in 2003, the SEC issued a press release urging the creation

of MD&As that are "informative and transparent" and that provide insights into the quality and potential variability of a company's earnings and cash flow. To sum up, both the research evidence and the SEC's call for informative MD&As underscore the importance of qualitative disclosure as a crucial medium for managerial communication.

The advancement of technological capabilities capable of processing extensive textual disclosures, including the firms' 10-K filings, has sparked substantial research into the economic implications of MD&A disclosures within the realms of accounting and finance. A fundamental question that arises concerning these disclosures is whether they possess informational value. Various methods have been employed in past studies, including the analysis of correlations between different aspects of MD&A disclosures and both current and future financial fundamentals, as well as examining their relationship with concurrent and future market reactions, in order to gauge the informational content of the textual content within MD&As. On one hand, in alignment with the SEC's intended purpose, MD&As stand as one of the most frequently read and pivotal components within financial statements (Knutson 1993; Rogers and Grant 1997). On the other hand, doubts persist regarding the informativeness of MD&A disclosures, primarily due to concerns within companies regarding proprietary costs (Verrecchis 1983) and uncertainties surrounding the legal interpretation of safe harbor protection. Furthermore, these disclosures have sometimes been criticized as boilerplate and generic, offering minimal substantive information (SEC, 2003). Consequently, the empirical results concerning the informational content of MD&A disclosures present a mixed picture.

By the time 10-K reports are filed, much of the key financial information, such as earnings and sales growth, is already publicly available. As a result, it is not surprising that early evidence fails to record a significant market reaction to 10-K filings (Easton and Zmijewski 1993). Some studies even suggest that only a limited reaction occurs in response to these filings when prior earnings releases are considered (Griffin 2003; Li and Ramesh 2009). However, recent research work utilizing computer-based approaches to analyze textual content indicates that there may be additional information beyond the financial statements within the narrative text of the 10-Ks. Studies focused on textual analyses of MD&A disclosures have discovered incremental information content in various aspects of the text, including the tone of the text (Loughran and McDonald 2011; Wang, Wu, and Yan 2021; Berns, Bick, Flugum, and Houston 2022), its readability (Li 2008; Loughran and McDonald 2014; Lo, Ramos, and Rogo 2017; Hasan 2020; Wang, Chen, Li, and Tian 2021), forwarding-looking statements (Muslu, Radhakrishnan, Subramanyam and Lim 2015; Bozanic, Roulstone, and Buskirk 2018; Henry, Thewissen, and Torsin 2023), its quantity (Dyer, Lang, and Stice-Lawrence 2017; Elsayed and Elshandidy 2021), and year-on-year changes within the MD&A section (Amel-Zadeh and Faasse 2016; Berns et al. 2022). This body of research has also shown that forward-looking MD&A disclosures can influence analyst behavior (Schleicher and Walker 1999; Hussainey, Schleicher, and Walker 2003; Fedorova, Drogovoz, Nevredinov, Kazinina, and Qitan 2022; Bochkay, Brown, Leone, and Tucker 2023).

However, there have been few studies in the literature addressing the impact of forward-looking MD&A disclosures in mitigating stock inefficiency related to earnings surprises. Such disclosures play a role in immediate and delayed market reactions. Earnings announcements and their components hold significance as they aide investors to efficiently incorporate accounting information into stock prices. Consequently, this study makes a significant contribution to existing research by establishing a clear relationship between forward-looking MD&A disclosures and enhanced market efficiency.[1]

2.3 Corporate disclosures and investor and analyst reaction to earnings surprises

It has been shown in PEAD studies that stock prices continue to move in the direction of the initial market response to current earnings surprises (SUE) for at least 120 trading days following the earnings announcement (Drake, Myers, and Myers 2009; Fu, Kraft, and Zhang 2011). Prior studies also show a positive serial correlation in analyst forecast errors (e.g., Mendenhall 1991; Abarbanell and Bernard 1992; Shane and Brous 2001; Mikhail, Walther, and Willis 2003). This suggests that market participants are slow to react to prior information about future earnings, and that this information is only partially incorporated into security prices and analysts' forecasts. This raises the question of whether high-quality disclosures about future earnings can reduce market participants' under-reaction to current earnings surprises. Previous research has shown that corporate disclosures can reduce the under-reaction to earnings surprises (Soffer and Lys 1999; Shane and Brous 2001; Li and Tse 2008). However, while the conventional role of quantitative factors in reducing PEAD has been extensively examined, there is a growing realization that incorporating qualitative information is essential to fully understand the movement of stock prices. Further analysis of the impact of qualitative communications on investor and analyst reactions to earnings surprises would enhance our understanding of financial markets.

3. Hypothesis Development

3.1 Forward-looking MD&A disclosures and market participants' underreaction to earnings surprises

PEAD, a phenomenon characterized by a delayed market response to new earnings

[1] Feldman, Govindaraj, Livnat, and Segal (2010) found not only that changes in MD&A tone were related to immediate market reactions around the SEC filing, but also that the market's response to the tone was ineffective, that changes in tone added to portfolio drift returns beyond the financial information conveyed by accruals and earnings surprises. Our aims differ from those of Feldman et al. in that we focus on the content of forward-looking disclosures (FLDs) within the MD&As, as opposed to analyzing the tone. While Feldman et al. explored the existence of market delay reactions to MD&A tone, our study delves into whether the FLDs in the MD&A disclosures mitigate market and analyst underreactions to previously announced earnings.

information, occurs when a company's stock price does not immediately adjust to announced earnings. Drawing from the structural uncertainty model pioneered by Brav and Heaton (2002) as discussed above, we posit that fully Bayesian investors grapple with uncertainty concerning potential shifts in the underlying earnings process. This uncertainty prompts a rational delay in their trading decisions, contingent upon the precision of the earnings signals.

Forward-looking MD&A disclosures emerge as a potential solution to overcoming this uncertainty. These disclosures offer clarity on whether a structural shift has indeed taken place, a claim supported by prior work highlighting the informative nature of forward-looking MD&A disclosures. Such disclosures shed light on indications of a firm's future prospects embedded within previously announced earnings, thus enriching the firm's information environment.

In prior research the emphasis has been on the significance of financial reporting, in particular, management's discussion and analysis, as a pivotal source of information (Marin and Poulter 2004). MD&As thus provide explanatory power to explain a company's financial statements (Hoberg 2016) and will be revised following operational changes, shifts in capital resources, and acquisitions or divestitures (Brown and Tucker 2011). They provide insights into future earnings, cash flows, investments, and firm value, especially during periods of business change (Bryan 1997; Li 2010; Ball, Hoberg, and Maksimovic 2015; Frankel, Jennings, and Lee 2016). Importantly, the explanatory power of MD&As extends beyond reiterating existing information; they contribute incremental insights beyond earnings announcements (Davis and Tama-Sweet 2012).

Taking into account the insights offered by FLDs, which can shed light on future earnings and cash flow prospects, and building upon the groundwork laid by previous earnings disclosures, it is argued that forward-looking MD&A disclosures have the potential to refine the accuracy of earnings signals. Additionally, they aid investors in determining whether a substantive shift in the payoff structure of investments has genuinely taken place. This reduction in information uncertainty empowers investors to attribute greater significance to earnings signals hither to characterized by heightened information uncertainty, thereby facilitating the differentiation between transient and persistent shocks to earnings. This results in a reduction of the PEAD.[2] State formally,

H1: *Forward-looking MD&A disclosures attenuate the post-earning announced drift.*

It is suggested in the existing literature that analysts often underreact to information, particularly to the persistent portion of previously announced earnings. Evidence of this underreaction has been documented in studies by Mendenhall (1991) and Abarbanell and

[2] Cazier, Merkley, and Treu (2020) failed to find a significant link between qualitative forward-looking statements and the likelihood of facing subsequent litigation. Yet, they did uncover compelling evidence that a positive tone within qualitative forward-looking statements corresponds to an increased likelihood of litigation within two specific U.S. jurisdictions. This association becomes pronounced in circuits where legal judgments have reduced safe harbor protections surrounding forward-looking statements. On the whole, their findings consistently align with the notion that the safe harbor provision effectively shields companies' qualitative forward-looking statements from the risk of litigation.

Bernard (1992). Additionally, prior research has found a positive serial correlation in analyst forecast errors, indicating that analysts may overlook some of the persistent portion found in previously announced earnings when forming expectations of future earnings. This underreaction is commonly attributed to the analysts' heuristics and biases under uncertainty, as pointed out by Daniel, Hirshleifer, and Subrahmanyam (1998). Greater uncertainty and a lack of accurate feedback about a set of stocks' fundamentals leave more room for psychological biases, as postulated by Hirshleifer (2001). Given that FLDs can reduce information uncertainty and provide additional information about the persistence of previously announced earnings for a firm, it is proposed that more FLDs will reduce analyst underreaction to earnings surprises.[3] Therefore, the following hypothesis is suggested:

H2: *Forward-looking MD&A disclosures reduce analyst underreaction to earnings surprises.*

4. Sample, Main Variable Definitions and Descriptive Statistics

4.1 Definition of the main variables

4.1.1 Forwarding-looking MD&A disclosures (*FLD*)

Forward-looking disclosures are identified following the methodology of Muslu et al. (2015), who analyzed the text of 10-K filings at the sentence level. To further refine this method, this study excludes tables, figures and boilerplate language, such as that related to the Safe Harbor statements. Consistent with the Muslu et al. (2015) methodology, forward-looking MD&A sentences are identified as those sentences containing specific phrases, including forward-looking expressions, verb conjugations implying the future, numerical references to future years, and forward-looking modal verbs. These phrases were analyzed using computer-science-based linguistics for identifying future-related sentences (Wang and Lin 2004). The forward-looking disclosures (FLD) used in the empirical tests were measured based on the number of forward-looking sentences divided by the total number of sentences in the MD&A section. The specifics for identifying forward-looking sentences, following the methodology outlined by Muslu et al. (2015), are provided in Appendix A.Standardized unexpected earnings (*SUE*)

The estimation of expected earnings per share is conducted using a seasonal random walk method with a trend model, where the trend is determined from the 12 most recent quarters of

[3] Soffer and Lys (1999) posited that making information available which enhances the clarity about the future consequences of present earnings shocks ought to alleviate investor underreaction, leading to a reduction in post-earnings announcement drift. This line of thought can be applied to analysts as well, with the implication that the pattern of consecutive errors in their forecasts should lessen as more insights are gained into the persistence of earlier reported earnings.

earnings per share. To calculate the standardized unexpected earnings (SUE), actual earnings per share are subtracted from the expected earnings per share and divided by the standard deviation of unexpected earnings over the trend estimation period. A firm's SUE for quarter *t* is ranked among all firms meeting initial CRSP and Compustat data requirements, and the resulting decile ranking is scaled between 0 and 1. Bernard and Thomas (1990) showed that when SUE is rescaled to fall between 0 and 1, the coefficient on *RSUE* represents the returns for a zero-investment portfolio strategy based on the cross-sectional distribution of seasonally differenced earnings previously announced.

4.1.2 Market adjusted buy-and-hold abnormal returns (*BHAR*)

To calculate *BHAR*, the compounded raw return during the return accumulation period is subtracted from the compounded value weighted return for a portfolio of companies in the same CRSP NYSE/AMEX/NASDAQ size decile over the same period. Return accumulation periods of 1 month, 3 months, and 6 months, all starting from the second day after the SEC filing date, are employed. Specifically, *BHAR1*, *BHAR3*, and *BHAR6* cover accumulation periods of one month, three months, and six months, respectively, beginning on the second day after the SEC filing.

4.1.3 Analyst forecast errors (*FERR*)

FERR is defined as the difference between a firm's earnings for the upcoming quarter (*t*+1) and the consensus of analysts' earnings forecasts for the same quarter's EPS after the 10-Q/10-K filing date of the previous quarter (*t*). Following Kimbrough (2005), the calculation includes only those analysts who have provided their latest forecasts for the earnings of quarter t, specifically up to 10 days before the SEC filing and revised their forecasts for the company's earnings for quarter *t*+1 within the 30-day interval subsequent to the SEC filing.[4] The consensus of analysts' predictions is calculated as an average.

4.2 Data

Electronic 10-Q reports filed with the SEC on EDGAR from the first quarter of 2000 to the fourth quarter of 2022 were downloaded and analyzed.[5, 6] The restricted sample included

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[4] The aim of setting a 30-day threshold following SEC filings to gauge *FERR* is to mitigate the potential influence of additional information arrivals, thereby preventing confounding effects. Employing a 10-day cutoff before SEC filings to quantify *FERR* is a strategic choice to prevent any interference from analyst exposure to potential 10-Q/10-K filings preannouncements, thereby safeguarding the integrity of *FERR*.

[5] Before the advent of EDGAR, details regarding SEC filings were accessible either directly from the companies or through the SEC library with a lag (Easton and Zmijewski 1993).

[6] One issue associated with the SEC EDGAR database is its reliance on CIK codes for firm identification. Unfortunately, these codes do not align seamlessly with other commonly utilized databases in both practical and academic spheres, such as the Compustat or CRSP databases. The Standard & Poor's (S&P) Filing Dates database endeavors to bridge the divide. It accomplishes this by establishing connections between all entities present in the Compustat database (identified by GVKEY) and the corresponding CIK identifiers within the SEC EDGAR database.

solely those SEC submissions completed within 55 days (for 10-Q forms) and 100 days (for 10-K forms). This measure ensures the omission of filings that have been subject to delays. After extraction of the MD&A sections, sentences were identified as the units of analysis. Observations in which EDGAR queries did not yield any outcomes, text files which either lacked MD&A sections or provided MD&A sections with fewer than 2,000 words that, upon examination were either unreadable or contained errors, were excluded. Forward-looking sentences were distinguished following the classification method developed by Muslu et al. (2015), and their characteristics examined.

The historical financial data was obtained from Compustat, stock return data from CRSP, and analysts' earnings forecast data was provided by the International Brokers Estimate System (I/B/E/S). Matching the 10-K filings with the CRSP/Compustat/IBES merged database was accomplished based on the company names and announcement dates. Institutional ownership was obtained from the 13-F filings. The sample was restricted to firms meeting certain criteria, including having at least one analyst whose most recent earnings forecast of quarter t's earnings as of 10 days prior to 10-Q /10-K filing was less than 90 days old, and who revised their forecast of quarter t+1's earnings after both 10-Q/10-K filing. Requiring analyst forecasts for the dataset leads to the omission of smaller and less-tracked companies from the sample pool. Observations with the necessary earnings per share and price data on I/B/E/S were included, and the sample was further restricted to calculate standardized unexpected earnings and cumulative abnormal returns.

Outliers were mitigated by winsorizing all continuous variables at the 1% and 99% levels. The final sample consisted of 144,824 firm-quarters and 9,574 unique firms, with observations for financial sector firms excluded.

4.3 Descriptive statistics

To test our hypotheses, we use future return tests and analyst forecast error tests. For the future return tests, we control for several variables associated with prior studies (Foster, Greer, and Thorbecke 1984; Atiase 1987; Bhushan 1994; Bartov, Radhakrishnan, and Krinsky 2000; Doukas, Kim, and Pantzalis 2002; Baker and Wurgler 2006): firm size (*SIZE*), stock price (*PRC*), trading volume (*VOL*) and the percentage of common shares held by institutional investors (*INST*). In the analyst forecast error tests, we control for firm size (*SIZE*), analyst following (*N*), book-to-market ratio (*BTM*), firm age (*AGE*), return volatility (*RETVOL*), profitability (*ROA*), and dividend payments (*DP*). For detailed definitions of these variables, see Appendix B. We further divide the sample into low and high FLD subsamples, with low (high) FLD subsamples consisting of firm-quarterly observations whose FLD is below (above) the median across all firm-quarter observations. The results of univariate tests comparing these two subsamples are presented in Table 1.

