

## **Reading Managerial Tone:**

### **How Analysts and the Market Respond to Conference Calls**

Marina Druz, Alexander F. Wagner and Richard J. Zeckhauser \*

January 16, 2016

#### **Abstract**

Conference call tone predicts future earnings and uncertainty. “Tone disappointment” (excessive negativity) predicts more strongly than “tone delight” (excessive positivity). However, analysts and investors respond more quickly to delight than disappointment. Consequently, stock prices drift downward after their initial reaction to tone disappointment. Tone surprises move stock prices more in those firms where tone surprise predicts earnings and uncertainty more strongly. These results hold even after controlling for negativity of words in the earnings press release, analyst expectations, the firm’s recent performance, and CEO fixed effects. Together, these coherent results suggest that market participants distill value-relevant information from conference calls.

**Keywords:** Analysts, earnings conference calls, information transmission, managerial tone, price drift, textual analysis

\* Druz: Flextronics, formerly at Swiss Finance Institute – Università della Svizzera italiana. Email: [marinadruz@gmail.com](mailto:marinadruz@gmail.com). Wagner: Swiss Finance Institute -- University of Zurich, CEPR, and ECGI. Address: University of Zurich, Department of Banking and Finance, Plattenstrasse 14, CH-8032 Zurich, Switzerland. Email: [alexander.wagner@bf.uzh.ch](mailto:alexander.wagner@bf.uzh.ch). Zeckhauser: Harvard University and NBER. Address: Harvard Kennedy School, 79 JFK Street, Cambridge, MA 02139, USA. Email: [richard\\_zeckhauser@harvard.edu](mailto:richard_zeckhauser@harvard.edu). We thank the Swiss Finance Institute and the NCCR FINRISK and the UZH Research Priority Program Finance and Financial Markets for support. We thank Jacob Boudoukh, Ettore Croci (SGF discussant), François Degeorge, Florian Eugster, Rajna Gibson, Nicholas Hirschey (EFA discussant), Timothy Loughran, Claudine Mangen, Bill McDonald, McKay Price, Farzad Saidi, Joel Sobel, Richard Taffler, Rossen Valkanov, Vikrant Vig, conference participants at the SFI Research Day, the SGF conference, the EFA conference, and the conference on Discourse Approaches in Financial Communication as well as seminar participants at Boston University, Cambridge University, the ETH Zurich, Hitotsubashi University, Keio University, Maastricht University, Nanyang Technological University, the National University of Singapore, the University of Neuchâtel, Osaka University, Erasmus University Rotterdam, Singapore Management University, and the Stockholm School of Economics for comments. We thank Andrew Kim for help with the data collection and Maxim Litvak for excellent programming. Ivan Petzev has provided outstanding research assistance. – All unreported results are available from the authors. The authors declare that they have no relevant or material financial interests that relate to the research described in this paper.

# 1 Introduction

How effectively is information transmitted from companies to market participants? This question is of fundamental importance for the assessment of the informational efficiency of markets, for investor decisions, and for regulatory efforts. This paper studies information flows in earnings conference calls. Those calls provide an excellent laboratory to study the overarching question that motivates this paper. Specifically, the analysis documents, in a direct manner not available in prior studies, the link between managerial tone (primarily the degree of negativity in word choice), and company fundamentals, analyst responses, and stock price reactions. Key elements of our analysis include (1) an evaluation of the distinct predictive powers of the tone of conference call presentations and answers after taking into account the tone in earnings press releases and analysts' tone in questions, (2) a distinction between the information contained in unusually negative vs. unusually positive managerial tone, and (3) the exploitation of cross-sectional differences among firms and analysts.

It is both well known and hardly surprising that market participants react 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, more subtle aspects of corporate communications also matter. The market reacts to the use of negative words in 10-Ks (Loughran and McDonald (2011)), and stock prices react to negative linguistic tone in earnings press releases (Demers and Vega (2010), Davis, Piger and Sedor (2012), and Huang, Teoh and Zhang (2014)). Existing studies show as well that linguistic tone and vocal cues during the earnings conference call engender stock market reactions (Mayew and Venkatachalam 2012; Price, Doran, Peterson and Bliss 2012).<sup>1</sup>

---

<sup>1</sup> Besides tone a number of papers have considered the role of readability of corporate communications (Li 2008; Loughran and McDonald 2014). Some work has explored the ability of the definitiveness of IPO-related filings to explain variation in investors' ability to value IPOs (Loughran and McDonald 2013). Textual analysis also provides

Why does the market initially react to the tone of corporate communications? Our overarching hypothesis in this paper is the *Rational Reactions Hypothesis*: Market participants rationally distill value-relevant information from managerial tone that is unexplained by past results and public information about a company's future. We should note that throughout we use such terminology as "react" when describing how managerial tone gets reflected in analysts' estimates or stock prices. We well recognize that in some cases there could be an intermediating third factor. Even if so, the overall clear and consistent picture that emerges when considering the empirical analysis as a whole suggests that interpreting analyst and investor behavior as rational reactions to tone is appropriate.

