Tone Analysis and Earnings Management

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In this study, we examine empirically whether the tone employed in earnings press releases is related to the manager's choice of the sign and amount of the discretionary earnings reported. The results show that managers of firms with high abnormal accruals and firms just meeting or beating earnings targets tend to use more positive words in earnings press releases to hype the discretionary accounting numbers that they subsequently report in financial statements to the SEC. This evidence implies that managers strategically use tone as a complement to earnings management to manage investor perceptions.

INTRODUCTION

Earnings announcements are significant news events. Investors rely heavily on earnings press releases for trading because they are timelier than the annual and quarterly financial statements filed with SEC such as 10K and 10Q. Press releases of earnings announcements contain salient information about both past and future performances of firms. Since Ball and Brown (1968) and Beaver (1968), the academic literature has shown that trading volume and stock price reactions generally are larger around earnings announcements than any other time in the year, except for special event announcements (Schweitzer, 1989).

Quantitative information such as earnings numbers limit investors' ability to predict future performance as they lack qualitative explanation such as outlook of future economic market and the persistence of current earnings. Also, individuals need to first decode information and then process them. By providing the necessary frame of reference, words can help in the decoding process, as is evident in many marketing research (Yoav and Nili 1995; Gamliel and Herstein 2008). In earnings release, managers can also choose how to present the quantitative information as there is no mandated format and the disclosure is voluntary. As such, they have at their disposal the choice of words to communicate earnings in a certain way or context. The presence of managerial agency issues and misalignment of incentives suggests that managers may strategically choose to paint the quantitative performance in such a way that it could be either helpful or detrimental to investors in their use of the released information to infer future performances. This study seeks to analyze how managers employ words in the earnings press

releases, and whether they use such qualitative information strategically to convey their optimism or pessimism.

The psychology literature has shown that framing affects perceptions. When essentially equivalent options are presented to individuals, the context and order in which the options are presented has a large impact on how individuals decide amongst the options. For example, a description of a glass as half-full evokes different emotions from a description of the same glass as half-empty. The effects of emotionally charged messages (positive vs. negative) on recipients tend to be additive than a neutral syntax (Basil, Schouter and Reeves, 1999). Therefore, the specific question we ask in this study is whether managers choose the tone of the press release to affect recipients' perceptions of the press release, either to hedge or hype the disclosed numbers. Following the previous literature, we consider various linguistic styles, such as positive versus negative styles, for tone. We examine empirically whether the tone employed in the press release is related to the manager's choice of the sign and amount of the discretionary earnings reported.

We also consider various aspects of earnings management. First, we use discretionary accruals to proxy for the amount of managerial bias in reported earnings. The earnings management studies in the literature have focused on extreme discretionary accruals (Jones 1991; Teoh, Welch and Wong 1998a; Teoh, Welch and Wong 1998b, etc.). If tone and discretionary earnings are related, the evidence would suggest that these two instruments are used strategically by the managers in their reporting about the firm to affect investors' perceptions. The earnings management literature has also found evidence that managers behave strategically to meet or beat earnings benchmark by managing earnings in small amounts. Therefore, we focus on the relation between the choice of tone and the tendency to meet or beat earnings benchmark.

The results show that managers of firms with high abnormal accruals and firms that just meet or beat earnings targets tend to use more positive words in earnings press releases to hype the discretionary accounting numbers that they subsequently report in financial statements to the SEC. This evidence implies that managers strategically use tone as a complement to earnings management to manage investor perceptions.

The remainder of the study is organized as follows. Section II reviews the literature and develops the hypotheses. Section III discusses the sample, presents variable definitions, and describes the tone measurement in earnings press releases. Section IV presents descriptive evidence, hypothesis test results, and supplemental analyses. Section V provides the conclusion to the study.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Accruals Management

Earnings press releases are an important disclosure mechanism by which managers employ to communicate firms' financial performance to investors. The FASB identifies news releases as examples of financial reporting, and the SEC formally required firms to file all earnings press releases from 2003 onwards. A former managing director of investor relations for Enron found that analysts relied more on earnings releases rather than SEC filings (Emshwiller and McWilliams 2006). Quantitative information content of earnings press releases have increased in the past years (Kross and Kim 2000; Francis, Schipper, and Vincent 2002a, 2002b; Collins, Li, and Xie 2009). Recently, Huang, Teoh and Zhang (2014) find that abnormal positive tone has a positive stock return effect at the earnings announcement and a delayed negative reaction in the one and two quarters afterward. These regulatory actions, anecdotal evidence and investor response demonstrate the importance of earnings press releases.

Earnings press releases are presented in both numbers and narrative forms. Most prior research focuses on numerical earnings press releases disclosure. Few studies examine narrative forms of earnings press releases. Recently, a growing group of papers use large samples to investigate the predictability and information content of narrative forms of financial disclosures including earnings press releases (e.g., Davis, Piger and Sedor 2012, Demers and Vega 2010).

A strand of literature in this area examines the market activities related to disclosure tone. Tetlock (2007) finds pessimistic sentiments contained in a daily news column from The Wall Street Journal lead to downward pressure on market prices and increased market trading volume. Tetlock et al. (2008) show that pessimism expressed in The Wall Street Journal and the Dow Jones News Service columns about S&P 500 firms predicts lower stock returns and future earnings. Davis et al. (2012) and Demers and Vega (2010) document positive short window returns to optimistic tone of earnings press releases around earnings announcements. In addition, Demers and Vega (2010) find a positive association between optimistic tone and long-run stock returns after earnings announcements. Feldman et al. (2010) show that the tone change of the 10-K/10-Q MD&A sections are positively related to short window market reactions around the SEC filings and drift excess returns.

