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ABSTRACT

Stock prices react significantly to the tone (negativity of words) managers use on earnings conference calls. This reaction reflects reasonably rational use of information. "Tone surprise" – the residual when negativity in managerial tone is regressed on the firm's recent economic performance and CEO fixed effects – predicts future earnings and analyst uncertainty. Prices move more, as hypothesized, in firms where tone surprise predicts more strongly. Experienced analysts respond appropriately in revising their forecasts; inexperienced analysts overreact (underreact) to tone surprises in presentations (answers). Post-call price drift, like post-earnings announcement drift, suggests less-than-full-use of information embedded in managerial tone.

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1 Introduction

How effectively can analysts and investors read "between the lines" of what managers say in earnings conference calls? This paper shows that these participants infer valuable information about future earnings and uncertainties, and react in a manner that moves the market in the appropriate direction. The analysis documents, in a more complete and direct manner than have prior studies, the link between managerial tone (primarily the degree of negativity in word choice), and company fundamentals, analyst responses, and stock price reactions.

It is well known and hardly surprising that market participants react strongly to news on concrete value-relevant information, such as earnings, that is contained in earnings press releases, as well as in documents such as 10-K filings and corporate annual reports. Interestingly, however, other aspects of the communication also matter. The market reacts to tone in 10-Ks (Loughran and McDonald (2011)), and tone in earnings press releases is also informative (Demers and Vega (2010) and Davis, Piger, and Sedor (2012)). Some studies show as well that the short-term stock market reaction reflects how – that is, using which linguistic tone and with which vocal cues – managers speak during the earnings conference call (Mayew and Venkatachalam 2012; Price, Doran, Peterson and Bliss 2012).[1]

Why does the market react to the tone of corporate communications? Our overarching hypothesis is the:

RATIONAL REACTIONS HYPOTHESIS: Market participants rationally distill value-relevant information from tone over and above observables such as earnings.

To investigate this hypothesis, we structure our analysis around the basic idea that the value of a company is the sum of the expected future cash flows, discounted at rate *r*. If tone drives rational

[1] Besides tone a number of papers have considered the role of readability of corporate communications (Li 2008; Loughran and McDonald 2013). Media news content about companies also has provided an important focus of the literature (Ober, Zhao, Davis and Alexander 1999; Tetlock 2007; Tetlock, Saar-Tsechansky and Macskassy 2008; Engelberg 2009). See Li (2011) and Loughran and McDonald (2014) for surveys of textual-analysis studies.

market reactions, it must predict expected future cash flows and/or influence uncertainty (which in turn would affect the discount rate).[2]

We study earnings conference calls for S&P 500 companies from 2004 to 2012. We first document a variety of factors that lead managers to be negative: poor recent economic performance by the company or the economy, and recent uncertainty. In addition, managers usually respond to analysts' negativity in questions with negativity in answers.

Controlling for both the determinants of negativity and CEO fixed effects, we compute residual, "excessive" negativity, that is, the *tone surprise*. We posit that the managers' choose words based on their total information. This includes much information that has already been disclosed or soon will be, but includes as well internal and non-quantifiable information that cannot be revealed in concrete fashion, for example, the managers' expectations for the future.

Managers might wish to reveal or conceal information of this latter type. Whether purposeful or inadvertent, tone surprise captures the negative elements in managers' speech beyond what is justified by previous recorded performance. Our prime tests are whether tone surprise contains value-relevant information about the future, and whether the stock market recognizes this.

Past work suggests that the stock market has the potential to react rationally to managerial tone, and not merely concrete information. Positivity in earnings press releases predicts higher future returns on assets (Davis, Piger and Sedor 2012). Moreover, the harder future returns are to assess, as in growth firms, the stronger is this effect (Demers and Vega 2010). More favorable disclosures in 10-K and 10-Q filings are associated with less dispersion in analysts' estimates and lower stock volatility (Kothari, Li, and Short (2009) and Loughran and McDonald (2011)),

[2] Earlier studies had shown that stock market participants react to conference calls (Frankel, Johnson and Skinner 1999) as well as even during calls (Matsumoto, Pronk and Roelofsen 2011) and had argued that this provides evidence that conference calls provide investors with information.

implying less uncertainty about the firm's future. However, past work also contains surprising and negative findings. The frequency of negative words in 10-K filings is positively correlated with positive future earnings surprises (Loughran and McDonald 2011). No robust association between unexpected future earnings and current linguistic tone (or vocal cues) emerged in a smaller sample of conference calls (Mayew and Venkatachalam (2012)).

First, we examine whether more positive tone predicts better future performance, favorable analyst reactions, and/or lower uncertainty (Hypothesis 1). Second, we recognize that even if Hypothesis 1 is confirmed, the market's reaction to tone may still deviate from rationality. This leads to three additional tests that focus on rationality. First, we expect that for firms for whom the stock market reacts more strongly to unusual managerial tone, tone will also more strongly predict the determinants of company value, future earnings and uncertainty (Hypothesis 2A). Second, to parse between rational and bubble reactions to managerial tone, we test whether stock price levels persist over the quarter following the conference call (Hypothesis 2B). Third, we determine whether experienced analysts distill the information from managerial tone more accurately – i.e. produce superior forecasts -- than their less experienced peers (Hypothesis 2C).

We find support for Hypothesis 1 and for each of Hypotheses 2A, 2B and 2C. First, tone surprises significantly predict future earnings. Interestingly, the effects are asymmetric: Excessive negativity more strongly predicts lower future unexpected earnings than excessive positivity predicts higher future unexpected earnings. These results hold controlling for other speech characteristics, such as the use of uncertain words. Importantly, sell-side analysts revise their forecasts downwards (upwards) for the next quarter if the manager adopts an excessively negative (positive) tone, though they adjust more strongly to excessive positivity. We proxy uncertainty by the standard deviation of analysts' post-call forecasts for earnings in the next quarter. Negative tone increases both that dispersion and the number of forecast revisions during

the following quarter. Bid-ask spreads further indicate uncertainty; they increase from the day before a conference call with excessive negativity to three days after. In sum, these results support Hypothesis 1.

We also obtain substantial evidence supporting the more targeted Hypotheses 2A, 2B, and 2C.

A first strand of our analysis examines whether managerial tone proves more important when objective information is less informative. Large earnings surprises suggest that a firm is harder to read. As posited by Hypothesis 2A, tone surprises in presentations more strongly predict future earnings for firms with a large (positive or negative) earnings surprise. Similarly, in these "cloudy" firms excessive negativity in managers' presentations and answers more strongly magnifies uncertainty (as indicated by higher variability of analysts' forecasts). Finally, as expected, the stock market reacts more to tone surprises in such firms. By tying together the results on earnings, uncertainty, and stock price reactions, these findings provide further evidence of a predominantly rational basis for stock market reactions to tone.

Second, consistent with Hypothesis 2B, stock prices tend to persist after their initial stock price reaction, as would be required for a rational response.

Third, experienced analysts do much better than novice analysts in reacting appropriately to tone surprises in both presentations and managers' answers. This confirms Hypothesis 2C.

The rest of this paper is organized as follows. Section 2 describes our data. Section 3 examines how quarterly performance influences a manager's negativity. Section 4 investigates whether a manager's word choice provides insight into future earnings, and how analysts incorporate this information. Section 5 studies (analyst) uncertainty. Section 6 examines the immediate stock price reaction to managerial tone, and looks at the long-run stock returns of portfolios of firms sorted on managerial tone. Section 7 documents that the stock market

responds more strongly to managerial tone precisely where we would expect stronger responses. Section 8 provides additional results and conducts the robustness analysis. Section 9 concludes.

2 Data and methods

2.1 Tips and tells

Earnings conference calls provide an ideal laboratory for examining how managers transmit information to investors, both purposefully and inadvertently. Conference calls have two components: first prepared remarks by management, then a more spontaneous section when managers respond to questions from analysts.[3]

First principles do not tell us whether prepared or impromptu remarks should reveal more. If managers wish to convey a message, they can be more confident to convey the intended message in an appropriate manner in their prepared remarks. Such intended messages we label a *tip*.

However, managers may not want to reveal some information, but convey it nevertheless. Such "revelations" we label a *tell*, the equivalent of a poker tell, a clue from behavior that reveals something about the player's assessment of his situation, i.e., poker hand or business prospects. By analogy, a witness in a trial might inadvertently reveal information unintentionally when cross examined, and thus put out a tell.

There is a second more subtle class of tips, indirect *tips*. The manager may wish to convey information, but not to do so in what looks like a purposeful manner, thus not in prepared

[3] Conference calls have allowed other researchers to study how the tone shifts with the time of day (Chen, Demers and Lev 2012), how companies strategically call on certain analysts (Mayew 2008; Cohen, Lou and Malloy 2013), the role of the communication pattern within the management team (Li, Minnis, Nagar and Rajan 2014), the extent to which asking questions allows analysts to obtain superior information (Mayew, Sharp and Venkatachalam 2013), whether the use of certain words suggests deception as later revealed by fraud (Larcker and Zakolyukina 2012), what the consequences of communication are for short-selling (Blau, DeLisle and Price 2012), or whether vocal dissonance markers help predict the likelihood of accounting restatements (Hobson, Mayew and Venkatachalam 2012).

remarks. To preserve seemliness or plausible deniability on intent, he might do so in response to a question. Given that answers to likely questions are prepared by managers, managers can prepare to provide indirect tips. Our focus is on what managers say. However, questions from knowledgeable analysts may also be informative.

2.2 Sample

S&P 500 companies provide the basis for our analyses. Our sample includes earnings conference calls for the period from 2004 through the end of 2012. Most panel regressions include around 450 companies, though the panel is unbalanced, as transcripts or other data for some quarters are missing for some companies.

2.3 Textual analysis

We rely on written transcripts of conference calls. This source has its limitations, but it is a tool available to all market participants.

2.3.1 Tone of speech

Our principal independent variable is managerial tone. To capture tone, we use the word lists compiled by Loughran and McDonald (2011). They contain 2,329 negative, 354 positive, and 297 uncertain words.[4] The robustness section tests whether a much simpler approach using a much shorter, self-compiled word list would yield similar results.

We correct for negation, by excluding a positive word from the count when a negation word (no, not, none, neither, never, nobody, *n't) occurs among the three words preceding the positive word (except when there is a comma or a period in that range).

Negativity provides our measure of the tone managers or analysts of company *j* in the

[4] We use the August 2013 version from http://www3.nd.edu/~mcdonald/Word_Lists.html.

conference call at time *t.* It is defined as

$$Negativity_{jt} = \frac{negative\ words_{jt} - positive\ words_{jt}}{negative\ words_{jt} + positive\ words_{jt} + 1}. \quad (1)$$

We winsorize negativity at the 1 and 99 percent levels.

As further alternative independent variables, we also use the ratio of negative words/positive words and the frequencies of negative and positive words separately.

We compute our negativity indicators separately for prepared presentations, for analysts' questions, and for managers' answers, as these parts are fundamentally different. Presentations are prepared and reviewed in advance, whereas answers require some degree of improvisation.

2.3.2 Other characteristics of managerial speech

Four additional patterns of speech we examine may indicate troubling times ahead.[5] First, there is *inconsistency in tone*, the absolute difference in negativity between presentations (prepared speech) and answers (improvised speech). Such differences may also indicate that the manager is particularly forthcoming with information in the answers part. Second, we code the use of specific "*uncertain,*" "*strong modal,*" and "*weak modal*" words or constructions, using the Loughran and McDonald (2011) classification. Modal words express levels of confidence. Examples of strong modal words include the words *always*, *definitely*, *never*, and *will*. Examples of weak modal words include the words *appears*, *could*, *depending*, and *possibly*. Third, as a measure of *complexity*, we calculate the number of words per sentence.

The *use of a "wrong" verb tense* provides a fourth indicator. Arguably, presentations should primarily announce and explain past results. Answers should clarify missed points, explain the current situation, or preview the future. If too few sentences in the presentation use

[5] With the first and the fourth of these measures, we also contribute to the literature by providing some simple, systematic measures of possibly evasive speech patterns, complementing approaches based on hand-collection (as in, for example, Hollander, Pronk, and Roelofsen (2010)).

the past tense, the managers may be trying to divert attention from actual outcomes to potential events in the future. We define *atypical tense* as the weighted average percentage of the manager's verbs not in the past tense in the presentation and the manager's verbs not in the present or future tense in the answers, weighted by the number of verbs in the two respective parts of the conference call.[6] We winsorize these four speech characteristics variables at the 1 and 99 percent levels.

2.4 Company and analyst variables

Price and returns data are from CRSP. The *stock return* in quarter t is the firm's share-price appreciation in the elapsed quarter, that is, the difference between the share price 5 days before the earnings announcement for quarter t and the share price 5 days after the earnings announcement for quarter $t-1$, divided by the stock price 5 days after the earnings announcement for quarter $t-1$.