Table 1 Descriptive statistic

Variables	Full sample (no. of obs. =144,824)		High FLD subsample (no. of obs. = 72,459)		Low FLD subsample (no. of obs. = 72,365)		Difference in	
	Mean	Median	Mean	Median	Mean	Median	Means (t-stat)	Medians (z-stat)
$BHAR_t$	0.006	0.004	0.010	0.008	0.002	−0.003	0.008** (2.235)	0.011** (2.422)
$FERR_t$	−0.027	−0.025	−0.009	−0.005	−0.045	−0.039	0.036*** (3.208)	0.034*** (3.033)
FLD_t	0.129	0.112	0.176	0.167	0.082	0.071	0.094*** (3.392)	0.096*** (2.820)
SUE_t	0.021	0.019	0.033	0.028	0.009	0.007	0.024** (2.207)	0.021** (1.997)
$SIZE_t$	8.887	8.842	10.753	8.961	7.019	5.399	3.734*** (3.261)	3.562*** (3.150)
PRC_t	45.908	36.333	46.367	38.639	45.448	37.960	0.919* (1.664)	0.679* (1.748)
VOL_t	2.129	2.265	2.150	1.792	2.108	1.722	0.042 (1.507)	0.070 (1.365)
$INST_t$	0.421	0.438	0.505	0.433	0.337	0.259	0.168*** (3.631)	0.174*** (2.884)
N_t	6.044	5.000	8.327	7.000	3.758	3.000	4.569*** (3.558)	4.000*** (2.819)
BTM_t	0.671	0.653	0.559	0.466	0.783	0.602	−0.224** (−2.365)	−0.136** (−2.292)
AGE_t	11.011	10.000	11.121	10.268	10.901	9.985	0.220** (2.171)	0.283** (2.266)
$RETVOL_t$	0.147	0.119	0.123	0.103	0.171	0.166	−0.048* (−1.870)	−0.063* (−1.757)
ROA_t	0.069	0.054	0.070	0.058	0.068	0.052	0.002 (1.367)	0.006 (1.485)
DP_t	0.021	0.013	0.024	0.021	0.018	0.014	0.006 (1.242)	0.007 (1.332)

Notes: Definitions of all variables are presented in Appendix 1. *** indicates $p < 0.01$; ** indicates $p < 0.05$; * indicates $p < 0.10$.

As can be seen in the table the contemporaneous as well as future size-adjusted buy-and-hold returns (*BHAR*) are higher for the high FLD firms than the low FLD firms (t-statistics = 2.235; z-statistics = 2.422). Consistent with Hypothesis H2, forward-looking disclosures reduce analyst forecast errors. We observe that forecast errors (*FERR*) are significantly greater within the high FLD subsample in contrast to the low FLD subsample, which indicates that forward-looking disclosures increase the amount of information available to analysts and improve earnings

forecast accuracy.[7] Additionally, the high FLD subsample has a significantly higher standardized unexpected earnings (*SUE*) relative to the low FLD subsample.[8]

We also observe that the high FLD subsample includes firms that are significantly larger in size than does the low FLD subsample.[9] The findings suggest that larger firms are more likely to include forward-looking disclosures in their MD&As than smaller firms. Additionally, the high FLD subsample is characterized by greater institutional ownership and a stronger analyst following than the low FLD subsample (p-value < 0.01; p-value < 0.01), indicating that firms with higher institutional holdings and greater analyst followings are more likely to engage in forward-looking disclosures. The findings also show that trading volume, stock price, firm age, profitability, and dividend payments are highly correlated with firm size and exhibit a similar pattern across the two subsamples. Finally, the high FLD subsample has a lower boot-to-market ratio and return volatility compared to the low FLD subsample (p-value < 0.05; p-value < 0.10). Overall, these results emphasize the importance of controlling for various firm characteristics when estimating empirical models.

5. Empirical Results

5.1 The impact of forward-looking disclosures on PEAD

To test Hypotheses 1, we used both the hedge portfolio approach and the regression-based approach. The portfolio approach has the advantage of addressing the potential nonlinear relationship between unexpected earnings and stock returns. On the other hand, the regression approach allows one to examine the association between current earnings surprises and future stock returns after controlling for factors affecting the magnitude of post-earnings announcement drift (PEAD).

5.1.1 Hedge portfolio approach

First, calculate the average abnormal returns for deciles grouped according to the SUE. The SUE hedge portfolio strategy involves assuming long positions in cases of extreme "good-news" (SUE = 10) firm-years and short positions in instances of "bad-news" (SUE = 1) firm-years. The initial investigation focuses on assessing whether forward-looking MD&A disclosures contribute to the mitigation of PEAD, achieved by influencing the market's response to prior earnings

[7] This is supported by the *t*-statistic, which indicates a difference in the mean of *FERR* between the two subsamples at 3.208, as well as the *z*-statistic, which records a difference in the median of *FERR* between the two subsamples at 3.033.

[8] This is supported by the *t*-statistic, which indicates a difference in the mean of *SEU* between the two subsamples at 2.207, as well as the *z*-statistic, which records a difference in the median of *SUE* between the two subsamples at 1.977.

[9] This is supported by the *t*-statistic, which indicates a difference in the mean of *SIZE* between the two subsamples at 3.261, as well as the *z*-statistic, which records a difference in the median of *SIZE* between the two subsamples at 3.150.

announcements. To validate this hypothesis, we analyzed the performance of hedge portfolio returns, beginning from the second day after earnings announcements and concluding six months after the day following earnings announcements, within the two subsets of FLD.

To investigate whether forward-looking MD&A disclosures mitigate PEAD after SEC filings, following the approach of Womack (1996), Loh (2010), and Philippot (2018), we conducted a comparison of the average buy-and-hold abnormal returns over 1, 2, 3, 4, 5, and 6 months after SEC filings for the ten portfolios, as well as the SUE hedge portfolio strategy, within both high and low forward-looking disclosure (FLD) sample groups.[10]

Table 2 provides information about the abnormal returns for each of the three post-earnings announcement periods broken down based on the two FLD subsamples. The table shows a positive relationship between the portfolio SUE ranking and abnormal returns across the two subsamples. Additionally, the magnitude of cumulative abnormal returns across the ten portfolios is negatively related to forward-looking disclosures. For example, the portfolio 6-month abnormal returns range from −0.020 for the lowest SUE portfolio to 0.019 for the highest SUE portfolio, for the high FLD sample, and range from −0.023 for the lowest SUE portfolio to 0.041 for the highest SUE portfolio for the low FLD sample. Accordingly, the SUE hedge portfolio returns also decrease with forward-looking disclosures, whereas the SUE hedge portfolio strategy takes a long position in the highest portfolio and a short position in the lowest portfolio. We observe that the sixth-month abnormal returns to the SUE hedge portfolio strategy is 0.039 for the high FLD subsample, and 0.064 for the low FLD subsample. Forward-looking MD&A disclosures tend to reduce the hedge portfolio returns based on the current earnings surprises.[11]

We further calculated the ratio of 1-month to 5-month hedge portfolio returns over 6-month hedge portfolio returns within both the low FLD subsample and high FLD subsample. The higher ratios for the 1-month to 5-month periods indicate that investors have a better grasp of the significant correlation between current earnings surprises and future earnings surprises, enabling them to incorporate the implications of current earnings into their expectations of future earnings more quickly. This, in turn, should speed up the dissemination of the implications of current annual earnings surprises into stock prices in addition to reducing the post-earnings-announcement drift.

As can be observed in Table 2, the 1-month, 2-month, 3-month, 4-month, and 5-month

[10] We have chosen a six-month horizon because it has been found in previous studies that PEAD typically occurs within the six months following earnings announcements. While Womack (1996), Loh (2010) and Philippot (2018) focused primarily on the PEAD for 1-month, 3-month, and 6-month periods, we present the six-month PEAD to ensure that our results are robust and not a result of data mining.

[11] Prior studies employed both time-series models and analyst forecasts to estimate earnings surprises in their analysis of post-earnings-announcement drift. In our case, we compute unexpected earnings (UE) using time-series models. Livnat and Mendenhall (2006) conducted a comparison between these two approaches, revealing a notably greater drift when analyst forecasts are utilized. Our untabulated findings corroborate this observation of a larger drift with analyst forecasts. Even when analyst forecasts are substituted with time-series models for estimating unexpected earnings, our results remain consistent.

Table 2 Average returns across various portfolios based on the prior year's SUE for both high and low forward-looking disclosure samples

	High FLD					Low FLD				
	SUE Portfolio			Diff (A)	% of 6-month Return	SUE Portfolio			Diff (B)	% of 6-month Return
	Lowest	2-9	Highest			Lowest	2-9	Highest		
Number of firm-years	7,245	57,969	7,245			7,236	57,893	7,236		
Size-adjusted returns										
1-month	−0.008	−0.001	0.012	0.020	51%	−0.014	−0.003	0.017	0.031	48%
2-month	−0.013	−0.002	0.014	0.027	69%	−0.017	−0.002	0.025	0.042	65%
3-month	−0.016	−0.002	0.016	0.032	82%	−0.019	−0.002	0.031	0.050	78%
4-month	−0.018	−0.003	0.017	0.035	90%	−0.021	−0.001	0.036	0.057	88%
5-month	−0.019	−0.003	0.018	0.037	95%	−0.022	−0.001	0.039	0.061	94%
6-month	−0.020	−0.004	0.019	0.039	100%	−0.023	0.000	0.041	0.064	100%

hedge portfolio returns for the low FLD subsample are 48%, 65%, 78%, 88%, and 94%, respectively but in contrast, for the high FLD subsample, the 1-month, 2-month, 3-month, 4-month, and 5-month hedge portfolio returns are 51%, 69%, 82%, 90%, and 95%, respectively. These results suggest that, in addition to helping investors comprehend the implications of current earnings surprises for future earnings surprises thereby reducing PEAD, higher FLD levels also lead to faster assimilation of future earnings information into stock prices. This expedites the incorporation of current annual earnings information into stock prices, leaving a reduced portion of PEAD for subsequent periods, while maintaining a consistent PEAD magnitude for both low FLD subsample and high FLD subsample.

Figure 1 shows the variation of the drift over the six months following the earnings announcement between the two FLD subsamples. The findings indicate that more forward-looking MD&A disclosures lead to less PEAD.

The observed variations in drift between the high FLD subsample and the low FLD subsample aligns with the idea that forward-looking MD&A disclosures play a role in reducing underreactions by investors to unexpected earnings results after 10-Q/10-K filings. However, interpreting the differences in magnitude of the post-earnings announcement drift between the low and high FLD subsamples requires caution. It is important to consider whether there is a stronger association between returns and earnings in the low FLD sample compared to the high FLD subsample. A smaller magnitude of drift in the high FLD subsample may be due to the inherent differences in earnings-return relationships, rather than the influence of forward-

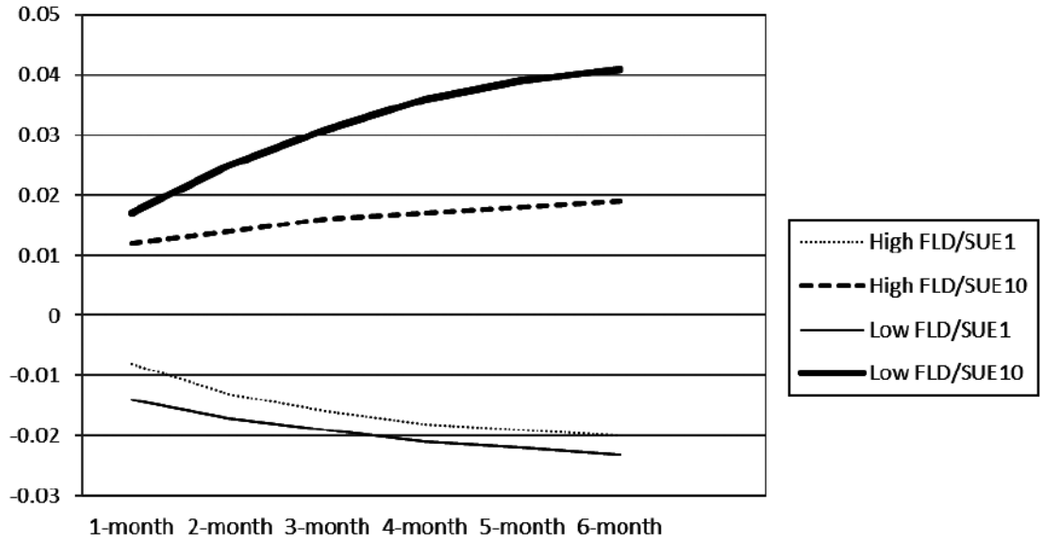

Figure 1 Buy-and-hold abnormal returns (BHAR) over six months

looking MD&A disclosures on helping investors grasp the future implications of current earnings announcements.

To address this issue, we used a measure called "proportionate drift", rather than solely relying on the raw magnitude of post-earnings drift. Proportionate drift is computed by taking the six-month hedge portfolio returns following the filing date of the 10-Q/10-K report and dividing it by the raw magnitude of post-earnings drift. The raw magnitude of post-earnings drift is measured from the second day after the earnings announcement in quarter *t* through six months after. 10-Q/10K filing date. This approach allowed us to account for the overall strength of the earnings-return relationship after earnings announcements when comparing the two subsamples. If forward-looking MD&A disclosures are effective in reducing investor underreactions, we would expect to see a decrease in the proportion of the market's total response to quarter t's earnings announcement after 10-K/10-Q filings.

The untabulated analytical result reveal that there is a difference in the hedge portfolio returns during the period spanning from the second day after the announcement of quarter t's earnings to the 10-K/10-Q filing date between the high and low FLD subsamples. Specifically, for the high FLD subsample, the returns amount to 0.028, whereas for the low FLD subsample, they amount to 0.023. Consequently, when calculating the proportionate drift for these subsamples, a value of 58.21% (calculated as 0.039/0.028+0.039) is obtained for the high FLD subsample and 73.56% (calculated as 0.064/0.023+0.064) for the low FLD subsample. The results of the proportionate drift analysis provide further support for the earlier findings regarding the variation in magnitude between the high and low FLD subsamples.

5.1.2 Regression approach

The following regression is performed to test Hypothesis H1:

$$\begin{aligned} BHAR_i\,(1,3,6) = {} & \alpha_0 + \alpha_1 RSUE_{i,t} + \alpha_2 FLD_{i,t} + \alpha_3 FLD_{i,t} \times RSUE_{i,t} + \\ & \alpha_4 SIZE_{i,t} \times RSUE_{i,t} + \alpha_5 PRC_{i,t} \times RSUE_{i,t} + \\ & \alpha_6 VOL_{i,t} \times RSUE_{i,t} + \alpha_7 INST_{i,t} \times RSUE_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{1}$$

where *BHAR, RSUE* and *FLD* are defined as above; the other variables are defined as follows:

SIZE = the market capitalization as of the end of the quarter;

PRC = the stock price at the end of quarter *t*;

VOL = dollar trading volume measured over the 12-month period preceding quarter *t*;

INST = the percentage of common shares held by institutional investors out of the total outstanding common stocks at the end of quarter *t*.