We test the Rational Reactions Hypothesis in the context of earnings conference calls for S&P 500 companies from 2004 to 2012, considering presentations and answers separately. Managers probably pursue multiple objectives with conference calls, including acting as "cheerleaders" for their companies, avoiding litigation risk, and addressing current information needs of the market. While we do not a priori posit that managers reveal information truthfully, 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 on a purely objective basis, for example, the managers' expectations for the future. Managerial linguistic tone, as indicated by the relative frequency of negative and positive words, contains potentially useful information.

We first document a variety of factors that lead managers to be negative: poor recent economic performance by the company or the economy, recent uncertainty, negative expected

---

an opportunity to develop alternative measures of firm characteristics, for example, financial constraints (Buehlmaier and Whited 2014; Hoberg and Lewis 2014; Bodnaruk, Loughran and McDonald 2015). 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 (2015) for surveys of textual-analysis studies.

future performance (as indicated by analyst forecasts just before the call). In contrast to established work on conference calls, we also account for the negativity of the earnings press release. Controlling for all these variables, and also for CEO fixed effects, we compute residual, “excessive” conference call negativity, that is, the *tone surprise*.<sup>2</sup> Tone surprises can be favorable or unfavorable; the implications are quite different: *Tone delight* occurs when management speaks less negatively than expected. *Tone disappointment* occurs when management speaks more negatively than expected.

Our prime tests are (a) whether tone surprise indicates value-relevant information about the future (the *Valuable Information Hypothesis*, VIH), and (b) whether analysts and the stock market recognize this (the *Reasonable Market Response Hypothesis*, RMRH). We structure our analysis invoking the standard assumption that the value of a company is the sum of the discounted expected future cash flows. If tone drives rational market reactions, it must predict expected future cash flows and/or influence uncertainty (where greater uncertainty would inflate the discount rate).<sup>3</sup>

Past work has examined the implications of the tone of earnings press announcements and conference calls as well as documents such as 10-Ks. These past works have sometimes come to different conclusions. On the one hand, some studies show that positivity in earnings press releases predicts higher future returns on assets (Davis, Piger and Sedor 2012). Moreover, where future returns are harder to assess, as in growth firms, this effect is stronger (Demers and Vega 2010). Also, more favorable disclosures in 10-K and 10-Q filings are associated with less uncertainty, as indicated by less dispersion in analysts’ estimates and lower stock volatility

---

<sup>2</sup> Our tone surprise variable is conceptually similar to abnormal tone (Huang, Teoh and Zhang 2014) and idiosyncratic tone (Blau, DeLisle and Price 2015). Importantly, in our analysis conference call tone surprises are assessed net of the negativity in the accompanying earnings press release. Also, we document that positive and negative tone surprises have quite different effects.

<sup>3</sup> 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). The purpose of our study is to shed light on what kind of value-relevant information conference calls may convey.

(Kothari, Li and Short (2009) and Loughran and McDonald (2011)). Lee's (2015) focus is on the spontaneity of managers, but he controls for the overall positive tone of the conference call (pooling presentations, answers and analysts), which turns out to be associated positively with future earnings, analyst reactions, and stock market responses, and negatively with uncertainty. On the other hand, the frequency of negative words in 10-K filings has been found to be positively correlated with positive future earnings surprises (Loughran and McDonald 2011). Abnormally positive tone in earnings releases predicts lower earnings in the following years (Huang, Teoh and Zhang 2014). No statistically significant association between unexpected future earnings and current linguistic tone (or vocal cues) emerged in a smaller sample of conference calls (Mayew and Venkatachalam (2012)). Some work shows that prices persist after the initial reaction to tone in conference calls, indeed continue to drift in the same direction (Price, Doran, Peterson and Bliss 2012). By stark contrast, other studies present evidence of a return reversal, and argue that the initial stock market response to tone in earnings press releases, in fact, represents an over-reaction by stock market participants who are fooled by "tone management" by companies (Huang, Teoh and Zhang 2014). One plausible explanation for these apparently divergent results is that the type of communication matters and that investigating all variables of interest – stock price reactions, firm fundamentals, and analyst responses – jointly and in the same sample is important. That joint investigation is the task we undertook.