Another group of studies investigates whether qualitative information and disclosures is informative or predictive about future financial performance. All of these papers find that future profitability is positively predicted by optimism in tone in various types of communications about the firm: Tetlock et al. (2008) for tone of articles about S&P 500 firms published in *The Wall Street Journal* or the *Dow Jones News Service* close to the earnings announcement date, Davis et al. (2012) for tone in earnings press releases, and Li (2010) for tone of forward-looking statements in 10-K/10-Q MD&A section.

These papers in general focus on the managers' use of tone in qualitative disclosures to convey information about firm fundamentals and they find that the market generally views tone as a credible indicator of future performance. However, managers can employ opportunistic discretionary disclosures to hide truthful information and mislead investors. The style of presentation using word choice can lead investors to infer incorrectly from what managers know. Prospect theory predicts that people's choices differ by the way risky alternatives are expressed, for example, in positive rather than negative terms. Experimental research (Tversky and Kahneman 1981, 1986) has shown that individuals' judgments are influenced by the terms in which risky alternatives are presented—"framing effects". Thus managers can employ opportunistic discretionary disclosures to accommodate their needs.

The potential for managers to employ tone strategically should be stronger when managers have incentives to manipulate earnings. Earnings management has been examined extensively in the last decade. The main focus of earnings management research has been on detecting whether and if so, when earnings management happens. Most prior studies detect earnings management based on reported financial statements numbers, such as discretionary accruals and deferred tax expense. However, there is an important question: will managers strategically frame earnings press releases when they have manipulated earnings? Although SEC regulation G provides guidance on firms' disclosure of non-GAAP financial measures, the content in earnings announcements is unregulated. Davis et al. (2008) propose that managers have more opportunities to exercise discretion in earnings press releases in narrative forms than numerical forms because SEC does not regulate the form and content of qualitative disclosure in earnings press releases. Further, verbal disclosures are non-verifiable and less precise than numerical forms. Finally, managers can easily change informative signals of verbal forms by choosing words, structure and length of earnings press releases. It would be interesting to examine the role of tone when managers' report discretionary earnings.

If managers' report discretionary earnings, will they employ tone to hide true performance as well? If managers strategically report earnings, they can also exercise discretion on narrative disclosures in the accompanying press releases to bolster the image of reported performance rather than disclose underlying true performance. Specifically, if managers inflate earnings strategically, they can use more positive or optimistic words to complement the high reported numbers in an attempt to persuade investors that the performance is good. If managers manipulate earnings downward to create cookie jar reserves, they can choose negative words to reinforce the low reported numbers and hide their true performance. In both cases, managers employ numbers and tone strategically in the same direction.

On the other hand, managers may have litigation concerns and reputation concerns that can constrain earnings manipulation. If managers manipulate earnings upward, they may use less positive or even negative words to "hedge" high reported earnings. Rogers, Van Buskirk and Zechman (2011) find that optimistic disclosure language increases the firms' likelihood of being sued. This suggests that managers

may dampen the tone of earnings press releases to reduce ligation risk. If managers manipulate earnings downward to create cookie jar reserves or for capital market reasons, they know their performance is not so bad, and don't want to let investors be too disappointed at their performance. So managers may use positive words to "hedge" the low reported earnings. In both cases, managers employ numbers and tone strategically in the opposite direction.

Thus it is unclear whether and how managers use tone when managing earnings. The relation between tone of earnings press release and the discretionary earnings reported is an empirical question. We propose hypothesis 1 as below:

H1: Tone of earnings press releases is affected by the manager's choice of the sign and amount of the discretionary earnings reported.

Earnings Management to Meet or Beat Earnings Targets

Researchers have investigated different measures of earnings management and sample firms with strong incentives to manage earnings. Dechow and Skinner (2000) argue that focusing on managerial incentives is a fruitful way to identify firms that practice earnings management. They posit that academic research should focus more on capital incentives, in particular, managers' incentives to manage earnings to maintain and improve stock market valuations. Regarding earnings management incentives, Dechow and Skinner (2000) propose earnings benchmarks as strong capital market incentives. Thus, our next step is to focus on the setting where managers manipulate earnings to meet or beat benchmarks.

Previous literature has documented that managers manipulate earnings to meet or beat target earnings benchmarks: earnings level (loss avoidance), earnings improvement (earnings changes), and analyst forecasts. Therefore, we consider these three situations following Phillips, Pincus and Rego (2003): firms with zero or slightly positive earnings changes versus firms with slightly negative earnings changes and firms with zero or slightly positive earnings levels versus firms with slightly negative earnings levels, and firms whose earnings exactly equal or slightly exceed analysts' forecasts versus firms whose earnings slightly miss analysts' forecasts.

For firms just meeting or beating earnings benchmarks, managers are more likely to manipulate earnings to meet or beat these thresholds. We expect these managers strategically employ tone as well in these earnings management situations. The tone of just-meet/beat firms should be different from tone of just-missed firms.