Earnings per share (hereafter, *earnings*) and EPS forecasts data are from I/B/E/S. Let $e_{t,j}$ be the earnings announced for the company j at quarter t recorded in I/B/E/S and, following Livnat and Mendenhall (2006), let $\hat{e}_{t,j}$ be the corresponding consensus forecast (the most recent mean analyst forecast included in the I/B/E/S detail file during the 90 days before the quarterly earnings announcement). The *earnings surprise* is the difference between actual and consensus forecast earnings, divided by the share price 5 trading days before the announcement in quarter t. Firms

[6] To automate the recognition of verb tenses we use the Natural Language Toolkit library as follows: (1) all words in each sentence are tagged with part-of-speech tags (POS tagging); (2) each tagged sentence is chunked into name and verb phrases; (3) for each verb phrase, its tense is deduced from the POS tag of the first word utilizing a number of heuristics to correct the most common errors of POS tagging; (4) if a sentence contains several verb phrases, its tense is defined as the most common tense among its phrases. If a most common tense is not identified, the sentence tense is not defined. We also hand-code tense usage in several full conference calls and cross-check the results with the automated approach described above. This algorithm does an excellent job in classifying both the presentation and the questions and answers section of the conference call. After we assign the tenses to each sentence we classify them as describing past, present, or future with the conference call day as the reference point. We classify the present perfect tense for our use as past-oriented speech, consistent with the definition of Merriam-Webster dictionary: "present perfect is a verb tense that expresses action or state completed at the time of speaking."

performing below expectations represent a negative surprise. Firms are grouped by *earnings surprise decile*, from -5 (for the largest negative surprises) through -1 (for the smallest negative surprises), then 0 for zero surprises, and then 1 to 5 from smallest to largest positive surprise. *EPS growth* is the fraction by which earnings in a quarter exceed earnings in the same quarter in the prior year.

Market return is the percent value-weighted market return for the period starting 5 days after an earnings announcement for the quarter $t-1$ and ending 5 days prior to the earnings announcement for the quarter t.

Monthly volatility is the monthly stock volatility computed from monthly return data over the previous 48 months.

As standard control variables, we use the natural logarithm of *total assets* and *Tobin's Q*, as well as Fama-French 48 industry fixed effects, and/or CEO fixed effects.

Three analyst-specific variables play a role in our analysis. *Forecast change* is the change in an analyst's forecast for earnings in quarter t+1, from the day before the conference call to three days after the call, divided by the earnings in quarter *t+1,* multiplied by 100.

Forecast error is difference between the post-conference call forecast (the forecast for quarter t+1 outstanding 3 days after the conference call for quarter t) and the actual earnings in quarter t+1, divided by the earnings in quarter t+1, multiplied by 100

Analyst experience is the natural logarithm of the number of years an analyst *i* has appeared in the IBES database.

Pre-call forecast std. dev. is the standard deviation of analysts' earnings forecasts for quarter *t* that remain outstanding the day before quarter *t*'s earnings are announced. *Pre-announcement revision frequency* is the fraction of analysts covering a firm who revise their forecasts for quarter *t* in the quarter before *t*'s earnings are announced. Frequent revisions

indicate that a firm's earnings are more difficult to forecast.

Post-call forecast std. dev. is the standard deviation of analysts' forecasts for earnings for quarter (*t*+1) tallied three days after the conference call of quarter *t.* Post-announcement *revision frequency* is the fraction of covering analysts who revise after the conference call of quarter *t* up to the earnings announcement of quarter *t+1*. *Change in bid-ask spread* is the change in the average bid-ask spread (divided by the midpoint between the bid and the ask) from the [-3,-1] day window prior to the conference call to the [+1,+3] window following the conference call, multiplied by 100. We calculate daily excess stock returns following Daniel, Grinblatt, Titman and Wermers (1997) (DGTW). DGTW provide monthly portfolio returns. We apply their methodology to daily returns to compute DGTW characteristic-adjusted stock returns.[7] *CAR01* is the two-day, [0,1] DGTW-adjusted stock return on and after the conference call date.[8] We also compute the cumulative DGTW-adjusted returns for up to 60 trading days following the conference call date.

In this analysis, the following variables are winsorized at the 1st and 99th percentiles: stock return, earnings surprise, EPS growth, Tobin's Q, earnings, forecast change, forecast error, and the CARs. The following variables, which have a bottom value at 0, are winsorized at the 99th percentile level: pre- and post-call forecast standard deviation, revision frequency, and the pre- and post-call bid-ask spreads.

[7] From each stock return we subtract the return on a portfolio of all CRSP firms matched on quintiles of market equity, book-to-market, and prior 1-year return (thus a total of 125 matching portfolios). Each of these 125 portfolios is reformed each year at the end of June based on the market equity and prior year return (skipping one month) from the end of June of the same year, and book-to-market from the fiscal period end of the preceding year. Book-value of equity is furthermore adjusted using the 48 industry classifications available from Kenneth French's website. The portfolios are value-weighted.

[8] Some conference calls take place during trading hours (which makes it appropriate to include the day of the conference call when calculating stock price reactions), others take place after trading hours. Unfortunately, we do not have exact times for the full sample of calls.

2.5 Descriptive statistics

Tables 1 and 2 present summary statistics for the variables we use.

TABLES 1 AND 2 ABOUT HERE

On average about 0.86% [0.75%] of all words used in presentations [answers] on conference calls are coded as negative and 1.68% [1.20%] are coded as positive. Both negative and positive words appear more frequently in presentations than in answers. The ratio of negative to positive words is significantly higher in the improvised answers than in the presentations, 0.71 as opposed to 0.60, producing average values for our main measure of negativity of -0.22 and -0.32, respectively. This disparity may reflect the tendency of CEOs to buff up assessments in presentations, or perhaps they think they can do so more judiciously in prepared remarks. However, a major factor is likely to be the negative cast of the analysts' questions to which they must respond. Analysts use 1.66 negative words per positive word. This strong downbeat tilt suggests that analysts differentially ask about concerns, sometimes about the validity of the remarks made in the formal presentations, and more generally about the company's past performance and future prospects.[9]

Our analysis also examines managers' use of the past, present and future tense. Normally, around half of the phrases in presentations use the past tense, whereas close to two thirds of the phrases in both questions and answers use the present tense. The use of future tense is relatively rare; fewer than 10% of verbs used in any of presentations, answers, and questions use the future

[9] This result accords with Brockman, Li, and Price (2014), who study a sample of 2880 conference calls from the 2004-2007 time period. Their paper focuses on the stock market reaction to analyst tone over a multi-day window. Chen, Nagar, and Schoenfeld (2014) use intra-day data to provide evidence that the market reacts to analyst tone during the time of the conference call. Consistent with the stock market response being rational, they also document that a specific analyst's tone on the call predicts that analyst's earnings forecasts and recommendations.

tense, though much present tense discussion is implicitly about the future.

3 Managerial tone

While different individuals speak on the conference call, the CEO usually speaks around half of the time. (Li, Minnis, Nagar and Rajan (2014) analyze who speaks when on conference calls.) We consider all management members' tone jointly, and usually refer to them collectively as the *manager*. However, we posit that the CEO, for whose identity we control with fixed effects, possibly quite literally, "sets the tone."

3.1 Determinants of managerial tone

Managers host a quarterly earnings conference call ostensibly to announce and comment on earnings in the prior quarter. Presumably, other factors matter to managers, analysts, and investors as well. We now analyze which performance characteristics most influence the managers' tone.

Table 3 presents the results. The main regressions include quarterly market returns (and, therefore, no quarter dummies) as well as industry fixed effects. We record when CEOs, the presumed tone setters, change. Hence, we also employ CEO fixed effects, and cluster standard errors at the CEO level.

TABLE 3 ABOUT HERE

The table shows that the earnings surprise for a quarter – the difference between actual earnings and market expectations -- plays an important role in determining a manager's tone. This finding confirms the importance to managers of beating the market's expectations, as

Degeorge, Patel and Zeckhauser (1999) report. The change in earnings compared to the same quarter in the previous year matters mostly for tone in presentations.

A firm's stock return in the preceding quarter, as expected, correlates negatively with managerial negativity, also after controlling for general market performance. Downbeat returns in the stock market as a whole foster downbeat announcements. Past volatility in the firm's stock return as well as greater uncertainty among analysts regarding the earnings of the past quarter produce more negativity.

Industry norms also affect tone, with financial firms sober, and "less serious" industries upbeat. Thus, managers in banking and insurance are the most cautious, while the tone of managers in the candy and soda business, as well as those in restaurants and hotels, are among the most positive (results not reported). Managers of growth firms (high Tobin's Q) speak more positively.

The tone of prepared presentations responds more strongly than do answers to analysts' questions to recent stock returns and earnings. And for the answers themselves, recent stock returns receive relatively greater weight.

Not surprisingly, the more negative news there is to report, the more negative are both prepared remarks and the analysts' questions. More negative questions receive more negative answers.

Columns (4) to (6) control for CEO fixed effects, recognizing that individual managers may have word choice propensities (Bamber, Jiang and Wang 2010; Davis, Ge, Matsumoto and Zhang 2014). The results prove similar, with the coefficients being very close to the case with industry fixed effects.[10]

[10] In unreported results, we also find that standard CEO controls, such as CEO age, CEO tenure, CEO outsider status, or CEO/chairman duality do not systematically explain variation in managerial tone, and neither do proxies for general abilities of the CEO, as developed in Custódio, Ferreira and Matos (2013).

To parse the effects on negative and positive word use, we analyze frequencies looking at each category individually; see Table A-1 in the Supplementary Appendix. As before, negative (positive) words become more (less) frequent when: the economy worsens, a firm's stock price declines, or its earnings come in below the consensus forecast. Indeed, earnings surprise appears to play a crucial role, discussed initially by the managers and questioned subsequently by the analysts. In unreported analysis, the need to present poor results produces an increase in inconsistency in tone between presentations and answers, more uncertain words, more wrong tense use, and to some extent more complexity.[11]

In sum, recent past performance predicts managerial tone.

3.2 The outcomes predicted by tone surprises: Overview of main findings

To assess the implications of managerial tone, we focus on the excessive components of managerial tone, that is, the *tone surprise*. We first estimate as a benchmark the normal level of negativity justified by the company's past performance, after controlling for CEO fixed effects. This benchmark model is shown for presentations in regression (4) and for answers in regression (5) of Table 3. *Tone surprise*, or *residual negativity* is the difference between actual negativity and the fitted value. We denote residual negativity in presentation by RNP and residual negativity in answers by RNA. To facilitate interpretation, all residuals measures are standardized to have a zero mean and a standard deviation of one.

The remainder of the paper looks at how tone surprises relate to three areas: future earnings (and analysts' earnings forecasts), uncertainty about future earnings, and stock returns. Our

[11] Frankel, Johnson and Skinner (1999) find that managers are less likely to provide earnings guidance during conference calls when performance deteriorates, consistent with our findings. Matsumoto, Pronk and Roelofsen (2011) instead find that managers are more likely to tilt to future-oriented words when performance is poor. One difference in our methods is that we focus on the verb tense whereas they focus on specific words that arguably are future-oriented.

overarching hypothesis embraces two hypotheses: First, tone conveys information to market participants about both future earnings and their uncertainty. Second, analysts distill this information, and convey it to investors who then invest utilizing this knowledge. Tone surprise (residual negativity) is our independent variable of prime interest for all of these studies. If that surprise is positive, that is, if managers use a more negative tone than seems "warranted" based on public information, that is a bad sign and vice versa. Thus, we expect positive [negative] tone surprise both to predict lesser [greater] future earnings and earnings forecasts, and to raise [lower] uncertainty. These factors in turn imply that stock prices will react negatively to positive tone surprises.

Table 4 summarizes the main findings in the rest of the paper. Broadly speaking, in columns (1) and (2), we would expect to find negative reactions (thus minuses in the table) for future earnings, earnings forecasts, and immediate stock price reactions. The signs for greater uncertainty, which is a bad factor, should go in the opposite direction. For long-term returns, an insignificant effect would indicate that three days after the call all the information is already impounded into the stock price. We expect the same signs as for immediate stock price reactions if there is a post-conference-call drift (which means that the market moved in the right direction quickly, but adjusted less than fully). Instead, if there is a reversal, that is, if tone surprises have an opposite sign in regressions of long-term as opposed to immediate immediate stock price returns, that would indicate a misdirected short-term response.

TABLE 4 ABOUT HERE

We also conduct an analysis examining separately abnormal negativity and abnormal positivity. For example, we will determine the effect of abnormal positivity (negativity) in

presentations on earnings from the coefficient on the absolute value of RNP when the signed value of RNP is negative (positive). Where managers are abnormally negative, columns (3) and (5), we expect earnings and stock price reactions to be negative, but uncertainty to increase. Where managers are less negative than public information would suggest, columns (4) and (6), earnings and stock price reactions should be positive, but uncertainty should decrease.

A remarkable 35 of the 36 entries in the table go in the predicted direction. The remaining one shows zero effect. None goes opposite to our predictions. The remainder of the paper presents the empirical tests that produced these results.

4 Managerial tone, future earnings, and earnings forecasts

If managerial tone helps predict earnings, the stock market reaction to managerial tone is likely to reflect rational information processing. This conclusion would be strengthened if analysts, the key messengers of the financial community, also react sensibly to managerial tone. We examine these two points in turn.