In line with the Valuable Information Hypothesis (VIH), tone surprises in conference calls significantly predict both future earnings and uncertainty. (Uncertainty is indicated by the standard deviation of analysts' post-call forecasts for earnings in the next quarter, the number of forecast revisions during the following quarter, and bid-ask spreads.) These baseline results expand on existing work in two dimensions: First, we control for the negativity of the earnings press release and for analyst negativity, thus arguably capturing the extra information contained

in management's tone on the conference call. Second, we treat tone disappointment and tone delight separately, and document that disappointment has stronger predictive power for both earnings and uncertainty.

We test the Reasonable Market Response Hypothesis (RMRH) as a three-component hypothesis. First, we test whether analysts distill the information from managerial tone accurately (*Appropriate Forecast Revision Hypothesis*). Second, to differentiate between rational and bubble reactions to managerial tone, we employ characteristics-adjusted returns to test whether stock price levels persist over the quarter following the conference call (*Price Persistence Hypothesis*). Third, the stock market reacts more strongly to unusual managerial tone for some firms. The RMRH posits that tone will also more strongly predict the determinants of company value, future earnings and uncertainty for those firms (*Heterogeneity Across Firms Hypothesis*). We refer to these firms, where objective information is less informative, as “cloudy”. A large earnings surprise suggests that a firm is cloudier.

Substantial evidence supports all three components of the RMRH. First, sell-side analysts revise their forecasts downwards (upwards) for the next quarter if the manager adopts an excessively negative (positive) tone. They adjust more strongly and largely appropriately to tone delight; they react in the appropriate direction but insufficiently to tone disappointment. Specialist analysts, who cover few firms, respond more appropriately than generalist (busy) analysts to tone surprises whether in presentations or managers' answers. These findings all support the Appropriate Forecast Revision Hypothesis.

Second, consistent with the Price Persistence Hypothesis, stock prices tend to persist after their initial stock price reaction, as a rational response would require. Prices continue to drift downward after tone disappointment. Thus, our basic results confirm the average post-call drift

pattern presented in Price, Doran, Peterson and Bliss (2012).<sup>4</sup> Our novel contribution in this context is to show that the overall drift is driven primarily by initial under-reaction to tone disappointment (excessive negativity). This fits nicely with our finding that in the first three days after the conference call, analysts adjust their forecasts more relative to the information indicated in response to tone delight than to tone disappointment.

Turning to the third strand of our analysis, as posited by the Heterogeneity Across Firms Hypothesis, tone surprises in presentations more strongly predict future earnings for firms that experience a large (positive or negative) current earnings surprise. Such surprises suggest that a firm is “cloudy”. Similarly, in these hard-to-read firms excessive negativity in both presentations and answers more strongly magnifies uncertainty (as indicated by greater variability of analysts’ forecasts). Finally, as expected, the stock market reacts more to tone surprises in such firms. We also document that tone surprises predict earnings, uncertainty, and market reactions most strongly in market downturns. By tying together the results on earnings, uncertainty, and stock price reactions, these findings further indicate that the stock market reacts to tone in the rational direction.

The rest of this paper is organized as follows. Section 2 describes our data and discusses why it is reasonable to consider linguistic tone. Section 3 investigates the ways a manager’s word choice provides insights into future earnings and uncertainty. Section 4 studies how analysts incorporate managerial tone into their forecasts. Section 5 examines the immediate and long-run stock price reactions to managerial tone. Section 6 documents that the stock market responds more strongly to managerial tone in cloudy firms. Section 7 provides additional results and conducts the robustness analysis. Section 8 concludes.

---

<sup>4</sup> Price, Doran, Peterson and Bliss (2012) use size-adjusted returns as the dependent variable and Huang, Teoh and Zhang (2014) use raw returns; both papers then control for company variables. We instead use characteristics-adjusted returns (Daniel, Grinblatt, Titman and Wermers 1997), thus also accounting for momentum.

## 2 Data and methods

### 2.1 Sample

S&P 500 companies for the period from 2004 through the end of 2012 provide the basis for our analyses. Most panel regressions include around 450 companies, though the panel is unbalanced, as earnings conference call transcripts or other data for some quarters are missing for some companies. All variables are defined in Table 1. Tables 2 and 3 present summary statistics for the variables we use.

TABLES 1, 2, AND 3 ABOUT HERE

### 2.2 Company and analyst variables

#### 2.2.1 Dependent variables

Earnings per share (hereafter, *earnings*) and EPS forecasts data are drawn from I/B/E/S.

Many of our dependent variables are expressed in percentage terms. For them we multiply by 100 after computing a quotient. *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. For an alternative measure, we also scale by the share price 5 days before the earnings announcement, instead of by earnings.