Following Womack (1996), Loh (2010), and Philippot (2018), we focuse on PEAD for 1-month, 3-month, and 6-month periods. To mitigate issues related to outliers and nonlinearity in the earnings-returns relationship, we utilize decile rankings, scaled between 0 and 1, for SUE (Standardized Unexpected Earnings), as suggested by Bernard and Thomas (1990) and Bartov et al. (2000), we incorporate the control variables identified in previous studies as factors affecting the magnitude of PEAD. In these cases, the original values of the control variables are retained rather than using the decile ranking variables. To address the issue of multicollinearity, we refrain from introducing interaction terms between the control variables and SUE (or RUSE). The estimation results from Equation (1) are presented in Table 3.

Cross-sectional regression analysis is conducted employing the pooled Ordinary Least Squares (OLS) estimation method.[12] A positive *RSUE* coefficient suggests that the market has failed to fully react to recent earnings surprises, presenting profitable trading opportunities. According to Bernard and Thomas (1990), α_3, the coefficient on standardized unexpected earnings (*SUE*), scaled between 0 and 1, reflects the returns on a zero-investment portfolio strategy based on SUE for low forward-looking disclosures. We anticipate that the coefficients on *RSUE* will exhibit positive values. The intersection of *FLD* and *RSUE* and (α_3) is of interest, with the estimate indicating the impact of forward-looking MD&A disclosures on PEAD. As proposed in Hypothesis H1, a negative α_3 coefficient suggests that increased forward-looking MD&A disclosures reduce post-earnings announcement drift.

To account for firm-specific factors that could be related to post-earnings announcement drift (PEAD), several additional independent variables are incorporated into the model. Foster et al. (1984) established that larger firms tend to operate within a more efficient information environment, resulting in a weaker PEAD effect. Therefore, firm size (*SIZE*) is employed as a proxy variable to capture the information environment. Likewise, Bhushan (1994) showed that lower transaction costs are correlated with a diminished PEAD effect. To represent transaction costs, we include the stock price (*PRC*) at the end of quarter *t* and trading volume (*VOL*) over the prior fiscal year as control variables in our model. Furthermore, in line with the findings of Bartov et al. (2000), who demonstrated that institutional ownership (*INST*), as a measure of investor sophistication, can mitigate PEAD, we introduce *INST* as an additional control variable. We anticipate that the coefficients on these control variables in relation to *RSUE* will exhibit negative values. For facilitate a direct comparison of the moderating role played by forward-looking MD&A disclosures, we use the original values of independent variables instead of decile

[12] According to Peterson's research (2009), the Fama-MacBeth regressions exhibit lack of bias but notable statistical inefficiency. The decision between utilizing pooled OLS or Fama-MacBeth involves a trade-off between potential bias and enhanced statistical efficiency. Pooled OLS encounters the risk of cross-sectional and time-series interdependence. Even so, although cross-sectional correlation might pose issues for extensive datasets, we rely predominantly on pooled OLS regressions due to its greater statistical efficiency. Additionally, the Fama-MacBeth regressions are incorporated to evaluate our hypotheses, and subsequent application of these regressions upholds the consistency of our results.

ranking them.[13]

The empirical results from Equation (1) are presented in Table 3, columns (1) to (3). Additionally, the *FLD*×*RSUE* coefficient (α_3) is equal to −0.016, −0.012, and −0.014 (*t*-statistic = −2.907, −2.725, −2.836, respectively).[14] Corresponding to the findings for the hedge portfolio tests, after controlling the information environment and trading cost variables potentially associated with PEAD, it can be observed that investors of low FLD firms fail to properly infer information about future earnings from current earnings announcements. By providing forward-looking MD&A disclosures, managers could improve the investors' response to predictable information about upcoming earnings, even though the high FLD firms still exhibit PEAD.[15]

To facilitate comparison of the regression results with the hedge portfolio test findings, Equation (1) is re-run after replacing *FLD* with two indicator variables, *DFLD* and *RFLD*. The empirical results are presented in Table 3 columns (4) to (6) for *DFLD* and columns (7) to (9) for *RFLD*. Note that *DFLD* takes a value of 1 when FLD is below the median of all firm-quarter observations for the fiscal quarter, and 0 otherwise. *RFLD* takes a value based on the decile ranking of FLD in the fiscal quarter.

The coefficients on *RSUE* represent the SUE hedge portfolio returns for the low FLD sample, while the addition of the coefficient on *RSUE* and *DFLD*×*RSUE* represent the SUE hedge portfolio returns for high FLD sample, after controlling for the various information environment and trading cost variables. As can be seen in Table 3 columns (4) to (6), the coefficients on *RSUE* are 0.037, 0.049 and 0.060 respectively, all having a *p*-value of less than 0.05. Recall that *RSUE* is normalized to vary from zero to one. The resultant SUE coefficients indicate that the spread in abnormal returns between the firms with the highest and lowest SUE values in the low FLD sample amounts to 0.035, 0.044, and 0.054 over periods of one to six months respectively. These magnitudes are akin to those seen in the hedge portfolio tests as shown in Table 2, whereas the hedge portfolio returns for the same period are 0.031, 0.050, and 0.064.

The *DFLD*×*RSUE* coefficients are −0.014, −0.018, and −0.020, respectively, all demonstrating *p*-values of less than 0.01. The addition of the coefficients on *RSUE* and *DFLD*×*RSUE*, reflecting the spread in abnormal returns between the firms with the highest and lowest SUE values in the high FLD sample, are 0.023, 0.031 and 0.040, all with *p*-values of less

[13] Controlling these variables is not intended to achieve independent control of their effects on subsequent returns in addition to the SUE hedge portfolio strategy. Instead, similar to the moderating role played by forward-looking MD&A disclosures, these controlling variables aim to manage the moderating effects associated with the influence of the SUE hedge portfolio strategy on subsequent returns. As such, according to Bartov et al. (2000), Mendenhall (2004) and Kimbrough (2005), we use the intersections of these controlling variables and *RSUE* rather than their original variables in the equations.

[14] To be concise, we focus solely on the coefficient estimates within the OLS regressions. The Fama-McBeth coefficient estimates can be interpreted in a similar manner.

[15] In addition, assessments are duplicated using timeframes of 2 months, 4 months, and 5 months. The untabulated outcomes exhibit a qualitative resemblance to those presented in the tabulated study, affirming the robustness of our conclusions.

Table 3 Results of forward-looking MD&A disclosures on the serial correlation in PEAD

Panel A: Rregression test										
Variables	Coef.	Expected sign	*BHAR1*	*BHAR3*	*BHAR6*	*BHAR1*	*BHAR3*	*BHAR6*	*BHAR1*	*BHAR3*	*BHAR6*
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept	α_0	?	−0.030***	−0.026***	−0.033***	−0.021***	−0.028***	−0.037***	−0.023***	−0.031***	−0.038***
			(−3.300)	(−3.214)	(−3.252)	(−3.465)	(−3.375)	(−3.415)	(−3.500)	(−3.409)	(−3.448)
$RSUE_t$	α_1	+	0.035**	0.044**	0.054**	0.037**	0.049**	0.060**	0.041**	0.053**	0.058**
			(2.332)	(2.161)	(2.267)	(2.487)	(2.500)	(2.396)	(2.558)	(2.375)	(2.468)
FLD_t	α_2	−	−0.011**	−0.012**	−0.015**						
			(−2.451)	(−2.462)	(−2.371)						
$FLD_t \times RSUE_t$	α_3	−	−0.016***	−0.012***	−0.014***						
			(−2.907)	(−2.725)	(−2.836)						
$DFLD_t$	α_{2-1}	−				−0.023***	−0.020***	−0.018***			
						(−2.686)	(−2.829)	(−2.729)			
$DFLD_t \times RSUE_t$	α_{3-1}	−				−0.014***	−0.018***	−0.020***			
						(−3.211)	(−3.015)	(−2.903)			
$RFLD_t$	α_{2-2}	−							−0.034***	−0.040***	−0.049***
									(−3.286)	(−3.437)	(−3.245)
$RFLD_t \times RSUE_t$	α_{3-2}	−							−0.021***	−0.030***	−0.025***
									(−3.022)	(−3.261)	(−2.840)
$SIZE_t \times RSUE_t$	α_4	−	−0.055**	−0.053**	−0.054**	−0.056**	−0.054**	−0.055**	−0.058**	−0.060**	−0.056**
			(−2.033)	(−2.240)	(−2.198)	(−2.074)	(−2.285)	(−2.140)	(−2.094)	(−2.308)	(−2.161)
$PRC_t \times RSUE_t$	α_5	−	−0.193*	−0.205*	−0.198*	−0.197*	−0.209**	−0.195*	−0.199*	−0.212**	−0.190*
			(−1.804)	(−1.930)	(−1.719)	(−1.852)	(−1.968)	(−1.754)	(−1.859)	(−1.988)	(−1.772)
$VOL_t \times RSUE_t$	α_6	−	−0.141*	−0.157*	−0.145*	−0.144*	−0.150*	−0.148*	−0.145*	−0.152*	−0.149*
			(−1.814)	(−1.828)	(−1.858)	(−1.916)	(−1.865)	(−1.895)	(−1.869)	(−1.884)	(−1.914)
$INST_t \times RSUE_t$	α_7	−	−0.107***	−0.110***	−0.108***	−0.109***	−0.112***	−0.110***	−0.113***	−0.115***	−0.109***
			(−3.289)	(−3.243)	(−3.394)	(−3.355)	(−3.307)	(−3.461)	(−3.389)	(−3.341)	(−3.496)
Year & Industry Indicators			Included	Included	Included	Included	Included	Included	Included	Included	Included
Adjusted R^2			0.294	0.298	0.305	0.300	0.304	0.311	0.303	0.307	0.314
No. of obs.			144,824	144,824	144,824	144,824	144,824	144,824	144,824	144,824	144,824
Panel B: Coefficient test											
$RSUE_t(\alpha_1)+DFLD_t \times RSUE_t(\alpha_{3-1})$						0.023**	0.031***	0.040***			
						(2.246)	(3.321)	(3.119)			
$RSUE_t(\alpha_1)+RFLD_t \times RSUE_t(\alpha_{3-2})$									0.020**	0.023**	0.033***
									(2.167)	(2.308)	(2.886)

Note: All variable definitions are presented in Appendix 1. ***indicates $p < 0.01$; ** indicates $p < 0.05$; * indicates $p < 0.10$.

than 0.05. Accordingly, the magnitudes of the hedge portfolio return for the high FLD sample, derived from the regression model, closely resemble those observed in the hedge portfolio tests, as detailed in Table 2, whereas the hedge portfolio returns for the same time spans are 0.020, 0.032, and 0.039.

The coefficients on *RSUE* and *RFLD*×*RSUE* shown in Table 3 columns (7) to (9) represent the average returns after an earnings announcement for the lowest SUE level (portfolio 1) and the returns of the SUE hedge portfolio after controlling for various variables associated with PEAD, including information environment and trading costs. Our findings show that when buy-and-hold abnormal returns are accumulated to the end of the first month, the third month, and the sixth month after quarterly earnings, the coefficients on *RSUE* are 0.041, 0.053, and 0.058 respectively, all with *p*-values of less than 0.05. The coefficients on *RFLD*×*RSUE* are −0.021, −0.030, and −0.025, respectively, for the same time periods, all with *p*-values of less than 0.01. The additions of the coefficients on *RSUE*+*RFLD*×*RSUE* are 0.020, 0.023 and 0.033 respectively, all with *p*-values of less than 0.05. These results support the findings which appear in columns (1) to (3) and columns (4) to (6), indicating that forward-looking disclosures do decrease investor and analyst underreaction to earnings surprises.

The interactions between the control variables and *RSUE* coefficients are significant and as expected. For the firm's information environment variables, the coefficients for *SIZE*×*RSUE* and *INST*×*RSUE* are both significantly negative. This suggests that firms with lower information uncertainty have less pronounced PEAD. Regarding transaction cost variables, the coefficients for *PRC*×*RSUE* and *VOL*×*RSUE* are significantly negative, implying that the magnitude of PEAD is negatively correlated with the transaction costs. Including control variables for information environment and transaction costs does not affect the profitability of the hedge strategies. Therefore, the decrease in hedge portfolio returns due to increased forward-looking MD&A disclosures is not solely attributable to the information environment or transaction cost effects.

In summary, in accordance with Hypothesis H1, both the hedge portfolio and regression approaches indicate that the stock market fails to fully comprehend the future implications of current earnings. Greater forward-looking MD&A disclosures can enhance the stock market's understanding of the future implications of current earnings, ultimately reducing PEAD.

5.2 The impact of forward-looking MD&A disclosures on serial correlation in analyst forecast errors

The following regression is performed to test Hypothesis H2:

$$\begin{aligned} FERR_{i,t+1} = {} & \alpha_0 + \alpha_1 FERR_{i,t} + \alpha_2 FLD_{i,t} + \alpha_3 FLD_{i,t} \times FERR_{i,t} + \\ & \alpha_4 SIZE + \alpha_5 N_{i,t} + \alpha_6 BTM_{i,t} + \alpha_7 AGE_{i,t} + \alpha_8 RETVOL_{i,t} + \\ & \alpha_9 ROA_{i,t} + \alpha_{10} DP_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{2}$$

where *FERR* is the analyst forecast error as defined earlier. A positive coefficient on *FERR* indicates a positive serial correlation in analyst forecast errors, suggesting that analysts have underreacted to prior publicly available information. The coefficient on the *FLD*×*FERR* (i.e., α_3) is of interest. As argued in Hypothesis H2, if analysts underreaction to prior earnings surprises is weaker when firms offer more forward-looking MD&A disclosure, the coefficient α_3 will be negative.

Control variables that are related to analyst forecast errors are also included. First, size (*SIZE*) is included as a proxy for the amount of public and private information available for the firm (Atiase 1987). Second, analyst following (*N*) is controlled. A larger analyst following can lead to more intense competition among analysts, which may motivate them to issue more optimistic forecasts to compete for management favor. Third, book-to-market ratio (*BTM*) is controlled because previous research has shown that investors are more optimistic when dealing with value stocks than with growth stocks; that is, a higher book-to-market ratio implies higher forecast errors (Doukas et al. 2002). The coefficient on the book-to-market ratio is expected to be negative. In addition, following the methodology of Baker and Wurgler (2006), firms are classified as more or less "uncertain" or "hard to value" on the basis of the following firm characteristics: age (*AGE*), return volatility (*RETVOL*), profitability (*ROA*), and dividend payments (*DP*). Young, volatile, and unprofitable firms that do not pay dividends are categorized as "uncertain. Age is defined as the number of months a firm has been listed on the CRSP, and is updated monthly. Return volatility is the standard deviation in returns over the prior 12 months. Profitability, measured as returns on total assets, is computed as earnings divided by average total assets. Earnings are defined as income before the deduction of extraordinary items. Dividend payments are measured using cash dividends divided by the book value of the equity.