4.1 The information leakage hypothesis

When quarter *t* has its earnings announced, the manager already has some idea of what to expect in the quarter *t*+1. He might reveal his expectations intentionally – thus a tip – for example, to align the market's expectations with his own. Alternatively, he might reveal them unintentionally -- thus a tell -- possibly even without noticing, and quite possibly contrary to his wishes. Whatever the source or the intent of the revelation, the content of the managers' tone unexplained by past results provides information about that company's prospects. Thus we are talking about information leakage: Managers reveal information about future earnings of the company by choosing (purposefully or inadvertently) the tone. Given such leakage, tone surprises, that is,

excess negativity, will predict earnings in the next quarter.

TABLE 5 ABOUT HERE

Table 5 strongly supports this hypothesis. Consider columns (1) to (3). We hypothesize that tone surprises would indicate that managers expect lower earnings in the future than past results would suggest. Indeed, excessively negative tone in both presentations and answers is associated with smaller future earnings.[12]

Columns (4) to (9) further develop these results. Columns (4) and (5) expand the earnings-prediction model by taking into consideration the forecasts of financial analysts. Column (4) considers the analysts' consensus just before the earnings announcement for quarter *t*, whereas column (5) computes the analysts' consensus following that announcement. The following consensus is the average of all current forecasts on the third day after the earnings announcement, implicitly positing that analysts incorporate new information within three days. Prior research shows that analysts' forecast revisions cluster around earnings announcements (Zhang 2008), with most revisions being made on the day of the earnings announcements or on the next trading day. Our results also hold when allowing for a seven-day period. Moreover, the results do not change if we include either lags of earnings or the previous quarter's tone surprise.[13]

Not surprisingly, analyst forecasts predict future earnings effectively. Importantly for this tips-and-tells study, the association between excessive negativity and future earnings still holds

[12] We note that using the residual negativity yields, in these basic regressions, the same inferences as using negativity and controlling for the same variables used to explain negativity in Table 3. However, using the tone surprise as the explanatory variable of interest strikes us as more intuitive. Moreover, this approach allows us to consider asymmetric effects of positive and negative residual negativity.

[13] Davis, Piger, and Sedor (2012) and Demers and Vega (2010) find that optimism predicts positive future earnings, which is in line with our results. By contrast, Huang, Teoh, and Zhang (2014) find that abnormally positive tone in annual earnings releases predicts lower future earnings. The difference between our findings and the latter paper's findings may, among other things, be due to a different domain (quarterly earnings conference calls and next quarter's earnings versus annual earnings press releases and earnings multiple years into the future).

strongly, though the coefficients are smaller than in column (3). Comparing columns (4) and (5), it appears that as analysts revise their forecasts, they take account of one third to one half of the information conveyed by tone.[14] We revisit analysts' responses in Section 4.2.

We expect abnormal negativity in residuals to predict earnings more strongly than abnormal positivity. Presumably powerful constraints operate on the negative side. That is, there are some things management should not (prefer not to) say about negative news, but which they could say comfortably about comparably positive news. Unusually negative statements imply overpowering some constraints and inhibiting factors. To examine this conjecture, we separate positive and negative residuals by multiplying them by dummy variables.

The results in columns (6) and (7) show that excess negativity in presentations and/or answers strongly signals lower earnings in the future. Though unusually positive presentations portend somewhat higher future earnings, the size of effect is much smaller than that for negative presentations. Unusually positive answers continue to have predictive power even after taking into account how analysts adjust their forecasts. Additional results, not presented, document that the predictive power of tone for the firm's performance extends to the medium-term horizon, namely up to earnings in the same quarter in the following year.

Columns (8) and (9) control for other speech characteristics. Their main result is that tone surprises retain their predictive power. In firms where managers use more uncertain words, more strong modal words, and where they employ more atypical tenses, lower future earnings are to be expected. Perhaps surprisingly, weak modal words display a positive association with future

[14] For example, in column (4), which does not control for the updated earnings forecast but for the forecast on the day before the call, the coefficient on RNP is -0.053. In column (5), which controls for the updated forecast, the coefficient is -0.037. Thus, analysts capture, on average, (0.053-0.037)/0.053, or about a third, of the information.

earnings.[15] Column (9) shows that differences in tone between presentations and answers, in either direction, relate negatively to future earnings.

In sum, the stock market and future earnings react to tone in the same and the predicted manner. This provides the first critical component of the hypothesis that the stock market reaction reflects the processing of value-relevant information.

4.2 Analyst reactions

The stock market requires a channel for getting informed about tone. No doubt some stock market investors simply listen to the conference call directly, and respond. For a much broader audience of investors, it is likely that sell-side analysts, the professionals allowed to ask questions on these calls, serve as the conduit of information. That is, analysts read and report on the tea leaves set forth by firm managers. Then investors respond to what analysts say. Thus, a market reaction to managerial tone is more likely to be due to information transmission if analysts' forecasts also respond to tone.

The results in Table 6 show how analysts react to tone. Analysts adjust their forecasts downward when the manager is negative, even controlling for observables (columns (1) to (3)). (This result contrasts with the findings in Mayew and Venkatachalam (2012), who find no association between linguistic tone and forecast revision activity.) Thus, analysts respond to tone surprises by adjusting their forecasts in the direction those surprises imply for future earnings.[16] Recall that residual negativity is standardized to have a zero mean and a standard deviation of

[15] This result also holds when not controlling for uncertain words, and is thus not due to the (moderate) correlation between these two word frequencies. One interpretation is that weak modal words capture appropriately careful statements of management.

[16] Analysts sometimes hold private calls with management just after the public conference calls (Soltes 2014). Thus, analyst reports after conference calls often contain topics that were not discussed on the call (Huang, Lehavy, Zhang and Zheng 2014). The result we document may thus arise in part from analysts following up with management to clarify why management spoke particularly positively or negatively, thus obtaining more specific information with which they can support their forecast changes.

one. The coefficient of -2.452 in column (1) means that, on average across analysts, a one standard deviation increase in residual negativity in the presentation section of the conference call reduces the earnings forecast for the next quarter by 2.45%, a sizable effect. Columns (4) and (5) show that they adjust more strongly following excessive positive as opposed to excessive negative surprises, especially in answers.

TABLE 6 ABOUT HERE

If analysts' forecasts accurately capture the tone of managers' speech, errors in those forecasts should not relate to the degree of the managers' excessive negativity. As column (6) shows, RNP is weakly negatively related with the forecast error. By contrast, positive forecast errors (expectations are above actual earnings) become larger and possibly more frequent when managers are excessively negative in answers. In other words, analysts on average tend to overreact to excessively negative presentations, but significantly underreact to excessively negative answers.[17]

These are averages, but analysts differ significantly in their ability to pick up tips and tells. To parse these differences, we consider each analyst's experience. Computing, from column (7), point estimates and significance levels for the association of residual negativity in presentation with the forecast error, we find that a novice analyst (one with one year of experience) will under-forecast future earnings by 1.7% (= -1.735 + ln(1)*0.606), whereas the forecast of an analyst with 7 years of experience (the median) will be statistically indistinguishable from the earnings actually realized. In results not reported we confirm that this result arises because

[17] These results are consistent with the observation in Table 5, column (3), that even after controlling for updated average forecasts, RNP and RNA still tells us something about future earnings. The two sets of analysis differ somewhat, though, as in Table 6 we consider individual analysts as the units of observation.

novice analysts reduce their earnings forecasts more strongly in response to abnormal negativity in presentations.

The results show a different pattern in response to residual negativity in answers. Novice analysts adjust their forecasts to tone surprises much less than experienced analysts. Column (7) implies that, if residual negativity in answers increases by one standard deviation, a novice analyst will tend to under react – pay insufficient heed -- and thus over-forecast next quarter's earnings by 3.5%, whereas the 7-year analyst will make a smaller, but still (marginally) significant error of 2.4% (=3.454 + ln(7)*(-0.527)). Fortunately, greater experience further tempers the errors. An analyst with 15 years of experience (the 90th percentile) makes no statistically significant error. In the final column (8), we include analyst fixed effects, which control for time-invariant differences among analysts that may be correlated with experience and forecast accuracy. Thus, these results focus on the variation in experience for a given analyst (rather than comparing across analysts). Interestingly, the coefficients on RNA and on the interaction with RNA increases strongly. Presumably, learning to distill valuable information from answers is harder than distilling what is in prepared presentations. The results reported here also hold when we give analysts 7 days to adjust their forecasts after the conference call. Overall, when novice analysts distill the message of tea leaves, they give too much credence to prepared remarks, and too little to less rehearsed answers. The former are almost certainly tips, the latter are relatively much more likely tells.

In sum, the results on future earnings and earnings forecasts are consistent with the idea that managerial tone conveys information regarding future earnings.

5 Managerial tone and uncertainty

Greater uncertainty about a firm's future depresses its stock price, since it drives up the discount

rate the market applies to those future earnings. This section investigates how the tone in a manager's speech impacts (analyst) uncertainty following the conference call.

TABLE 7 ABOUT HERE

Table 7 documents that residual negativity predicts a greater standard deviation of forecasts regarding next quarter. Excess negativity has a greater absolute effect than excess positivity.

The degree of uncertainty, as reflected in the disparity in analysts' predictions, is greater the more tone differs between presentations and answers, and when management uses more uncertain or more strong modal words and fewer weak modal words.

In Table A-2 in the Supplementary Appendix, we document that the effects of tone surprises also can be seen in a greater revision frequency after the call. Moreover, that table shows that when management speaks excessively negatively, bid-ask spreads increase from just before to just after the call.

Collectively, these results imply that negative managerial tone and certain "cloaking" patterns appear to sow uncertainty among analysts – the tea leaf readers for the financial community.

6 Managerial tone and stock returns

6.1 Immediate stock market reactions

We now examine whether and how effectively the market, not merely analysts, reads between the lines. Columns (1) to (6) of Table 8 consider the immediate stock market reaction. They regress CAR01, the abnormal returns on the day of the conference call plus the immediately following day, on managerial tone. All regressions control for the earnings surprise, several other firm-

level controls, and industry and CEO fixed effects.

TABLE 8 ABOUT HERE

Columns (1) to (3) of Table 8 show that excessive negativity (in both presentations and answers) relates strongly negatively to the short-term stock market reaction around the earnings announcement. Mayew and Venkatachalam (2012) (for a year 2007 cross-section) and Price, Doran, Peterson and Bliss (2012) (for a 2004-2007 panel) find similar effects. Working with residual negativity allows us to separate out the effects of abnormal negativity and abnormal positivity; see columns (4) and (5). The market appears to take abnormal positivity more strongly into account than abnormal negativity.

Columns (6) and (7) of Table 8 investigate how the stock market reacts to the other speech patterns we measure in conference calls. Inconsistency in tone is by itself negatively related to short-term stock reactions, as is the use of uncertain words. Shareholders also respond negatively to management using the past tense in the answers part of the earnings call and to talking in the present or future tense in the presentation part of the earnings call. Perhaps surprisingly, but consistent with findings for earnings, investors react favorably to the use of weak modal words by managers.

Interestingly, when the answers section is longer, investors seem to sense trouble ahead, as can be seen in the, the negative coefficient on the number of words management speaks in the Q&A part of the conference call. Finally results also hold controlling for the previous quarter's tone surprise.

Overall, tone surprises prove to be a very robust determinant of stock return reactions.

6.2 Excess returns over the next quarter

Next, we consider how stock prices behave in the quarter following a conference call. If stock prices respond immediately to managerial tone but then revert back to their levels before the call, this would suggest that tone does not indicate fundamental value. If initial movements are sustained, by contrast, this would suggest that the immediate reaction was rational. Assuming no reversal, a medium-term study can shed light on how quickly information is incorporated in stock prices.

Given well known results from another arena, on post-earnings announcement drift, it would not be surprising if after part of the information from tone in conference calls was absorbed, there would be further drift in the same direction. For example, to the extent that earnings announcements are relied on insufficiently, we might also expect that for information contained in tone. Moreover, under-reaction may be inherent because analysts are cautious about acting on difficult-to-convey information, such as managerial tone. Recall from Section 4 that within the first three days after the conference call analysts on average revise their earnings forecasts only about a third of or half the way of what tone surprises actually predict for future earnings. Thus, we expect to see a drift beyond the initial response time frame.

As a baseline result, we first plot the earnings announcement drift over the quarter following the earnings announcement within our sample. Specifically, we compute cumulative value-weighted excess returns of portfolios formed on the earnings surprise. As described earlier, the returns are characteristics-adjusted following Daniel, Grinblatt, Titman and Wermers (1997).

Figure 1 presents a familiar picture: Companies in the highest quintile of the earnings-surprise experience an immediate positive stock price reaction, but there is a drift upwards over the quarter that follows. Similarly, companies in the lowest quintile of earnings are punished by the market immediately. They then drift downward further following the initial reaction. This is

the well-known post-earnings announcement drift (PEAD).

