Narrative Tone and Share Price Anticipation of Earnings

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Declaration of Interests
None.

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Abstract: We contribute to the literature on the intersection between the lexical features of firms' financial disclosures and prices leading earnings by examining the relationship between the tone of financial disclosures and share price anticipation of earnings. In efficient markets, if managers disclose incrementally informative (misleading) narratives on the firm-fundamentals, then the tone is expected to improve (deteriorate) the share price informativeness of future earnings. However, managerial incentives to disclose incrementally informative versus misleading narratives is expected to differ between profit firms and loss firms. Using a sample of 10-K disclosures, we find that the tone improves (deteriorates) the share price informativeness of future earnings in profit (loss) firms. Segregating the tone into positive and negative tonal components suggests that both components contribute towards improving (deteriorating) the share price informativeness of future earnings in profit (loss) firms. Additional analysis reveals that the association of the tone (and both positive and negative tonal components) with the future earnings response coefficient (FERC) is stronger in short disclosures than in long disclosures, suggesting that investors find the tone in short disclosures to be better predictors of future earnings than long disclosures.

Keywords: Tone, Financial Disclosures, Narratives, FERC, Loss Firms, Disclosure Length.

1. Introduction

Numerous prior studies suggest that due to lack of earnings timeliness in efficient capital markets, the current period share price reflects information available on future earnings (Choi & Kim, 2017; Collins, Kothari, Shanken, & Sloan, 1994; Kothari, 1992; Kothari & Sloan, 1992; Lee, 2018; Schleicher, Hussainey, & Walker, 2007). An interesting subset of this literature examines the link between firms' financial disclosure content and prices leading earnings (e.g., Lundholm & Myers, 2002; Schleicher & Walker, 1999; Schleicher et al., 2007). However, linkages between the lexical features of firms' financial disclosures and prices leading earnings have been left largely unexplored in prior research. In this paper, we address this gap in the literature by examining the relationship between the tone of financial disclosures and share price anticipation of earnings.

The tone (i.e., sentiment of narratives) is one of the most important lexical features in financial disclosures. Extant literature suggests that the tone of disclosures such as annual reports, earnings announcements and trading updates is associated with future earnings (Davis, Piger, & Sedor, 2012, Davis, Matsumoto, & Zhang, 2015; Demers & Vega, 2014; Druz, Ptezev, Wagner, & Zeckhauser, 2020; Schleicher & Walker, 2010; Rahman, 2019, 2023). This is consistent with the expectations-adjustment hypothesis that managers use the tone of narratives to signal their assessments of firm fundamentals to investors, to align investor expectations of the firm's performance with their own assessments (Davis et al., 2012; Rahman, 2023). Prior studies also find that the tone of financial disclosures is associated with market returns around the time of the disclosure (Henry, 2008; Henry & Leone, 2016; Loughran & McDonald, 2011), suggesting that investors adjust their buy-hold-and-sell decisions in response to tonal signals.

In this study, we first argue that managers adjust investor-expectations by either disclosing incrementally informative narratives that convey value-relevant firm-fundamental

information, or by disclosing misleading narratives that convey inaccurate information. Given that the tone is associated with future earnings (Davis et al., 2012; Demers & Vega, 2014; Schleicher & Walker, 2010), we posit that the informativeness of share price for future earnings is related to the informativeness of the narratives disclosed. If managers predominantly disclose incrementally informative (misleading) narratives, then the tone is expected to be positively (negatively) associated with future earnings. As this value-relevant (inaccurate) information is impounded in the share prices, the tone improves (deteriorates) the share price informativeness of future earnings. Therefore, we hypothesize that the tone changes the share price informativeness of future earnings.

We further argue that managerial incentives to disclose incrementally informative vis a vis misleading narratives is expected to vary between profit firms and loss firms. This is because managers have greater incentives to disclose incrementally informative narratives in profit firms, to reduce information asymmetry and maximize the market rewards of the good earnings news (Kimbrough & Wang, 2014; Merkl-Davies & Brennan, 2007). Conversely, managers have relatively fewer incentives to disclose incrementally informative narratives in loss firms, as it prevents managers from exploiting information asymmetry to delay or minimize the market penalties of the bad earnings news (Demers & Vega, 2014; Kimbrough & Wang, 2014; Merkl-Davies & Brennan, 2007; Schleicher & Walker, 2010; Verrecchia, 1983). *Ceteris paribus*, if managers disclose incrementally informative narratives, the tone in profit (loss) firms is expected to increase (decrease). This implies that an increase in the tone is more likely to increase the share price informativeness of future earnings in profit firms than in loss firms. Consequently, we hypothesize that the tone changes the share price informativeness of future earnings more positively in profit firms than in loss firms.

To examine our hypotheses, we measure the tone of a sample of US 10-K disclosures based on the Loughran and McDonald (2011) wordlist. Following the approach of Collins et

al. (1994), Schleicher et al. (2007) and subsequent studies, we develop a measure of the future earnings response coefficient (FERC) using two years' ahead earnings data. Our multivariate analysis suggests, first, that the tone improves the share price informativeness of future earnings. Second, separating out the tonal effects of profit firms from loss firms reveal that the tone of profit (loss) firms improves (deteriorates) the share price informativeness of future earnings, consistent with our hypothesis that the association between the tone and the FERC is more positive in profit firms than in loss firms. We then replace the tone with separate positive and negative tonal components and find that both positive tone and negative tone contribute to improving (deteriorating) the share price informativeness of future earnings in profit (loss) firms. Our supplementary analysis suggests that investors consider the tone of short 10-Ks to be better predictors of future earnings than the tone of long 10-Ks.

This paper contributes to the literature on the intersection between the lexical features of firms' financial disclosures and prices leading earnings. Previous studies have examined the relationship of the share price informativeness of earnings with disclosure content (Lundholm & Myers, 2002; Schleicher & Walker, 1999; Schleicher et al., 2007), analyst following, institutional ownership (Choi & Jung, 2008), accruals (Dargenidou, McLeay, & Raonic, 2011), credit ratings (Chou, 2013) and CEO share-based compensation (Choi & Kim, 2017) in a variety of research settings. However, there is currently little to no research on the link between the lexical features of financial disclosures and share price anticipation of earnings. To the best of our knowledge, this is the first study to examine the relationship between the disclosure tone and share price informativeness of earnings. Another contribution of this paper is to examine the differences in this relationship between profit firms and loss firms. Our analysis separating out the effects of the positive and negative tonal components provide further insight on this relationship. Finally, we provide evidence

suggesting that the length of financial disclosure plays an important role on the association between the tone and share price informativeness of earnings.

The rest of this paper is organized as follows. Section 2 reviews the relevant literature and develops the hypotheses. Section 3 discusses the sample and variable measurements. Section 4 discusses our main results while Section 5 discusses the results of some additional analysis not hypothesized in Section 2. Section 6 concludes.

2. Literature review and hypotheses

2.1. Tone of financial disclosures, earnings and market returns

Tone is broadly defined as the affect or feeling of a communication (Henry, 2008). In the context of corporate financial communication, the tone indicates whether the sentiment of textual narratives in financial disclosures is positive, neutral or negative (Henry & Leone, 2016; Huang, Teoh, & Zhang, 2014; Loughran & McDonald, 2011). Positive (neutral, negative) tone signifies favorable (neutral, unfavorable) narrative sentiment of the firm's financial performance. The tone of financial disclosures depends on both the information content and word choice. Therefore, managers can provide a more positive (neutral, negative) tone by either focusing on favorable (neutral, unfavorable) performance or by describing performance in a favorable (neutral, unfavorable) way (Henry, 2008). While early research uses manual techniques for tone measurement (e.g. Francis, Philbrick, & Schipper, 1994; Hoskin, Hughes, & Ricks, 1986), contemporary research uses computer-automated counts employing 'bag of words' or 'machine-learning' techniques (Arslan-Ayaydin, Thewissen, & Torsin, 2021; D'Augusta & DeAngelis, 2020; Davis et al., 2012, 2015; Henry, 2008; Henry & Leone, 2016; Huang et al., 2014). Such automated techniques are often 'form-oriented' – they allow researchers to process large volumes of financial disclosures quickly and

consistently but are less adept in capturing subtleties in meaning and context than manual techniques (Clatworthy & Jones, 2003; Rahman, 2019; Schleicher & Walker, 2010).

Extant literature suggests that the tone of financial disclosures such as annual reports, earnings press releases and trading updates is aligned with reported financial performance (Davis et al., 2012, 2015; Huang et al., 2014). Financial disclosures comprise both quantitative financial statements summarizing a firm's economic transactions and textual narratives describing related economic events. As such, textual narratives allow managers to provide supplementary information absent in the quantitative statements, perhaps owing to reporting constraints (Huang et al., 2014; Hutton, Miller, & Skinner, 2003). Consistent with the expectations-adjustment hypothesis, managers use the tone of narratives to signal their firms' financial performance to investors, to align the investors' expectations of financial performance with their own assessments (Davis et al., 2012, 2015; D'Augusta & DeAngelis, 2020; Price, Doran, Peterson, & Bliss, 2012; Rahman, 2023). Managerial incentives for this expectations-alignment include lowering information asymmetry and increasing credibility of their narratives (Verrechhia, 2001; Mercer, 2005; Merkl-Davies & Brennan, 2007). This in turn allows managers to maximize the market rewards for good earnings news and minimize the market penalties for bad earnings news (Kimbrough & Wang, 2014; Rahman, 2023). Accordingly, prior studies often find that the narrative tone is positively associated with both current and future earnings and cash flow numbers (Arslan-Ayaydin et al., 2021; D'Augusta & DeAngelis, 2020; Davis et al., 2012, 2015; Demers & Vega, 2014; Price et al., 2012). This suggests that the tone of financial disclosures coincides with decision-useful information (Henry, 2008). Consistent with the efficient market hypothesis, this stream of research also documents a positive association between the tone of financial disclosures such as annual reports and earnings announcements and short-window abnormal market returns around the time of their publication (Henry, 2008; Henry & Leone, 2016; Loughran & McDonald, 2011;

Davis et al., 2012; Price et al., 2012; Tetlock, Saar-Tsechansky, & Macskassy, 2008). This suggests that investors align their buy-hold-or sell decisions based on the signal of the tone (Davis et al., 2012; Henry, 2008; Tetlock, 2007; Tetlock et al., 2008).

Some recent studies argue that managers exploit information asymmetries with investors by biasing the narrative tone for their own benefit (Huang et al., 2014; Rahman, 2019). Grounded on management obfuscation hypothesis, this stream of research segregates the tone into a normal component that proportionally represents the reported quantitative information and an abnormal component that represents managerial bias or spin. These studies find that the abnormal tone of earnings announcements disclosed at the start of the year is negatively associated with year-end earnings (Huang et al., 2014) while the abnormal tone of third-quarter trading updates is positively associated with year-end earnings (Rahman, 2019). Arguably, this suggests that the abnormal tone is used by managers to mislead investors of future performance if investors are unlikely to detect the narrative bias in the short-term. Huang et al. (2014) subsequently find that although abnormal market returns is positively associated with the abnormal tone at the start of the year, it is followed by a delayed negative reaction in the post-announcement period once the market learns of the initial mispricing.