H2: Tone in earnings press releases of just-meet/beat firms is different from that of just-missed firms.

DATA AND EMPIRICAL METHODS

Sample

The sample is collected as follows: (1) we start with the CRSP/Compustat merged database; (2) obtain annual earnings press releases for the period from 1998 to 2007 from PR newswire and business wire; (3) match earnings press releases with the CRSP/Compustat merged database using company name, the announcement date and fiscal year; (4) consistent with previous literature, we exclude financial institutions (SIC 6000 to 6999) from the sample. We also exclude all firm-years with missing financial variables, negative book values and stock price below $1. This yields a sample of 4924 firms and 22,188 firm-years observations.

For the analysis of analysts' earnings forecasts, we obtain forecast and actual earnings data from Thomson Financial (I/B/E/S), and use the last mean forecast prior to annual earnings announcements over the 1998–2007 period.

Measure of Tone in Earnings Press Releases

Loughran and McDonald (2011) argue that word classifications developed for other disciplines are not appropriate for the business area. Based on the analysis of 41,842 firm-year 10-Ks from 1994 and

2007, they find that many words classified as negative in the Harvard Psychological Dictionary (IV-4) are not typically negative in financial reports. Words like *tax, liability* or *foreign* are defined as negative words in the Harvard Psychological Dictionary, but have little negative connotations in financial reports. Same for words employed in the Diction software, which is a language processing algorithm. Loughran and McDonald create new six categories of financial words: negative, positive, uncertain, litigious, strong and weak modal words. Uncertainty indicates the general notion of imprecision rather than risk, such as *approximate, uncertain,* and *variability.* Litigious words reflect a propensity for legal contest or litigiousness, such as *claimant, deposition,* and *testimony.* Strong and weak modal words include terms expressing levels of confidence. Examples of strong modal words are *always, highest, must,* and *will.* Examples of weak modal words are *could, depending, might,* and *possibly.* They show new word categories are significantly related to different return measures, alleged accounting fraud, and disclosures of material weaknesses in internal control.

We use the word lists developed by Loughran and McDonald (2011). Even though their word lists are created from 10-Ks, we expect the word categories can also be applied to other financial disclosures. We focus on positive and negative words. Word-based measures are frequency of the words relative to an earnings announcement's total non-numerical words. Following Loughran and McDonald (2011), we account for simple negation for positive words. If there are negation words (*no, not, none, neither, never, nobody*) immediately before a positive word, we count the positive word as negative. We create the variable Net Positive (NET-POS), which is defined as the frequency difference between positive and negative words in a document. We also count the instances of double negatives, i.e., negation words immediately before other negative words, and find the frequency is 2%. The results remain the same by either counting them as positive or ignoring them.

Measure of Earnings Management

Earnings can be decomposed into operating cash flow and total accruals. Based on prior research on earnings management, accruals consist of normal and abnormal accruals. Normal accruals are modeled as a function of a firm's operating activity and fixed capacity. Abnormal accruals are the difference between total accruals and normal accruals, which can be used to estimate earnings management. Following the prior earnings management literature, this study employs annual Performance-Matched Modified Jones model abnormal accruals (*PMMJ*).

According to Kothari, Leone, and Wasley (2005), performance matching on return on assets controls for the effect of performance on measured discretionary accruals. To estimate a firm's *PMMJ*, we first compute total accruals from the statement of cash flows (Hribar and Collins 2002):

$$TAcc_{jt} = EBEI_{jt} - (CFO_{jt} - EIDO_{jt}),$$

where
    $TAcc_{jt}$ = firm *j*'s total accruals in year *t*
    $EBEI_{jt}$ = firm *j*'s income before extraordinary items in year *t*
    CFO_{jt} = firm *j*'s cash flows from operations in year *t*
    $EIDO_{jt}$ = firm *j*'s extraordinary items and discontinued operations included in CFO_{jt} in year *t*.

We then estimate the following equation to compute modified Jones model abnormal accruals:

$$TAcc_{jt} = \beta_0 (1/Assets_{j,t-1}) + \beta_1 (\Delta Sales_{jt} - \Delta AR_{jt}) + \beta_2 PPE_{jt} + v_{jt},$$

where
    $Assets_{jt-1}$ = firm *j*'s total assets in year *t-1*
    $\Delta Sales_{jt}$ = change in firm *j*'s sales from year *t-1* to *t*
    ΔAR_{jt} = change in firm *j*'s accounts receivable from operating activities from year *t-1* to *t*
    PPE_{jt} = firm *j*'s gross property, plant, and equipment in year *t*.

All variables are scaled by beginning-of-year total assets.

According to Li, Pincus and Rego (2008), normal accrual ($NAMJ_{jt}$) and abnormal accrual ($AAMJ_{jt}$) metrics are:

$$NAMJ_{jt} = \beta_0 (1/Assets_{j,t-1}) + \beta_1 (\Delta Sales_{jt} - \Delta AR_{jt}) + \beta_2 PPE_{jt}$$
$$AAMJ_{jt} = TAcc_{jt} - NAMJ_{jt}.$$

Then the sample is divided into deciles by ranking firms within two-digit SIC industries by the current year's return on assets (ROA_{jt}). ROA_{jt} is the net income before extraordinary items scaled by beginning-of-year total assets. $PMMJ_{jt}$ is the difference between firm j's year t modified Jones model abnormal accrual metric and the median metric for its industry and ROA_{jt} decile, where the median calculation excludes firm j.