FIGURE 1 ABOUT HERE

Our main interest is with the stock returns of portfolios sorted by tone negativity. Figure 2 shows the results in Panels A and B. They respectively show the characteristics-adjusted excess returns of portfolios sorted on negativity in presentations and answers. Several results are noteworthy. First, there is no reversal, but rather a post-conference call drift (PCCD) that is partially associated with managerial tone.[18] Moreover, this drift pattern is found in both graphs. Second, it takes the market three days to incorporate high negativity. This is in contrast to the immediate one-day jump in the case of the earnings surprise.[19] That it takes three or more days for a large part of the response in stock prices to take place is consistent with the idea that the nuggets of information available "between the lines" of conference calls are more difficult to digest than the quantitative information in earnings announcements.

FIGURE 2 ABOUT HERE

To control in addition for the earnings surprise, Panels C and D first sort firms into 5 quintiles of the earnings surprise and then, within each earnings surprise quintile, into 5 quintiles of negativity. Q1 of negativity then is the average excess return of those firms in the lowest

[18] Our results on characteristics-adjusted returns are consistent with and add to the findings in the 2004-2007 sample of Price, Doran, Peterson, and Bliss (2012), who document size-adjusted excess returns to sorting on negativity in conference calls. By contrast, Huang, Teoh, and Wang (2014) find a reversal after abnormally positive tone in annual earnings announcements. In their setting, this is consistent with their finding that a positive abnormal tone actually predicts lower earnings. In our case, a reversal could also have happened in particular for presentations because, as we saw, abnormal positivity in presentations is not significantly positively associated with future earnings. We documented above that residual tone in answers predicts future earnings and uncertainty.

[19] We also note a steep decline in the highest quintile portfolio around days 47-49. In fact, a similar decline also occurs in the post-earnings announcement drift graph in Figure 1.

quintile of negativity, averaged across the five earnings surprise groups, and so on.[20] The same picture emerges as in Panels A and B. Very similar graphs appear if we sort directly on residual negativity.

Table 9 shows, for these double-sorted portfolios, the value-weighted average DGTW characteristic-adjusted excess returns from the day after the conference call until day 60. As can be seen, within each earnings surprise quintile, returns decrease with negativity.

TABLE 9 ABOUT HERE

The differences in excess returns across the portfolios are sizable. The move from the top to the bottom quintile in negativity (which corresponds to an approximately two standard deviation move in negativity, from 0.2 negative words per positive word to 1.3 negative words per positive word), foreshadows a return differential of roughly 1 percentage point. The same two standard deviation move in the earnings surprise itself (a move from Q1 to Q5 in Figure 1, from a negative earnings surprise of -0.4% to a positive earnings surprise of +0.6%) implies a return differential of about 2 percentage points. In other words, sorting on managerial tone adds another 50% to return differences.

Columns (8) to (10) of Table 8 study the statistical significance of the post-call drift in the days 3 to 60 after the conference call when one also controls for other factors. Interestingly, column (8) suggests that on average the drift in additional excess returns is approximately the same size of as the one realized in the immediate time window. This is broadly consistent with the observation in Table 5 that analysts on average respond approximately one third or half way in their earnings forecast changes, that is, that after controlling for updated earnings forecasts,

[20] The conditional sorting procedure ensures that we have an equal number of companies in each of the resulting 25 portfolios. An independent sorting yields very similar results.

residual negativity still holds explanatory power for future earnings.

Columns (9) and (10) suggest that the significance of the post-call drift is stronger for excessive negativity than for excessive positivity. Thus, the market appears to more quickly incorporate good news than bad news, which is consistent with the fact that just after the conference call analysts change their forecasts more strongly in response to excessive positivity than excessive negativity (recall column (4) and especially column (5) of Table 6). Table 8 also shows that firms where managers use atypical tenses tend to underperform significantly over the medium term.

Supplementary Table A-3 reports the results for CAR060 as the dependent variable. It shows that over the whole quarter stock prices react somewhat more strongly to excessive negativity than to excessive positivity. This is consistent with the earlier findings that excessive negativity predicts earnings and uncertainty more strongly than excessive positivity.

In sum, even after controlling for the earnings surprise, firms with highly negative conference calls underperform the benchmark of firms with similar characteristics, while high-positivity firms over-perform. We observe a drift after the initial reaction and no general reversal. These are important findings as a reversal would have indicated that the initial stock price reaction merely reflected short-term sentiment. By contrast, the present results accord with our broader finding that stock price reactions to managerial tone represent reasonably rational responses. The drift that follows, however, indicates that the market fails to immediately price the information fully.

7 Heterogeneity among firms and the managerial-tone-response coefficient

We have documented that negative tone in the earnings conference call is associated with (a) lower future earnings and lower earnings forecasts, (b) greater uncertainty about earnings, and (c)

negative stock price reactions. This evidence is fully consistent with a causal effect of managerial tone on stock price reactions. However, we sought an additional test of the hypothesis that the stock market's reaction is due to rational processing of information. This led to the following intuitive joint hypothesis. The market's reaction to tone will vary across firms. In firms where the market reacts strongly to managerial tone, we would expect managerial tone to be particularly strongly related to future earnings and/or uncertainty.

Specifically, we hypothesize that in firms where a large (either positive or negative) earnings surprise has just occurred, the tone surprise should be particularly informative because there is more news to be explained, that is, in these firms we should observe stronger reactions of earnings, uncertainty, and stock returns. Table 10 provides evidence supporting this hypothesis: In the firms in the highest absolute earnings surprise quartile, tone surprises very strongly predict each of lower future earnings, higher uncertainty, and negative stock reactions. By contrast, in the lowest earnings surprise quartile, the impact of residual negativity on these quantities is much smaller.

TABLE 10 ABOUT HERE

Table 11 tests these ideas more formally. Specifically, each quarter, we sort firms into 20 quantiles of the absolute earnings surprise. We then construct 20 portfolios, where the first portfolio contains all firm-quarter observations across the sample that are in the bottom five percent of the absolute earnings surprise and the 20^{th} portfolio contains the observations in the top five percent of the absolute earnings surprise. (The reason to sort firms in portfolios is to reduce measurement error and to avoid results that are driven by outliers, as would potentially be the case in by-firm regressions in quarterly data as in the present case.) Then, within each

portfolio we run panel regressions of earnings in the quarter t+1 on residual negativity in presentation (RNP) and residual negativity in answers (RNA), and we save the coefficients on these variables. To help interpret the results, we define *Sensitivity of future earnings to RNP* (and *to RNA*) as the *negative* of these saved coefficients. Thus, the larger the Sensitivity of future earnings to RNP, the stronger will be the negative association of the current residual negativity in presentation and future earnings.

We then regress stock reactions on the two residual negativity measures and the interactions of these residuals with the corresponding sensitivity measure. If the coefficient on such an interaction is negative, this means that the stock market reacts more negatively to excessive negativity of management precisely where this excessive negativity more strongly indicate poor future earnings. We note that, in this approach, we have an errors-in-variables problem, which biases the coefficients towards zero. This implies that any results we secure will be understated.

TABLE 11 ABOUT HERE

Column (1) of Table 11 shows that excessive negativity in presentations is associated with negative stock price reactions, as we had already seen earlier. Our current interest is whether this effect is more pronounced in those companies where tone surprises are more informative. The interaction term in column (1) shows just such complementarity. Similarly, column (2) shows a significant interaction term for tone surprises in answers.[21]

The findings in columns (3) and (4) suggest that both negativity in presentations and in

[21] We caution that even taking into account the heterogeneous responses, consistent with other studies investigating tone, the additional explanatory power of qualitative information for stock returns is not large; although R-squared increases from 0.11 to 0.12 when including the interactions (a 1 percentage point increase, but a roughly 10% increase), the R-squared remains low.

answers gets priced into stock prices because either one increases uncertainty. The interaction term reveals that the stock market response to tone surprises is particularly pronounced in those companies where tone surprises strongly impact analyst uncertainty.

Supplementary Appendix Table A-4 presents the results of an alternative approach. There, we reverse the investigation in the following sense: We regress future earnings and uncertainty on unusual managerial tone and the interaction of unusual tone with the sensitivity the stock market has shown, on average, to unusual tone in the respective firm. As one would expect given the results presented in this section, we find that where the market reacts more strongly to unusual tone in presentations, unusual tone more strongly predicts future earnings and to some extent analyst uncertainty (see the significant interaction terms with RNP in columns (1) and (3)). And where the market reacts more strongly to unusual tone in answers, unusual tone predicts future uncertainty strongly and earnings to some extent.

Overall, these findings show that the market reacts more strongly to tone for firms where tone has greater predictive impact on future earnings and on analyst uncertainty. This is as it should be if stock market participants rationally process value-relevant information from the conference call. Thus, our additional test of rational processing is passed.

8 Additional results and robustness tests

Institutional investors: In firms with more institutional investors, managers are generally somewhat more negative in their answers. When distinguishing among institutional investors, using the classification of institutional investors developed by Bushee (2001),[22] we find that analysts tend to be more sober in companies with a lot of "dedicated," low investment turnover

[22] These data are available for the years up to 2010 from http://acct3.wharton.upenn.edu/faculty/bushee/IIclass.html.

investors, while they are less negative in companies with a large fraction of "transient" institutional investors.

Simple word list. The extensive word list used in the main part of the paper is comprehensive, but may differentially credit tone patterns of managers who use richer vocabularies. As a robustness check, we therefore repeated the main analysis using a simpler, streamlined classification list. To construct this list, we tallied the list of the most frequently used words in conference calls, and then classified those that were 1) positive, 2) negative, and 3) those indicating uncertainty. The complete list of chosen words in these three groups, arranged by their frequency, is shown in Table A-5 in the Supplementary Appendix. Most of the words on our word list also appear on the Loughran and McDonald (2011) list; there are some exceptions, such as the word "growth." Naturally, using our own stricter classification for words, the percentages of negative and positive words is much lower for negative words, about 0.28%, and slightly lower for positive words, 1.02%, of all words used in either presentations or answers. Results not reported show that our main findings are not sensitive to the choice of word classification list.

Earnings surprise. Rather than using the earnings surprise decile, we also used the actual earnings surprise, divided by the stock price. The results prove similar.

Distance from the earnings announcement and conference calls concerning other topics. 85% of the conference calls take place on the day of the earnings announcement; 13% take place on the following day; and almost all other calls take place in the following two weeks. Restricting the sample to firms whose conference calls and earnings announcements coincide does not change the results. Conversely, sometimes, within close vicinity of the earnings announcement, firms hold conference calls concerning topics that do not only relate to earnings but concern other corporate events. Including these roughly 1,000 calls generally strengthens our results. (Results presented exclude these non-earnings calls, however.)

Other estimation technique and two-way clustering of standard errors. Throughout the analysis, we estimated the tone surprise including CEO fixed effects. All results hold when using only industry effects only (thus not conditioning residual negativity on the typical tone of the CEO and his management team). In addition to clustering standard errors on the CEO level (as in the main analysis), we also clustered standard errors across periods. The results were sustained, suggesting that firm (or manager) effects (Petersen 2008) are not important in this analysis.

9 Conclusion

Managers conduct conference calls to accompany earnings announcements. Stock prices respond to the words managers employ. The overarching hypothesis tested in this paper is that these responses are consistent with the rational use of the embedded information. That hypothesis is confirmed.

We first establish that the most important determinant of tone is the gap between the analysts' expectations and the actual earnings. Beyond that, weak EPS growth in the past year and poor recent stock returns, as well as higher volatility, increase the frequency of negative words used by the managers.

We then test two broad hypotheses. Hypothesis 1 holds that deviations from expected tone patterns, *tone surprises*, help predict a company's future performance. Consistent with this hypothesis, we document that excessive negativity not explained by past performance foreshadows lower than hitherto expected future earnings. That is, managers leak information, perhaps purposefully (through a tip) or inadvertently (through a tell). We also show that higher excessive negativity magnifies analyst uncertainty, as is reflected in larger variance in forecasts, more frequent forecast revisions, and increased bid-ask spreads.

A second set of tested hypotheses, Hypotheses 2A, 2B and 2C, sought insight into the

causes of this pattern.

First, consistent with Hypothesis 2A, the market reacts more strongly to tone surprises in those firms where surprises more strongly predict future earnings and uncertainty, as our rational response theory would require.

Second, consistent with Hypothesis 2B, after the initial response to the conference call, stock prices of companies drift further in the direction the tone suggested. In other words, more information is conveyed by tone than the market initially processes.

Third, consistent with Hypothesis 2C, we find an intriguing pattern of analyst responses to managerial tone. Experienced analysts appear to recognize that tone surprises predict future earnings, and they adjust their forecasts appropriately. Inexperienced analysts, however, have a less accurate and less nuanced response: They overreact to abnormally negative tone in presentations, but underract to abnormal negativity in responses to analysts' questions.

Overall, this coherent set of results, with 35 of 36 signs (Table 4) going in the predicted direction, strongly supports the Rational Reactions Hypothesis: "Market participants rationally distill value-relevant information from tone over and above observables such as earnings." In other words, participants read "between the lines" to process the information contained in the tips and tells conveyed by managers.

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Figure 1: Post-earnings announcement drift

This figure shows excess returns of five portfolios of stocks. Quintile portfolios were formed on the mean earnings surprise. The graph shows, at each event time t (in trading days), the cumulative value-weighted excess return of each portfolio from the time it was formed until time t. Excess returns are computed as characteristics-adjusted returns, using the methodology of Daniel, Grinblatt, Titman and Wermers (1997), adapted to the case of daily returns.