2.2. Share price anticipation of earnings

An extensive body of accounting research suggests that share price movements reflect investors' assessments of current earnings and their expectations of future earnings (Choi & Jung, 2008; Choi & Kim, 2017; Chou, 2013; Collins et al., 1994; Dargenidou et al., 2011; Donnelly & Walker, 1995; Kothari, 1992; Kothari & Sloan, 1992; Lee, 2018; Lundholm & Myers, 2002; Schleicher & Walker, 1999; Schleicher et al., 2007). In efficient markets, share prices reflect the unexpected component of current earnings and any incremental information

that leads investors to change their expectations about future earnings (Collins et al., 1994; Dargenidou et al., 2011; Lee, 2018). However, current period returns are unlikely to reflect the expected component of current earnings as they are already adjusted with the previous period's returns (Collins et al., 1994; Lee, 2018). There are at least two implications of this. First, if investors are better able to anticipate a firm's equity value changes, then more information about future earnings will be reflected in the share price (Chou, 2013; Choi & Jung, 2008; Kothari & Sloan, 1992). Second, value-relevant information about a firm's financial performance is reflected in the share prices before the reported earnings number (Collins et al., 1994; Kothari & Sloan, 1992; Lundholm & Myers, 2002). As periodic financial statements are static in nature, the reported earnings number captures changes in the firm's equity value at a specific point in time only. Arguably, this lack of earnings timeliness results in low explanatory power of current earnings for current period returns (Collins et al., 1994; Donnelly & Walker, 1995; Kothari & Sloan, 1992; Lee, 2018; Schleicher & Walker, 1999). In contrast, the share price captures changes in the firm's equity value continuously (Collins et al., 1994; Lee, 2018) as value-relevant information is made publicly available via ad-hoc disclosures, media articles, and other sources. As such, the share price incorporates value-relevant information about future earnings beyond the current earnings number. To address the lack of earnings timeliness for current period returns, Collins et al. (1994) develop the future earnings response coefficient (FERC) model that regresses current period returns on current earnings and future earnings. They find that the FERC model (i.e., current earnings and future earnings together) exhibits significantly greater explanatory power for current period returns than current earnings alone. More recently, Lee (2018) provides theoretical and empirical evidence to support the validity of the FERC as an analytical model to examine lack of earnings timeliness.

Previous studies have used the FERC model in a variety of contexts to examine share price anticipation of earnings. Schleicher and Walker (1999) examine a sample of UK annual reports and find that current period returns are more informative of future earnings when the annual reports provide greater disclosure of firms' operating and financing activities. Lundholm and Myers (2002) examine the relationship between disclosure activity and share price anticipation of earnings. They proxy disclosure activity by firm-specific AIMR ratings and find that current period returns of firms with higher AIMR ratings are more informative of future earnings. Subsequently, Schleicher et al. (2007) examine differences in the association of UK annual report narratives and prices leading earnings between profit firms and loss firms. They find that current period returns of loss firms, but not profit firms, are more informative of future earnings when the annual reports contain a higher number of forward-looking earnings narratives. Schleicher et al. (2007) conclude that annual report narratives of loss firms contain more value-relevant information than profit firms. Choi and Jung (2008) examine a sample of South Korean firms and document that the number of analyst following and institutional ownership are both positively associated with share price informativeness of future earnings. They also find that the implementation of Regulation FD in South Korea (signifying decrease in information disclosure) leads to lower share price informativeness of future earnings. Dargenidou et al. (2011) argue that firms primarily employ accruals accounting to convey information about future earnings. Using a sample of S&P Europe 350 non-financial firms, they find that the level of disclosures and accruals jointly affect share price informativeness of future earnings, depending on the sign and magnitude of the firm's operating and non-operating assets. Chou (2013) documents that the S&P Long-Term Issuer Credit Rating scores improve share price informativeness of future earnings. Chou additionally finds that share prices become more informative of future earnings after a ratings initiation or upgrade. Choi and Kim (2017) examine the effect of CEO

share-based compensation on the pricing of future earnings. In a sample of S&P 1500 firms, they find that increases in CEO share-based compensation increase share price informativeness of future earnings. However, this positive association is weaker for firms engaged in high levels of earnings management and less frequent management forecasts.

Our study differs from the aforementioned research in that it is the first to examine the relationship between the tone of financial disclosures and prices leading earnings. This extends the literature on the intersection between the lexical features of financial disclosures and lack of earnings timeliness. Arguably, the tone is one of the most widely examined lexical attributes of firms' financial disclosures. Prior research suggests that the tone of financial disclosures is positively associated with future earnings (Davis et al., 2012; Price et al., 2012; Rahman, 2023) and positively associated with short-window announcement period abnormal market returns (Henry, 2008; Henry & Leone, 2016; Davis et al., 2012; Loughran & McDonald, 2011). However, these studies do not examine lack of earnings timeliness in the relationship between the tone, reported earnings and market returns. In contrast, we examine the association between the tone and the FERC as an analytical model for lack of earnings timeliness. Our study provides empirical evidence on whether the tone changes the informativeness of current period returns for future earnings.

2.3. Hypothesis development

Prior studies frequently document a strong alignment between the tone of financial disclosures and future earnings (Davis et al., 2012, 2015; Demers & Vega, 2014; Druz et al., 2020; Schleicher & Walker, 2010; Rahman, 2023). This suggests that managers use the narrative tone to influence investor expectations of future earnings. If investors expect the firm's future earnings to increase (decrease), they are likely to ascribe higher (lower) share prices (Davis et al., 2012; Henry, 2008; Huang et al., 2014; Rahman, 2019). Managers have

incentives to provide financial disclosure narratives that are not easily refutable by concurrently disclosed or otherwise publicly available information, to preserve their credibility and avoid market penalties (Demers & Vega, 2014; Kimbrough & Wang, 2014; Merkl-Davies & Brennan, 2007). However, managerial incentives to provide biased narratives is heightened if the information disclosed is not readily verifiable (e.g. forward-looking statements) (Demers & Vega, 2014; Hutton et al., 2003). If this is the case, then managers have the option to disclose either incrementally informative or misleading narratives on their firm's financial performance. Incrementally informative narratives convey value-relevant information and are thus expected to assist in optimal capital allocation. In contrast, misleading narratives convey inaccurate information and are thus designed to suboptimize capital allocation, perhaps for managerial gains. Alternatively, managers may also provide narratives that are irrelevant to investor decision making.

An implication of the lack of earnings timeliness in efficient markets is that current period returns reflect the information available on future earnings (Collins et al., 1994; Schleicher et al., 2007; Lee, 2018). Given that managers use the narrative tone to signal information on future earnings to the market (Davis et al., 2012; Demers & Vega, 2014; Druz et al., 2020; Schleicher & Walker, 2010), the informativeness of the share price for future earnings depend on the managers' incentives to provide incrementally informative vis a vis misleading narratives. If managerial incentives to provide incrementally informative narratives override their incentives to provide misleading narratives, then the tone is expected to be positively associated with future earnings (Davis et al., 2012; Demers & Vega, 2014; Rahman, 2023). As value-relevant information is impounded in the share prices, the tone improves the informativeness of current period returns in relation to future earnings, resulting in a positive association between the tone and the FERC. In contrast, if managerial incentives to disclose misleading narratives override their incentives to provide incrementally

informative narratives, then the tone is expected to be negatively associated with future earnings (Huang et al., 2014; Rahman, 2019). As inaccurate information is impounded in the share prices, the tone deteriorates the informativeness of current period returns in relation to future earnings, resulting in a negative association between the tone and the FERC. If the narratives are irrelevant to the firm's financial performance, then the tone is unlikely to be associated to the FERC. Given this, we now develop our first (non-directional) hypothesis:

H1: Tone changes the informativeness of the share price in relation to future earnings.

The tone is typically measured as the net or excess of positive tone over negative tone (Davis et al., 2012, 2015; Henry, 2008; Henry & Leone, 2016: Loughran & McDonald, 2011; Price et al., 2012). A higher (lower) tone value can be achieved by either increasing (decreasing) the tonal positivity of the narratives or by decreasing (increasing) the tonal negativity of the narratives (Rahman, 2023). Therefore, by construction, if managers have greater incentives to provide incrementally informative narratives than to provide misleading narratives, then the positivity (negativity) is expected to be positively (negatively) associated with future earnings. In this case, the positivity (negativity) improves the informativeness of current period returns for future earnings, resulting in a positive (negative) association between the positivity (negativity) and the FERC. Similarly, if managers have greater incentives to disclose misleading narratives than to disclose incrementally informative narratives, then the positivity (negativity) is expected to be negatively (positively) associated with future earnings. Consequently, the positivity (negativity) reduces share price informativeness of future earnings, resulting in a negative (positive) association between the positivity (negativity) and the FERC. If the narratives are irrelevant to the firm's financial performance, then neither positivity nor negativity are expected to be related to the FERC.

We do not necessarily expect alignments between the positivity and the FERC to be proportional to corresponding alignments between the negativity and the FERC. This is because the agency theory suggests that managers have greater incentives to overstate (downplay) positive (negative) news than negative (positive) news – to maximize (minimize) the market rewards (penalties) of positive (negative) news (Clatworthy & Jones, 2003; Kimbrough & Wang, 2014; Rutherford, 2005; Verrecchia, 1983). The tendency to overstate positive news but not negative news is also consistent with the "Pollyanna Principle" (Merkl-Davies & Brennan, 2007). Hence arguably, positivity and negativity may concurrently serve different communication purposes, and may affect the share price in different ways (Tetlock et al., 2008). Likewise, prior studies reveal asymmetries in the magnitude (and sign) of market reaction to positivity and negativity (Loughran & McDonald, 2011; Tetlock, 2007; Tetlock et al., 2008).[3] Therefore, we develop separate (non-directional) hypotheses for the association of the FERC with positivity and negativity:

H2(a): Positivity changes the informativeness of the share price in relation to future earnings.

H2(b): Negativity changes the informativeness of the share price in relation to future earnings.