Regression Models and Control variables

Li (2010) is the first one to examine the determinants of tone, specifically, economic factors that may explain the variations in MD&A tones of 10-K and 10-Q. Even though he only examines the forward-looking statements in the MD&A section (sentences containing: "will," "should," "can," "could," "may," "might," "expect," "anticipate," "believe," "plan," "hope," "intend," "seek," "project," "forecast," "objective," or "goal."), the economic factors should be able to explain the variations in earnings press releases tone as well since both SEC filings and earnings press releases are managerial disclosures. We hand collected MD&A sections of 10-K report of 1000 firms from 10-K wizard and correlate tone measures of MD&A sections with matched earnings press releases. The tone measures are highly and significantly correlated. Therefore, the determinants of the MD&A should be applied to earnings press releases as well.

Li (2010) identifies determinants of the MD&A forward looking statement tones, which are total accruals, current firm performance (proxied by current earnings and contemporaneous stock returns), firm size, market-to-book ratio, and volatility of operations (proxied by stock return volatility and earnings volatility). We use the following regression model to test the association between discretionary accruals and tone of earnings announcements:

$$Tone\ (NET\text{-}POS) = \alpha + \beta_0\ PMMJ_{jt} + \beta_1\ NA_{jt} + \beta_2\ CFO_{jt} + \beta_3\ SIZE_{jt} + \beta_4\ MTB_{jt} + \beta_5\ RET_{jt} + \beta_6 STD\_RET_{jt} + \beta_7 STD\_EARN_{jt} + \varepsilon_{jt}, \qquad (1)$$

where
   $PMMJ_{jt}$ = firm j's performance-matched modified Jones model abnormal accruals in year t;
   NA_{jt} = firm j's normal accruals estimated from performance-matched modified Jones model;
   CFO_{jt} = firm j's cash flows from operations in year t;
   $SIZE_{jt}$ = firm j's log of the market value of equity at the end of the year t;
   MTB_{jt} = firm j's market value of equity plus the book value of total liability scaled by the book value of total assets at the end of the year t;
   RET_{jt} = firm j's contemporaneous stock returns at fiscal year t;
   STD_RET_{jt} = firm j's standard deviation of stock return calculated using daily data from the last fiscal year to this fiscal year ending data.
   STD_EARN_{jt} = firm j's standard deviation of earnings scaled by book value of assets calculated using data from the last 5 years.
   ε_{jt} = the error term.
   For meet/beat samples, we use the following regression to estimate H2:

$$Tone\ (NET\text{-}POS) = \beta_0 + \beta_1\ MEET + \beta_2 TAC_{jt} + \beta_3 EARN_{jt} + \beta_4\ SIZE_{jt} + \beta_5\ MTB_{jt} + \beta_6\ RET_{jt} + \beta_7\ STD\_RET_{jt} + \beta_8 STD\_EARN_{jt} + \varepsilon_{jt}, \qquad (2)$$

where
1) meet or beat earnings changes
$MEET=1$ if zero and slightly positive earnings changes (the change in firm j's net income from year t-1 to t divided by the market value of equity at the end of year t-2 is ≥ 0 and < 0.01) and 0 if slightly negative earnings changes (the change in net income $\geq$ -0.01 and < 0);
2) meet or beat earnings levels

MEET=1 if zero and slightly positive scaled earnings levels (firm *j*'s net income in year *t* divided by the market value of equity at the end of year *t*-1 is ≥ 0 and < 0.02) and 0 if slightly negative scaled earnings levels (net income ≥ -0.02 and <0);

3) meet or beat analysts' forecast

MEET=1 if zero and slightly positive analysts' earnings forecast error (firm *j*'s actual EPS less mean analysts' forecast in year t ≥ 0 and ≤ 0.01) and 0 if slightly negative forecast error (forecast error ≥ -0.01 and <0).

TAC_t = firm *j*'s total accruals in year *t*;

$EARN_{jt}$ = firm *j*'s earnings in year *t*;

β_1 indicates the tone effect for just meet/beat firms relative to just missed firms.

EMPIRICAL RESULTS

Descriptive Statistics

Table 1 shows the statistic summaries. Panel A presents descriptive statistics for the sample. The mean of positive words is 1.15% (median is 1.09%). The mean of negative words is 0.73% (median is 0.64%). Loughran and McDonald (2011) report a higher mean of negative words than that of positive words in 10-K. It implies that managers tend to use more positive words in earnings press releases than in 10-K. The mean of uncertain words list is 0.57 (median is 0.53%). The mean (median) of strong, weak modal and litigious words is 0.55% (0.55%), 0.25% (0.20%), and 0.89% (0.00%) respectively. In addition to tone words lists, we calculate numbers used in the earnings press releases. NUMBERS is the total numbers used in the text divided by total words. The mean of numbers is 10.16% (median is 9.90%).

We examine the tone of earnings press releases before and after the passage of the Sarbanes-Oxley Act (SOX) in 2002. Table 1 panel B reports the percentages of words used in earnings press releases by word categories pre- and post-SOX. Following the passage of SOX, managers tend to use less positive, less strong modal words but more negative, uncertain, weaker modal and litigious words in earnings press releases. The results are consistent with the findings in Loughran and McDonald (2011), which imply that the legislation clearly had an effect on managers' word selection in disclosures.