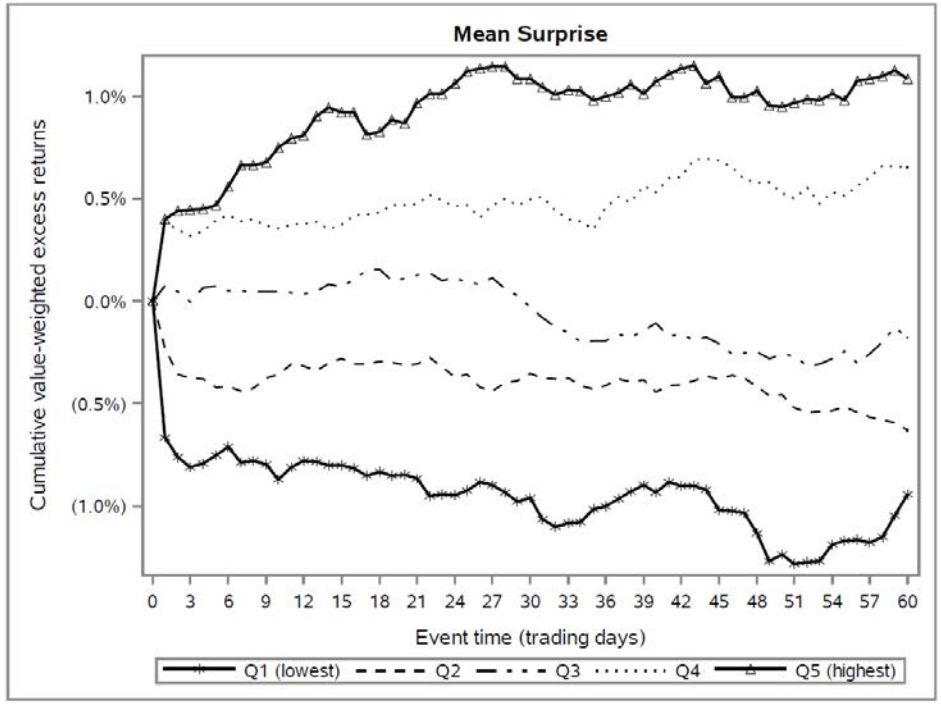
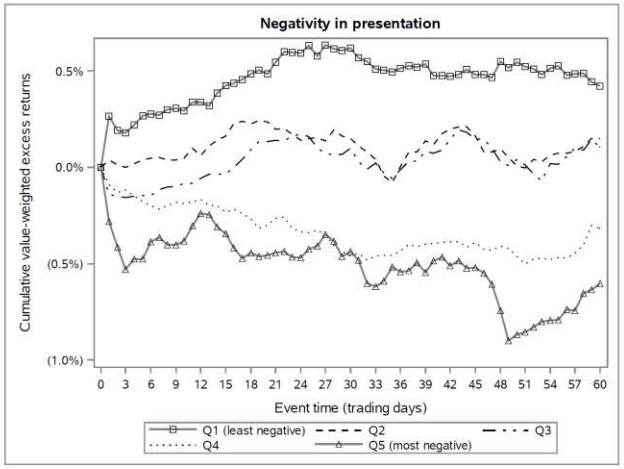
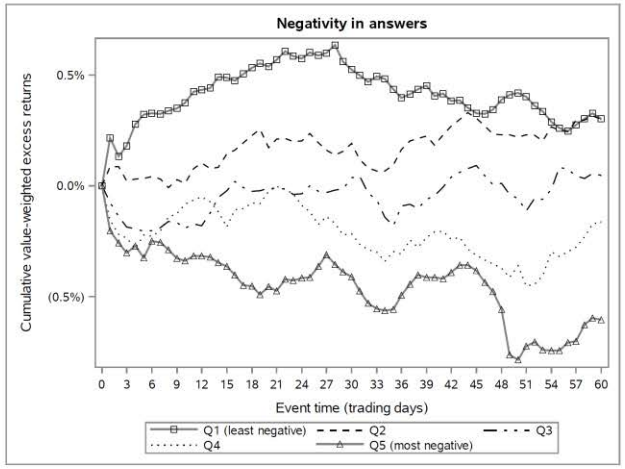


Figure 2: Post-conference call drift

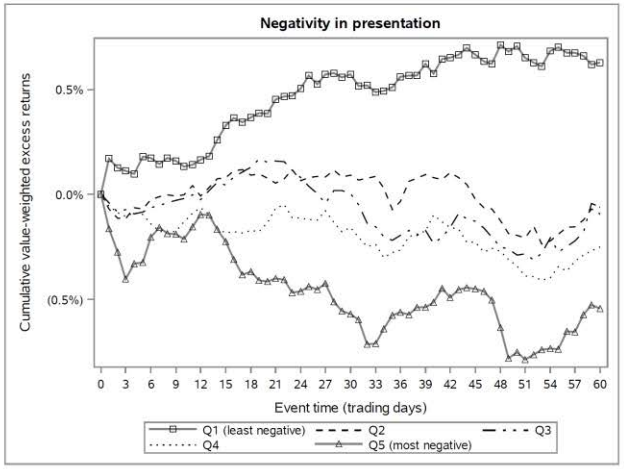
Each panel in this figure shows excess returns of five portfolios of stocks. Quintile portfolios were formed based on the variables noted in the caption of each figure. The graph shows, at each event time t (trading days), the cumulative value-weighted excess return of each portfolio from the time it was formed until t. Excess returns are computed as characteristics-adjusted returns, using the methodology of Daniel, Grinblatt, Titman and Wermers (1997), adapted to the case of daily returns. In Panels C and D, to control for the earnings surprise, firms are first sorted into 5 quintiles of the earnings surprise and then, within each earnings surprise quintile, into 5 quintiles of negativity. Q1 of negativity then is the average excess return of those firms in the lowest quintile of negativity, averaged across the five earnings surprise groups, and so on.



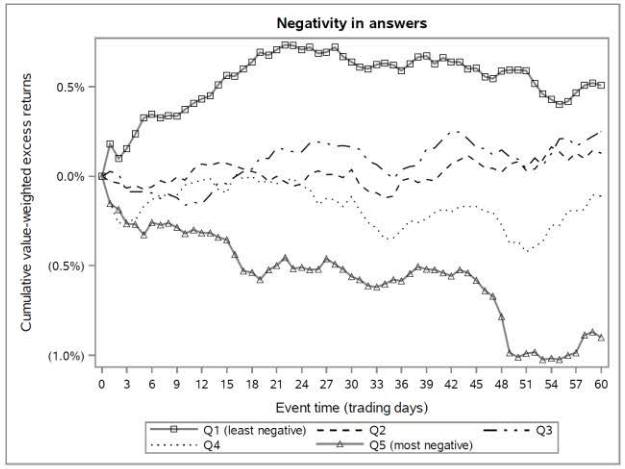
Panel A: Portfolios sorted by negativity in presentation



Panel B: Portfolios sorted by negativity in answers



Panel C: Double-sorts: Negativity in pres. and earnings surprise



Panel D: Double-sorts: Negativity in ans. and earnings surprise

Table 1: Variable Descriptions

Variable Name	Definition	Source
Stock return	The firm's capital gain in the elapsed quarter, that is, the difference of the share price 5 days before an earnings announcement for quarter *t* minus the share price 5 days after the earnings announcement for quarter *t*−1, divided by the stock price 5 days after the earnings announcement for quarter *t*−1	CRSP
Earnings surprise	The difference between actual and consensus forecast earnings (the mean of the most recent analyst forecasts recorded in I/B/E/S during the 90 days before the quarterly earnings announcement), divided by the share price 5 days before the earnings announcement	IBES
EPS growth since same quarter last year	Earnings in quarter t, minus the earnings in the same quarter in the previous year, divided by the earnings in the same quarter in the previous year	Compustat
Market return	The percent value-weighted market return for the period starting 5 days after an earnings announcement for the quarter *t*−1 and ending 5 days prior to the earnings announcement for the quarter t.	CRSP
Monthly volatility	The monthly stock volatility computed from monthly return data over the past 48 months	CRSP
Ln (assets)	The natural logarithm of total assets	Compustat
Tobin's Q	The ratio of the market value of assets to the book value of assets	Compustat
Earnings in quarter t+1	Earnings per share in the next quarter	IBES
Forecast change	The change in the analyst's forecast for earnings in quarter t+1, from the day before the conference call to three days after the call, divided by the earnings in quarter t+1, multiplied by 100	IBES
Forecast error	The difference between the post-conference call forecast (the forecast for quarter t+1 outstanding 3 days after the conference call for quarter t) and the actual earnings in quarter t+1, divided by the earnings in quarter t+1, multiplied by 100	IBES
Analyst experience	The natural logarithm of the number of years an analyst has been in the IBES database	IBES
Pre-call forecast std. dev.	The standard deviation of analysts' earnings forecasts for quarter *t* that are outstanding the day before quarter *t*'s earnings are announced.	IBES
Post-call forecast std. dev.	The standard deviation of analysts' forecasts for earnings in the next quarter (t+1) outstanding three days after the conference call	IBES
Revision frequency	The number of revisions after the conference call for quarter t until the earnings announcement of quarter t+1, divided by the number of analysts	IBES

[continued on next page]

Table 1: Variable Descriptions [continued]

Variable Name	Definition	Source
Change in bid-ask spread	The change in the average bid-ask spread (divided by the midpoint between the bid and the ask) from the [-3,-1] window prior to the conference call to the [+1,+3] window following the conference call, multiplied by 100	CRSP
CAR01	The two-day, [0,1] cumulative Daniel, Grinblatt, Titman and Wermers (1997) (DGTW) characteristic-adjusted stock return on or after the conference call date, in percent. DGTW characteristic-adjusted returns are defined as raw daily returns minus the returns on a portfolio of all CRSP firms in the same size, market-book, and 1-year momentum quintiles	CRSP, WRDS, own calculation
CAR360	The 58 trading days [3,60] cumulative DGTW characteristic-adjusted stock return in percent from 3 days after the conference call date through 60 days.	CRSP, WRDS, own calculation
Inconsistency in tone	The absolute difference in negativity between presentations (prepared speech) and answers (improvised speech)	Own calculation
Complexity	The words per sentence, calculated as a weighted average of presentation and answers	Own calculation
Atypical tense	We code tense use as described in Section 2.2.2. Atypical tense is the weighted average percentage of the manager's verbs not in the past tense in the presentation and the manager's verbs not in the present or future tense in the answers, weighted by the number of verbs in the two respective conference call parts	Own calculation
Residual Negativity (RN)	Residual negativity in presentation (RNP) is the residual of regression (4) in Table 3. Residual negativity in answers is the residual of regression (5) in Table 3. All residuals are standardized to have 0 mean and a standard deviation of 1	Own calculation

Table 2: Descriptive statistics

Panel A: Descriptive statistics for company characteristics and analyst behavior

This table provides descriptive statistics. All variables are defined in Table 1. We winsorize stock return, earnings surprise, EPS growth, Tobin's Q, earnings, forecast change, forecast error, and CAR01 at the 1 and the 99 percent levels. We winsorize pre- and post-call forecast standard deviation, revision frequency, and the pre- and post-call bid-ask spread – quantities that cannot go below 0 -- at the 99 percent level. We winsorize negativity as well as the percent uncertain words, the percent strong modal words, ther percent weak modal words, complexity, and the percent atypical tense at the 1 and 99 percent levels.