We argue that the narrative tone is a better predictor of future earnings in profit firms than in loss firms. This is because managers have greater incentives to disclose incrementally informative narratives in profit firms than in loss firms (Kimbrough & Wang, 2014; Merkl-Davies & Brennan, 2007; Verrecchia, 1983). When firms generate profits, managers have greater incentives to disclose incrementally informative narratives to investors, to reduce information asymmetry and maximize the market rewards of positive earnings news. Conversely, when firms incur losses, managers have fewer incentives to disclose

[3] These studies examine short-window market reactions around the disclosure of financial information.

incrementally informative narratives, as they seek to delay or minimize the market penalties of negative earnings news (Demers & Vega, 2014; Kimbrough & Wang, 2014; Merkl-Davies & Brennan, 2007; Schleicher & Walker, 2010; Verrecchia, 1983). *Ceteris paribus*, if managers disclose incrementally informative narratives, the tone is expected to increase in profit firms and decrease in loss firms. Given that the narrative tone signals future earnings performance to investors (Davis et al., 2012; Demers & Vega, 2014; Druz et al., 2020; Rahman, 2023), an increase in the tone is more likely to improve the informativeness of the share price for future earnings in profit firms than in loss firms. This implies that the tone of profit firms is expected to be more positively associated with the FERC than the tone of loss firms. Given this, we develop our third (non-directional) hypothesis:

H3: Tone changes the informativeness of the share price in relation to future earnings more positively in profit firms than in loss firms.

We further argue that the tonal positivity and negativity are both better predictors of future earnings in profit firms than in loss firms, given that managers have greater incentives to disclose incrementally informative narratives when the firm generates profits (Merkl-Davies & Brennan, 2007; Verrecchia, 1983). *Ceteris paribus*, if managers disclose incrementally informative narratives, the positivity (negativity) is expected to increase (decrease) in profit firms and decrease (increase) in loss firms. Given that investors adjust their buy-hold-and-sell decisions in response to tonal signals (Davis et al., 2012; Demers & Vega, 2014; Druz et al., 2020; Henry, 2008; Schleicher & Walker, 2010), then an increase in the positivity is more likely to improve the share price informativeness of future earnings in profit firms than in loss firms. This implies that the positivity is expected to be more positively associated with the FERC in profit firms than in loss firms. Similarly, an increase in the negativity is also more likely to improve the share price informativeness of future

earnings in profit firms than in loss firms. This implies that the negativity is expected to be more negatively associated with the FERC in profit firms than in loss firms. Consequently, we develop the following (non-directional) hypotheses for positivity and negativity:

H4(a): Positivity changes the informativeness of the share price in relation to future earnings more positively in profit firms than in loss firms.

H4(b): Negativity changes the informativeness of the share price in relation to future earnings more negatively in profit firms than in loss firms.

3. Methodology

3.1. Sample selection

For tone measurement, we obtain from the *Mergent Online* database a sample of 10-K filings for S&P 500 firms during the period 2010 – 2019. Arguably, 10-K filings are the most comprehensive mandatory disclosures of firm's annual financial performance. In addition to the full set of financial statements and supplementary notes, 10-Ks contain the management's detailed discussion and analysis on the financial performance, position and outlook. We start from the year 2010 and collect all 10-K reports for firm-years with at least two consecutive years ahead earnings information available. Consistent with Schleicher et al. (2007), this allows us to measure the FERC using two-years ahead earnings data, to preserve the maximum number of observations for analysis. Our sample period spans 10 years, and the final year of our 10-K collection is 2019 (two years ahead of 2019 is 2021). We measure the tone of 10-Ks using *WordStat8* software. For measuring firm-specific variables we collect data from *Mergent Online* and *Yahoo Finance* databases for the years 2009 – 2021.

We delete all observations for which the corresponding 10-K reports are either unavailable in the *Mergent Online* database or unreadable in *WordStat8* (usually due to formatting). This leaves us with a tally of 4450 10-Ks with at least two consecutive years

ahead earnings data. After deleting observations for missing variable data, we have a final sample of 4402 firm-year observations with a complete series of 10-K tone scores and matching firm-specific variable information.

We note that our sample of 4402 observations is distributed almost evenly over the sample period, with around 10% observations per year. A breakdown of the sample by industry reveals that the three largest industries are Financials (14.3%), Information Technology (13.9%) and Industrials (13.6%) while the smallest three industries are Energy (3.6%), Communications (3.7%) and Materials (5.5%).

3.2. Textual analysis

We measure the tone of 10-K reports using the Loughran and McDonald (2011) list (henceforth 'LM') of positive and negative keywords. This list has 354 positive words and 2355 negative words. We employ the 'bag of words' technique where *WordStat8* processes each 10-K report uploaded and returns the number of positive and negative keywords in the report that matches the LM keyword list. This technique of tone measurement is simple, intuitive, and allows us to process a large number of 10-K reports cheaply and consistently (Henry, 2008). Following Henry and Leone (2016), after tallying the number of positive and negative words in all 10-K reports, we measure the tone, *TONE*, using the following formula:

$$TONE = (POSITIVE - NEGATIVE) / (POSITIVE + NEGATIVE) \quad (1)$$

In Eq. (1), *POSITIVE* and *NEGATIVE* represent the number of positive and negative keywords in a 10-K report respectively. By construction, *TONE* ranges from –1 to 1 where reports with more optimistic sentiment exhibit higher tone values.

We also measure the tonal positivity and negativity for each 10-K report, namely *POS* and *NEG*. We measure *POS* as the natural logarithm of the total number of positive keywords from the LM keyword list that matches a 10-K report. Similarly, we *NEG* measure as the

natural logarithm of the total number of negative keywords from the LM keyword list that matches a 10-K report. This measurement approach is consistent with Li (2008).[4] Finally, we develop a proxy for the size of the 10-K report, *DISC*, as the natural logarithm of the total number of words in a 10-K report. By construction, *POS*, *NEG* and *DISC* increases with increased tonal optimism, tonal pessimism and word-count of the 10-K disclosure respectively.

3.3. Share price anticipation of earnings

We follow the approach of Collins et al. (1994), Lundholm and Myers (2002) and Schleicher et al. (2007) to detect share price anticipation of earnings. Our basic return-earnings regression model is as follows:

$$RET_t = \alpha + \beta_1 EARN_{t-1} + \beta_2 EARN_t + \beta_3 EARN_{t2} + \beta_4 RET_{t2} + \varepsilon_{it} \quad (2)$$

In Eq. (2), RET_t is the current period returns measured as 12-month (annual) buy-and-hold returns; $EARN_{t-1}$ is prior year earnings measured as income before extraordinary items for year *t-1* scaled by total assets of year *t-2*; $EARN_t$ is current year earnings measured as income before extraordinary items for year *t* scaled by total assets of year *t-1*; $EARN_{t2}$ is the sum of annual earnings before extraordinary items for year *t+1* and year *t+2* scaled by total assets in year *t*; RET_{t2} is the sum of 12-month buy-and-hold returns for year *t+1* and year *t+2*. The coefficient β_1 represents the past earnings response coefficient (PERC), β_2 represents the current earnings response coefficient (CERC) and β_3 represents the FERC. Due to the mean reverting nature of earnings, we expect β_1 to be negative and β_2 to be positive. The realized future earnings ($EARN_{t2}$) is comprised of an expected component and an unexpected

[4] We find this approach to measuring *POS* (*NEG*) as more preferrable to dividing the number of positive (negative) words in a 10-K report by the denominator in Eq. (1). This allows us to avoid a linear combination between *POS* and *NEG* when included in the same regression model. We believe this approach is also more preferrable to dividing the number of positive (negative) words with the total number of words in the 10-K report since it assumes that the tone is inversely related to the word count in a document.

component. The unexpected component represents earnings in future periods resulting from events that are not anticipated at the end of year *t* (Choi & Kim, 2017). We include future share price returns (RET_{t2}) in Eq. (2) to control for the measurement error cause by these unanticipated events. We expect the coefficient of the $EARN_{t2}$, β_3, to be positive and the coefficient of RET_{t2} to be negative.

3.4. Other variables

Following prior research, we add several other variables to Eq. (2) to control for firm characteristics expected to be associated with annual returns (Collins et al., 1994; Choi & Kim, 2017; Schleicher et al., 2007). This includes asset growth (*AG*) measured as the percentage change of total assets during the year; firm size (*SIZE*) measured as the natural logarithm of total assets; firm growth opportunities (*MTB*) measured as the market value of equity divided by the book value of equity; financial leverage (*LEV*) as the long-term debt divided by total assets; and profitability status (*LOSS*) which is an indicator variable taking the value of 1 if the annual earnings (*EARN*) is negative, 0 otherwise.

4. Results

4.1. Descriptive statistics and correlations

Table 1 reports the descriptive statistics of the variables used in this study. We find that the means of *POSITIVE* and *NEGATIVE* are both higher than their corresponding medians. This left-skewness suggests that a relatively few 10-Ks disclose a very high number of positive and negative tonal words. This is also evident from the very large gaps between their third-quartile and maximum values. The mean and median values of *TONE* are negative, perhaps owing to a much larger number of negative keywords than positive keywords in the LM list. By construction, all values of *POS* and *NEG* are greater than 0. All three tone

variables – *TONE*, *POS* and *NEG* have relatively low coefficient of variation (<0.20) and narrow interquartile ranges, suggesting a clustering of the tone values around the median. With regards to the other variables, the means of *EARN* and *RET* are both higher than their corresponding median values, implying left-skewness in distribution. This suggests that a relatively few firm-years report much higher earnings and have higher annual buy-and-hold returns. In addition, the means and medians of both *EARN* and *RET* are positive, implying that most firms report an annual profit and experience share price increases over the year. We also find that RET_{t2}, *AG* and *MTB* are left-skewed. However, all three variables have relatively high coefficient of variation (>2), suggesting a great deal of variability in future returns, asset growth and firm growth. Slightly over 6% of the firms report an annual loss. Some of the firm-characteristic variables appear to have at least one outlier in the right-hand side. Nevertheless, we retain these observations to avoid losing tone scores derived from textual analysis.

[**Table 1 near here**]

Table 2 reports the Spearman's Rank correlations of the variables used in this study. We find a strong positive correlation between *POSITIVE* and *NEGATIVE* (r= 0.95), and strong positive correlations of *DISC* with both *POSITIVE* (r= 0.86) and *NEGATIVE* (r= 0.87). This suggests that the number of tonal words are typically at sync with the word-count of the document. By construction, *TONE* is positively correlated with *POSITIVE* (r= 0.11) but negatively correlated with *NEGATIVE* (r= –0.13). More importantly, *TONE* is positively correlated with *POS* (r=0.05) but negatively correlated with *NEG* (r= –0.20), implying a general level of consistency between our tone, positivity, and negativity measures. The correlation between *TONE* and *DISC* is negative (r= –0.03), suggesting that firms with less

optimistic narratives disclose longer 10-Ks. *TONE* is also positively correlated with *EARN* (r= 0.07) and *AG* (r= 0.09) but negatively correlated with *LOSS* (r= –0.06), suggesting that firms reporting higher annual earnings and asset growth disclose more optimistic narratives while firms reporting a loss disclose more pessimistic narratives. This is consistent prior studies suggesting that managers typically disclose narratives that are consistent with concurrently reported numbers (Davis et al., 2012, 2015; Demers & Vega, 2014; Huang et al., 2014). We find that *LOSS* is positively correlated with *POS* (r= 0.07), *NEG* (r= 0.09) and *DISC* (r= 0.08). This suggests that managers disclosure longer 10-Ks and higher number of both positive and negative tonal words when the firm reports a loss. Consistent with this, we also find that *RET* is negatively correlated with both *POS* (r= –0.04) and *NEG* (r= –0.04). Arguably, this suggests that investors find negative tonal words to be more credible than positive tonal words. The intra-variable correlations among the firm-characteristic variables are relatively low (<0.5) and provide no indication of multicollinearity.