The results of Equation (2) are presented in Table 4 column (1), and they are consistent with the findings of the future returns test presented in Table 3. We find that the coefficients on *FERR* (i.e., α_1) are positively significant (*Coef.* = 1.058, *t*-statistics = 2.803), implying that analysts tend to underreact to the future implications of current earnings surprises. However, the coefficients on *FLD*×*FERR* (i.e., α_3) are significantly negative (*Coef.* = −0.400, *t*-statistics = −2.238), indicating that more forward-looking MD&A disclosures can mitigate analyst underreaction to the implications of current earnings surprises for future profitability.[16]

To delve further into this relationship, we replaced *FLD* with *DFLD* and *RFLD* and re-ran Equation (2). As can be seen in Table 4 columns (2) and (3), the coefficients on *DFLD*×*FERR* and *RFLD*×*FERR* are significantly negative, being −0.286 and −0.607, respectively, and *t*-statistics

[16] We also utilize the latest IBES analyst consensus earnings forecast subsequent to SEC filings, rather than relying on the average of earnings forecasts from analysts who provided their latest forecasts for earnings of quarter *t*, specifically up to 30 days before the SEC filings and revised their forecasts for the company's earnings for quarter *t*+1 within the 30-day interval subsequent to the SEC filings. Our untabulated results demonstrate that these modifications do not alter our findings.

Table 4 Results of forward-looking MD&A disclosures on the serial correlation in analyst forecast errors

Panel A: Rregression test					
Variables	Coef.	Expected sign	$FERR_{t+1}$		
			(1)	(2)	(3)
Intercept	α_0	?	1.507** (2.510)	1.610** (2.548)	1.495** (2.531)
$FERR_t$	α_1	+	1.058*** (2.803)	1.071*** (3.242)	1.095*** (3.361)
FLD_t	α_2	−	−0.287** (−2.146)		
$FLD_t \times FERR_t$	α_3	−	−0.400** (−2.238)		
$DFLD_t$	α_{2-1}	−		−0.179** (−2.177)	
$DFLD_t \times FERR_t$	α_{3-1}	−		−0.286** (−2.377)	
$RFLD_t$	α_{2-2}	−			−0.524** (−2.216)
$RFLD_t \times FERR_t$	α_{3-2}	−			−0.607*** (−2.961)
$SIZE_t$	α_4	+	0.281** (2.213)	0.294** (2.176)	0.307** (2.221)
N_t	α_5	+	1.168*** (3.425)	1.192*** (3.503)	1.175*** (2.856)
BTM_t	α_6	−	−0.834*** (−2.605)	−0.847** (−2.544)	−0.828** (−2.412)
AGE_t	α_7	+	0.360** (2.359)	0.367** (2.556)	0.387** (2.405)
$RETVOL_t$	α_8	+	0.491 (1.532)	0.519 (1.496)	0.487 (1.471)
ROA_t	α_9	+	0.212* (1.788)	0.216* (1.804)	0.228* (1.915)
DP_t	α_{10}	+	0.089** (2.200)	0.107** (2.071)	0.100** (2.237)
Year & Industry Indicators			Included	Included	Included
Adjusted R^2			0.429	0.377	0.399
No. of obs.			144,824	144,824	144,824
Panel B: Coefficient test					
$FERR_t$ (α_1) + $DFLD_t \times FERR_t$ (α_{3-1})				0.785*** (3.446)	
$FERR_t$ (α_1) + $RFLD_t \times FERR_t$ (α_{3-2})					0.488*** (3.041)

Notes: All variable definitions are presented in Appendix 1. *** indicates $p < 0.01$; ** indicates $p < 0.05$; * indicates $p < 0.10$.

of −2.377 and −2.961, respectively. However, the coefficients on the addition of *FERR* and *DFLD×FERR* and the addition of *FERR* and *RFLD×FERR* are 0.785 and 0.488, respectively (both with *p*-values of less than 0.01). These results suggest that while more forward-looking MD&A disclosures can reduce analyst underreaction to the future implications of current earnings, such disclosures cannot completely eliminate analyst underreaction for the high FLD sample and the firms located in the highest FLD decile.

The results for the control variables in Equation (2) are largely consistent with our predictions and prior research findings. The coefficients for firm size (*SIZE*) and the number of analysts (*N*) are all positive and significant, indicating that forecast biases decrease with firm size and analyst coverage. The coefficients for book-to-market ratio (*BTM*) is negative and significant, indicating that forecast error is lower. The coefficients for firm characteristics, including firm age (*AGE*), return volatility (*RETVOL*), profitability (*ROA*), and dividend payments (*DP*), are all positive and significant, implying that forecast bias increases with firms faced with more "uncertain" and "hard to value" situations.

6. Robustness Testing

6.1 Identification

A significant challenge related to the endogeneity of forward-looking MD&A disclosures is encountered in this empirical investigation. If we fail to effectively control for these factors, it could lead to the omission of variable bias, undermining the reliability of the analysis and hindering our ability to draw robust conclusions about the relation between forward-looking MD&A disclosures and the underreaction of investors and analysts to earnings surprises. In this section, three tests are discussed, namely, controlling for potential self-selection bias, incorporating firm fixed effects into the estimations and applying the instrumental variable approach to address this identification challenge. The objective is to enhance confidence in the causal interpretation that forward-looking MD&A disclosures play a role in facilitating the reactions of investors and analysts to earnings surprises.

6.1.1 Controlling for potential self-selection bias

As noted above, there may be concerns regarding the endogeneity of forward-looking MD&A disclosures in this investigation. The results obtained may have stemmed from certain unobservable firm characteristics that could be linked to forward-looking MD&A disclosures, as well as market and analyst response to earnings announcements. One plausible explanation is that a firm's choice to engage in forward-looking MD&A disclosures might be driven endogenously by factors such as the information environment and the level of attention from capital markets, which would influence market and analyst response to the announced earnings.

In such a scenario, the impact of forward-looking MD&A disclosure on both PEAD and analyst underreaction to earnings announcement might not stem from the disclosures themselves but instead from an incidental correlation caused by certain hidden attributes of the company.

To address this potential endogeneity, we employed a two-stage least squares (2SLS) model and incorporated identifying instruments that are expected to be correlated with forward-looking MD&A disclosures, but without the error term in the second-stage regression. Following Li (2010) and Huang, Zang, and Zheng (2014), Probit regression is used in the first stage and the dependent variable is *FLD*. The instruments employed include earnings (*EARN*), firm size (*SIZE*), book-to-market ratio (*BTM*), contemporaneous annual stock returns (*RET*), standard deviation of monthly stock returns for the fiscal year (*RETVOL*), and standard deviation of earnings (*EARNVOL*), which are calculated using data from the preceding five years. The definitions for all instruments are the same as those discussed above.

For brevity, we omit the outcomes of the first stage regressions. However, the coefficients on the various instruments align with those used in prior studies on forward-looking MD&A disclosures. Additionally, in the second stage, we incorporate the inverse Mills ratio (*Mills*) derived from the first-stage Probit regressions as a supplementary independent variable. For brevity, the outcomes of the controlling variables are omitted. As can be seen in Table 5 Panel A, the coefficients on *FLD*×*RSUE*, *DFLD*×*RSUE*, *RFLD*×*RSUE* are significantly negative; the coefficients on *FLD*×*FERR*, *DFLD*×*FERR*, *RFLD*×*FERR* shown in Panel B are also significantly negative, with coefficients of −0.392, −0.256 and −0.781, respectively and *t*-statistics of −2.294, −2.330 and −2.903, respectively. This indicates that the findings are robust even after accounting for potential self-selection bias. The coefficients on the inverse Mills ratio (i.e., *Mills*) do not carry any significance, suggesting that there is no requirement to adjust for self-selection bias.

6.1.2 Incorporating firm fixed effects into the estimations

To further address potential endogeneity concerns, omitted variables are taken into account by incorporating firm fixed effects into the estimations. The untabulated findings reveal that even when considering firm fixed effects as a control variable, the coefficient related to *FLD*×*RSUE* (*FLD*×*FERR*) remains significantly negative. This observation lends credence to the notion that the outcomes are unlikely to be influenced by unaccounted time-invariant firm attributes in the regression analysis.

6.1.3 Instrumental variable approach

To address the concern of endogeneity, a two-stage least squares (2SLS) regression approach is employed to re-estimate Equations (1) and (2). An instrumental variable is introduced to account for a firm's forward-looking MD&A disclosures (*FLD*). The instrumental variable chosen should be related to those forward-looking MD&A disclosures while remaining unrelated to *BHAR*, *FERR* and *SUE*. The firm's litigation risk is selected as the instrumental variable.

Table 5 Controlling for potential self-selection bias

Panel A: Serial correlation in PEAD

Variables	Coef.	Expected sign	*BHAR1*	*BHAR3*	*BHAR6*	*BHAR1*	*BHAR3*	*BHAR6*	*BHAR1*	*BHAR3*	*BHAR6*
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$RSUE_t$	α_1	+	0.037** (2.492)	0.047** (2.317)	0.057** (2.222)	0.042** (2.408)	0.054** (2.526)	0.065** (2.420)	0.043** (2.226)	0.056** (2.447)	0.061** (2.541)
FLD_t	α_2	?	−0.010** (−2.491)	−0.015*** (−2.624)	−0.017** (−2.530)						
$FLD_t \times RSUE_t$	α_3	−	−0.017*** (−2.874)	−0.013*** (−2.893)	−0.015*** (−2.698)						
$DFLD_t$	α_{2-1}	−				−0.026*** (−2.713)	−0.021*** (−2.858)	−0.024*** (−2.757)			
$DFLD_t \times RSUE_t$	α_{3-1}	−				−0.015*** (−3.132)	−0.020*** (−3.046)	−0.031*** (−2.940)			
$RFLD_t$	α_{2-2}	−							−0.042*** (−3.498)	−0.038*** (−3.650)	−0.047*** (−3.435)
$RFLD_t \times RSUE_t$	α_{3-2}	−							−0.022*** (−3.224)	−0.033*** (−3.143)	−0.027*** (−3.026)
Mills	α_4	?	−0.242 (−1.346)	−0.228 (−1.311)	−0.233 (−1.326)	−0.230 (−1.421)	−0.236 (−1.456)	−0.244 (−1.408)	−0.252 (−1.430)	−0.259 (−1.436)	−0.243 (−1.445)
Intercept & Controls			Included	Included	Included	Included	Included	Included	Included	Included	Included
Year & Industry Indicators			Included	Included	Included	Included	Included	Included	Included	Included	Included
Adjusted R^2			0.306	0.301	0.311	0.308	0.302	0.314	0.301	0.306	0.315
No. of obs.			144,824	144,824	144,824	144,824	144,824	144,824	144,824	144,824	144,824

Table 5 Controlling for potential self-selection bias (continued)

Panel B: Serial correlation in analyst forecast errors

Variables	Coef.	Expected sign	$FERR_{t+1}$		
			(1)	(2)	(3)
$FERR_t$	α_1	+	1.037*** (2.748)	1.050*** (3.178)	1.074*** (3.295)
FLD_t	α_2	?	−0.281** (−2.104)		
$FLD_t \times FERR_t$	α_3	−	−0.392** (−2.294)		
$DFLD_t$	α_{2-1}	?		−0.193** (−2.134)	
$DFLD_t \times FERR_t$	α_{3-1}	−		−0.256** (−2.330)	
$RFLD_t$	α_{2-2}	?			−0.514** (−2.173)
$RFLD_t \times FERR_t$	α_{3-2}	−			−0.781*** (−2.903)
Mills	α_4	?	−0.793 (−1.328)	−0.847 (−1.341)	−0.787 (−1.402)
Intercept & Controls			Included	Included	Included
Year & Industry Indicators			Included	Included	Included
Adjusted R^2			0.421	0.369	0.391
No. of obs.			144,824	144,824	144,824

Notes: All variable definitions are presented in Appendix 1. *** indicates $p < 0.01$; ** indicates $p < 0.05$; * indicates $p < 0.10$.

This choice is based on the premise that companies often have concerns about the uncertainties surrounding the legal interpretation of safe harbor protection, which can discourage them from engaging in forward-looking MD&A disclosures (Grundfest and Perino 1997). Firms facing higher litigation risk tend to be more cautious in their forward-looking MD&A disclosures. Importantly, litigation risk is not inherently related to earnings surprises, analyst forecast errors, or abnormal returns, making it a suitable instrument for our two-stage regression.

Our measure of litigation risk relies on an industry-based proxy, a common approach in the literature. This proxy, which stems from the work of Francis, Philbrick, and Schipper (1994), focuses on industries such as biotechnology, computers, electronics, and retail which have historically faced a high incidence of litigation, making them a relevant choice for assessing litigation risk. Specifically, Francis et al.'s (1994) industry proxy is used and denoted as the instrumental variable (IV), which takes a value of one if the firm belongs to these specified industries and zero otherwise.

For the sake of brevity, we present only the results of the second-stage regression in Table 6. In this second stage, it is found that the interaction terms of *Pre_FLD*×*RSUE* and *Pre_FLD*×*FERR* in both BHAR and FERR regressions exhibit significantly negative coefficients. These findings indicate that the earlier results remain robust even after accounting for the potential endogeneity of FLD.

6.2 Using the most recent consensus earnings forecast in lieu of the initial consensus earnings forecast

Previously, the initial consensus earnings forecast after 10-Q filings were used in the analyses of the analysts' response to FLDs. In this section, an alternative dependent variable is used, which is the forecast error based on the most recent IBES consensus earnings forecast before quarter t+1's SEC filing date. This forecast takes into account all the information released leading up to the subsequent quarter's 10-K filings. By using this alternative dependent variable, we can investigate whether forward-looking MD&A disclosures provide additional information on the future implications of previous earnings surprises that analysts use after 10-Q filings. For brevity the estimated results for the controlled variables are omitted.

In Table 7, it can be observed that the negative significance of the coefficient on *FLD*×*FERR*, *DFLD*×*FERR*, *RFLD*×*FERR* remains (with coefficients of −0.424, −0.251 and −0.649, respectively and t-statistics of −2.370, −1.717 and −3.135, respectively.) when using the alternative forecast error metric in Equation (2). Additionally, a decrease in the level of serial correlation in analyst forecast errors can be observed when using the alternative forecast error metric. These results indicate that forward-looking MD&A disclosures increase the amount of information available to analysts after 10-Q filings for comprehending the implications of the announced earnings of quarter t for future quarters.

Table 6 Estimated results for the instrumental variable approach

Variables	Hypothesis H1			Hypothesis H2
	2nd Stage Regression			*2nd Stage Regression*
	*BHAR*1	*BHAR*3	*BHAR*6	$FERR_{t+1}$
	(1)	(2)	(3)	(4)
Intercept	−0.033*** (−3.363)	−0.029*** (−3.355)	−0.036*** (−3.457)	1.658** (−2.561)
Pre_FLD_t	−0.010** (−2.289)	−0.012** (−2.127)	−0.015** (−2.329)	−0.309** (−2.314)
$RSUE_t$	0.038** (2.541)	0.049** (2.499)	0.059** (2.395)	
$Pre\_FLD_t \times RSUE_t$	−0.027*** (−3.100)	−0.023*** (−3.120)	−0.025*** (−2.909)	
$SIZE_t \times RSUE_t$	−0.058** (−2.134)	−0.055** (−2.352)	−0.057** (−2.202)	
$PRC_t \times RSUE_t$	−0.223* (−1.894)	−0.216* (−1.927)	−0.218* (−1.805)	
$VOL_t \times RSUE_t$	−0.158* (−1.905)	−0.165* (−1.920)	−0.152* (−1.951)	
$INST_t \times RSUE_t$	−0.112*** (−3.453)	−0.115*** (−3.406)	−0.113*** (−3.564)	
$FERR_t$				1.141*** (3.023)
$Pre\_FLD_t \times FERR_t$				−0.431** (−2.523)
$SIZE_t$				0.292** (2.302)
N_t				1.215*** (3.562)
BTM_t				−0.867*** (−2.709)
AGE_t				0.374** (2.453)
$RETVOL_t$				0.511 (1.593)
ROA_t				0.220* (1.860)
DP_t				0.093** (2.288)
Hausman test	3.218***	3.172***	3.406***	4.759***
Adjusted R^2	0.305	0.309	0.311	0.395
No. of obs.	144,824	144,824	144,824	144,824

Notes: All variable definitions are presented in Appendix 1. *** indicates $p < 0.01$; ** indicates $p < 0.05$; * indicates $p < 0.10$.