Table 2 shows the correlation matrix among word categories (positive, negative and net positive) defined in Loughran and McDonald (2011), discretionary accruals estimated from performance-matched modified Jones model and other control variables. The right upper part shows Pearson correlation and the left lower part illustrates Spearman correlation. Performance-matched modified Jones model abnormal accruals are positively related to positive, net-positive, but negatively related to negative words. The positive and significant association between discretionary accruals and net-positive tone suggests that managers employ tone strategically. For control variables, net-positive is positively related to market-to-book ratio and stock return volatility, but negatively related to normal accruals, cash flow and firm size.

Multivariate Analysis

Table 3 indicates the results of testing H1, in which Net-Pos is regressed on PMMJ and the other control variables. To reduce estimation standard errors caused by both time and industry effects, year dummies and industry dummies are included in the regression. T-statistics are clustered on firm dimension to reduce estimation standard errors from firm effect. The coefficient on PMMJ is positive (0.273 with a t-statistic of 4.53), confirming the univariate correlation in Table 1. Managers tend to use more (less) positive words as discretionary accruals increase (decrease). It implies managers use tone in the same direction with discretionary accruals to hype the reported numbers.

TABLE 1
SUMMARY STATISTICS FOR EARNINGS PRESS RELEASES FROM 1998 TO 2007

Panel A: Descriptive Statistics

Variable	Mean	Median	Standard Deviation
Word Lists			
Positive	1.15%	1.09%	0.52%
Negative	0.73%	0.64%	0.49%
Net-Pos	0.42%	0.42%	0.75%
Uncertain	0.57%	0.53%	0.33%
Strong	0.55%	0.55%	0.40%
Weak	0.25%	0.20%	0.21%
Litigious	0.89%	0.00%	2.76%
Numbers	10.16%	9.90%	3.36%
Observations	22188		

Panel B: Percent of Words in Earnings Press Releases by Word List Pre- and Post-SOX*

Word Lists	Before SOX	After SOX	Differences
Positive	1.23%	1.07%	-0.16%***
Negative	0.69%	0.77%	0.08%***
Net-Pos	0.53%	0.30%	-0.23%***
Uncertain	0.53%	0.62%	0.09%***
Strong	0.56%	0.53%	-0.03%***
Weak	0.23%	0.26%	0.03%***
Litigious	0.62%	1.20%	0.58%***
Numbers	10.16%	10.16%	0.00%
Observations	11745	10443	

*Note: *** means $p < 0.01$; ** $p<0.05$; * $p<0.1$.
Reported percentages are for the 1998-2007 sample of 22,188 earnings press releases with complete data. The Sarbanes-Oxley Act (SOX) was signed into law on July 30, 2002.
Word categories are from Loughran and McDonald (2011) (available at http://www.nd.edu/~mcdonald)
NET-POS is defined as the frequency difference between positive and negative words in a document. UNCERTAINTY indicates the general notion of imprecision rather than risk, such as *approximate, uncertain,* and *variability*. LITIGIOUS words reflect a propensity for legal contest or litigiousness, such as *claimant, deposition,* and *testimony*. STRONG and WEAK modal words include terms expressing levels of confidence. Examples of strong modal words are *always, highest, must,* and *will*. Examples of weak modal words are *could, depending, might,* and *possibly*. NUMBERS is total numerical numbers divided by total words including numbers.

TABLE 2
CORRELATIONS FOR TONE AND EARNINGS MANAGEMENT MEASURES

(Upper right part is Pearson correlation; lower left part is Spearman correlation. P-values are reported.)

Variables	Positive	Negative	Net-Pos	PMMJ	NA	CFO	SIZE	MTB	RET	STD_RET	STD_EARN
Positive		-0.095 <.0001	0.760 <.0001	0.042 <.0001	-0.004 0.522	-0.015 0.027	-0.138 <.0001	-0.008 0.215	-0.001 0.882	0.092 <.0001	0.005 0.436
Negative	-0.085 <.0001		-0.720 <.0001	-0.017 0.010	0.060 <.0001	0.029 <.0001	-0.016 0.014	-0.174 <.0001	0.002 0.774	-0.087 <.0001	-0.002 0.808
Net-Pos	0.736 <.0001	-0.695 <.0001		0.041 <.0001	-0.042 <.0001	-0.029 <.0001	-0.085 <.0001	0.108 <.0001	-0.002 0.771	0.121 <.0001	0.005 0.483
PMMJ	0.047 <.0001	-0.012 0.064	0.041 <.0001		-0.158 <.0001	-0.032 <.0001	-0.097 <.0001	0.007 0.282	-0.002 0.809	0.023 0.001	-0.015 0.025
NA	-0.001 0.896	0.021 0.001	-0.014 0.035	-0.179 <.0001		-0.041 <.0001	0.025 0.000	-0.216 <.0001	0.000 0.970	-0.158 <.0001	-0.003 0.673
CFO	-0.076 <.0001	-0.045 <.0001	-0.022 0.001	-0.418 <.0001	-0.225 <.0001		0.005 0.479	0.003 0.693	0.000 0.990	0.000 0.955	-0.168 <.0001
SIZE	-0.138 <.0001	-0.008 0.223	-0.090 <.0001	-0.124 <.0001	0.048 <.0001	0.305 <.0001		0.225 <.0001	-0.007 0.267	-0.289 <.0001	-0.125 <.0001
MTB	-0.010 0.135	-0.222 <.0001	0.139 <.0001	-0.043 <.0001	-0.035 <.0001	0.182 <.0001	0.369 <.0001		-0.002 0.820	0.200 <.0001	0.113 <.0001
RET	0.016 0.018	-0.101 <.0001	0.077 <.0001	0.005 0.485	-0.055 <.0001	0.208 <.0001	0.206 <.0001	0.333 <.0001		0.019 0.005	0.005 0.495
STD_RET	0.119 <.0001	-0.093 <.0001	0.144 <.0001	0.011 0.104	-0.058 <.0001	-0.298 <.0001	-0.365 <.0001	0.055 <.0001	-0.084 <.0001		0.452 <.0001
STD_EARN	0.055 <.0001	0.013 0.057	0.034 <.0001	-0.019 0.005	0.027 <.0001	-0.296 <.0001	-0.312 <.0001	0.150 <.0001	-0.092 <.0001	0.452 <.0001	