[**Table 2 near here**]

4.2. Hypothesis testing

H1 predicts that the tone changes the share price informativeness of future earnings. To test H1, we develop the following regression models (excluding industry and year fixed-effects):

$$RET_t = \alpha + \beta_1 EARN_{t-1} + \beta_2 EARN_t + \beta_3 EARN_{t2} + \beta_4 RET_{t2} + \beta_5 TONE_t + \beta_6 AG_t + \beta_7 SIZE_t + \beta_8 MTB_t + \beta_9 LEV_t + \beta_{10} LOSS_t + \varepsilon_{it} \quad (3a)$$

$$RET_t = \alpha + \beta_1 EARN_{t-1} + \beta_2 EARN_t + \beta_3 EARN_{t2} + \beta_4 RET_{t2} + \beta_5 TONE_t + \beta_6 AG_t + \beta_7 SIZE_t + \beta_8 MTB_t + \beta_9 LEV_t + \beta_{10} LOSS_t + \beta_{11} (TONE_t \times EARN_{t-1}) + \beta_{12} (TONE_t \times EARN_t) + \beta_{13} (TONE_t \times EARN_{t2}) + \varepsilon_{it} \quad (3b)$$

Eq. (3a) is essentially our baseline regression, developed by adding to Eq. (2) the independent variable *TONE* and the control variables *AG*, *SIZE*, *MTB*, *LEV* and *LOSS*. Eq. (3a) helps us to understand the relationship of current period returns with the FERC (β_3) and *TONE* (β_5) after controlling for firm characteristics. We then develop Eq. (3b) by adding to this baseline regression the interaction terms between *TONE* and $EARN_{t-1}$, $EARN_t$ and $EARN_{t2}$. In Eq. (3b), our main interest is in the interaction term $TONE_t \times EARN_{t2}$. The coefficient of this interaction term, β_{13}, signifies the relationship between the tone and share price informativeness of future earnings. For H1 to hold, the coefficient β_{13}, needs to be either positive or negative. Similarly, the coefficients of the interaction terms $TONE_t \times EARN_{t-1}$ (β_{11}) and $TONE_t \times EARN_t$ (β_{12}) represent the relationship between the tone and share price informativeness of previous years earnings and current year earnings respectively.

Columns (1) and (2) of Table 3 report the results of Eq. (3a). We find that *TONE* exhibits a weak positive association with *RET* ($p<0.10$), suggesting that investors align their annual buy-hold-and sell decisions with the signal of the tone. Consistent with prior research, *RET* is negatively associated with $EARN_{t-1}$ ($p<0.01$) and positively associated with $EARN_t$ ($p<0.01$) and $EARN_{t2}$ ($p<0.01$), suggesting that the PERC is negative while the CERC and FERC are both positive. *RET* also exhibits a positive association with *AG* ($p<0.01$) and *LEV* ($p<0.01$) but a negative association with RET_{t2} ($p<0.01$) and *SIZE* ($p<0.01$).

Columns (3) and (4) of Table 4 report the results of Eq. (3b). In this regression, the coefficient of $EARN_{t2}$, β_3, represents the association between *RET* and future earnings when *TONE*=0 (i.e., neutral). We find that β_3 is positive ($p<0.01$), suggesting that current period returns is positively associated with future earnings when the tone is neutral. Similarly, we find that *RET* is positively associated with current earnings $EARN_t$ ($p<0.01$) but negatively associated with prior year's earnings $EARN_{t-1}$ ($p<0.01$) when the tone is neutral. More importantly, the coefficient of our main interaction term $TONE_t \times EARN_{t2}$, β_{13}, is positive

($p<0.05$). This is consistent with H1 and suggests that tone improves the informativeness of the share price in relation to future earnings. We also find that the coefficients of $TONE_t \times EARN_{t-1}$ and $TONE_t \times EARN_t$ are negative ($p<0.01$) and positive ($p<0.01$) respectively, suggesting that the tone improves the share price informativeness of current earnings but deteriorates the share price informativeness of previous year's earnings. With regards to the control variables, *RET* continues to exhibit a positive association with *AG* ($p<0.01$) and *LEV* ($p<0.01$) and a negative association with RET_{t2} ($p<0.01$) and *SIZE* ($p<0.01$).

[**Table 3 near here**]

H2a predicts that the positivity changes the share price informativeness of future earnings. H2b predicts that the negativity changes the share price informativeness of future earnings. To test H2a and H2b, we replace *TONE* in Eq. (3) with *POS* and *NEG* and develop the following regressions (excluding industry and year fixed-effects):

$$RET_t = \alpha + \beta_1 EARN_{t-1} + \beta_2 EARN_t + \beta_3 EARN_{t2} + \beta_4 RET_{t2} + \beta_5 POS_t + \beta_6 NEG_t + \beta_7 AG_t + \beta_8 SIZE_t + \beta_9 MTB_t + \beta_{10} LEV_t + \beta_{11} LOSS_t + \varepsilon_{it} \quad (4a)$$

$$RET_t = \alpha + \beta_1 EARN_{t-1} + \beta_2 EARN_t + \beta_3 EARN_{t2} + \beta_4 RET_{t2} + \beta_5 POS_t + \beta_5 NEG_t + \beta_6 AG_t + \beta_7 SIZE_t + \beta_8 MTB_t + \beta_9 LEV_t + \beta_{10} LOSS_t + \beta_{11} (POS_t \times EARN_{t-1}) + \beta_{12} (POS_t \times EARN_t) + \beta_{13} (POS_t \times EARN_{t2}) + \beta_{14} (NEG_t \times EARN_{t-1}) + \beta_{15} (NEG_t \times EARN_t) + \beta_{16} (NEG_t \times EARN_{t2}) + \varepsilon_{it} \quad (4b)$$

Eq. (4a) is our baseline regression designed to examine the relationships of current period returns with *POS* (β_5) and *NEG* (β_6). We then develop Eq. (4b) by adding to Eq. (4a) separate interaction terms of *POS* and *NEG* with $EARN_{t-1}$, $EARN_t$ and $EARN_{t2}$. In Eq. (4b), our main interests are in the interaction terms $POS_t \times EARN_{t2}$ and $NEG_t \times EARN_{t2}$. The coefficients of these interaction terms, β_{14} and β_{15}, denote the relationships between the share price

informativeness of future earnings with the positivity and the negativity respectively. For H2a to hold, the coefficient β_{14} needs to be either positive or negative. For H2b to hold, the coefficient β_{15} needs to be either positive or negative.

Columns (1) and (2) of Table 4 report the results of Eq. (4a). We do not find a significant association between *POS* and *RET*. However, *NEG* exhibits a weak negative association with *RET* ($p<0.10$), suggesting that increased negativity in narratives is aligned with lower annual buy-and-hold returns. Arguably, the apparently stronger alignment of the negativity with current period returns than the positivity implies that investors find negative sentiment to be more credible than positive sentiment. This also suggests that the weak positive alignment between the tone and current period returns depicted in Columns (1) – (2) of Table 3 is driven by negativity. Consistent with Table 3, we find that the PERC is negative while the CERC and FERC are both positive.

Columns (3) and (4) of Table 4 report the results of Eq. (4b). We find that the coefficient of the interaction term $POS_t \times EARN_{t2}$, β_{14}, is positive ($p<0.05$). Consistent with H2a, this suggests that the positivity improves the share price informativeness of future earnings. We further find that the coefficient of the interaction term $NEG_t \times EARN_{t2}$, β_{15}, is negative ($p<0.05$). This is supportive of H2b and suggests that the negativity also improves the share price informativeness of future earnings. Apparently, these results imply that the positive association between the tone and the FERC depicted in Table 3 is driven by both the positivity and the negativity. In addition, we now find that the coefficients of $POS_t \times EARN_{t-1}$ and $POS_t \times EARN_t$ are negative ($p<0.01$) and positive ($p<0.01$) respectively, while the coefficients of $NEG_t \times EARN_{t-1}$ and $NEG_t \times EARN_t$ are positive ($p<0.01$) and negative ($p<0.01$) respectively. This suggests that both the positivity and the negativity improve the share price informativeness of current earnings but deteriorate the share price informativeness of

previous year's earnings. The remaining variables in Columns (1) – (4) of Table 4 provide qualitatively similar results to corresponding variables of Table 3.

[**Table 4 near here**]

We now examine differences in the association between the tone and share price anticipation of earnings. For this, we adopt two approaches. First, we divide the full sample of 4402 firm-year observations into profit firms and loss firms. This yields 4133 observations in the profit firm subsample and 269 observations in the loss firm subsample. We then repeat Eq. (3b) (excluding the indicator variable *LOSS* from the right-hand side) on each subsample. This should help us to understand differences in the linkage between the tone and the FERC in profit firms vis a vis loss firms.

Columns (1) – (2) of Table 5 report the results of this regression for profit firms. We find that the coefficient of the interaction term $TONE_t \times EARN_{t2}$ is positive ($p<0.01$), which suggests that the tone of profit firms improves the share price informativeness of future earnings. We also find that the coefficient of $TONE_t \times EARN_{t-1}$ is negative ($p<0.05$) and the coefficient of $TONE_t \times EARN_t$ is positive ($p<0.01$). This implies that the tone of profit firms improves the share price informativeness of current earnings but deteriorates the share price informativeness of prior year's earnings. Overall, these results are very similar to our full sample results in Table 3.

Columns (3) – (4) of Table 5 report the results for loss firms. These results apparently contradict Columns (1) – (2) as we find that the coefficient of $TONE_t \times EARN_{t2}$ is negative ($p<0.01$). This suggests that the tone of loss firms deteriorates the share price informativeness of future earnings. We now find that the tone does not exhibit a statistically significant association with either the PERC or the CERC.