Table 7 Estimation results using the most recent consensus earnings forecast

Variables	Coef.	Expected sign	$FERR\_CONSENSUS_{t+1}$		
			(1)	(2)	(3)
$FERR_t$	α_1	+	1.120*** (2.968)	1.134*** (3.433)	1.129*** (3.559)
FLD_t	α_2	−	−0.304** (−2.272)		
$FLD_t \times FERR_t$	α_3	−	−0.424** (−2.370)		
$DFLD_t$	α_{2-1}	−		−0.187** (−2.305)	
$DFLD_t \times FERR_t$	α_{3-1}	−		−0.251* (−1.717)	
$RFLD_t$	α_{2-2}	−			−0.555*** (−2.946)
$RFLD_t \times FERR_t$	α_{3-2}	−			−0.649*** (−3.135)
Intercept			Included	Included	Included
Controls			Included	Included	Included
Year Indicators			Included	Included	Included
Industry Indicators			Included	Included	Included
Adjusted R^2			0.417	0.366	0.388
No. of obs.			115,850	115,850	115,850

Notes: All variable definitions are presented in Appendix 1. *** indicates $p < 0.01$; ** indicates $p < 0.05$; * indicates $p < 0.10$.

7. Supplementary Analyses

7.1 Examining whether more forward-looking MD&A disclosures help inform more accurate expectations of future earnings

As previously demonstrated, the PEAD literature suggests that one explanation for the market underreaction to earnings announcements is that the stock market is incapable of fully comprehending the implications of current earnings news on future earnings. This explanation is supported by prior studies, which have found predictable returns surrounding the subsequent four quarterly earnings announcements based on current earnings surprises. Moreover, a significant proportion of the PEAD returns accrue at the earnings announcement of the subsequent quarter (see for instance, Bernard and Thomas 1989; Freeman and Tse 1989; Bernard and Thomas 1990; Ball and Bartov 1996). More forward-looking MD&A disclosures may reduce PEAD by conveying information that enables investors to form more accurate expectations of future earnings. This mechanism would enable investors to better comprehend the relationship between

the earnings surprise in quarter t and future earnings surprises in quarters t+1 to t+4, which could reduce the market's response to the zero-investment portfolio formed based on quarter t earnings for quarters t+1 to t+4 earnings announcements. In this study, we employ both hedge portfolio tests and regression-based tests to prove our conjectures.

The results of the hedge portfolio tests, shown in Table 8 Panel A, illustrate the three-day abnormal returns around subsequent earnings announcements to the abnormal return cumulated over periods from the day after the announcement for quarter t, through the announcements for subsequent quarters. For the low FLD sample, the cumulative abnormal returns through quarter t+1 to quarter t+4 are 1.4%, 2.5%, 3.1%, and 3.6%, respectively, with the three-day abnormal returns accounting for 45% to 53% of the PEAD. For high FLD sample, the cumulative abnormal returns through quarter t+1 to quarter t+4 are 0.8%, 1.3%, 1.4%, and 2.3%, respectively, with the three-day abnormal returns accounting for 40% to 50% of the PEAD.[17] These findings indicate that forward-looking MD&A disclosures assist investors in predicting future earnings based on current earnings announcements.

This conjecture is further tested by estimating the following equation:

$$\begin{aligned} BHAR\,[-2,0]_{\,i,\,t+n} = {} & \alpha_0 + \alpha_1 RSUE_{i,\,t+n} + \alpha_2 FLD_{i,\,t} + \alpha_3 FLD_{i,\,t} \times RSUE_{i,\,t+n} + \\ & \alpha_4 SIZE_{i,\,t+n} \times RSUE_{i,\,t+n} + \alpha_5 PRC_{i,\,t+n} \times RSUE_{i,\,t+n} + \\ & \alpha_6 VOL_{i,\,t+n} \times RSUE_{i,\,t+n} + \alpha_7 INST_{i,\,t+n} \times RSUE_{i,\,t+n} + \varepsilon_{i,\,t} \end{aligned} \tag{3}$$

where $BHAR[-2,0]_{i,t+n}$ is the accumulative abnormal returns for the hedge portfolio from day −2 to day 0 for quarter t based on the $RSUE_{i,t}$. The findings in Table 8 Panel B are in line with those obtained in earlier studies, as the coefficients $RSUE_{t+n}$ for t+1, t+2 and t+3 are significantly positive (with t-statistic 3.373, 2.339 and 1.924 respectively), while the $RSUE_{t+n}$ coefficient for t+4 is significantly negative (with a coefficient of −0.069 and an t-statistic of −3.721). Moreover, the coefficients on the interactions of FLD with $RSUE_{t+n}$ for t+1, t+2 and t+3 are negative and significant (with t-statistics of −2.842, −2.765 and −2.013, respectively), while the coefficient on the interaction of FLD with $RSUE_{t+n}$ for t+4 is positive and significant (with a coefficient of 0.057 and an t-statistic of 2.078). This suggests that the forward-looking MD&A disclosures have a mitigating effect on the abnormal returns to the earnings surprise in the quarters through t+1 to t+4, implying that forward-looking MD&A disclosures can assist investors in interpreting the implications of current quarterly earnings for future quarterly earnings and forming more accurate expectations of future earnings.

[17] Cumulative abnormal returns for the hedge portfolio strategy, spanning from quarter t's SEC filing date to the SEC filings for quarter t+1, are lower than the accumulated abnormal returns over a 3-month period starting from the second day following the SEC filing. This difference arises because the 3-month accumulation period, beginning from the second day after the SEC filing, covers a longer duration than the period from quarter t's SEC filing date to the SEC filings for quarter t+1.

Table 8 Predictions of market reaction to subsequent quarterly earnings announcements based on contemporaneous earnings information

Panel A: Three-day hedge portfolio return in quarter $t+k$ based on SUE (t-statistics in parentheses)

	High FLD				Low FLD			
	$t+1$	$t+2$	$t+3$	$t+4$	$t+1$	$t+2$	$t+3$	$t+4$
Abnormal return three days [−2,0] around announcement long (short) in quarter t SUE decile 10 (1)	0.008*** (3.792)	0.005*** (2.988)	0.001* (1.701)	−0.009*** (−3.252)	0.014*** (3.383)	0.010** (2.433)	0.006 (1.521)	−0.005*** (−4.134)
Sum of above returns (position reversed in quarter $t+4$)	0.008	0.013	0.014	0.023	0.014	0.025	0.031	0.036
Ratio of sum of three−day abnormal returns through $t+k$ to *BHAR* since quarter t announcement (with reversal of long and short positions in quarter $t+4$)	0.400	0.406	0.358	0.501	0.452	0.512	0.484	0.534

Panel B: Regression results

Variables	Coef.	Expected sign	$BHAR_{[-2,0],\ t+n}$			
			$t+1$	$t+2$	$t+3$	$t+4$
Intercept	α_0	?	−0.045** (−2.473)	−0.039** (−2.409)	−0.046** (−2.338)	−0.040** (−2.413)
$RSUE_{t+n}$	α_1	+	0.230*** (3.575)	0.165** (2.339)	0.135* (1.924)	−0.069*** (−3.721)
FLD_t	α_2	−	−0.046*** (−2.735)	−0.055*** (−2.880)	−0.050*** (−2.777)	−0.044*** (−2.696)
$FLD_t \times RSUE_{t+n}$	α_3	−	−0.090*** (−2.842)	−0.066*** (−2.765)	−0.040** (−2.013)	0.057** (2.078)
Controls			Included	Included	Included	Included
Year & Industry Indicators			Included	Included	Included	Included
Adjusted R^2			0.402	0.406	0.398	0.410
No. of obs.			131,658	131,658	131,658	131,658

Notes: All variable definitions are presented in Appendix 1. *** indicates $p < 0.01$; ** indicates $p < 0.05$; * indicates $p < 0.10$.

Overall, the hedge portfolio test and regression-based test results demonstrate that more forward-looking MD&A disclosures can reduce PEAD by assisting investors in forming more accurate expectations for future earnings.

7.2 The role of the financial verifiability of FLDs on their effect on market and analyst underreaction to earnings surprises

In this section we explore how the verifiability of forward-looking disclosures (VFLD) affects the relationship between FLD and market and analyst underreaction with respect to earnings signals. FLDs are categorized as verifiable forward-looking statements or qualitative "soft talk" disclosures, and verifiability is defined as the extent to which investors believe the forecast. Verifiable FLDs are those that enable investors to compare the information provided with subsequent actual performance. However, they also come with increased litigation and reputation costs. This gives firms with more verifiable FLDs the incentive to disclose them more accurately. Investors and analysts may also give greater weight to verifiable FLDs, leading to reduced post-earnings announcement drift and lower serial correlation in analyst forecast errors. Thus, it is argued that the extent of the effect of FLDs on post-earnings announcement drift and serial correlation in analyst forecast errors is positively related to the percentage of FLD financial verifiability.

A forward-looking sentence is considered verifiable if its impact on financial performance can be confirmed. In particular, it is deemed verifiable if it is disclosed using a metric, either financial or non-financial, that enables a comparison with its actual realization in relation to expected future financial performance. This distinction enables us to differentiate between verifiable and non-verifiable disclosures. The percentage of financial verifiability for FLD can be obtained by dividing the number of verifiable forward-looking sentences by the total number of sentences in forward-looking disclosures.

To test this conjecture, the sample is divided into two subsamples based on the percentage of financially verifiable FLD contained in the overall MD&A disclosures. The high VFLD (low VFLD) subsample refers to the sample having the larger percentage of financially verifiable FLDs above (below) its median. Next, Equation (1) and Equation (2) are re-run for both subsamples for comparison of the coefficients of *FLD*×*RSUE* in Equation (1) and the coefficients of *FLD*×*FERR* in Equation (2). If the coefficients for the high VFLD subsample are more negative than those for the low VFLD subsample, it indicates that verifiable FLD bolsters the credibility of FLDs and thus has a stronger effect on reduction in post-earnings announcement drift and the serial correlation in analyst forecast errors, a measure of initial analyst underreaction.

In Table 9 it can be observed that the coefficients on *FLD*×*RSUE* and *FLD*×*FERR* are both negative and significant for both the low VFLD and high VFLD subsamples. However, the coefficients for the high VFLD sample are significantly less than for low VFLD sample. These

Table 9 Effect of financial verifiability of forward-looking disclosures on market's delayed to earnings surprises

Panel A: Effect of financial verifiability of FLDs on the stock market

Variables	Coef.	Expected sign	*BHAR1*		*BHAR3*		*BHAR6*	
			High VFLD	Low VFLD	High VFLD	Low VFLD	High VFLD	Low VFLD
			(1)	(2)	(3)	(4)	(5)	(6)
Intercept	α_0	?	−0.028** (−2.227)	−0.032** (−2.249)	−0.030** (−2.180)	−0.036** (−2.425)	−0.042** (−2.466)	−0.048** (−2.348)
$RSUE_t$	α_1	+	0.029** (2.337)	0.025** (2.384)	0.056** (2.174)	0.050** (2.209)	0.075** (2.348)	0.066** (2.125)
FLD_t	α_2	?	−0.016** (−2.336)	−0.012** (−2.383)	−0.019** (−2.460)	−0.010** (−2.509)	−0.025** (−2.372)	−0.017** (−2.420)
$FLD_t \times RSUE_t$	α_3	−	−0.079*** (−3.765)	−0.019* (−1.884)	−0.066*** (−2.712)	−0.012** (−2.018)	−0.059*** (−3.347)	−0.010* (−1.681)
Coefficient test	High VFLD (α_3) > Low VFLD (α_3)		−0.060*** (−3.123)		−0.054** (−2.237)		−0.049** (−2.182)	
Controls			Included	Included	Included	Included	Included	Included
Year & Industry Indicators			Included	Included	Included	Included	Included	Included
Adjusted R^2			0.312	0.306	0.310	0.304	0.316	0.309
No. of obs.			72,602	72,222	72,602	72,222	72,602	72,222

Panel B: Effect of financial verifiability of FLDs on analysts

Variables	Coef.	Expected sign	$FERR_{t+1}$	
			High VFLD	Low VFLD
			(1)	(2)
Intercept	α_0	?	1.537*** (2.561)	1.583*** (2.637)
$FERR_t$	α_1	+	1.080*** (2.859)	1.112*** (2.945)
FLD_t	α_2	?	−0.253** (−2.189)	−0.261** (−2.255)
$FLD_t \times FERR_t$	α_3	−	−0.599*** (−3.283)	−0.280* (−1.851)
Coefficient test	High VFLD (α_3) > Low VFLD (α_3)		−0.319*** (−4.261)	
Controls			Included	Included
Year & Industry Indicators			Included	Included
Adjusted R^2			0.405	0.393
No. of obs.			72,602	72,222

Notes: All variable definitions are presented in Appendix 1. *** indicates $p < 0.01$; ** indicates $p < 0.05$; * indicates $p < 0.10$.

results suggest that the impact of forward-looking MD&A disclosures on market and analyst underreaction to earnings surprises is more pronounced when the disclosures are more verifiable.

7.3 The impact of MD&A tone on investor and analyst underreaction to earnings announcements

The primary objective of this study is to examine how the amount of forward-looking information disclosed in the MD&A affects analysts' and market expectations. This area has been widely studied in the literature and prior studies suggest that managers also use the tone of MD&A disclosures to convey information about the firm's underlying fundamentals and that the tone of MD&A disclosures conveys information to investors and affects stock prices (e.g., Rogers, Van Buskirk, and Zechman 2011; Davis and Tama-Sweet 2012; Davis, Piger, and Sedor 2012; Wang et al. 2021; Berns et al. 2022). To gain a more comprehensive understanding of the role of MD&A disclosures in enhancing stock market efficiency and provide additional insights, we investigate whether the tone of MD&A disclosures can mitigate investor and analyst underreaction to current earnings surprises. Specifically, the following equations are applied:

$$\begin{aligned} BHAR_i\,(1,3,6) = {} & \alpha_0 + \alpha_1 RSUE_{i,t} + \alpha_2 Confirmnig\_TONE_{i,t} + \\ & \alpha_3 Confirmnig\_\ TONE_{i,t} \times RSUE_{i,t} + \\ & \alpha_4 SIZE_{i,t} \times RSUE_{i,t} + \alpha_5 PRC_{i,t} \times RSUE_{i,t} + \\ & \alpha_6 VOL_{i,t} \times RSUE_{i,t} + \alpha_7 INST_{i,t} \times RSUE_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{4}$$

$$\begin{aligned} FERR_{i,t+1} = {} & \alpha_0 + \alpha_1 FERR_{i,t} + \alpha_2 Confirming\_TONE_{i,t} + \\ & \alpha_3 Confirming\_TONE_{i,t} \times FERR_{i,t} + \alpha_4 SIZE_{i,t} + \alpha_5 N_{i,t} + \\ & \alpha_6 BTM_{i,t} + \alpha_7 AGE_{i,t} + \alpha_8 RETVOL_{i,t} + \alpha_9 ROA_{i,t} + \alpha_{10} DP_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{5}$$

It can be seen that *Confirming_TONE* is equal to one if the sign of the net positive MD&A tone is the same of the sign of SUE, whereas the net positive MD&A tone is defined as the frequency difference between the optimistic words and the pessimistic words scaled by the total number of words in the 10-K filings.