Total observations: 22,188.
Words categories are from Loughran and McDonald (2011) (available at http://www.nd.edu/~mcdonald)
NET-POS is defined as the frequency difference between positive and negative words in a document. PMMJ is performance-matched modified Jones model abnormal accruals. NA is normal accruals estimated from modified Jones model. CFO is cash flow from operations. Size is log of the market value of equity at the end of the year. MTB is market value of equity plus the book value of total liability scaled by the book value of total assets. RET is contemporaneous stock returns in the current year. STD_RET is standard deviation of stock return calculated using daily data from the last fiscal year to this fiscal year ending data. STD_EARN is standard deviation of earnings scaled by book value of assets calculated using data from the last 5 years.

TABLE 3
REGRESSION OF NET POSITIVE TONE ON PERFORMANCE-MATCHED
MODIFIED JONES MODEL ABNORMAL ACCRUALS

Dependent variable: NET-POS
Independent Variables: PMMJ, NA, CFO, SIZE, MTB, RET, STD_RET, STD_EARN

	Coefficient
PMMJ	0.273*** (4.53)
NA	0.045 (0.38)
CFO	0.046 (0.96)
SIZE	-0.018*** (-3.63)
MTB	0.039*** (8.57)
RET	-0.000*** (-5.43)
STD_RET	0.135* (1.81)
STD_EARN	-0.085** (-2.66)
Year Dummy	Not reported
Industry Dummy	Not reported
Observations	21532
R^2	8.33%

T-statistics clustered firm level.
*** means p <0.01; ** p<0.05; * p<0.1.
NET-POS is defined as the frequency difference between positive and negative words in a document. PMMJ is performance-matched modified Jones model abnormal accruals. NA is normal accruals estimated from modified Jones model. CFO is cash flow from operations. Size is log of the market value of equity at the end of the year. MTB is market value of equity plus the book value of total liability scaled by the book value of total assets. RET is contemporaneous stock returns in the current year. STD_RET is standard deviation of stock return calculated using daily data from the last fiscal year to this fiscal year ending data. STD_EARN is standard deviation of earnings scaled by book value of assets calculated using data from the last 5 years.

   For other control variables, the tone of earnings press releases is negatively related to SIZE (the coefficient on SIZE is -0.018 with a t-statistic of -3.63). The result indicates that large firms release more negative earnings press releases. It is consistent with the findings in Li (2010), which proposes that large firms are more cautious in disclosures because of political and legal costs concerns. The coefficient on MTB is significantly positive (0.039 with a t-statistic of 8.57), indicating that firms with high market-to-book ratio have more positive tones. High market-to-book firms are growth firms, and have more uncertain informational environments and generally less successful performance. These firms tend to release more positive discussions to investors. Firms with more volatile returns also have more positive earnings press releases (the coefficient on STD_RET is 0.135 with a t-statistic of 1.81). This implies that volatile firms tend to convey positive information to make up for volatile performance. While firms with

more volatile earnings have less positive earnings press releases (the coefficient on STD_EARN is -0.085 with a t-statistic of -2.66).

Table 4 presents regression estimates of H2 across the three earnings management settings. The first set of results is shown in the left-hand pair of columns labeled ''Earnings Target 1: Scaled Earnings Changes'' and indicates earnings management to avoid an earnings decline. The middle set of columns, labeled ''Earnings Target 2: Scaled Earnings,'' shows the results for earnings management to avoid a loss. The right-hand set of columns, labeled ''Earnings Target 3: Analysts' Forecasts,'' presents the results for earnings management to avoid failing to meet or beat analysts' earnings forecasts. For the first set of results, the coefficient on MEET is positive and significant (0.147 with t-statistic of 5.61). The middle column shows the positive coefficient on MEET as well (0.075 with t-statistic of 1.73). In the third column of results in Table 4, MEET has a positive and significant coefficient (0.111 with t-statistic of 3.32). The results are consistent for all three earnings management settings, implying that managers of just-meet/beat firms use more positive words in earnings press releases than just-missed firms.