Second, we extend Eq. (3b) by adding new interactions terms of *LOSS* with *TONE, EARN*$_{t-1}$, *EARN*$_t$ and *EARN*$_{t2}$ and also interacting *LOSS* with *TONE*$_t$ × *EARN*$_{t-1}$, *TONE*$_t$ × *EARN*$_t$ and *TONE*$_t$ × *EARN*$_{t2}$, as follows (excluding industry and year fixed-effects):

$$RET_t = \alpha + \beta_1 EARN_{t-1} + \beta_2 EARN_t + \beta_3 EARN_{t2} + \beta_4 RET_{t2} + \beta_5 TONE_t + \beta_6 AG_t + \beta_7 SIZE_t + \beta_8 MTB_t + \beta_9 LEV_t + \beta_{10} LOSS_t + \beta_{11} (TONE_t \times EARN_{t-1}) + \beta_{12} (TONE_t \times EARN_t) + \beta_{13} (TONE_t \times EARN_{t2}) + \beta_{14} (LOSS_t \times TONE_t) + \beta_{15} (LOSS_t \times EARN_{t-1}) + \beta_{16} (LOSS_t \times EARN_t) + \beta_{17} (LOSS_t \times EARN_{t2}) + \beta_{18} (LOSS_t \times TONE_t \times EARN_{t-1}) + \beta_{19} (LOSS_t \times TONE_t \times EARN_t) + \beta_{20} (LOSS_t \times TONE_t \times EARN_{t2}) + \varepsilon_{it} \quad (5)$$

We then estimate Eq. (5) on the full sample of 4402 observations. In Eq. (5), the interaction terms *TONE*$_t$ × *EARN*$_{t2}$ and *LOSS*$_t$ × *TONE*$_t$ × *EARN*$_{t2}$ represent the relationships between the tone and share price informativeness of future earnings for profit firms and loss firms respectively. H3 predicts that the tone changes the share price informativeness of future earnings more positively in profit firms than in loss firms. To test H3, we compare in Eq. (5) the coefficients of the interaction terms *TONE*$_t$ × *EARN*$_{t2}$, β_{13}, and *LOSS*$_t$ × *TONE*$_t$ × *EARN*$_{t2}$, β_{20}. For H3 to hold, the coefficient β_{13} needs to be more positive than the coefficient β_{20}.

Columns (5) – (6) of Table 5 report the results of Eq. (5). We find that the coefficient of *TONE*$_t$ × *EARN*$_{t2}$, β_{13}, is positive ($p<0.01$) while the coefficient of *LOSS*$_t$ × *TONE*$_t$ × *EARN*$_{t2}$, β_{20}, is negative ($p<0.01$). Consistent with Columns (1) – (4), this implies that the tone is positively associated with the FERC in profit firms but negatively associated with the FERC in loss firms. This supports H3, suggesting that the tone changes the share price informativeness of future earnings more positively in profit firms than in loss firms. We also find that the coefficients of both *TONE*$_t$ × *EARN*$_t$ and *LOSS*$_t$ × *TONE*$_t$ × *EARN*$_t$ are positive ($p<0.01$ and $p<0.05$ respectively). This suggests that the tone in both profit firms and loss firms improve the share price informativeness of current earnings. In addition, we find that the coefficient of *TONE*$_t$ × *EARN*$_{t-1}$ is negative ($p<0.05$) but the coefficient of *LOSS*$_t$ ×

$TONE_t \times EARN_{t-1}$ is statistically insignificant. The results of the remaining variables are qualitatively similar to the results in Table 3.

[**Table 5 near here**]

For completeness, we examine differences between profit firms and loss firms in the associations of the positivity and the negativity with share price informativeness of future earnings. Akin to the two approaches discussed above, we first repeat Eq. (4b) (excluding the indicator variable *LOSS* from the right-hand side) on the profit subsample and then separately on the loss subsample. Columns (1) – (2) of Table 6 report the results of this regression on profit firms. We find that the coefficients of the interactions terms $POS_t \times EARN_{t2}$ is positive ($p<0.01$) and $NEG_t \times EARN_{t2}$ is negative ($p<0.01$). These results are similar to Table 4, suggesting that both the positivity and the negativity in profit firms improve the share price informativeness of future earnings. We also find that the coefficients of $POS_t \times EARN_{t-1}$ and $POS_t \times EARN_t$ are negative ($p<0.10$) and positive ($p<0.01$) respectively, while the coefficients of $NEG_t \times EARN_{t-1}$ and $NEG_t \times EARN_t$ are positive ($p<0.05$) and negative ($p<0.01$) respectively. This implies that in profit firms, both the positivity and the negativity improve the share price informativeness of current earnings but deteriorate the share price informativeness of previous year's earnings.

Columns (3) – (4) of Table 6 report the results of this regression for loss firms. Similar to Table 5, these results appear to contradict our findings of the profit sample given that the coefficient of $POS_t \times EARN_{t2}$ is negative ($p<0.01$) and the coefficient of $NEG_t \times EARN_{t2}$ is positive ($p<0.05$). This implies that both the positivity and the negativity in loss firms deteriorates the share price informativeness of future earnings. In addition, the positivity (negativity) is positively (negatively) aligned with the CERC, suggesting that the

positivity (negativity) improves the share price informativeness of current earnings in loss firms.

Second, we extend Eq. (4b) by adding interaction terms of *LOSS* with *POS*, *NEG*, our three earnings variables, and with the interaction terms of *POS* and *NEG* with these three earnings variables, as follows (excluding industry and year fixed-effects):

$$RET_t = \alpha + \beta_1 EARN_{t-1} + \beta_2 EARN_t + \beta_3 EARN_{t2} + \beta_4 RET_{t2} + \beta_5 POS_t + \beta_6 NEG_t + \beta_7 AG_t + \beta_8 SIZE_t + \beta_9 MTB_t + \beta_{10} LEV_t + \beta_{11} LOSS_t + \beta_{12} (POS_t \times EARN_{t-1}) + \beta_{13} (POS_t \times EARN_t) + \beta_{14} (POS_t \times EARN_{t2}) + \beta_{15} (NEG_t \times EARN_{t-1}) + \beta_{16} (NEG_t \times EARN_t) + \beta_{17} (NEG_t \times EARN_{t2}) + \beta_{18} (LOSS_t \times POS_t) + \beta_{19} (LOSS_t \times NEG_t) + \beta_{20} (LOSS_t \times EARN_{t-1}) + \beta_{21} (LOSS_t \times EARN_t) + \beta_{22} (LOSS_t \times EARN_{t2}) + \beta_{23} (LOSS_t \times POS_t \times EARN_{t-1}) + \beta_{24} (LOSS_t \times POS_t \times EARN_t) + \beta_{25} (LOSS_t \times POS_t \times EARN_{t2}) + \beta_{26} (LOSS_t \times NEG_t \times EARN_{t-1}) + \beta_{27} (LOSS_t \times NEG_t \times EARN_t) + \beta_{28} (LOSS_t \times NEG_t \times EARN_{t2}) + \varepsilon_{it} \quad (6)$$

We now estimate Eq. (6) on our full sample. In Eq. (6), the interaction terms $POS_t \times EARN_{t2}$ and $LOSS_t \times POS_t \times EARN_{t2}$ represent the associations between the positivity and share price informativeness of future earnings for profit firms and loss firms respectively. Similarly, the interaction terms $NEG_t \times EARN_{t2}$ and $LOSS_t \times NEG_t \times EARN_{t2}$ represent the links between the negativity and share price informativeness of future earnings for profit firms and loss firms respectively. H4a predicts that the positivity changes the share price informativeness of future earnings more positively in profit firms than in loss firms. To test H4a, we compare in Eq. (6) the coefficients of the interaction terms $POS_t \times EARN_{t2}$, β_{14}, and $LOSS_t \times POS_t \times EARN_{t2}$, β_{25}. For H4a to hold, the coefficient β_{14} needs to be more positive than the coefficient β_{25}. H4b predicts that the negativity changes the share price informativeness of future earnings more negativity in profit firms than in loss firms. To test H4b, we compare in Eq. (6) the coefficients of the interaction terms $NEG_t \times EARN_{t2}$, β_{17}, and

$LOSS_t \times POS_t \times EARN_{t2}$, β_{28}. For H4b to hold, the coefficient β_{17} needs to be more negative than the coefficient β_{28}.

Columns (5) – (6) of Table 6 report the results of Eq. (6). We find that the coefficient of $POS_t \times EARN_{t2}$, β_{14}, is positive ($p<0.01$) while the coefficient of $LOSS_t \times POS_t \times EARN_{t2}$, β_{25}, is negative ($p<0.01$). This affirms H4a, suggesting that the positivity changes the share price informativeness of future earnings more positively in profit firms than in loss firms. We also find that the coefficient of $NEG_t \times EARN_{t2}$, β_{17}, is negative ($p<0.01$) while the coefficient of $LOSS_t \times NEG_t \times EARN_{t2}$, β_{28}, is positive ($p<0.01$). This supports H4b, suggesting that the negativity changes the share price informativeness of future earnings more negatively in profit firms than in loss firms. For profit firms, we find that both *POS* and *NEG* improve the share price informativeness of current earnings but deteriorate the share price informativeness of prior year's earnings. In loss firms, although both *POS* and *NEG* improve the share price informativeness of current earnings, the results are statistically insignificant for prior year's earnings. The remaining variables yield qualitatively similar results to Tables 3 – 5.

[**Table 6 near here**]

We make a few observations from our findings in Tables 3 – 6. In particular, the positive association between the tone and the FERC documented in Table 3 is attributable to both positive and negative tonal words but does not apply equally across profit firms and loss firms. The tone, the positivity and the negativity all seem to be better indicators of future earnings for investors in profit firms than in loss firms. This implies that loss firm managers are less likely to provide incrementally informative vis a vis misleading narratives while discussing both good earnings news and bad earnings news.

5. Additional analysis

5.1. Subsample analysis

We observe from Table 2 that while longer 10-K disclosures provide less optimistic narratives. We also note that loss firms disclose longer 10-Ks and provide less optimistic narratives. Prior studies identify the length of disclosures as a likely proxy for readability (e.g., Henry, 2008; Li, 2008; Merkl-Davies & Brennan, 2007). These studies argue that managers may provide longer disclosures to obfuscate or explain the causes of poor financial performance to investors, to minimize market penalties of bad earnings news (Henry, 2008; Li, 2008; Kimbrough & Wang, 2014). At the same time, we recall that managers have fewer incentives to provide misleading narratives on readily verifiable information as opposed to forward-looking information (Demers & Vega, 2014; Hutton et al., 2003; Kimbrough & Wang, 2014). Given this, we now examine whether the relationship between the tone and share price anticipation of earnings in long disclosures is different from short disclosures. This will provide us with an idea on whether the relevance of the tone as a source of share price informativeness of earnings varies with disclosure length.

To examine this, we first rank our full sample of 4402 firm-year observations by the length of 10-Ks (*DISC*) and then divide this sample into two equal subsamples of 50% observations each representing long disclosures and short disclosures respectively, namely HIGH DISC and LOW DISC. We use the number of positive words and negative words as alternative measures of disclosure length, given that tonal words are expected to contain value-relevant information on financial performance (Henry, 2008; Loughran & McDonald, 2011). This is also supported by our results in Table 2 demonstrating a positive correlation between the disclosure length and the number of positive and negative tonal words. Accordingly, we also divide our full sample based on more and less positive tonal words to represent long and short disclosures, namely HIGH POS and LOW POS, and more and less

negative tonal words to represent long and short disclosures, namely HIGH NEG and LOW NEG. Each of our six subsamples contain 2201 observations.