Various software packages have been applied to measure the qualitative characteristics of financial reports, such as Diction (Davis et al. 2012), General Inquirer (Tetlock 2007; Tetlock, Saar-Tsechansky, and Macskassy 2008), and Bayesian machine learning algorithms (Li 2010; Chen and Lin 2022). The Loughran-McDonald word list has been developed specifically for the business context, unlike other word lists such as Diction (Loughran and McDonald 2015); it contains 354 positive words and 2,355 negative words. Loughran and McDonald (2011) argue that word classifications developed for general purposes are not appropriate for evaluating business communications. Based on a large sample of 10-Ks, they found that many words which

had been classified as negative in the Harvard Psychological Dictionary (IV-4) (using the General Inquirer software) are not typically negative in financial reports. They compiled an alternative word list that they showed to be more suitable for describing positive and negative tones in financial communications. The tone measures applied in this study are based on the 2018 version of the word lists developed by Loughran and McDonald (2011). All these positive and negative lists are available at http://www.nd.edu/^mcdonaldVWord_List.

As demonstrated earlier, *Confirming_TONE* is equal to one if the sign of the net positive MD&A tone matches the sign of SUE. The PEAD literature consistently indicates that, on average, returns exhibit a tendency to move in the same direction as previously reported earnings surprises. Based on this observation, we hypothesize that when the net positive MD&A tone aligns with prior earnings surprises, it conveys a stronger signal regarding the implications of past earnings surprises for future performance. In this scenario, MD&A disclosures are likely to assist in incorporating prior earnings surprises into stock prices, thereby contributing to the reduction of post-earnings announcement drift and the serial correlation in analyst forecast errors. Consequently, it is predicted that *Confirming_TONE*×RSUE and *Confirming_TONE*×FERR will be negative.

Of interest are the coefficients at the intersection of *Confirming_TONE* and *RSUE*, *Confirming_TONE* and *FERR* in both Equations (4) and (5). As can be seen in Table 10, the coefficients of *Confirming_TONE*×*RSUE* from Equation (4) and *Confirming_TONE* ×*FERR* from Equation (5) are significantly negative, and both have *p*-values of less than 0.05.[18] These results suggest that both the content and tone of MD&A disclosures are critical in enhancing the information efficiency of the stock market and analysts. The findings bolster confidence in the usefulness of MD&A disclosures for delivering valuable information to capital markets, even though some researchers and practitioners have expressed concern regarding the effectiveness of MD&A disclosures, citing issues such as their timeliness, lack of stringent regulations governing their content, and the presence of significant amounts of boilerplate disclaimers, generic language, and immaterial details.

[18] Equation (4) and Equation (5) are also estimated after replacing *Confirming_TONE* with *Unsigned_TONE*, where *Unsigned_TONE* represents the summation of positive and negative MD&A tones. This combined metric can potentially reflect a company's extraordinary efforts to enhance the transparency of its future prospects. We posit that the magnitude of the unsigned tone in a firm's MD&A content might correlate with an enhancement in the firm's information environment, thereby aiding investors and analysts in comprehending the implications of earlier earnings announcements for predictions of future performance. Consequently, this could contribute to a reduction in market and analyst underreaction to these past earnings releases. Our untabulated findings demonstrate that the coefficients on *Unsigned_TONE*×*SUE* and *Unsigned_TONE*×*FERR* both exhibit significant negative values. These results provide further support for the notion that managers can employ the tone of MD&A disclosures to effectively communicate information about the fundamental aspects of the firm. This, in turn, helps inform investors and analysts about the persistence of previously reported earnings.

Table 10 Effect of MD&A tone on investor and analyst underreaction to earnings surprises

Panel A: Effect of MD&A tone on investor underreaction to earnings surprises					
Variables	Coef.	Expected sign	*BHAR*1	*BHAR*3	*BHAR*6
			(1)	(2)	(3)
Intercept	α_0	?	−0.038** (−2.311)	−0.042** (−2.430)	−0.045** (−2.256)
$RSUE_t$	α_1	+	0.045** (2.330)	0.036** (2.147)	0.060** (2.527)
$Confirming\_TONE_t$	α_2	?	−0.188*** (−3.164)	−0.197*** (−3.205)	−0.179*** (−3.487)
$Confirming\_TONE_t \times RSUE_t$	α_3	−	−0.230** (−2.216)	−0.253** (−2.467)	−0.237*** (−2.627)
Controls			Included	Included	Included
Year & Industry Indicators			Included	Included	Included
Adjusted R^2			0.313	0.317	0.314
No. of obs.			108,618	108,618	108,618
Panel B: Effect of MD&A tone on analyst underreaction to earnings surprises					
Variables	Coef.	Expected sign		$FERR_{t+1}$	
Intercept	α_0	?		1.493** (2.328)	
$FERR_t$	α_1	+		1.112*** (2.945)	
$Confirming\_TONE_t$	α_2	?		−0.734** (−2.255)	
$Confirming\_TONE_t \times FERR_t$	α_3	−		−0.561*** (−3.653)	
Controls				Included	
Year & Industry Indicators				Included	
Adjusted R^2				0.441	
No. of obs.				108,618	

Notes: All variable definitions are presented in Appendix 1. *** indicates $p < 0.01$; ** indicates $p < 0.05$; * indicates $p < 0.10$.

7.4. Assessing the externality effect of industry peers' forward-looking MD&A on investor and analyst underreaction to earnings surprises for focal firms

Forward-looking MD&A disclosures have the potential to reduce information asymmetry at the industry level and enhance industry-level information environments. This can result in a faster price discovery process for earnings among industry peers, which in turn generates externalities

on PEAD (Cho and Muslu 2021). To examine these effects, we estimate the following equation:

$$\begin{aligned} BHAR_i\,(1,3,6) = {} & \alpha_0 + \alpha_1 RSUE_{i,t} + \alpha_2 FLD_{i,t} + \alpha_3 RivalFLD_{i,t} + \\ & \alpha_4 FLD_{i,t} \times RSUE_{i,t} + \alpha_5 RivalFLD_{i,t} \times RSUE_{i,t} + \\ & \alpha_6 SIZE_{i,t} \times RSUE_{i,t} + \alpha_7 PRC_{i,t} \times RSUE_{i,t} + \\ & \alpha_8 VOL_{i,t} \times RSUE_{i,t} + \alpha_9 INST_{i,t} \times RSUE_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{6}$$

where *RivalFLD* is the average forward-looking MD&A disclosures for the industry peers whose SEC filing dates precede that of the focal firm; the other variables are defined as before. To identify industry peers, this study uses the 3-digit Standard Industry Classification (SIC) codes, as applied in prior research (Beatty, Liao and Yu 2013). These codes categorize firms based on their production processes, and are generally stable over time.

The results of Equation (6) are presented in Table 11 Panel A. Focus on the coefficients of *RivalFLD*×*RSUE* (α_5). It can be observed that the coefficients on *FLD*×*RSUE* and *RivalFLD*×*RSUE* are −0.040, −0.041, −0.046 and −0.010, −0.012, −0.014 for the return accumulation periods of 1, 3, and 6-months, respectively, and that all have *p*-values of less than 0.10. Additionally, the coefficient of *RivalFLD*×*RSUE* (α_5) is smaller in magnitude than that of *FLD*×*RSUE* (α_4). These results suggest that the forward-looking disclosures of peer rivals have an externality effect on reducing PEAD for the focal firm. However, this effect is weaker than that of the focal firm's own disclosures. Overall, the results suggest that more forward-looking MD&A disclosures can improve the industry-level information environment and generate spillover effects that reduce PEAD for rival peers.

We further examine the spillover effects of forward-looking MD&A disclosures for analysts' forecasts of rival peers. Specifically, we estimate the following equation:

$$\begin{aligned} FERR_{i,t+1} = {} & \alpha_0 + \alpha_1 FERR_{i,t} + \alpha_2 FLD_{i,t} + \alpha_3 RivalFLD_{i,t} + \alpha_4 FLD_{i,t} \times FERR_{i,t} + \\ & \alpha_5 RivalFLD_{i,t} \times FERR_{i,t} + \alpha_6 SIZE + \alpha_7 N_{i,t} + \alpha_8 BTM_{i,t} + \alpha_9 AGE_{i,t} + \\ & \alpha_{10} RETVOL_{i,t} + \alpha_{11} ROA_{i,t} + \alpha_{12} DP_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{7}$$

Table 11 Panel B presents the outcomes of Equation (7), focusing on the coefficient of *RivalFLD*×*FERR*. The coefficients on *FLD*×*FERR* (α_4) and *RivalFLD*×*FERR* (α_5) are −0.528 and −0.337, respectively (with *t*-statistics of −2.953 and −1.847, respectively). Moreover, the coefficient of *RivalFLD*×*FERR* (α_5) is smaller in magnitude than that of *FLD*×*FERR* (α_4). These findings suggest that both a firm's and its peers' forward-looking MD&A disclosures prompt analysts to react more quickly to future earnings implications and mitigate the underreaction to current earnings surprises. This indicates that forward-looking MD&A disclosures leads to information spillover effects that decrease underreaction to current earnings surprises among analysts for rival peers.

Table 11 Effect of rivals' forward-looking MD&A disclosures on the focal firm's investor and analyst underreaction to earnings surprises

Panel A: Effect of rivals' forward-looking MD&A disclosures on the focal firm's investor underreaction to earnings surprises

Variables	Coef.	Expected sign	*BHAR*1	*BHAR*3	*BHAR*6
			(1)	(2)	(3)
Intercept	α_0	?	−0.022*** (−3.239)	−0.025*** (−3.153)	−0.030*** (−3.403)
$RSUE_t$	α_1	+	0.040** (2.442)	0.032** (2.272)	0.048** (2.177)
FLD_t	α_2	?	−0.013** (−2.441)	−0.015** (−2.571)	−0.011** (−2.479)
$RivalFLD_t$	α_3	?	−0.009* (−1.786)	−0.012* (−1.888)	−0.010* (−1.913)
$FLD_t \times RSUE_t$	α_4	−	−0.040*** (−2.901)	−0.041*** (−3.139)	−0.046*** (−3.343)
$RivalFLD_t \times RSUE_t$	α_5	−	−0.010* (−1.915)	−0.012** (−2.033)	−0.014** (−2.179)
Coefficient test	$\alpha_4 > \alpha_5$		−0.030*** (−2.814)	−0.029*** (−3.457)	−0.032*** (−3.379)
Controls			Included	Included	Included
Year & Industry Indicators			Included	Included	Included
Adjusted R^2			0.312	0.316	0.318
No. of obs.			130,341	130,341	130,341

Panel B: Effect of rivals' forward-looking MD&A disclosures on the focal firm's analyst underreaction to earnings surprise

Variables	Coef.	Expected sign	$FERR_{t+1}$
Intercept	α_0	?	1.477** (2.461)
$FERR_t$	α_1	+	1.038*** (2.748)
FLD_t	α_2	?	−1.078** (−2.104)
$RivalFLD_t$	α_3	?	−0.947*** (−3.124)
$FLD_t \times FERR_t$	α_4	−	−0.528*** (−2.953)
$RivalFLD_t \times FERR_t$	α_5	−	−0.337* (−1.847)
Coefficient test	$\alpha_4 > \alpha_5$		−0.191*** (−4.232)
Controls			Included
Year & Industry Indicators			Included
Adjusted R^2			0.450
No. of obs.			130,341

Notes: All variable definitions are presented in Appendix 1. *** indicates $p < 0.01$; ** indicates $p < 0.05$; * indicates $p < 0.10$.

In summary, the results obtained in this section indicate that investors and analysts can leverage the narratives of their rival peers to gain a better understanding of the future implications of current earnings surprises and reduce underreaction.

7.5 Examining the association between forward-looking MD&A disclosures and investor and analyst underreaction in the context of annual earnings announcements

To find the results for an annual context, the hedge portfolio tests, regression tests and analyst serious correlation analyses are re-run in the context of annual earnings announcements. Unexpected annual earnings (SUE) is defined as the difference between current annual earnings before extraordinary items and the expected earnings based on random walk trends. As defined above, SUE is expressed as the ratio of unexpected earnings to the standard deviation of unexpected earnings. RSUE, on a scale between 0 and 1. Consistent with prior research on post-earnings announcement drift (PEAD), the focus in the literature is typically on quarterly earnings announcements. To facilitate comparison with our primary findings centered around quarterly earnings, we conduct abnormal return tests over a 6-month horizon. In addition, to gauge the robustness of the results in relation to timing effects, PEAD return tests are conducted over time horizons ranging from 1 month to 6 months. In the context of annual reporting, FERR is computed as the difference between a firm's earnings for the upcoming year (t+1) and the consensus of analysts' earnings forecasts for the same year's earnings per share (EPS) after the 10-K filing date of the preceding year (t).