Robustness Check

Some previous literature on tone analysis adopts an expectation model for tone in an attempt to capture the "surprise" element of the level of tone contained in management's press release. Following these papers, we use the standardized unexpected net-positive instead of levels to rerun regression (1) for robustness check. We calculate the unexpected net-positive as $\Delta NET\_POS_{jt} = NET\_POS_{jt} - NET\_POS_{jt-1}$. Therefore the standardized unexpected net-positive associated with firm j at time t is:

$$SNET\text{-}POS_{jt} = \frac{\Delta NET_{POS jt} - \mu \Delta NET_{POS}}{\sigma \Delta NET_{POS}}$$

where ΔNET_POS_{jt} is the difference between the net-positive of firm j in year t, estimated using net positive words, and the net-positive of the most recent prior year's announcement by firm j. $\mu \Delta NET_{POS}$ and $\sigma \Delta NET_{POS}$ are the mean and standard deviation of ΔNET_POS across all firms and all years in the sample respectively.

We then conducted the following regression - a variation of regression (1):

$$Tone\ (SNET\text{-}POS) = \alpha + \beta_0\ \Delta PMMJ_{jt} + \beta_1\ NA_{jt} + \beta_2\ CFO_{jt} + \beta_3\ SIZE_{jt} + \beta_4\ MTB_{jt} + \beta_5\ RET_{jt} + \beta_6\ STD\_RET_{jt} + \varepsilon_{jt}, \tag{3}$$

where $\Delta PMMJ$ is the difference between discretionary accruals of firm j in year t, estimated from performance-matched modified Jones model, and the most recent prior year's announcement by firm j. The results are shown in Table 5. The coefficient of $\Delta PMMJ$ is positive (0.216) and significant (t = 3.35). The results are consistent with the results of regression (1).

For the tone measurement, we use net positive words as a fraction of total words. To eliminate the possibility that total words may drive any variation in the ratio since there are many more total words than positive or negative word, we also use net positive words not scaled by the total words in the regression and include total words as a control variable. The results are consistent with those using scaled net positive words.

As for abnormal accruals, Dechow et al. (2003) propose the forward-looking Jones model, which has advantages over the cross-sectional Jones model. They show that the forward-looking model has a higher mean adjusted R^2 (0.20) relative to that of modified Jones model ($R^2 = 0.092$), which suggests that more of the variation in total accruals is explained by the variables in the model. That is, the residuals of the forward-looking Jones model regression include smaller amounts of nondiscretionary accruals. Hence we also use the forward-looking Jones model as a proxy for earnings management as another robustness check.

TABLE 4
REGRESSION OF NET POSITIVE TONE ON MEETING/BEATING EARNINGS BENCHMARKS

Dependent variable: NET-POS
Independent Variables: MEET, TAC, EARN, SIZE, MTB, RET, STD_RET, STD_EARN

	Earnings Target 1: Scaled Earnings Changes	Earnings Target 2: Scaled Earnings	Earnings Target 3: Analysts' Forecast
MEET	0.147***	0.075*	0.111***
	(5.61)	(1.73)	(3.32)
TAC	-0.092*	0.152	0.002
	(-1.76)	(0.74)	(0.02)
EARN	0.152***	-0.029	0.052
	(2.94)	(-0.06)	(1.12)
SIZE	-0.018**	-0.039***	-0.028***
	(-2.17)	(-3.21)	(-3.01)
MTB	0.016*	0.052***	0.025**
	(1.96)	(4.16)	(2.44)
RET	0.005***	-0.004	0.030
	(3.15)	(-1.22)	(1.35)
STD_RET	0.170	0.539**	0.312
	(1.07)	(2.19)	(1.51)
STD_EARN	0.082***	-0.028	0.029
	(3.71)	(-0.35)	(0.53)
Year Dummy	Not reported	Not reported	Not reported
Industry Dummy	Not reported	Not reported	Not reported
Observations	3452	2049	2634
R^2	8.54%	13.34%	8.59%

Note: T-statistics clustered at firm level. *** means $p < 0.01$; ** $p<0.05$; * $p<0.1$.
Earnings Target 1: Scaled Earnings Changes. Earnings management to avoid an earnings decline.
Earnings Target 2: Scaled Earnings. Earnings management to avoid a loss.
Earnings Target 3: Analysts' Forecasts. Earnings management to avoid failing to meet or beat analysts' forecasts. TAC is total accruals. EARN is current year earnings. See Table 3 for variable definitions.

TABLE 5
REGRESSION OF STANDARDIZED NET POSITIVE TONE ON PERFORMANCE-MATCHED MODIFIED JONES MODEL ABNORMAL ACCRUALS

Dependent variable: SNET-POS
Independent Variables: Δ PMMJ, NA, CFO, SIZE, MTB, RET, STD_RET, STD_EARN

	Coefficient
Δ PMMJ	0.216*** (3.35)
NA	-0.311** (-2.07)
CFO	-0.006 (-0.12)
SIZE	-0.001*** (-0.15)
MTB	0.012** (2.33)
RET	-0.000*** (-2.63)
STD_RET	0.304*** (3.27)
STD_EARN	0.014 (0.57)
Year Dummy	Not reported
Industry Dummy	Not reported
Observations	14346
R^2	3.37%

Note: T-statistics clustered at firm level.
*** means p <0.01; ** p<0.05; * p<0.1.
SNET-POS is the standardized unexpected net-positive. ΔPMMJ is the difference between performance-matched modified Jones model abnormal accruals of firm j in year t and the most recent prior year's announcement by firm j. See Table 3 for variable definitions.