First, we repeat Eq. (3b) separately for each subsample. The results of these regressions are reported in Table 7. We find a consistent pattern in the high disclosure subsamples that is different from the low disclosure subsamples. Specifically, we find in HIGH DISC, HIGH POS and HIGH NEG subsamples that the coefficients of $TONE_t \times EARN_{t2}$ are statistically insignificant. In contrast, we find these corresponding coefficients in LOW DISC, LOW POS and LOW NEG subsamples to be positive, consistent with the results in Table 3. This suggests that the tone improves the share price informativeness of future earnings in short 10-Ks but not necessarily in long 10-Ks. We also find that the coefficients of $TONE_t \times EARN_t$ and $TONE_t \times EARN_{t-1}$ in HIGH DISC, HIGH POS and HIGH NEG subsamples are positive and negative respectively but the corresponding coefficients of LOW DISC, LOW POS and LOW NEG subsamples are statistically insignificant in most cases. This suggests that the tone improves (deteriorates) the share price informativeness of current (previous year's) earnings in long 10-Ks more than short 10-Ks. With regards to the control variables, we find that *LOSS* is negatively associated with *RET* in short disclosure subsamples, but not in the long disclosure subsamples. The other firm-characteristic variables have similar relationships with *RET* across both short and long disclosure subsamples.

[**Table 7 near here**]

Finally, we repeat Eq. (4b) on all six subsamples. The results of these regressions are reported in Table 8. We continue to find a pattern that is consistent across the high disclosure subsamples but different from the low disclosure subsamples. In particular, we find in LOW DISC, LOW POS and LOW NEG that the coefficients of $POS_t \times EARN_{t2}$ positive, while the

coefficients of $NEG_t \times EARN_{t2}$ are negative, consistent with our findings in Table 4. In contrast, we find in HIGH DISC, HIGH POS and HIGH NEG subsamples that the coefficients of both $POS_t \times EARN_{t2}$ and $NEG_t \times EARN_{t2}$ are statistically insignificant. Overall, these results suggest that the both the positivity and the negativity improve the share price informativeness of future earnings in short disclosures but not necessarily in long disclosures. The positivity and negativity in high disclosure subsamples seem to be more important to investors for assessing current and previous year's earnings. Akin to the results in Table 4, we often find in high disclosure subsamples that the coefficients of $POS_t \times EARN_t$ and $NEG_t \times EARN_t$ are positive and negative respectively. However, we often find that these coefficients to be statistically insignificant in the low disclosure subsamples. Similarly, we find in the high disclosure subsamples the coefficients of $POS_t \times EARN_{t-1}$ and $NEG_t \times EARN_{t-1}$ to be negative and positive respectively, but these coefficients are statistically insignificant in the low disclosure subsamples. Therefore, both the positivity and the negativity improve (deteriorate) the informativeness of the share price for current (previous year's) earnings in long 10-Ks more than short 10-Ks. With regards to the other variables, the results in Table 8 are qualitatively similar results to the corresponding subsample results in Table 7.

[**Table 8 near here**]

Overall, it appears from the results in Tables 7 and 8 that the relevance of the tone as a measure of share price informativeness of earnings in short disclosures is different from long disclosure. Arguably, investors view all three tone measures – *TONE*, *POS* and *NEG* to be better descriptors of current earnings in long disclosures than short disclosures.

Conversely, investors view all three tone measures as better predictors of future earnings in short disclosures than long disclosures.

5.2. Robustness tests

We perform a few robustness tests to determine whether our results are limited to specific variable definitions. First, following Loughran and McDonald (2011), we measure *TONE* as the difference between *POSITIVE* and *NEGATIVE*, scaled by the total word length of the 10-K. We repeat Eq. (3b) akin to the approach in Table 3 and continue to find a positive association between *TONE* and the FERC ($p<0.10$). We then modify Eq. (3b) to examine the tonal differences between profit firms and loss firms akin to the approach in Table 5 and continue to find a positive association between *TONE* and the FERC in profit firms ($p<0.05$) and a negative association between *TONE* and the FERC in loss firms ($p<0.05$). Second, we define *POS* (*NEG*) as *POSITIVE* (*NEGATIVE*) scaled by the total word length of the 10-K. We repeat Eq. (4b) akin to the approach in Table 4 and find a weak positive association between *POS* and the FERC ($p<0.13$) and a negative association between *NEG* and the FERC ($p<0.10$). We further modify Eq. (4b) to examine the differences in positivity and negativity between profit firms and loss firms akin to the approach in Table 6. We continue to find a positive (negative) association between *POS* (*NEG*) and the FERC in profit firms ($p<0.05$, $p<0.05$) and a negative (positive) association between *POS* (*NEG*) and the FERC in loss firms ($p<0.10$, $p<0.05$). We repeat the subsample tests akin to the approach in Tables 7 and 8 using these new variable definitions and continue to find stronger associations between the FERC and our three tone measures – *TONE*, *POS* and *NEG* in the short disclosure subsamples than in the long disclosure subsamples. Overall, the results of our robustness tests are qualitatively similar to the main results reported in Tables 3 – 8.

6. Conclusions

In this paper, we examine the association between the tone of financial disclosures and share price anticipation of earnings. Our study extends the literature on lack of earnings timeliness. The starting point of our argument is the link between the narrative tone and future earnings documented in prior research (Davis et al., 2012; Demers & Vega, 2014; Druz et al., 2020). If financial disclosures predominantly contain incrementally informative narratives, then the tone is expected to be positively aligned with future earnings. In efficient markets, as this information is impounded in the share prices, it expedites the pricing of future earnings in current period's returns. Consistent with this argument, we find a positive association between the tone of 10-K disclosures and the FERC. Replacing the tone with separate measures of tonal positivity and negativity suggests that both tonal components improve share price informativeness of future earnings. However, given that managers have fewer incentives to provide incrementally informative narratives in loss firms than in profit firms, we separate out the tonal effects of profit firms from loss firms. This reveals that the tone of profit (loss) firms improves (deteriorates) the share price informativeness of future earnings. We additionally find that both the tonal positivity and negativity in profit firms expedite (impede) the prices of future earnings in current period returns. Subsequent subsample analyses indicates that the alignments between our tone measures and the FERC are stronger in short 10-Ks than in long 10-Ks, suggesting that investors view the tone of shorter disclosures as better predictors of future earnings.

We note some limitations of this study. To measure the tone, we use the 'bag of words' approach and employ the LM list of positive and negative keywords. While our approach is simple, intuitive and widely used, alternative approaches such as manual textual analysis is expected to provide a more 'context-accurate' measure of the tone (Clatworthy & Jones, 2003; Schleicher & Walker, 2010). We do not employ manual tone measurement for

10-K disclosures to economize on the costs of data collection. Our resource limitations also prevent us from employing 'machine-learning' techniques. A secondary limitation is that we assume in this study that loss firm managers have fewer incentives to provide incrementally informative narratives. However, we note this may not always be the case. For instance, managers in high-risk, high-growth loss firms have heightened incentives to provide incrementally informative (optimistic) narratives on financial performance.

Future studies can examine the relationship between other lexical features of firm's financial disclosures and share price anticipation of earnings, such as readability indexes, risk disclosure and financial performance attributions which have previously been shown to be related to earnings (Elzahar & Hussainey, 2012; Li, 2008; Kimbrough & Wang, 2014). Future studies can also extend the literature on the relationship between quantitative measures of financial disclosure quality and share price anticipation of earnings. This should provide further evidence on whether more decision-relevant financial information expedites the pricing of future earnings in current period's returns. To this end, different measures of disclosure quality such as discretionary accruals, real activities manipulation, earnings predictability, conservatism, etc. can be employed. Finally, future studies can also examine the relationship between share price anticipation of earnings and the implementation of regulations than mandate new types of disclosures, such as climate-related disclosure mandates.

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Declaration of Interests

We, the authors, declare that we have no competing financial interests or personal relationships that could potentially affect the work reported in this paper.

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Data Availability

All data used in this paper have been obtained from publicly available sources identified in the paper. Data used in this study will be provided upon reasonable request.

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Table 1. Descriptive statistics.

Variable	Mean	Std. Dev.	Minimum	Q1	Median	Q3	Maximum
$POSITIVE_t$	2185.0	1373.0	9.0000	1417.0	1867.0	2517.0	21819
$NEGATIVE_t$	4459.0	2697.0	22.000	2828.0	3832.0	5286.0	53755
$TONE_t$	– 0.3406	0.0601	– 0.5438	– 0.3785	– 0.3441	– 0.3073	0.3077
POS_t	8.2629	0.5351	3.0910	7.9473	8.2510	8.5728	10.892
NEG_t	7.5504	0.5254	2.1972	7.2565	7.5321	7.8308	9.9905
RET_t	0.1647	0.2979	– 1.0000	– 0.0102	0.1415	0.3071	3.4414
$EARN_{t-1}$	0.0679	0.0907	– 1.2064	0.0241	0.0578	0.1038	0.8428
$EARN_t$	0.0716	0.0837	– 1.1833	0.0260	0.0597	0.1065	0.8428
$EARN_{t2}$	0.0137	0.0682	– 0.4531	– 0.0054	0.0078	0.0318	1.0846
RET_{t2}	0.0409	0.7673	– 1.0000	– 0.2791	– 0.0591	0.2434	37.893
AG_t	0.1095	0.3352	– 0.7286	0.0008	0.0539	0.1264	10.048
$SIZE_t$	16.661	1.5112	11.254	15.637	16.609	17.528	21.712
MTB_t	2.2119	5.3184	0.0000	0.4381	0.9868	2.1619	112.63
LEV_t	0.6482	0.2642	0.0328	0.4987	0.6424	0.7912	4.3502
$LOSS_t$	0.0619	0.2411	0.0000	0.0000	0.0000	0.0000	1.0000
$DISC_t$	11.118	0.5175	6.0845	10.808	11.095	11.408	13.874
						OBS (for all variables) = 4402	

Notes: This table reports descriptive statistics of variables used in the study from 4402 firm-year observations from S&P500 firms during the period 2010 – 2019. Std. Dev = Standard Deviation. Q1 = first quartile. Q3 = third quartile. TONE, POS and NEG are reported prior to standardization. OBS = number of firm-year observations. All variables are defined in Appendix.