The outcomes of the regression analysis are displayed in Panel A of Table 12. In these analyses, the dependent variables are the size-adjusted buy-and-hold returns over different time horizons: 1-month (BHAR1), 3-month (BHAR3), and 6-month (BHAR6). For brevity we omit the estimate results for the intercept and the controlling variables. The findings reveal significantly positive coefficients of RSUE for these various return horizons. Of particular interest are the coefficients on the intersections of various FLD variables and RSUE. These coefficients exhibit significantly negative values in the cases of 1-month BHAR, 3-month BHAR and 6-month BHAR. This suggests that greater levels of forward-looking MD&A disclosures are associated with a reduction in post-earnings announcement drift (PEAD) over these particular time horizons. Note that the magnitude of the coefficient for $FLD_{i,t}$×$\mathrm{RSUE}_{i,t}$ exhibits a notably more negative trend in the annual context when compared to the quarterly context. For instance, in column (6), it can be seen that the coefficient of *RSUE* is 0.089, while the coefficient of *DFLD*×*RSUE* is −0.048. These findings indicate that, in contrast to the low FLD subsample, there is a decrease of 53.932 percent (= −0.048/0.089) in the six-month hedge portfolio returns for the high FLD subsample when calculated on an annual basis. Examining column (6) of Table 3, the results show a decrease of 33.333 percent (= −0.020/0.060) in the quarterly context for the six-month hedge portfolio returns for the high FLD subsample compared to the low FLD

Table 12 Performing the tests in the annual context

Panel A: Serial correlation in PEAD

Variables	Coef.	Expected sign	*BHAR*1	*BHAR*3	*BHAR*6	*BHAR*1	*BHAR*3	*BHAR*6	*BHAR*1	*BHAR*3	*BHAR*6
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$RSUE_t$	α_1	+	0.078** (2.125)	0.077** (1.976)	0.086** (2.189)	0.080** (2.336)	0.083** (2.174)	0.089** (2.084)	0.078** (2.224)	0.085** (2.239)	0.090** (2.146)
FLD_t	α_2	?	−0.047** (−2.220)	−0.032** (−2.339)	−0.041** (−2.255)						
$FLD_t \times RSUE_t$	α_3	−	−0.045** (−2.349)	−0.043** (−2.363)	−0.048** (−2.204)						
$DFLD_t$	α_{2-1}	−				−0.050*** (−3.238)	−0.049*** (−3.357)	−0.053*** (−3.274)			
$DFLD_t \times RSUE_t$	α_{3-1}	−				−0.053* (−1.815)	−0.056* (−1.953)	−0.048* (−1.878)			
$RFLD_t$	α_{2-2}	−							−0.083*** (−3.266)	−0.096*** (−3.407)	−0.085*** (−3.208)
$RFLD_t \times RSUE_t$	α_{3-2}	−							−0.066*** (−3.070)	−0.070*** (−3.189)	−0.069*** (−2.881)
Intercept & Controls			Included	Included	Included	Included	Included	Included	Included	Included	Included
Year & Industry Indicators			Included	Included	Included	Included	Included	Included	Included	Included	Included
Adjusted R^2			0.323	0.328	0.335	0.330	0.334	0.342	0.333	0.338	0.346
No. of obs.			59,202	59,202	59,202	59,202	59,202	59,202	59,202	59,202	59,202

Panel B: Serial correlation in analyst forecast errors

Variables	Coef.	Expected sign	$FERR_{t+1}$		
			(1)	(2)	(3)
$FERR_t$	α_1	+	0.913** (2.498)	0.915** (2.119)	0.920** (2.297)
FLD_t	α_2	?	−0.141*** (−2.753)		
$FLD_t \times FERR_t$	α_3	−	−0.235** (−2.340)		
$DFLD_t$	α_{2-1}	?		−0.197** (−2.092)	
$DFLD_t \times FERR_t$	α_{3-1}	−		−0.475*** (−3.240)	
$RFLD_t$	α_{2-2}	?			−0.206* (−1.811)
$RFLD_t \times FERR_t$	α_{3-2}	−			−0.316*** (−3.193)
Intercept & Controls			Included	Included	Included
Year & Industry Indicators			Included	Included	Included
Adjusted R^2			0.383	0.395	0.418
No. of obs.			59,202	59,202	59,202

Notes: All variable definitions are presented in Appendix 1. *** indicates $p < 0.01$; ** indicates $p < 0.05$; * indicates $p < 0.10$.

subsample. This implies that the impact of forward-looking MD&A disclosures in mitigating investor underreactions to prior earnings announcements is more pronounced within the annual reporting context than in the quarterly reporting context.

To investigate the impact of forward-looking MD&A disclosures on analyst underreactions to annual earnings announcements, Equation (2) is re-estimated after replacing the quarterly *FERR* with its annual counterpart. The focus here centers on the coefficients related to *FLD*×*FERR, DFLD*×*FERR* and *RFLD*×*FERR*. In line with the findings in the quarterly context, it can observe that the coefficient for *FLD*×*FERR, DFLD*×*FERR* and *RFLD*×*FERR* are significantly negative in the annual context as well. However, it should be noted that the magnitude of the coefficient for $FLD_{i,t}$×$\text{FERR}_{i,t}$ is more strongly negative in the annual context than in the quarterly context. For instance, in column (2), the coefficient for *FERR* is 0.915, while the coefficient for *DFLD*×*FERR* is −0.475. In comparison with the low FLD subsample, there is a decrease in the correlation of analyst forecast errors for the high FLD subsample of 51.912 percent (= −0.475/0.915) in an annual context. Conversely, in the quarterly context, as shown in column (2) of Table 3 there is a decrease of 26.704 percent (= −0.286/1.071) in the correlation for the high FLD sample. This confirms that the influence of forward-looking MD&A disclosures on reducing analyst underreactions to previously announced earnings is more pronounced in the annual reporting context than in the quarterly context.

In summary, our findings align with those derived from the context centered on quarterly earnings announcements. Specifically, we discern significantly reduced post-earnings announcement drift and reduced serial correlation in analyst forecast errors when there are greater levels of forward-looking MD&A disclosures. Furthermore, we observe that the impact of forward-looking MD&A disclosures on mitigating both investor and analyst underreaction to earnings surprises is more pronounced in the annual reporting context compared to the quarterly reporting context.

8. Conclusions

Financial disclosures consist of several sections, with the MD&A section being critical as it offers a detailed analysis of a company's present state and future prospects. MD&A disclosures provides additional information and insights into a company's financial performance, including the factors that contribute to the current results and the company's future prospects. Studies have shown that forward-looking MD&A disclosures can have a significant impact on the capital market, providing information about future earnings and cash flow (Bryan 1997; Li 2010; Ball et al. 2015; Frankel et al. 2016). However, there is a lack of understanding about how forward-looking MD&A disclosures relate to market efficiency and public information. This study contributes to our understanding of the information contained in MD&A disclosures by examining their influence on analysts' and investors' underreaction to current earnings surprises.

The findings show that forward-looking MD&A disclosures are associated with a significant

reduction in post-earnings announcement drift and the serial correlation in analyst forecast errors. These results imply that forward-looking MD&A disclosures are useful in providing insight into the future implications of current earnings surprises. Our results are not subject to potential self-selection bias.

To obtain more comprehensive evidence, several supplementary tests were conducted. First, we investigated the relationship between forward-looking MD&A disclosures and the market's future reactions to earnings announcements for quarters t+1 through t+4, based on the earnings of quarter t. The findings suggest that there is a negative association between forward-looking MD&A disclosures and the magnitude of market reactions for future four quarters. These results indicate that forward-looking MD&A disclosures can help investors develop more accurate expectations of future earnings, which is critical in speeding up their response to future implications of current earnings.

Second, the findings show that the impact of forward-looking MD&A disclosures on investor and analyst underreaction to earnings surprises is more significant when the disclosures are more verifiable. Third, it is found that the tone of MD&A disclosures can mitigate investor and analyst underreaction to current earnings surprises. Finally, observations show that the effect of forward-looking MD&A disclosures on investor and analyst underreaction to earnings surprises is more pronounced for annual context relative to quarterly context.

In summary, our findings underscore the significance of forward-looking MD&A disclosure as a means of communicating valuable information to the market participants. These disclosures serve to direct investors' and analysts' attention towards the future and potentially convey forward-looking information that increases the transparency of the future implications of current earnings surprises. This increased transparency, in turn, helps investors and analysts in comprehend the future implications of currently announced earnings.

References

Abarbanell, J. S., and Bernard, V. L., 1992. "Tests of analysts' overreaction/underreaction to earnings information as an explanation for anomalous stock price behavior." *The Journal of Finance* 47(3): 1181-1207.

Amel-Zadeh, A., and Faasse, J., 2016. "The information content of 10-K narratives: comparing MD&A and footnotes disclosures." Working paper.

Atiase, R. K., 1987. "Market implications of predisclosure information: Size and exchange effects." *Journal of Accounting Research* 25(1): 168-176.

Ball, R., and E. Bartov, 1996. "How naïve is the stock market`s use of earnings information?" *Journal of Accounting and Economics* 21: 319-337.

Ball, C., Hoberg, G., and Maksimovic, V., 2015. "Disclosure, business change and earnings quality." Working Paper.

Baker, M. and Wurgler, J., 2006. "Investor sentiment and the cross-section of stock returns." *The journal of Finance* 61(4): 1645-1680.

Bartov, E., Radhakrishnan, S., and Krinsky, I., 2000. "Investor sophistication and patterns in stock returns after earnings announcements." *The Accounting Review* 75(1): 43-63.

Beatty, A., Liao, S., and Yu, J. J., 2013. "The spillover effect of fraudulent financial reporting on peer firms' investments." *Journal of Accounting and Economics* 55: 183-205.

Bernard, V. L., and Thomas, J. K., 1989. "Post-earnings-announcement drift: Delayed price response or risk premium?" *Journal of Accounting Research* 27: 1-36.

Bernard, V. L., and Thomas, J. K., 1990. "Evidence that stock prices do not fully reflect the implications of current earnings for future earnings." *Journal of Accounting and Economics* 13: 305-340.

Berns, J., Bick, P., Flugum, R., and Houston, R. 2022. "Do changes in MD&A section tone predict investment behavior?" *Financial Review* 57(1): 129-153.

Bhushan, R., 1994. "An informational efficiency perspective on the post-earnings announcement drift." *Journal of Accounting and Economics* 18(1): 45-65.

Bochkay, K., and Levine, C. B. 2019. "Using MD&A to improve earnings forecasts." *Journal of Accounting, Auditing and Finance* 34(3): 458-482.

Bochkay, K., Brown, S. V., Leone, A. J., and Tucker, J. W. 2023. "Textual analysis in accounting: What's next?" *Contemporary Accounting Research* 40(2):765-805.

Bozanic, Z., Roulstone, D. T., and Buskirk, A. V. 2018. "Management earnings forecasts and other forward-looking statements." *Journal of Accounting and Economics* 65(1):1-20.

Brav, A., and Heaton, J. B. 2002. "Competing theories of financial anomalies." *Review of Financial Studies* 15(2): 475-506.

Brown, S., Tucker, J. W., 2011. "Large sample evidence on firms' year-over-year MD&A modifications." *Journal of Accounting Research* 49(2): 309-346.

Bryan, S. H., 1997. "Incremental information content of required disclosures contained in management discussion and analysis." *The Accounting Review* 72: 285-301.

Cazier, R. A., Merkley, K. J., and Treu, J. S. 2020. "When are firms sued for qualitative disclosures? Implications of the safe harbor for forward-looking statements." *The Accounting Review* 95(1): 31-55.

Chen, Y. T., and Lin, C. J. 2022. "Application of transfer learning and text mining on reports to

shareholders." *Taiwan Accounting Review* 18(1): 123-166.

Cho, H., and Muslu, V. 2021. "How do firms change investments based on MD&A disclosures of peer firms?" *The Accounting Review* 96(2): 177-204.

Chordia, T. and L. Shivakumar. 2005. "Inflation illusion and post-earnings announcement drift." *Journal of Accounting Research* 43(4): 521-556.

Cole, C. J., and Jones, C. L. 2004. "The usefulness of MD&A disclosures in the retail industry." *Journal of Accounting, Auditing and Finance* 19(4): 361-388.

Daniel, K., Hirshleifer, D., and Subrahmanyam, A., 1998. "Investor psychology and security market under- and overreactions." *Journal of Finance* 53: 1839-1885.

Davis, A. and I. Tama-Sweet. 2012. "Managers' use of language across alternative disclosure outlets: Earnings press releases versus MD&A." *Contemporary Accounting Research* 29(3): 804-837.

Davis, A., J. Piger, and L. Sedor. 2012. "Beyond the numbers: Measuring the information content of earnings press release language." *Contemporary Accounting Research* 29(3): 845-868.

Doukas, J. A., Kim, C., and Pantzalis, C., 2002. "A test of the errors-in-expectations explanation of the value/glamour stock returns performance: Evidence from analysts' forecasts." *The Journal of Finance* 57(5): 2143-2165.

Drake, M. S., Myers, J. N., and Myers, L. A., 2009. "Disclosure quality and the mispricing of accruals and cash flows." *Journal of Accounting, Auditing and Finance* 24(3): 357-384.

Dyer, T., Lang, M., and Stice-Lawrence, L., 2017. "The evolution of 10-K textual disclosure: Evidence from Latent Dirichlet Allocation." *Journal of Accounting and Economics* 64(2-3): 221-245.

Easton, P., and Zmijewski, M. 1993. "SEC form 10K/10Q reports and annual reports to shareholders: Reporting lags and squared market model prediction errors." *Journal of Accounting Research*: 31: 113-129.

Elsayed, M. and Elshandidy, T. 2021. "Internal control effectiveness, textual risk disclosure, and their usefulness: U.S. evidence." *Advances in Accounting* 53: 100531.

Feldman, R., Govindaraj, S., Livnat, J., and Segal, B., 2010. "Management's tone change, post earnings announcement drift and accruals." *Review of Accounting Studies* 15: 915-953.

Fedorova, E., Drogovoz, P., Nevredinov, A., Kazinina, P. and Qitan, C. 2022. "Impact of MD&A sentiment on corporate investment in developing economies: Chinese evidence." *Asian Review of Accounting* 30(4): 513-539.

Foster, J., Greer, J., and Thorbecke, E., 1984. "A class of decomposable poverty measures." *Econometrica* 52(3): 761-766.

Francis, J., Philbrick, D., and Schipper, K., 1994. "Shareholder litigation and corporate disclosures." *Journal of Accounting Research* 32: 137-164.

Frankel, R., Jennings, J., and Lee, J., 2016. "Using unstructured and qualitative disclosures to explain accruals." *Journal of Accounting and Economics* 62: 209-227.

Freeman, R., and S. Tse., 1989. "The multiperiod information content of accounting earnings: Confirmations and contradictions of previous earnings reports." *Journal of Accounting Research* 27: 49-79.

Fu, R., Kraft, A., and Zhang, H., 2011. "Financial reporting frequency, information asymmetry, and the cost of equity." Working paper.

Griffin, P., 2003. "Got information? Investor response to form 10-K and form 10-Q EDGAR filings." *Review of Accounting Studies* 8: 433-466.

Grundfest, J. A., and M. A. Perino. 1997. "Ten things we know and ten things we don't know about the private securities litigation reform Act of 1995: Testimony before the subcommittee on securities of the committee on banking, housing, and urban affairs of the united states senate."

Hasan, M. M. 2020. "Readability of narrative disclosures in 10-K reports: Does managerial ability matter?" *European Accounting Review* 29(1): 147-168.

Henry, E., Thewissen, J., and Torsin, W. 2023. "International earnings announcements: Tone, forward-looking statements, and informativeness." *European Accounting Review* 32(2): 275-309.

Hirshleifer, D., 2001. "Investor psychology and asset pricing." *Journal of Finance* 56: 1533-1597.

Hoberg, G., 2016. "Discussion of using unstructured and qualitative disclosures to explain accruals." *Journal of Accounting and Economics* 62(2-3): 228-233.

Hoberg, G., and Phillips, G. 2016. "Text-based network industries and endogenous product differentiation." *Journal of Political Economy* 124(5): 1423-1465.

Huang, A. H., Zang, A. Y., and Zheng, R., 2014. "Evidence on the information content of text in analyst reports." *The Accounting Review* 89(6): 2151-2180.

Hussainey, K., Schleicher, T., and Walker, M., 2003. "Undertaking large-scale disclosure studies when AIMR-FAF ratings are not available: The case of prices leading earnings." *Accounting and Business Research* 33(4): 275-294.

Hutton, A. P., Miller, G. S., and Skinner, D. J., 2003. "The role of supplementary statements with management earnings forecasts." *Journal of Accounting Research* 41: 867-890.

Kimbrough, M. D., 2005. "The effect of conference calls on analyst and market underreaction to earnings announcements." *The Accounting Review* 80(1): 189-219.

Knutson, P., 1993. Financial reporting in the 1990's and beyond. Charlottesville, VA. NY: Association for Investment Management and Research.

Li, F., 2008. "Annual report readability, current earnings, and earnings persistence." *Journal of Accounting and Economics* 45: 221-247.

Li, H., and Tse, S. Y., 2008. "Can supplementary disclosures eliminate post-earnings-announcement drift? The case of management earnings guidance." Working paper.