To estimate a firm's discretionary accruals, we first compute total accruals from the statement of cash flows (Hribar and Collins 2002):

$TAcc_{jt} = EBEI_{jt} - (CFO_{jt} - EIDO_{jt})$,

where

   $TAcc_{jt}$ = firm j's total accruals in year t;
   $EBEI_{jt}$ = firm j's income before extraordinary items in year t;
   CFO_{jt} = firm j's cash flows from operations in year t;
   $EIDO_{jt}$ = firm j's extraordinary items and discontinued operations included in CFO_{jt}
      in year t;

   We then estimate the following equation to compute the forward-looking Jones model discretionary accruals (AA_{jt}):

$TAcc_{jt} = \alpha + \beta_1 (\Delta Sales_{jt} - (1 - k) \Delta AR_{jt}) + \beta_2 PPE_{jt} + \beta_3 TAcc_{jt-1} + \beta_4 GR\_Sale_{jt+1} + vjt$,

where

   $\Delta Sales_{jt}$ = change in firm j's sales from year t-1 to t;
   K = the slope coefficient from a regression of ΔAR_{jt} on $\Delta Sales_{jt}$;
   ΔARj = change in firm j's accounts receivable from operating activities from year t-1 to t;
   PPE_{jt} = firm j's gross property, plant, and equipment in year t;
   $TAcc_{jt-1}$ = firm j's total accruals in year t-1, scaled by year t-2 total assets;

GR_Sales_{jt+1}= the change in firm j's sales from year t to $t+1$, scaled by year t sales;
$vjt =$ the error term.
All variables are scaled by beginning-of-year total assets except $TAcc_{jt-1}$ and GR_Sales_{jt+1}.

The forward-looking Jones model makes three adjustments to the modified Jones model. First, the model does not assume that all credit sales are discretionary. The model expects part of the increase in credit sales, regresses $\Delta ARjt$ on $\Delta Salesjt$ and winsorizes the estimated parameter k so it ranges from 0 to 1. Second, the model assumes a portion of total accruals to be predictable and captured by including last year's accruals in the model. Third, the modified Jones model treats increases in inventory made in anticipation of higher sales as abnormal accruals rather than as a rational increase in inventory. The forward-looking model includes next year's sales growth to correct for such misclassifications. We estimate the forward-looking Jones model separately for each two-digit SIC code and calendar year with at least ten observations. We estimate the model without the k adjustment, without the ΔAR term included, and use only the subsample of firm-years in which we assume there is no earnings management (just missed firms).

Table 6 represents the results. AA has a positive coefficient (0.339) and significant at the 5% level (t=3.11). This implies the higher abnormal accruals estimated from forward-looking Jones model, the more positive words managers tend to use in earnings press releases. The evidence is consistent with main findings.

TABLE 6
REGRESSION OF NET POSITIVE TONE ON FORWARD-LOOKING ABNORMAL ACCRUALS

Dependent variable: NET-POS
Independent Variables: AA, NA, CFO, SIZE, MTB, RET, STD_RET

	Coefficient
Intercept	0.347***
	(12.25)
AA	0.339**
	(3.11)
NA	0.254
	(1.03)
CFO	-0.048
	(-0.57)
SIZE	-0.028 ***
	(-4.47)
MTB	0.062***
	(5.68)
RET	0.027 *
	(2.02)
STD_RET	0.507**
	(3.46)
Year Dummy	Not reported
Industry Dummy	Not reported
Observations	14,379
R^2	9.25%

Note: T-statistics clustered at firm level.
*** means p <0.01; ** p<0.05; * p<0.1.
NET-POS is defined as the frequency difference between positive and negative words in a document. AA is forward-looking Jones mode abnormal accruals. NA is normal accruals estimated from forward-looking Jones model. See Table 3 for variable definitions.

CONCLUSION

Managers convey information about firms' performances to their investors in many forms. Audited financial statements are filed with the SEC periodically. Prior to the SEC filing, however, firms often announce their earnings in press releases, which are more timely and therefore relied upon heavily by investors. These press releases contain salient numbers about the earnings performance and the accounting academic literature has shown them to be informative to investors. Beyond the quantitative information, managers also have at their disposal choice of words to accompany the numbers. These words put the reported numbers in context and may be incrementally useful to enable investors to infer future performances. Therefore, we analyze how managers employ words in the earnings press releases, and whether they use tone of words beyond reported numbers strategically to convey their optimism or pessimism.

In this study, we investigate how tone of words is related to the manager's choice of the sign and amount of the discretionary earnings reported, and earnings management to beat or meet analysts' benchmarks versus miss benchmarks. The results show that managers of firms with high abnormal accruals tend to use more positive words in earnings press releases to hype the reported discretionary accounting numbers. Managers of just-meet/beat firms employ more positive tone in earnings press releases than just-missed firms.

This study contributes to the extant literature of textual analysis and earnings management. Previous literature on earnings management mainly focuses on numbers, while this study provides a different perspective – qualitative information related to earnings management. The managers choose tone of earnings press releases to complement the message they convey in their choice of the discretionary reported numbers. Managers do strategically use tone beyond the numbers in their disclosures to affect investor perceptions.

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