Table 2. Spearman correlations.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
$POSITIVE_t$	1	1.00															
$NEGATIVE_t$	2	**0.95**	1.00														
$TONE_t$	3	**0.11**	**– 0.13**	1.00													
POS_t	4	**0.87**	**0.86**	**0.05**	1.00												
NEG_t	5	**0.83**	**0.88**	**– 0.20**	**0.97**	1.00											
RET_t	6	**– 0.05**	**– 0.05**	0.01	**– 0.04**	**– 0.04**	1.00										
$EARN_{t-1}$	7	**– 0.20**	**– 0.21**	**0.06**	**– 0.22**	**– 0.23**	**– 0.03**	1.00									
$EARN_t$	8	**– 0.23**	**– 0.24**	**0.07**	**– 0.25**	**– 0.26**	**0.08**	**0.74**	1.00								
$EARN_{t2}$	9	**– 0.04**	**– 0.03**	– 0.02	**– 0.05**	**– 0.04**	**0.14**	**0.03**	**– 0.14**	1.00							
RET_{t2}	10	0.01	**0.02**	0.00	**– 0.05**	**– 0.05**	**0.06**	**0.03**	**0.03**	**0.07**	1.00						
AG_t	11	**0.02**	0.01	**0.09**	0.03	0.00	**0.10**	**0.06**	**0.12**	– 0.02	0.02	1.00					
$SIZE_t$	12	**0.41**	**0.44**	**– 0.13**	**0.35**	**0.38**	**– 0.15**	**– 0.18**	**– 0.26**	**– 0.16**	**– 0.04**	**– 0.05**	1.00				
MTB_t	13	**– 0.11**	**– 0.12**	0.02	**– 0.12**	**– 0.13**	**0.09**	– 0.01	**0.06**	**0.10**	**– 0.04**	**0.03**	**– 0.34**	1.00			
LEV_t	14	**0.17**	**0.19**	**– 0.09**	**0.17**	**0.19**	0.00	**– 0.12**	**– 0.15**	**0.01**	– 0.01	**– 0.06**	**0.26**	**– 0.14**	1.00		
$LOSS_t$	15	**0.05**	**0.07**	**– 0.06**	**0.07**	**0.09**	0.01	**– 0.32**	**– 0.44**	**0.28**	0.01	**– 0.01**	**– 0.04**	**0.06**	**0.07**	1.00	
$DISC_t$	16	**0.86**	**0.87**	**– 0.03**	**0.96**	**0.95**	**– 0.06**	**– 0.22**	**– 0.26**	**– 0.05**	**– 0.05**	0.02	**0.42**	**– 0.13**	**0.20**	**0.08**	1.00

Notes: This table reports the Spearman's Rank correlations of variables used in the study from 4402 firm-year observations from S&P500 firms during the period 2010 – 2019. TONE, POS and NEG are reported prior to standardization. The coefficients printed in bold are significant at the 5% level. All variables are defined in Appendix.

Table 3. Tone and share price anticipation of earnings.

Variable	Dependent Var: RET_t			
	(1) Coeff.	(2) P-value	(3) Coeff.	(4) P-value
INTERCEPT	0.534 ***	0.000	0.533 ***	0.000
$TONE_t$	0.007 *	0.088	– 0.001	0.894
$EARN_{t-1}$	– 0.794 ***	0.000	– 0.817 ***	0.000
$EARN_t$	0.801 ***	0.000	0.829 ***	0.000
$EARN_{t2}$	0.677 ***	0.000	0.707 ***	0.000
$TONE_t \times EARN_{t-1}$			– 0.226 ***	0.000
$TONE_t \times EARN_t$			0.302 ***	0.000
$TONE_t \times EARN_{t2}$			0.148 **	0.021
RET_{t2}	– 0.015 ***	0.001	– 0.015 ***	0.001
AG_t	0.063 ***	0.000	0.066 ***	0.000
$SIZE_t$	– 0.022 ***	0.000	– 0.022 ***	0.000
MTB_t	0.001	0.103	0.001	0.127
LEV_t	0.065 ***	0.000	0.065 ***	0.000
$LOSS_t$	– 0.020	0.294	– 0.022	0.246
INDUSTRY FE	Included		Included	
YEAR FE	Included		Included	
F-VALUE	55.75 ***		51.15 ***	
P > F	0.000		0.000	
ADJ. R-SQD.	0.270		0.273	
OBS	4402		4402	

Notes: This table reports regressions of twelve-month buy-and-hold returns on tone, earnings and the interactions of tone and earnings for 4402 firm-year observations from S&P500 firms during the period 2010 – 2019. INDUSTRY FE = industry fixed-effects. YEAR FE = year fixed-effects. TONE is standardized to have a mean of 0 and standard deviation of 1. OBS = number of firm-year observations. All variables are defined in Appendix. *, **, *** indicate significance at the $p < 0.10, 0.05, 0.01$ level respectively.

Table 4. Positivity, negativity and share price anticipation of earnings.

Variable	Dependent Var: RET_t			
	(1) Coeff.	(2) P-value	(3) Coeff.	(4) P-value
INTERCEPT	0.525 ***	0.000	0.528 ***	0.000
POS_t	0.027	0.107	– 0.003	0.884
NEG_t	– 0.030 *	0.080	– 0.001	0.979
$EARN_{t-1}$	– 0.796 ***	0.000	– 0.823 ***	0.000
$EARN_t$	0.799 ***	0.000	0.835 ***	0.000
$EARN_{t2}$	0.677 ***	0.000	0.709 ***	0.000
$POS_t \times EARN_{t-1}$			– 0.871 ***	0.003
$POS_t \times EARN_t$			1.178 ***	0.000
$POS_t \times EARN_{t2}$			0.576 **	0.023
$NEG_t \times EARN_{t-1}$			0.948 ***	0.002
$NEG_t \times EARN_t$			– 1.219 ***	0.000
$NEG_t \times EARN_{t2}$			– 0.601 **	0.019
RET_{t2}	– 0.015 ***	0.001	– 0.015 ***	0.001
AG_t	0.064 ***	0.000	0.066 ***	0.000
$SIZE_t$	– 0.021 ***	0.000	– 0.022 ***	0.000
MTB_t	0.001	0.100	0.001	0.117
LEV_t	0.065 ***	0.000	0.065 ***	0.000
$LOSS_t$	– 0.020	0.313	– 0.021	0.284
INDUSTRY FE	Included		Included	
YEAR FE	Included		Included	
F-VALUE	53.90 ***		45.47 ***	
P > F	0.000		0.000	
ADJ. R-SQD.	0.270		0.273	
OBS	4402		4402	

Notes: This table reports regressions of twelve-month buy-and-hold returns on positivity, negativity, earnings and the interactions of positivity, negativity and earnings for 4402 firm-year observations from S&P500 firms during the period 2010 – 2019. INDUSTRY FE = industry fixed-effects. YEAR FE = year fixed-effects. POS and NEG are standardized to have a mean of 0 and standard deviation of 1. OBS = number of firm-year observations. All variables are defined in Appendix. *, **, *** indicate significance at the $p < 0.10, 0.05, 0.01$ level respectively.

Table 5. Tone and share price anticipation of earnings – separating loss firms from profit firms.

	Dependent Var: RET_t					
	PROFIT FIRMS		LOSS FIRMS		ALL FIRMS	
Variable	(1) Coeff.	(2) P-value	(3) Coeff.	(4) P-value	(5) Coeff.	(6) P-value
INTERCEPT	0.499 ***	0.000	1.158 ***	0.005	0.531 ***	0.000
$TONE_t$	– 0.003	0.615	0.110 ***	0.009	– 0.003	0.656
$EARN_{t-1}$	– 0.780 ***	0.000	– 0.527 **	0.029	– 0.784 ***	0.000
$EARN_t$	0.760 ***	0.000	1.100 ***	0.007	0.729 ***	0.000
$EARN_{t2}$	1.016 ***	0.000	– 0.202 ***	0.397	0.982 ***	0.000
$TONE_t \times EARN_{t-1}$	– 0.185 **	0.028	– 0.430	0.093	– 0.185 **	0.038
$TONE_t \times EARN_t$	0.258 ***	0.004	0.705	0.126	0.260 ***	0.005
$TONE_t \times EARN_{t2}$	0.256 ***	0.000	– 0.662 ***	0.018	0.255 ***	0.001
RET_{t2}	– 0.019 ***	0.000	– 0.008	0.564	– 0.016 ***	0.000
AG_t	0.055 ***	0.000	0.089	0.108	0.064 ***	0.000
$SIZE_t$	– 0.020 ***	0.000	– 0.061 **	0.022	– 0.021 ***	0.000
MTB_t	0.001	0.118	0.005	0.405	0.002 *	0.048
LEV_t	0.053 ***	0.000	0.235 *	0.082	0.063 ***	0.000
$LOSS_t$					0.063 ***	0.004
$LOSS_t \times TONE_t$					0.100 ***	0.000
$LOSS_t \times EARN_{t-1}$					– 0.115	0.445
$LOSS_t \times EARN_t$					0.370	0.122
$LOSS_t \times EARN_{t2}$					– 1.111 ***	0.000
$LOSS_t \times TONE_t \times EARN_{t-1}$					– 0.238	0.184
$LOSS_t \times TONE_t \times EARN_t$					0.520 **	0.066
$LOSS_t \times TONE_t \times EARN_{t2}$					– 0.743 ***	0.000
INDUSTRY FE	Included		Included		Included	
YEAR FE	Included		Included		Included	
F-VALUE	53.92 ***		4.64 ***		45.15 ***	
P > F	0.000		0.000		0.000	
ADJ. R-SQD.	0.290		0.377		0.288	
OBS	4133		269		4402	

Notes: This table reports regressions of twelve-month buy-and-hold returns on tone, earnings and the interactions of tone and earnings for 4133 profit firm-year observations and 269 loss firm-year observations from S&P500 firms during the period 2010 – 2019. The table also reports the full sample regressions for 4402 observations. INDUSTRY FE = industry fixed-effects. YEAR FE = year fixed-effects. TONE is standardized to have a mean of 0 and standard deviation of 1. OBS = number of firm-year observations. All variables are defined in Appendix. *, **, *** indicate significance at the $p < 0.10, 0.05, 0.01$ level respectively.

Table 6. Positivity, negativity and share price anticipation of earnings – separating loss firms from profit firms.