Company characteristics and analyst behavior	Obs	Mean	Std. Dev.	Min	Max
Stock return	14213	0.02	0.13	-0.41	0.41
Earnings surprise	14270	0.00	0.01	-0.03	0.02
EPS growth since same quarter last year	14223	0.07	0.92	-4.03	5.00
Market return	14288	0.02	0.09	-0.33	0.29
Monthly volatility	14288	0.09	0.05	0.01	0.47
Ln (assets)	14288	9.62	1.35	6.11	14.68
Tobin's Q	13750	1.85	1.03	0.83	6.38
Earnings next quarter	14274	0.73	0.63	-0.75	3.31
Forecast change	137874	-1.87	20.82	-115.38	84.62
Forecast error	160766	-4.60	46.59	-224.32	233.33
Analyst experience	171178	1.89	0.73	0.00	3.43
Pre-call forecast std. dev.	13995	0.05	0.07	0.00	0.51
Post-call forecast std. dev.	13839	0.06	0.08	0.00	0.46
Revision frequency	14225	0.56	0.82	0.00	5.88
Change in bid-ask spread	14263	0.00	0.11	-1.16	1.10
CAR01 (Cumulative abnormal return [0; 1])	13387	0.08	5.18	-16.29	15.39
CAR360 (Cumulative abnormal return [3; 60])	13020	0.34	11.09	-33.82	33.36

[continued on next page]

Table 2, Panel B: Descriptive statistics for managerial tone and other speech characteristics [continued]

Tone	Obs	Mean	Std. Dev.	Min	Max
Negative words in presentation	14288	33.63	23.89	0	446
Negative words in answers	14288	31.54	17.21	0	446
Negative words in analysts' questions	14288	20.72	11.34	0	363
Positive words in presentation	14288	66.19	35.66	0	349
Positive words in answers	14288	50.80	24.58	0	256
Positive words in analysts' questions	14288	15.04	8.43	0	118
% Negative words in presentations	14288	0.86	0.44	0	3.81
% Negative words in answers	14279	0.75	0.29	0	4.00
% Positive words in presentations	14288	1.68	0.58	0	5.45
% Positive words in answers	14279	1.20	0.40	0	3.52
Negative/positive words in presentation	14284	0.60	0.43	0	2.57
Negative/positive words in answers	14263	0.71	0.42	0	2.60
Negative/positive words in analysts' questions	13991	1.66	1.09	0	7.00
Negativity ((n-p)/(n+p+1)) in presentation	14288	-0.32	0.27	-0.95	0.44
Negativity ((n-p)/(n+p+1)) in answers	14288	-0.22	0.24	-0.92	0.45
Negativity ((n-p)/(n+p+1)) in analysts' questions	14288	0.15	0.25	-0.90	0.74
Residual negativity in presentation (RNP)	13861	0.00	1.00	-2.07	2.45
Residual negativity in answers (RNA)	13861	0.00	1.00	-1.76	2.58

[continued on next page]

Table 2, Panel B: Descriptive statistics for managerial tone and other speech characteristics [continued]

Other speech patterns	Obs	Mean	Std. Dev.	Min	Max
Difference in negativity of presentation and answers	14260	-0.12	0.43	-2.35	2.47
Absolute difference in negativity of presentation and answers	14260	0.32	0.32	0.00	2.47
% Uncertain words	14288	0.70	0.21	0.15	1.92
% Strong modal words	14288	0.58	0.18	0.23	1.19
% Weak modal words	14288	0.22	0.09	0.05	0.50
Complexity (words per sentence)	14288	22.65	2.54	15.59	32.32
% Past tense verbs in presentation	14288	47.06	8.60	10.91	85.14
% Present tense verbs in presentation	14288	43.76	7.99	10.64	81.82
% Future tense verbs in presentation	14288	9.18	3.51	0.00	37.50
% Past tense verbs in answers	14279	28.28	4.80	0.00	100.00
% Present tense verbs in answers	14279	62.26	5.42	0.00	100.00
% Future tense verbs in answers	14279	9.46	3.32	0.00	60.00
% Past tense verbs in analysts' questions	14052	32.46	5.87	0.00	100.00
% Present tense verbs in analysts' questions	14052	61.74	6.04	0.00	100.00
% Future tense verbs in analysts' questions	14052	5.80	2.67	0.00	80.77
% Atypical tense	14279	40.23	5.86	19.50	75.39
Words Presentations	14288	3904.80	1580.55	80	26453
Words Answers	14288	4217.35	1529.47	0	19380
Phrases Presentations	14288	167.73	67.94	5	1141
Phrases Answers	14288	195.67	73.24	1	910

Table 3: Negativity in the tone of conference calls

This table presents panel regressions. The dependent variable is the negativity of the tone in presentations (columns 1 and 4), in answers (column 2 and 5), and in analysts' questions (columns 3 and 6). Negativity is (Negative words – Positive words) / (Negative words + Positive words + 1). The explanatory variables are defined in Table 1 and in the text. Columns (4) to (6) include CEO fixed effects. T-statistics are shown in parentheses. The underlying standard errors are clustered on the CEO level and robust to heteroskedasticity. * p<0.1, ** p<0.05, *** p<0.01.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: Negativity in	Presentations	Answers	Questions	Presentations	Answers	Questions
Stock return in quarter t	-0.153***	-0.068***	-0.169***	-0.107***	-0.073***	-0.142***
	(-8.84)	(-4.94)	(-10.71)	(-7.06)	(-5.64)	(-8.84)
EPS growth since same quarter last year	-0.025***	-0.000	-0.004**	-0.021***	-0.002	-0.005**
	(-8.84)	(-0.02)	(-2.02)	(-8.33)	(-1.10)	(-2.19)
Earnings surprise decile	-0.014***	-0.001	-0.007***	-0.013***	-0.003***	-0.007***
	(-15.15)	(-1.36)	(-9.52)	(-17.77)	(-3.80)	(-10.36)
Monthly volatility quarter t	0.224*	0.228***	0.096	0.205**	0.232***	-0.223**
	(1.96)	(3.04)	(1.45)	(1.97)	(2.63)	(-2.51)
Pre-call forecast std. dev.	0.454***	0.061	0.136***	0.486***	0.116***	0.097**
	(6.60)	(1.47)	(3.66)	(9.48)	(3.35)	(2.48)
Negativity in presentation		0.195***	0.114***		0.153***	0.112***
		(16.90)	(16.72)		(19.07)	(16.20)
Negativity in analysts' questions		0.052***			0.044***	
		(25.00)			(23.03)	
Ln(words in the presentation)	-0.054***			-0.013		
	(-3.47)			(-0.93)		
Ln(words in the answers)		-0.018***			-0.015**	
		(-2.80)			(-2.45)	
Ln(words in the analysts' questions)			0.020***			0.024***
			(12.95)			(15.61)
Market return in quarter t	-0.264***	-0.082***	-0.125***	-0.246***	-0.108***	-0.106***
	(-11.94)	(-3.98)	(-5.45)	(-12.20)	(-5.48)	(-4.52)

[continued on next page]

Table 3: Negativity in the tone of conference calls [continued]

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: Negativity in	Presentations	Answers	Questions	Presentations	Answers	Questions
Ln(assets)	-0.008	-0.001	-0.000	-0.049***	-0.031***	-0.043***
	(-1.42)	(-0.16)	(-0.14)	(-3.13)	(-2.86)	(-3.87)
Tobin's Q	-0.047***	-0.012**	-0.004	-0.091***	-0.018***	-0.025***
	(-6.60)	(-2.09)	(-0.93)	(-8.89)	(-3.15)	(-5.13)
Constant	0.277**	-0.266***	-0.047	0.350**	0.152	0.512***
	(2.10)	(-4.31)	(-1.37)	(1.99)	(1.33)	(4.84)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	No	No	No	Yes	Yes	Yes
Observations	13,318	13,034	13,313	13,318	13,034	13,313
Adjusted R^2	0.22	0.34	0.16	0.54	0.53	0.32

Table 4: Overview of results: The outcomes predicted by positive tone surprises (residual negativity)

This table presents an overview of our main results on residual negativity in presentation (RNP) and in answers (RNA). RNP>0 and RNA>0 refer to RNP and RNA being positive, respectively, indicating excessive negativity. RNP<0 and RNA<0 refer to RNP and RNA being negative, respectively, indicating excessive positivity. |RNP| and |RNA| indicate their absolute values. As explanatory variables, they indicate whether greater magnitudes imply greater effects. In the cells of the table, a single + or – indicates an effect significant at the 10% level. A double ++ or -- indicates an effect significant at either the 5% or 1% level. A 0 indicates no significant effect on conventional significance levels.

	(1)	(2)	(3)	(4)	(5)	(6)
	Overall effects		Distinguishing sign of residual negativity			
			RNP>0	RNP<0	RNA>0	RNA<0
Explanatory variable:	RNP	RNA	|RNP|	|RNP|	|RNA|	|RNA|
Dependent variable						
Earnings in quarter t+1	--	--	--	0	--	++
Change in analyst forecasts for earnings in quarter t+1	--	--	-	++	--	++
Uncertainty (Post-call forecast std. dev.)	++	++	++	--	++	--
Uncertainty (Revision frequency)	++	++	++	--	++	--
Stock price: [0;1] days abnormal return	--	--	--	++	--	++
Stock price: [3;60] days abnormal return	--	--	--	++	--	+

Table 5: Predicting earnings with textual analysis

This table presents panel regressions. The dependent variable is earnings per share in the quarter t+1. 1{RN>0} is an indicator variable which is equal to one if the corresponding residual negativity is positive; it is zero if the residual negativity is negative. The explanatory variables are defined in Table 1 and in the text. T-statistics are shown in parentheses. The underlying standard errors are clustered on the CEO level and robust to heteroskedasticity. * p<0.1, ** p<0.05, *** p<0.01.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	Earnings in quarter t+1								
Residual negativity in presentation (RNP)	-0.099***		-0.092***	-0.053***	-0.037***			-0.035***	-0.035***
	(-8.99)		(-8.60)	(-7.66)	(-5.32)			(-5.27)	(-5.30)
Residual negativity in answers (RNA)		-0.072***	-0.029***	-0.028***	-0.020***			-0.018***	-0.006
		(-5.70)	(-2.60)	(-4.18)	(-2.97)			(-2.65)	(-0.83)
Mean earnings forecast, 1 day before call in t				0.706***					
				(7.91)					
Mean earnings forecast, 3 days after call in t					0.756***	0.755***	0.761***	0.755***	0.754***
					(8.72)	(8.71)	(8.79)	(8.71)	(8.68)
Absolute RNP * 1{RNP>0}						-0.061***			
						(-4.90)			
Absolute RNP * 1{RNP<0}						0.015			
						(1.42)			
Absolute RNA * 1{RNA>0}							-0.041***		
							(-3.44)		
Absolute RNA * 1{RNA<0}							0.031***		
							(2.89)		
Inconsistency in tone									-0.035***
									(-2.96)
% Uncertain words								-0.066***	-0.065***
								(-2.63)	(-2.63)
% Strong modal words								-0.032*	-0.028
								(-1.78)	(-1.64)
% Weak modal words								0.098**	0.100**
								(2.06)	(2.09)
Complexity (words per sentence)								-0.001	-0.001
								(-1.15)	(-1.04)
% Atypical tense								-0.001	-0.001
								(-1.62)	(-1.41)

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Table 5: Predicting earnings with textual analysis [continued]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	Earnings in quarter t+1								
Ln(Words in the presentation)	-0.104***	-0.106***	-0.103***	-0.040**	-0.026*	-0.028*	-0.026*	-0.013	-0.021
	(-4.11)	(-4.16)	(-4.07)	(-2.41)	(-1.65)	(-1.76)	(-1.69)	(-0.75)	(-1.22)
Ln(Words in the answers)	0.011	0.010	0.011	-0.002	0.001	0.000	0.000	-0.010	-0.018*
	(0.79)	(0.74)	(0.81)	(-0.20)	(0.11)	(0.04)	(0.05)	(-0.88)	(-1.83)
Market return in quarter t	0.206***	0.207***	0.206***	0.271***	0.204***	0.203***	0.204***	0.195***	0.187***
	(5.21)	(5.11)	(5.21)	(6.77)	(6.25)	(6.15)	(6.16)	(6.22)	(5.87)
Ln(Assets)	0.290***	0.291***	0.290***	-0.008	-0.010	-0.009	-0.012	-0.011	-0.009
	(6.22)	(6.22)	(6.23)	(-0.31)	(-0.49)	(-0.45)	(-0.57)	(-0.52)	(-0.42)
Tobin's Q	0.148***	0.149***	0.148***	0.041	0.031	0.031	0.031	0.030	0.030
	(7.75)	(7.59)	(7.76)	(1.39)	(1.03)	(1.02)	(1.02)	(1.00)	(1.00)
Constant	-1.811***	-1.799***	-1.817***	1.222***	0.225	1.047***	1.043***	0.337	0.431*
	(-3.01)	(-2.98)	(-3.02)	(3.91)	(1.05)	(4.44)	(4.38)	(1.43)	(1.89)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,139	14,139	14,139	13,656	13,775	13,775	13,775	13,766	13,748
Adjusted R^2	0.62	0.62	0.62	0.8	0.83	0.83	0.83	0.83	0.83

Table 6: Forecast changes, forecast errors, and managerial tone

This table presents panel regressions. The dependent variable in columns (1) to (5) is the forecast change in percent of earnings in quarter t+1. In columns (6) to (8), the dependent variable is the forecast error in percent of earnings in quarter t+1. The explanatory variables are defined in Table 1 and in the text. T-statistics are shown in parentheses. The underlying standard errors are clustered on the CEO level and are robust to heteroskedasticity. * p<0.1, ** p<0.05, *** p<0.01.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:			Forecast change				Forecast error	
Residual negativity in presentation (RNP)	-2.452***		-2.133***			-1.205	-1.735*	-1.542
	(-7.33)		(-6.31)			(-1.27)	(-1.66)	(-1.61)
Residual negativity in answers (RNA)		-2.380***	-1.391***			2.789**	3.454***	4.177***
		(-5.91)	(-3.52)			(2.30)	(2.67)	(3.12)
Absolute RNP * 1{RNP>0}				-2.350***				
				(-4.75)				
Absolute RNP * 1{RNP<0}				2.588***				
				(4.59)				
Absolute RNA * 1{RNA>0}					-1.522***			
					(-3.05)			
Absolute RNA * 1{RNA<0}					3.226***			
					(4.59)			
Analyst experience * RNP							0.606**	0.589
							(2.29)	(1.56)
Analyst experience * RNA							-0.527**	-1.419***
							(-2.08)	(-3.15)
Analyst experience							-0.285	0.938
							(-1.61)	(1.30)
Ln(Assets)	-0.867	-0.944	-0.924	-0.871	-0.979*	6.046***	6.163***	0.647
	(-1.44)	(-1.58)	(-1.54)	(-1.45)	(-1.65)	(3.76)	(3.82)	(1.56)
Tobin's Q	1.603***	1.526***	1.605***	1.609***	1.496***	3.539***	3.607***	1.581***
	(4.41)	(4.16)	(4.43)	(4.42)	(4.07)	(4.04)	(4.12)	(3.11)
Market return in quarter t	12.075***	11.963***	12.078***	12.079***	11.961***	-16.761***	-16.407***	-13.259**
	(4.90)	(4.88)	(4.92)	(4.90)	(4.89)	(-3.11)	(-3.07)	(-2.53)
Pre-announcement revision frequency						-0.931	-0.890	0.300
						(-0.82)	(-0.79)	(0.30)
Constant	2.397	3.576	2.920	2.309	3.232	-97.519***	-98.468***	-17.349***
	(0.42)	(0.62)	(0.51)	(0.40)	(0.56)	(-6.27)	(-6.30)	(-3.43)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Analyst fixed effects	No	No	No	No	No	No	No	Yes
Observations	134,882	134,882	134,882	134,882	134,882	157,286	146,775	146,775
Adjusted R^2	0.07	0.07	0.08	0.07	0.07	0.08	0.08	0.03