Li, E. X., and Ramesh, K., 2009. "Market reaction surrounding the filing of periodic SEC reports." *The Accounting Review* 84: 1171-1208.

Li, F. 2010. "The information content of forward-looking statements in corporate filings-A naive Bayesian machine learning approach." *Journal of Accounting Research* 48(5): 1049-1102.

Li, F., Lundholm, R. J., and Minnis, M. 2013. "A measure of competition based on 10-K filings." *Journal of Accounting Research* 51(2): 399-436.

Livnat, J. and Mendenhall, R. R., 2006. "Comparing the post-earnings announcement drift for surprises calculated from analyst and time series forecasts." *Journal of Accounting Research* 44(1): 177-205.

Lo, K., Ramos, F., and Rogo, R., 2017. "Earnings management and annual report readability." *Journal of Accounting and Economics* 63(1):1-25.

Loh, Roger K., 2010. "Investor inattention and the underreaction to stock recommendations." *Financial Management* 39(3): 1223-1252.

Loughran, T., and McDonald, B., 2011. "When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks." *Journal of Finance* 66: 35-65.

Loughran, T., and McDonald, B., 2014. "Measuring readability in financial disclosures." *Journal of Finance* 69: 1643-71.

Loughran, T., and McDonald, B., 2015. "The use of word lists in textual analysis." *Journal of Behavioral Finance* 16(1): 1-11.

Loughran, T., and McDonald, B. 2016. "Textual analysis in accounting and finance: A survey." *Journal of Accounting Research* 54 (4): 1187-1230.

Marin, J., Poulter, A., 2004. "Dissemination of competitive intelligence." *Journal of Information Science* 30: 165-180.

Mendenhall, R. R., 1991. "Evidence on the possible underweighting of earnings-related information." *Journal of Accounting Research* 29(1): 170-179.

Mendenhall, R. R., 2004. "Arbitrage risk and post-earnings-announcement drift." *The Journal of Business* 77(4): 875-894.

Mikhail, M., Walther, B., and Willis, R., 2003. "The effect of experience on security analyst underreaction." *Journal of Accounting and Economics* 35: 101-116.

Miller, B. P. 2010. "The effects of reporting complexity on small and large investor trading." *The Accounting Review* 85: 2107-2143.

Muslu, V., Radhakrishnan, S., Subramanyam, K. R., and Lim, D., 2015. "Forward-looking MD&A disclosures and the information environment." *Management Science* 61(5): 931-948.

Peterson, M. A., 2009. "Estimating standard errors in finance panel data sets: Comparing approaches." *The Review of Financial Studies* 22(1): 435-480.

Philippot, A. 2018. "Analysts' reinitiations of coverage and market underreaction." *Journal of Banking and Finance* 94: 208-220.

Rogers, R. K. and Grant, J., 1997. "An empirical investigation of the relevance of the financial reporting process to financial analysts." Working paper.

Rogers, J. A. Van Buskirk, S. Zechman. 2011. "Disclosure tone and shareholder litigation." *The Accounting Review* 86(6): 2155-2183.

Schleicher, T., and Walker, M., 1999. "Share price anticipation of earnings and management's discussion of operations and financing." *Accounting and Business Research* 29(4): 321-335.

Shane, P., and Brous, P., 2001. "Investor and (value line) analyst underreaction to information about future earnings: The corrective role of non-earnings-surprise information." *Journal of Accounting Research* 39(2): 387-404.

Shin, H. S. 2006. "Disclosure risk and price drift." *Journal of Accounting Research* 44(2): 351-379.

Siano, F., and Wysocki, P. 2021. "Transfer learning and textual analysis of accounting disclosures: Applying big data methods to small(er) data sets." *Accounting Horizons* 35(3): 217-244.

Soffer, L. C., and Lys, T., 1999. "Post-earnings announcement drift and the dissemination of predictable information." *Contemporary Accounting Research* 16(2): 305-331.

Sun, Y. 2010. "Do MD&A disclosures help users interpret disproportionate inventory increase?" *The Accounting Review* 85(4): 1411-1440.

Tetlock, P. 2007. "Giving content to investor sentiment: The role of media in the stock market." *Journal of Finance* 62: 1139-1167.

Tetlock, P., M. Saar-Tsechansky, and S. Macskassy. 2008. "More than words: Quantifying language to measure firms' fundamentals." *Journal of Finance* 63: 1437-1467.

Verrecchia, R., 1983. "Discretionary disclosure." *Journal of Accounting and Economics* 5: 179-194.

Wang Y. H, and Lin, C. H., 2004. "A multimedia database supports English distance learning." *Information Sciences* 158(1): 189-208.

Wang, Q., Wu, D., and Yan, L. 2021. "Effect of positive tone in MD&A disclosure on capital structure adjustment speed: Evidence from China." *Accounting and Finance* 61(4): 5809-5845.

Wang, L., Chen, X., Li, X., and Tian, G. 2021. "MD&A readability, auditor characteristics, and audit fees." Accounting and Finance 61(4): 5025-5050.

Womack, K. L., 1996. "Do brokerage analysts' recommendations have investment value?" *The Journal of Finance* 51(1): 137-167.

Appendix A The definitions of forward-looking sentences

In accordance with the approach of Muslu et al. (2015), we identify a sentence in the MD&A section as forward-looking through a three-step search process:

First step

The initial search classifies an MD&A sentence as forward-looking if it contains any 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". Sentences containing keywords such as "shall," "should," "can," "could," "may," or "might" are not categorized as forward-looking, even if they imply future events. This is because these terms are often associated with legal language and boilerplate disclosures that lack meaningful forward-looking implications. Our decision to exclude such boilerplate language from the forward-looking category aligns with the SEC's criticism of firms for frequently providing non-informative boilerplate disclosures and immaterial information in their MD&A reports (SEC 2003, Li 2010).

Second step

The second search approach categorizes a sentence as forward-looking if it contains variations of specific verbs, including: "aim," "anticipate," "assume," "commit," "estimate," "expect," "forecast," "foresee," "hope," "intend," "plan," "project," "seek," and "target." We assess these verbs in various forms to capture the forward-looking context. For brevity, "expect" serves as our template verb, and we consider phrases such as "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," and "also expects." Similar to the first search, this comprehensive approach with multiple conjugations minimizes the risk of erroneously capturing nouns derived from certain verbs that lack forward-looking connotations, especially those related to "plan," "project," and "estimate".

Third step

The third search method classifies a sentence as forward-looking if it contains a reference to a year that is subsequent to the year of the filing (for example, "2022" in a company's 10-K filing in 2021). To ensure accuracy, the program is designed to exclude phrases that involve numerical or percentage values occasionally within the specified search range. Any use of characters, whether before, after, or in between the digits (e.g., "$," "%," ",") disqualifies the number from being classified as a year reference.

Appendix B Variable Definitions

Dependent or independent variables for main tests	
$BHAR1,3,6$ =	the compounded raw return during the raw accumulation period minuses the compounded value return for a portfolio of companies in the same CRSP NYSE/AMEX/NASDAQ size decile over the same period. We employ return accumulation periods of 1 month, 3 months, and 6 months, all starting from the second day after the SEC filing date. Specifically, BHAR1, BHAR3, and BHAR6 cover accumulation periods of one month, three months, and six months, respectively, beginning on the second day after the SEC filing.
$FERR_{t+1}$ =	the difference between actual earnings for quarter t+1 and the average of the prevailing forecast of firm i's earnings for quarter t+1 divided by stock price.
FLD =	the number of forward-looking sentences divided by the total number of sentences in the MD&A section.
$DFLD$ =	a value of 1 when FLD is below the median of all firm-quarter observations for the fiscal quarter, and 0 otherwise.
$RFLD$ =	a value based on the decile ranking of FLD in the fiscal quarter.
$RSUE$ =	decile rankings for SUE, scaled between 0 and 1.
$FERR$ =	the difference between actual earnings for quarter t and the average of the prevailing forecast of firm i's earnings for quarter t divided by stock price.
Control variables for main tests	
$SIZE$ =	log of total assets at the beginning of quarter t.
PRC =	the stock price at the end of the quarter t.
VOL =	dollar trading volume measured over the 12-month period preceding quarter t.
$INST$ =	the percentage of common shares held by institutional investors out of the total outstanding common stocks at the end of the quarter t.
N =	analyst following
BTM =	book-to-market ratio
AGE =	the number of months a firm has been listed on the CRSP, updated monthly.
$RETVOL$ =	the standard deviation in returns over the prior 12 months.
ROA =	earnings divided by average total assets.
DP =	cash dividends divided by the book value of equity.
Other variables used in robust and supplementary tests	
$Mills$ =	inverse Mills ratio.
Pre_FLD =	the predictive value of FLD from first stage regression.
$FERR\_CONSENSUS_{t+1}$ =	the forecast error based on the most recent IBES consensus earnings forecast before quarter t+1's SEC filing date.
$Confirming\_TONE$ =	a value of 1 if the sign of net positive MD&A tone is the same of the sign of SUE, and 0 otherwise.
$RivalFLD$ =	the average forward-looking MD&A disclosures for the industry peers whose SEC filing dates precede that of the focal firm.

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中文粹要

前瞻性 MD&A 揭露對市場參與者盈餘公告反應不足的影響

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摘　要

本研究探討前瞻性管理階層討論與分析 (以下簡稱 MD&A) 揭露是否可以幫助投資者和分析師瞭解公告的盈餘對對未來盈餘的影響，進而減緩市場和分析師在公司提交 10-Q 或 10-K 文件後對先前公告之盈餘驚奇的不足反應。我們的研究發現，前瞻性 MD&A 揭露會促使市場和分析師對先前公告的盈餘做出反應。因此，前瞻性 MD&A 揭露會降低盈餘公告後股票報酬的延遲反應 (post-earnings-announcement drift)，並降低分析師預測誤差的時間序列相關性。我們還發現，前瞻性 MD&A 揭露係透過幫助投資人與分析師更準確的預測未來盈餘，從而降低投資人與分析師對盈餘公告的反應不足現象。

關鍵詞：前瞻性管理階層討論與分析揭露、盈餘公告後股票報酬的延遲反應、分析師反應不足

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1. 研究議題

本研究旨在研究美國年報的 MD&A 單元關於前瞻性揭露部分是否可以減少投資者和分析師對當期公告盈餘的反應不足現象。雖然公司財報中的量化資訊可以增加投資者和分析師對金融市場的瞭解，但先前研究發現，僅依靠財報的量化資訊無法完全解釋公司揭露對股價的影響。上市公司對申報年報文件中的 MD&A 部分是強制性的規定，包括管理階層對公司當前和未來前景的評論。先前的研究顯示，MD&A 揭露為投資人提供了有價值的資訊，MD&A 的揭露也提供市場參與者瞭解公司財務績效和未來前景等資訊。然而，目前尚不清楚前瞻性 MD&A 揭露如何影響市場效率，從而減輕投資者和分析師對當期盈餘驚奇的反應不足現象。

2. 研究假說

先前的研究強調公司質性揭露的重要性，10-K/10-Q 申報的 MD&A 揭露更引起廣泛的注意，MD&A 揭露已成為投資人與分析師主要的資訊來源 (Marin & Poulter 2004)。MD&A 可用來解釋公司的財務報表內容 (Hoberg 2016)，並提供營運變化、資本結構變化以及公司重要投資與融資決策的資訊 (Brown & Tucker 2011)。MD&A 也提供企業未來收益、現金流量和公司價值的攸關資訊 (Bryan 1997; Li 2010; Ball, Hoberg & Maksimovic 2015; Frankel, Jennings & Lee 2016)。因此，本研究認為，MD&A 前瞻性揭露可以幫助投資人確定公司未來獲利是否發生結構性的改變，進而促使投資人對於公告的盈餘做出快速的反應，進而降低盈餘公告後市場反應不足的現象 (post-earnings-announcement drift)。因此我們建立的第一個假設如下：

H1：*前瞻性 MD&A 揭露會降低盈餘公告後市場反應不足的現象。*

現有文獻發現，分析師常常對資訊反應不足，如同投資人，分析師也會對公告的盈餘反應不足 (Mendenhall 1991; Abarbanell & Bernard 1992)。因此，分析師的前後期預測誤差之間存在序列相關性，這表明分析師對未來盈餘的預期，可能忽略前期公佈盈餘之持續性部分。Daniel, Hirshleifer & Subrahmanyam (1998) 指出，分析師對公告盈餘的反應不足通常歸因於分析師在面臨不確定性資訊環境下，無法立即調整本期盈餘驚奇對未來盈餘的影響。Hirshleifer (2001) 亦發現，更大的不確定性，導致分析師誤差更大。前瞻性資訊可以有效減少資訊不確定性，並提供公司所公佈盈餘持續性的額外訊息，因此更多的前瞻性資訊將可以減少分析師對公告盈餘反應不足的現象。因此我們建立的第二個假設如下：

H2：*前瞻性 MD&A 揭露會降低分析師對公告盈餘反應不足的現象。*

3. 研究方法

本研究執行以下迴歸來檢驗假說 H1：

$$BHAR_i\,(1,3,6) = \alpha_0 + \alpha_1 RSUE_{i,t} + \alpha_2 FLD_{i,t} + \alpha_3 FLD_{i,t} \times RSUE_{i,t} + \alpha_4 SIZE_{i,t} \times RSUE_{i,t} + \alpha_5 PRC_{i,t} \times RSUE_{i,t} + \alpha_6 VOL_{i,t} \times RSUE_{i,t} + \alpha_7 INST_{i,t} \times RSUE_{i,t} + \varepsilon_{i,t} \quad (1)$$

本研究執行以下迴歸來檢驗假說 H2：

$$FERR_{i,t+1} = \alpha_0 + \alpha_1 FERR_{i,t} + \alpha_2 FLD_{i,t} + \alpha_3 FLD_{i,t} \times FERR_{i,t} + \alpha_4 SIZE + \alpha_5 N_{i,t} + \alpha_6 BTM_{i,t} + \alpha_7 AGE_{i,t} + \alpha_8 RETVOL_{i,t} + \alpha_9 ROA_{i,t} + \alpha_{10} DP_{i,t} + \varepsilon_{i,t} \quad (2)$$

4. 研究結果

實證結果發現，前瞻性 MD&A 揭露可以幫助投資人與分析師瞭解本期盈餘驚奇對未來盈餘的影響，進而減少盈餘公佈後投資人與分析師對公告盈餘反應不足現象。本研究排除了前瞻性 MD&A 揭露的自我選擇問題所造成的係數估計偏誤問題。進一步的額外測試更加證實本文的主要發現。首先，我們發現前瞻性 MD&A 揭露降低公告後第一到第四季盈餘公告日的超額報酬。其次，我們發現前瞻性 MD&A 揭露具財務可驗證性時，更能顯著地降低投資人和分析師對公告盈餘反應不足之現象。第三，同業的前瞻性 MD&A 揭露對本公司具外溢效果，可減輕投資者和分析師對公告盈餘反應不足的現象。第四，除了前瞻 MD&A 揭露的數量外，MD&A 的揭露語調亦可幫助投資人和分析師瞭解本期盈餘驚奇對未來盈餘的影響，進而降低投資人和分析師對公告盈餘反應不足之現象。最後，與季度盈餘報告相比，前瞻性 MD&A 揭露對於緩解投資者和分析師對盈餘公告反應不足現象的影響在年度盈餘報告中更為明顯。