	Dependent Var: RET_t					
	PROFIT FIRMS		LOSS FIRMS		ALL FIRMS	
Variable	(1) Coeff.	(2) P-value	(3) Coeff.	(4) P-value	(5) Coeff.	(6) P-value
INTERCEPT	0.484 ***	0.000	1.161 ***	0.007	0.522 ***	0.000
POS_t	– 0.019	0.417	0.496 ***	0.003	– 0.018	0.469
NEG_t	0.006	0.803	– 0.505 ***	0.004	0.005	0.853
$EARN_{t-1}$	– 0.781 ***	0.000	– 0.395	0.109	– 0.784 ***	0.000
$EARN_t$	0.788 ***	0.000	1.329 ***	0.002	0.756 ***	0.000
$EARN_{t2}$	1.027 ***	0.000	– 0.169	0.489	1.001 ***	0.000
$POS_t \times EARN_{t-1}$	– 0.622 *	0.063	– 1.593	0.107	– 0.617 *	0.080
$POS_t \times EARN_t$	1.060 ***	0.002	3.893 **	0.038	1.065 ***	0.003
$POS_t \times EARN_{t2}$	1.068 ***	0.000	– 2.500 ***	0.019	1.068 ***	0.000
$NEG_t \times EARN_{t-1}$	0.772 **	0.021	1.186	0.257	0.769 **	0.030
$NEG_t \times EARN_t$	– 1.053 ***	0.003	– 4.662 **	0.023	– 1.059 ***	0.004
$NEG_t \times EARN_{t2}$	– 1.084 ***	0.000	2.318 **	0.037	– 1.082 ***	0.000
RET_{t2}	– 0.019 ***	0.000	– 0.013	0.331	– 0.018	0.000
AG_t	0.053 ***	0.000	0.082	0.149	0.060 ***	0.000
$SIZE_t$	– 0.019 ***	0.000	– 0.059 **	0.035	– 0.021 ***	0.000
MTB_t	0.001	0.079	0.007	0.260	0.002 **	0.025
LEV_t	0.055 ***	0.000	0.266 **	0.050	0.067 ***	0.000
$LOSS_t$					0.065 ***	0.004
$LOSS_t \times POS_t$					0.461 ***	0.000
$LOSS_t \times NEG_t$					– 0.447 ***	0.000
$LOSS_t \times EARN_{t-1}$					– 0.026	0.862
$LOSS_t \times EARN_t$					0.526 **	0.032
$LOSS_t \times EARN_{t2}$					– 1.089 ***	0.000
$LOSS_t \times POS_t \times EARN_{t-1}$					– 0.965	0.166
$LOSS_t \times POS_t \times EARN_t$					3.174 ***	0.006
$LOSS_t \times POS_t \times EARN_{t2}$					– 2.800 ***	0.000
$LOSS_t \times NEG_t \times EARN_{t-1}$					0.515	0.479
$LOSS_t \times NEG_t \times EARN_t$					– 4.010 ***	0.001
$LOSS_t \times NEG_t \times EARN_{t2}$					2.612 ***	0.000
INDUSTRY FE	Included		Included		Included	

YEAR FE	Included	Included	Included
F-VALUE	48.03 ***	4.31 ***	38.10 ***
P > F	0.000	0.000	0.000
ADJ. R-SQD.	0.291	0.393	0.291
OBS	4133	269	4402

Notes: This table reports regressions of twelve-month buy-and-hold returns on positivity, negativity, earnings and the interactions of positivity, negativity and earnings for 4133 profit firm-year observations and 269 loss firm-year observations from S&P500 firms during the period 2010 – 2019. The table also reports the full sample regressions for 4402 observations. INDUSTRY FE = industry fixed-effects. YEAR FE = year fixed-effects. POS and NEG are standardized to have a mean of 0 and standard deviation of 1. OBS = number of firm-year observations. All variables are defined in Appendix. *, **, *** indicate significance at the p < 0.10, 0.05, 0.01 level respectively.

Table 7. Tone and share price anticipation of earnings – high and low disclosure levels

	Dependent Var: RET_t					
	HIGH DISC	LOW DISC	HIGH POS	LOW POS	HIGH NEG	LOW NEG
Variable	(1) Coeff.	(2) Coeff.	(3) Coeff.	(4) Coeff.	(5) Coeff.	(6) Coeff.
INTERCEPT	0.635 ***	0.481 ***	0.618 ***	0.487 ***	0.556 ***	0.523 ***
$TONE_t$	0.000	– 0.004	0.002	0.003	0.000	– 0.005
$EARN_{t-1}$	– 0.898 ***	– 0.681 ***	– 0.822 ***	– 0.753 ***	– 0.881 ***	– 0.665 ***
$EARN_t$	0.883 ***	0.715 ***	1.028 ***	0.620 ***	1.097 ***	0.575 ***
$EARN_{t2}$	0.718 ***	0.700 ***	0.676 ***	0.786 ***	0.790 ***	0.642 ***
$TONE_t \times EARN_{t-1}$	– 0.280 ***	– 0.064	– 0.232 **	– 0.192	– 0.389 ***	0.017
$TONE_t \times EARN_t$	0.428 ***	0.129	0.226 *	0.225 *	0.388 ***	0.102
$TONE_t \times EARN_{t2}$	0.127	0.198 **	– 0.025	0.302 ***	0.070	0.219 ***
RET_{t2}	– 0.016 **	– 0.020 **	– 0.014 **	– 0.019 ***	– 0.018 ***	– 0.018 ***
AG_t	0.058 ***	0.089 ***	0.051 ***	0.090 ***	0.049 ***	0.089 ***
$SIZE_t$	– 0.030 ***	– 0.018 ***	– 0.030 ***	– 0.018 ***	– 0.028 ***	– 0.020 ***
MTB_t	0.002	0.001	0.000	0.002 **	0.002	0.001
LEV_t	0.133 ***	0.041 **	0.116 ***	0.051 ***	0.135 ***	0.047 ***
$LOSS_t$	0.009	– 0.087 ***	0.017	– 0.075 **	0.007	– 0.074 **
INDUSTRY FE	Included	Included	Included	Included	Included	Included
YEAR FE	Included	Included	Included	Included	Included	Included
F-VALUE	28.34 ***	23.80 ***	27.02 ***	25.39 ***	27.72 ***	25.12 ***
P > F	0.000	0.000	0.000	0.000	0.000	0.000
ADJ. R-SQD.	0.295	0.260	0.285	0.273	0.291	0.270
OBS	2201	2201	2201	2201	2201	2201

Notes: This table reports regressions of twelve-month buy-and-hold returns on tone, earnings and the interactions of tone and earnings in sub-samples of high and low disclosure levels of total words, positive words and negative words during the period 2010 – 2019. INDUSTRY FE = industry fixed-effects. YEAR FE = year fixed-effects. TONE is standardized to have a mean of 0 and standard deviation of 1. OBS = number of firm-year observations. All variables are defined in Appendix. *, **, *** indicate significance at the $p < 0.10, 0.05, 0.01$ level respectively.

Table 8. Positivity, negativity and share price anticipation of earnings – high and low disclosure levels

	Dependent Var: RET_t					
	HIGH DISC	LOW DISC	HIGH POS	LOW POS	HIGH NEG	LOW NEG
Variable	(1) Coeff.	(2) Coeff.	(3) Coeff.	(4) Coeff.	(5) Coeff.	(6) Coeff.
INTERCEPT	0.620 ***	0.504	0.647 ***	0.494 ***	0.580 **	0.533 ***
POS_t	0.002	– 0.028	0.014	0.006	0.002	– 0.018
NEG_t	– 0.007	0.016	0.009	– 0.007	0.018	0.020
$EARN_{t-1}$	– 1.030 ***	– 0.523 ***	– 0.848 ***	– 0.544 ***	– 1.001 ***	– 0.473 ***
$EARN_t$	1.001 ***	0.768 ***	1.309 ***	0.508 ***	1.477 ***	0.469 ***
$EARN_{t2}$	0.835 ***	0.704 ***	0.834 ***	0.792 ***	1.039 ***	0.606 ***
$POS_t \times EARN_{t-1}$	– 1.012 ***	– 0.013	– 0.783 **	– 0.397	– 1.365 ***	0.157
$POS_t \times EARN_t$	1.462 ***	0.547	0.531	0.721	1.367 ***	0.408
$POS_t \times EARN_{t2}$	0.264	0.852 **	– 0.324	1.308 ***	0.149	0.968 ***
$NEG_t \times EARN_{t-1}$	1.232 ***	0.294	0.827 **	0.747	1.570 ***	0.161
$NEG_t \times EARN_t$	– 1.708 ***	– 0.515	– 1.077 **	– 0.939 *	– 2.072 ***	– 0.613
$NEG_t \times EARN_{t2}$	– 0.463	– 0.866 **	0.052	– 1.338 ***	– 0.557	– 1.048 ***
RET_{t2}	– 0.016 **	– 0.021 ***	– 0.016 **	– 0.020 ***	– 0.018 ***	– 0.018 ***
AG_t	0.058 ***	0.089 ***	0.049 ***	0.088 ***	0.049 ***	0.087 ***
$SIZE_t$	– 0.029 ***	– 0.020 ***	– 0.033 ***	– 0.018 ***	– 0.030 ***	– 0.020 ***
MTB_t	0.002	0.002 *	0.000	0.002 **	0.002	0.001
LEV_t	0.131 ***	0.037 **	0.113 ***	0.049 ***	0.132 ***	0.045 ***
$LOSS_t$	0.011	– 0.083 ***	0.013	– 0.075 **	0.004	– 0.074 **
INDUSTRY FE	Included	Included	Included	Included	Included	Included
YEAR FE	Included	Included	Included	Included	Included	Included
F-VALUE	25.32 ***	21.69 ***	24.45 ***	22.77 ***	25.17 ***	22.58 ***
P > F	0.000	0.000	0.000	0.000	0.000	0.000
ADJ. R-SQD.	0.296	0.265	0.289	0.275	0.295	0.273
OBS	2201	2201	2201	2201	2201	2201

Notes: This table reports regressions of twelve-month buy-and-hold returns on positivity, negativity, earnings and the interactions of positivity, negativity and earnings in sub-samples of high and low levels of total words, positive words and negative words during the period 2010 – 2019. INDUSTRY FE = industry fixed-effects. YEAR FE = year fixed-effects. POS and NEG are standardized to have a mean of 0 and standard deviation of 1. OBS = number of firm-year observations. All variables are defined in Appendix. *, **, *** indicate significance at the $p < 0.10, 0.05, 0.01$ level respectively.

Appendix A. Variable definitions.

Variable	Definition
$POSITIVE_t$	The total number of positive keywords from the Loughran and McDonald (2011) list that matches a 10-K disclosure of an S&P500 firm.
$NEGATIVE_t$	The total number of number keywords from the Loughran and McDonald (2011) list that matches a 10-K disclosure of an S&P500 firm.
$TONE_t$	The difference between the total number of positive and negative keywords from the Loughran and McDonald (2011) list that matches a 10-K disclosure, divided by the sum of positive and negative keywords from that disclosure.
POS_t	Natural logarithm of the total number of positive keywords from the Loughran and McDonald (2011) list that matches a 10-K disclosure.
NEG_t	Natural logarithm of the total number of negative keywords from the Loughran and McDonald (2011) list that matches a 10-K disclosure.
RET_t	12-month (annual) buy-and-hold returns.
$EARN_{t-1}$	Annual earnings before extraordinary items of the year t-1 divided by total assets in year t-2.
$EARN_t$	Annual earnings before extraordinary items of the year t divided by total assets in year t-1.
$EARN_{t2}$	Sum of annual earnings before extraordinary items for year t+1 and year t+2 divided by total assets in year t.
RET_{t2}	Sum of 12-month (annual) buy-and-hold returns for year t+1 and year t+2
AG_t	Percentage change in total assets during the year.
$SIZE_t$	Natural logarithm of total assets.
MTB_t	Market value of equity divided by book value of equity.
LEV_t	Long-term debt divided by total assets.
$LOSS_t$	Indicator variable which takes the value of 1 if EARN is negative, 0 otherwise.
$DISC_t$	Natural logarithm of the total number of words in the 10-K disclosure.

Notes: This appendix table provides the definitions of the variables used in the study.