Table 7: Analyst uncertainty and managerial tone

This table presents panel regressions. The dependent variable is the post-call forecast standard deviation of analysts' forecasts outstanding three days after the conference call. (Results for revision frequency and the change in the bid-ask spread are in the Supplementary Appendix). The explanatory variables are defined in Table 1 and in the text. T-statistics are shown in parentheses. The underlying standard errors are clustered on the CEO level and are robust to heteroskedasticity. * p<0.1, ** p<0.05, *** p<0.01.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:	Post-call forecast std. dev.						
Residual negativity in presentation (RNP)	0.011***		0.010***		0.009***		
	(8.26)		(7.61)		(7.22)		
Residual negativity in answers (RNA)		0.010***	0.006***		0.005***		
		(6.42)	(3.98)		(2.98)		
Absolute RNP * 1{RNP>0}						0.013***	
						(5.97)	
Absolute RNP * 1{RNP<0}						-0.007***	
						(-4.84)	
Absolute RNA * 1{RNA>0}							0.011***
							(4.17)
Absolute RNA * 1{RNA<0}							-0.007***
							(-3.74)
Inconsistency in tone				0.007***	0.001	0.004*	0.001
				(3.13)	(0.47)	(1.75)	(0.22)
% Uncertain words				0.021***	0.011*	0.012*	0.017***
				(3.25)	(1.65)	(1.91)	(2.63)
% Strong modal words				0.009***	0.009***	0.008***	0.010***
				(3.17)	(2.90)	(2.86)	(3.22)
% Weak modal words				-0.010	-0.006	-0.006	-0.009
				(-0.93)	(-0.58)	(-0.60)	(-0.85)
Complexity (words per sentence)				0.000	0.000	0.000	0.000
				(1.32)	(1.11)	(0.94)	(1.51)
% Atypical tense				-0.000	-0.000	-0.000	-0.000
				(-0.75)	(-0.30)	(-0.13)	(-0.86)

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Table 7: Analyst uncertainty and managerial tone [continued]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:	Post-call forecast std. dev.						
Ln(Words in the presentation)	0.012***	0.012***	0.012***	0.015***	0.012***	0.013***	0.014***
	(4.19)	(4.39)	(4.13)	(4.72)	(4.03)	(4.11)	(4.49)
Ln(Words in the answers)	0.001	0.000	0.001	0.002	0.002	0.003	0.001
	(0.35)	(0.27)	(0.32)	(1.09)	(0.98)	(1.25)	(0.71)
Monthly volatility in quarter t	0.078*	0.075*	0.078*	0.070	0.075*	0.074*	0.072
	(1.75)	(1.66)	(1.75)	(1.54)	(1.68)	(1.65)	(1.58)
Ln(Assets)	0.024***	0.024***	0.024***	0.024***	0.025***	0.024***	0.024***
	(4.27)	(4.23)	(4.29)	(4.22)	(4.29)	(4.27)	(4.25)
Tobin's Q	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.20)	(-0.25)	(-0.19)	(-0.14)	(-0.13)	(-0.09)	(-0.21)
Stock return in quarter t	-0.019***	-0.019***	-0.019***	-0.016***	-0.018***	-0.017***	-0.017***
	(-3.75)	(-3.69)	(-3.75)	(-3.18)	(-3.44)	(-3.37)	(-3.32)
EPS growth since same quarter last year	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(-1.38)	(-1.39)	(-1.38)	(-1.27)	(-1.34)	(-1.29)	(-1.33)
Earnings surprise decile	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-4.22)	(-4.18)	(-4.23)	(-3.85)	(-4.02)	(-3.97)	(-3.97)
Market return in quarter t	-0.048***	-0.048***	-0.048***	-0.044***	-0.047***	-0.046***	-0.046***
	(-7.98)	(-7.80)	(-7.99)	(-7.22)	(-7.68)	(-7.59)	(-7.47)
Constant	-0.325***	-0.324***	-0.324***	-0.378***	-0.361***	-0.373***	-0.359***
	(-5.48)	(-5.45)	(-5.47)	(-5.95)	(-5.83)	(-6.01)	(-5.66)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,275	13,275	13,275	13,251	13,275	13,251	13,251
Adjusted R^2	0.62	0.62	0.62	0.62	0.62	0.62	0.62

Table 8: Stock price reactions around the conference call and medium-term excess returns

This table presents panel regressions. The dependent variable in columns (1) to (7) is CAR01, the two-day, [0,1] cumulative DGTW characteristic-adjusted stock return on and after the conference call date, in percent. The dependent variable in columns (8) to (10) is CAR360, the 58 trading days [3,60] cumulative DGTW characteristic-adjusted stock return in percent from 3 days after the conference call date through 60 days. The explanatory variables are defined in Table 1 and in the text. T-statistics are shown in parentheses. The underlying standard errors are clustered on the CEO level and robust to heteroskedasticity. * p<0.1, ** p<0.05, *** p<0.01.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	CAR01	CAR01	CAR01	CAR01	CAR01	CAR01	CAR01	CAR360	CAR360	CAR360
Residual negativity in presentation (RNP)	-0.615***		-0.471***				-0.479***	-0.480***		
	(-8.45)		(-6.24)				(-6.23)	(-2.77)		
Residual negativity in answers (RNA)		-0.948***	-0.685***				-0.677***	-0.577**		
		(-7.41)	(-5.13)				(-4.39)	(-2.10)		
Absolute RNP * 1{RNP>0}				-0.522***					-0.650**	
				(-4.60)					(-2.29)	
Absolute RNP * 1{RNP<0}				0.733***					0.685***	
				(5.49)					(2.64)	
Absolute RNA * 1{RNA>0}					-0.730***					-1.183***
					(-4.02)					(-2.78)
Absolute RNA * 1{RNA<0}					1.175***					0.811*
					(6.16)					(1.88)
Absolute diff. in neg. of pres. and answers						-0.545***	-0.036	0.203	-0.068	0.286
						(-3.52)	(-0.20)	(0.45)	(-0.18)	(0.63)
% Uncertain words						-1.041***	-0.402	0.332	0.193	-0.063
						(-2.96)	(-1.13)	(0.39)	(0.22)	(-0.07)
% Strong modal words						0.080	0.098	1.286**	1.310**	1.220*
						(0.29)	(0.36)	(2.04)	(2.08)	(1.95)
% Weak modal words						2.202***	2.036***	2.424	2.409	2.597
						(3.00)	(2.79)	(1.44)	(1.43)	(1.54)
Complexity (words per sentence)						-0.026	-0.028	0.005	0.009	-0.001
						(-1.28)	(-1.38)	(0.10)	(0.18)	(-0.02)
% Atypical tense						-0.019	-0.023*	-0.107***	-0.110***	-0.099***
						(-1.51)	(-1.85)	(-3.80)	(-3.89)	(-3.54)
Ln(Words in the presentation)	0.239	0.232	0.257*	0.246	0.223	0.361**	0.502***	0.240	0.210	0.156
	(1.57)	(1.54)	(1.69)	(1.62)	(1.48)	(2.11)	(2.92)	(0.63)	(0.56)	(0.41)
Ln(Words in the answers)	-0.254**	-0.254**	-0.252**	-0.253**	-0.247**	-0.416***	-0.371***	-0.703**	-0.754**	-0.661*
	(-2.51)	(-2.52)	(-2.49)	(-2.50)	(-2.44)	(-2.91)	(-2.61)	(-1.97)	(-2.13)	(-1.85)

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Table 8: Stock price reactions around the conference call and medium-term excess returns [continued]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	CAR01	CAR01	CAR01	CAR01	CAR01	CAR01	CAR01	CAR360	CAR360	CAR360
Ln(Assets)	-0.707***	-0.717***	-0.727***	-0.710***	-0.728***	-0.708***	-0.728***	-4.359***	-4.352***	-4.347***
	(-4.27)	(-4.41)	(-4.40)	(-4.28)	(-4.46)	(-4.34)	(-4.39)	(-10.75)	(-10.70)	(-10.78)
Tobin's Q	-0.501***	-0.504***	-0.493***	-0.496***	-0.512***	-0.539***	-0.504***	-2.716***	-2.734***	-2.727***
	(-5.00)	(-5.00)	(-4.85)	(-4.96)	(-5.06)	(-5.42)	(-4.94)	(-10.86)	(-10.91)	(-11.07)
Market return in quarter t	-0.852	-0.827	-0.845	-0.849	-0.847	-0.998	-0.845	9.318***	9.241***	9.288***
	(-1.41)	(-1.37)	(-1.40)	(-1.41)	(-1.40)	(-1.63)	(-1.39)	(6.51)	(6.48)	(6.50)
Earnings surprise decile	0.576***	0.577***	0.576***	0.576***	0.577***	0.573***	0.575***	-0.006	-0.008	-0.004
	(27.18)	(27.15)	(27.18)	(27.22)	(27.16)	(27.07)	(27.26)	(-0.14)	(-0.19)	(-0.10)
EPS growth since same quarter last year	-0.015	-0.012	-0.017	-0.014	-0.011	-0.018	-0.019	0.325**	0.322**	0.329**
	(-0.25)	(-0.20)	(-0.28)	(-0.24)	(-0.19)	(-0.29)	(-0.31)	(2.19)	(2.16)	(2.21)
Stock return in quarter t	-0.757	-0.773	-0.779	-0.744	-0.765	-0.830*	-0.783	-1.572	-1.606	-1.596
	(-1.59)	(-1.62)	(-1.63)	(-1.56)	(-1.60)	(-1.74)	(-1.64)	(-1.47)	(-1.49)	(-1.49)
Monthly volatility in quarter t	0.145	0.045	0.143	0.151	0.061	-0.005	-0.064	14.230***	14.288***	14.165***
	(0.09)	(0.03)	(0.09)	(0.09)	(0.04)	(-0.00)	(-0.04)	(3.50)	(3.50)	(3.48)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	7.166***	7.305***	7.154***	7.014***	7.196***	9.345***	7.531***	51.466***	52.437***	51.939***
	(3.67)	(3.79)	(3.67)	(3.59)	(3.74)	(4.40)	(3.53)	(9.22)	(9.44)	(9.32)
Observations	13,291	13,291	13,291	13,291	13,291	13,264	13,264	12,620	12,620	12,620
Adjusted R^2	0.11	0.11	0.11	0.11	0.11	0.1	0.11	0.04	0.04	0.04

Table 9: Excess returns of double-sorted portfolios

This table presents excess returns of portfolios sorted on the earnings surprise and negativity. Firms are first sorted into 5 quintiles of the earnings surprise and then, within each earnings surprise quintile, into 5 quintiles of negativity. Panel A uses negativity in presentation; Panel B uses negativity in answers. Within each portfolio, we then compute the value-weighted average DGTW characteristic-adjusted stock return from the day after the conference call to day 60.

	Panel A: Negativity in presentation				
Earnings surprise	Q1 (least negative)	Q2	Q3	Q4	Q5 (most negative)
Q1 (lowest)	-0.30%	-0.79%	-0.80%	-1.03%	-1.90%
Q2	-0.39%	-0.48%	-1.02%	-0.81%	-0.96%
Q3	0.40%	-0.43%	0.34%	-1.05%	-1.07%
Q4	1.01%	0.32%	0.88%	0.63%	0.49%
Q5 (highest)	2.41%	0.91%	0.31%	1.00%	0.72%

	Panel B: Negativity in answers				
Earnings surprise	Q1 (least negative)	Q2	Q3	Q4	Q5 (most negative)
Q1 (lowest)	-0.52%	-1.24%	-0.27%	-0.65%	-1.84%
Q2	-0.76%	0.16%	-0.73%	-1.25%	-0.99%
Q3	0.39%	0.10%	-0.03%	-0.62%	-1.33%
Q4	0.88%	0.50%	1.07%	1.09%	-0.39%
Q5 (highest)	2.55%	1.12%	1.20%	0.86%	0.05%

Table 10: Heterogeneous consequences of tone surprises

This table presents summary results of panel regressions. The sample is split in four quartiles of absolute earnings surprise. Within each quartile, we run regressions of earnings in quarter t+1, post-call forecast std. dev., and CAR01 on residual negativity in presentation (RNP) and residual negativity in answers (RNA), respectively, as well as control variables. Thus, we run regressions equivalent to those in columns (1) and (2) of Table 5, columns (1) and (2) of Table 7, and columns (1) and (2) of Table 8, respectively. The coefficients on the control variables are not shown. T-statistics are shown in parentheses. The underlying standard errors are clustered on the CEO level and robust to heteroskedasticity. * p<0.1, ** p<0.05, *** p<0.01

		Quartiles of absolute earnings surprise			
Dependent var.	Explanatory var.	Q1 (lowest)	Q2	Q3	Q4 (highest)
Earnings in quarter t+1	RNP	-0.021	-0.038***	-0.096***	-0.199***
		(-1.63)	(-3.16)	(-6.32)	(-8.43)
	RNA	-0.024	-0.043***	-0.018	-0.163***
		(-1.54)	(-2.73)	(-0.94)	(-5.11)
Post-call forecast std. dev.	RNP	0.005***	0.007***	0.010***	0.017***
		(3.77)	(5.13)	(7.29)	(5.04)
	RNA	0.004***	0.002	0.007***	0.024***
		(3.92)	(1.35)	(2.96)	(5.52)
CAR01	RNP	-0.723***	-0.636***	-0.748***	-0.905***
		(-5.08)	(-4.01)	(-4.63)	(-3.42)
	RNA	-0.760***	-0.897***	-0.981***	-1.234***
		(-3.65)	(-4.37)	(-4.30)	(-4.44)

Table 11: Managerial-tone-response-coefficients

This table presents panel regressions. The dependent variable is CAR01, the two-day, [0,1] cumulative DGTW characteristic-adjusted stock return on and after the conference call date, in percent. To calculate *Tone-Sensitivity of future earnings*, we begin by sorting firms into 20 portfolios by the absolute earnings surprise. Then, within each portfolio we run panel regressions of earnings in quarter t+1 on residual negativity in presentation (RNP) and residual negativity in answers (RNA), respectively, in quarter t, and we save the coefficient on this variable. To help interpret the results, we define *Sensitivity of future earnings to RNP/RNA* as *minus* this saved coefficient. That is, the larger the *Sensitivity of future earnings*, the stronger the negative association of current residual negativity and future earnings. *Sensitivity of post-call forecast std. dev. to RNP/RNA* is calculated in a similar way, regressing, within each portfolio, post-call forecast std. dev. on the respective residual negativity measure. The regressions include the same control variables as the regressions in Table 8, but the coefficients are not shown to conserve space. T-statistics are shown in parentheses. The underlying standard errors are clustered on the level of the portfolios used to calculate *Sensitivity of future earnings* and *Sensitivity of post-call forecast std. dev.* and are robust to heteroskedasticity. * p<0.1, ** p<0.05, *** p<0.01.

	(1)	(2)	(3)	(4)
Dependent variable:			CAR01	
Residual negativity (RN) measure:	RNP	RNA	RNP	RNA
Residual negativity (RN)	-0.458***	-0.717***	-0.443***	-0.701***
	(-4.95)	(-6.72)	(-4.42)	(-6.57)
Sensitivity of future earnings to RN	1.328	1.037		
	(1.00)	(1.03)		
RN * Sensitivity of future earnings to RN	-2.501***	-2.433***		
	(-3.06)	(-2.91)		
Sensitivity of post-call forecast std. dev. to RN			-3.886	-9.038
			(-0.32)	(-0.95)
RN * Sensitivity of post-call forecast std. dev. to RN			-28.088***	-19.778***
			(-2.89)	(-3.04)
Firm-level controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes
Observations	13,291	13,291	13,291	13,291
Adjusted R^2	0.12	0.12	0.12	0.12

SUPPLEMENTARY APPENDIX

Please note: This supplementary appendix is not meant for publication in print. It can be made available on a Journal website and the authors' websites upon publication. It is included for the benefit of referees.

Supplementary Table A-1: Frequencies of negative and positive words in conference calls

This table presents panel regressions. The dependent variable is the frequency of negative and positive words, respectively, in presentations (columns 1-2), in answers (columns 3-4), and in analysts' questions (columns 5-6). The explanatory variables are defined in Table. T-statistics are shown in parentheses for the main variables of interests. The underlying standard errors are clustered on the CEO level and robust to heteroskedasticity. * p<0.1, ** p<0.05, *** p<0.01.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Presentation negative frequency	Presentation positive frequency	Answers negative frequency	Answers positive frequency	Questions negative frequency	Questions positive frequency
Stock return in the quarter	-0.076***	0.216***	-0.119***	0.153***	-0.165***	0.185***
	(-3.07)	(7.88)	(-6.84)	(6.95)	(-6.16)	(8.43)
EPS growth since same quarter last year	-0.041***	0.015***	-0.015***	0.006**	-0.018***	0.005
	(-9.40)	(3.27)	(-4.60)	(2.08)	(-5.26)	(1.48)
Earnings surprise decile	-0.016***	0.018***	-0.007***	0.010***	-0.008***	0.013***
	(-13.10)	(14.28)	(-7.48)	(10.07)	(-6.01)	(12.07)
Monthly volatility in the quarter	0.707***	0.434**	0.274***	-0.108	-0.336**	0.064
	(3.71)	(2.00)	(2.71)	(-0.65)	(-2.19)	(0.52)
Pre-call forecast dispersion	0.882***	-0.478***	0.422***	-0.275***	0.325***	-0.168***
	(9.43)	(-5.17)	(5.76)	(-4.97)	(4.07)	(-3.17)
Market return in previous quarter	-0.435***	0.250***	-0.213***	0.199***	-0.289***	0.109***
	(-11.98)	(6.37)	(-7.89)	(6.19)	(-6.85)	(3.19)
Ln(Words in the respective call part)	0.039*	0.038	-0.036***	-0.022	-0.110	-0.027*
Ln(assets)	-0.093***	0.016	-0.031***	0.086***	-0.066***	0.033**
Tobin's Q	-0.171***	0.017	-0.065***	0.014	-0.070***	0.018**
Constant	1.661***	1.342***	1.460***	0.330	2.808***	0.470***
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Manager fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,861	13,861	13,852	13,852	13,632	13,632
Adjusted R^2	0.52	0.61	0.37	0.45	0.24	0.22

Supplementary Table A-2: Uncertainty and managerial tone

This table presents panel regressions. The dependent variable in columns (1) to (5) is revision frequency, which is the number of revisions after the conference call for quarter t up to the earnings announcement of quarter t+1, divided by the number of analysts. In columns (6) and (10), it is the change in the average bid-ask spread (divided by the midpoint between the bid and the ask) in the [-3,-1] day window prior to the conference call to the [+1,+3] window following the conference call, multiplied by 100. The explanatory variables are defined in Table 1 and in the text. The regressions include the same control variables as the regressions in Table 7, but the coefficients are not shown to conserve space. T-statistics are shown in parentheses. The underlying standard errors are clustered on the CEO level and are robust to heteroskedasticity. * p<0.1, ** p<0.05, *** p<0.01.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	Revision frequency					Change in bid-ask spread				
Residual negativity in presentation (RNP)	0.053***		0.048***			0.004***		0.004***		
	(7.80)		(6.93)			(3.41)		(2.79)		
Residual negativity in answers (RNA)		0.052***	0.031***				0.006**	0.004*		
		(4.98)	(3.01)				(2.38)	(1.66)		
Absolute RNP * 1{RNP>0}				0.060***					0.004**	
				(5.44)					(2.03)	
Absolute RNP * 1{RNP<0}				-0.045***					-0.005**	
				(-3.97)					(-2.12)	
Absolute RNA * 1{RNA>0}					0.043***					0.010**
					(2.58)					(2.56)
Absolute RNA * 1{RNA<0}					-0.059***					-0.002
					(-4.17)					(-0.67)
Other speech patterns	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,207	13,207	13,207	13,207	13,207	12,775	12,775	12,775	12,775	12,775
Adjusted R^2	0.37	0.36	0.37	0.37	0.36	0.03	0.03	0.03	0.03	0.03

Supplementary Table A-3: Medium-term excess returns

This table presents panel regressions. The dependent variable is CAR060, the 61 trading days [0,60] cumulative DGTW characteristic-adjusted stock return in percent from the conference call date through 60 days. The explanatory variables are defined in Table 1 and in the text. The regressions include the same control variables as the regressions in Table 8, but the coefficients are not shown to conserve space. T-statistics are shown in parentheses. The underlying standard errors are clustered on the CEO level and robust to heteroskedasticity. * p<0.1, ** p<0.05, *** p<0.01.

	(1)	(2)	(3)
Dependent variable:	CAR060	CAR060	CAR060
Residual negativity in presentation (RNP)	-0.533**		
	(-2.54)		
Residual negativity in answers (RNA)	-0.879***		
	(-2.93)		
Absolute RNP * 1{RNP>0}		-0.739**	
		(-2.35)	
Absolute RNP * 1{RNP<0}		0.653**	
		(2.12)	
Absolute RNA * 1{RNA>0}			-1.248***
			(-2.91)
Absolute RNA * 1{RNA<0}			1.041***
			(2.67)
Other speech patterns	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes
Observations	12,620	12,620	12,620
Adjusted R^2	0.05	0.05	0.05

Supplementary Table A-4: Future earnings, analyst uncertainty, and managerial-tone-response-coefficients

This table presents a variant of the analysis in Table 11 in the paper. It presents panel regressions. The dependent variable in columns (1) to (3) is earnings in the quarter t+1. The dependent variable in columns (3) to (6) is post-call forecast standard deviation, To calculate sensitivity of CAR01 to residual negativity (in either presentation or answers), we begin by sorting firms into 20 portfolios by the absolute earnings surprise. Then, within each portfolio we run panel regressions of CAR01 on the respective residual negativity in quarter t, and we save the coefficient on this variable. To help interpret the results, we define sensitivity of CAR01 to residual negativity as *minus* this saved coefficient. That is, the larger the sensitivity of CAR01 to residual negativity, the stronger the negative association of current Residual negativity and the immediate stock market reaction. The coefficient of interest in these regressions is the coefficient on the interaction term of residual negativity and sensitivity of CAR. The regressions include the same control variables as the regressions in Tables 5 and 7, respectively, but the coefficients are not shown to conserve space. T-statistics are shown in parentheses. The underlying standard errors are clustered on the level of the portfolios used to calculate the sensitivities and are robust to heteroskedasticity. * p<0.1, ** p<0.05, *** p<0.01.

	(1)	(2)	(3)	(4)
Dependent variable:	Earnings in quarter t+1		Post-call forecast standard deviation	
Residual negativity in presentation (RNP)	-0.046***		0.006***	
	(-5.85)		(6.35)	
Sensitivity of CAR01 to residual negativity in presentation (RNP)	0.014		-0.002	
	(0.91)		(-1.16)	
Residual negativity in presentation * Sensitivity of CAR01 to RNP	-0.096***		0.004**	
	(-6.68)		(2.36)	
Residual negativity in answers (RNA)		-0.052***		0.004***
		(-5.40)		(3.62)
Sensitivity of CAR01 to residual negativity in answers (RNA)		0.013		0.001
		(0.73)		(0.35)
Residual negativity in answers * Sensitivity of CAR01 to RNA		-0.040**		0.011***
		(-2.16)		(4.45)
Firm-level controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes
Observations	13,291	13,291	13,291	13,291
R^2	0.65	0.64	0.65	0.65

Supplementary Table A-5: Alternative word classification by group

Our main analysis uses the Loughran and McDonald (2011) word list. We also use our own simplified classification, shown here, as an alternative. To compile this classification, we compute the frequencies of all words appearing in managers' and analysts' speeches during conference calls (initial earnings announcements and answers to analysts' questions). Then, from among the most frequent words we choose the words belonging to these three groups: (1) positive words, (2) negative words, (3) words indicating uncertainty. The words in the table are ordered in the frequency of their use, within their categories.

Positive		**Negative**		**Uncertain**	
growth	improvements	decline	volatility	think	reasonable
good	confident	risks	weakness	may	plans
strong	successful	risk	problem	expect	efforts
opportunities	stronger	loss	lost	anticipate	prelimiary
opportunity	comfortable	negative	challenge	believe	possible
improvement	excellent	uncertainties	slowdown	maybe	planning
positive	nice	difficult	difficulty	compared	expecting
grow	confidence	losses	problems	guess	estimates
growing	profitable	below	declining	knowledge	predict
improved	attractive	declines	negatively	expected	forecasting
improve	optimistic	pressure	worse	expectations	forecasts
grew	benefited	reduce	uncertainty	assumptions	pretty
ability	exciting	incorrect		assume	approximately
strength	wins	decrease		assuming	might
gain	safe	inaccuracies		projections	wondering
success	successfully	decreased		forecast	enough
favorable	grown	tough		fairly	hope
advantage	strength	challenging		generally	potential
outstanding	encouraging	challenges		perhaps	comparison
improving	perfect	declines		roughly	assumption