*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). Price and returns data are taken from CRSP. DGTW provide monthly portfolio returns. We apply their methodology to daily returns to compute DGTW characteristic-adjusted stock returns.<sup>5</sup> *CAR01* is the two-day,  $[0,1]$  DGTW-adjusted stock return on and after the conference call date.<sup>6</sup> We also compute the cumulative DGTW-adjusted returns for up to 60 trading days following the conference call date. We express such returns in percent.

The following variables are winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentiles: earnings, forecast change, forecast error, and the CARs. The following variables, which have a bottom value at 0, are winsorized at the 99<sup>th</sup> percentile level: post-call forecast standard deviation, revision frequency, and the pre- and post-call bid-ask spreads.

### 2.2.2 Control variables

The *stock return (in percent)* 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  $t-1$ , multiplied by 100.

---

<sup>5</sup> 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.

<sup>6</sup> 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.

Let  $e_{i,j}$  be the earnings announced for the company  $j$  at quarter  $t$  recorded in I/B/E/S. Following Livnat and Mendenhall (2006), let  $\hat{e}_{i,j}$  be the corresponding consensus forecast for quarter  $t$  (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 given as a percentage of the share price. It is the difference between actual and consensus forecast earnings, divided by the share price 5 trading days before the announcement in quarter  $t$ , multiplied by 100. Firms performing above (below) expectations represent a positive (negative) surprise. Firms are grouped by *earnings surprise decile*, from 5 to 1 from largest positive to smallest positive surprise, then 0 for zero surprises, and then from -1 (for the smallest negative surprises) through -5 (for the largest negative surprises). Following Bernard and Thomas (1989) and Tetlock, Saar-Tsechansky and Macskassy (2008), for robustness checks we also compute standardized unexpected earnings (*SUE*) based on a seasonal random walk with trend model as an additional or alternative measure of the earnings surprise.

*EPS growth* is the fraction by which earnings in a quarter exceed earnings in the same quarter in the prior year. *Consensus forecast  $t+1$ , 1 day before call in  $t$*  is the mean of the most recent analyst forecasts for quarter  $t+1$  recorded in IBES during the 1 day before the earnings announcement for quarter  $t$ .

*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  $t$ .

We use the natural logarithm of *total assets* classified into five quintiles, *Tobin's Q*, as well as Fama-French 48 industry fixed effects, and/or CEO fixed effects.

*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. More frequent revisions indicate that a firm's earnings are more difficult to forecast. *Monthly volatility* is the monthly stock volatility computed from monthly return data over the previous 48 months.

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

The following variables are winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentiles: stock return, earnings surprise, EPS growth, Tobin's Q. Pre-call forecast standard deviation is winsorized at the 99<sup>th</sup> percentile level.

## **2.3 Reading managerial tone**

This section first discusses what managers may be trying to achieve on the calls and why linguistic tone is an interesting feature to consider. Then, it turns to the measurement of tone.

### **2.3.1 Why might investors pay attention to conference calls, and what are managers trying to achieve on these calls?**

Management communicates with the market in numerous ways. We argue that earnings conference calls provide an important conduit through which 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.<sup>7</sup>

---

<sup>7</sup> Conference calls have allowed other researchers to study how the tone shifts with the time of day (Chen, Demers and Lev 2012), whether vocal dissonance markers help predict the likelihood of accounting restatements (Hobson, Mayew and Venkatachalam 2012), whether the use of certain words suggests deception as later revealed by fraud (Larcker and Zakolyukina 2012), how companies strategically call on certain analysts (Mayew 2008; Cohen, Lou and Malloy 2013), the extent to which asking questions allows analysts to obtain superior information (Mayew, Sharp and Venkatachalam 2013), the role of the communication pattern within the management team (Li, Minnis,

Managers regularly host quarterly earnings conference calls, calls on which they announce earnings in the prior quarter and then comment on those earnings and possibly future developments. They presumably pursue multiple objectives on these calls, including promoting the firm and its valuation, establishing and safeguarding credibility, avoiding litigation for misleading or insufficiently informing investors but avoiding as well the release of private information, addressing challenges brought by investors or other stakeholders, etc.

First principles cannot tell us whether prepared or impromptu remarks by management on conference calls should reveal more. Prepared remarks provide a more confident way to convey the intended message in an appropriate manner. However, managers may not want to reveal some information, but convey it nevertheless when answering questions. By analogy, a witness in a trial might inadvertently reveal information unintentionally when cross examined. Finally, a manager may wish to convey some items of information in a non-purposeful manner, thus not in his prepared remarks. Doing so in response to a question preserves seemliness and plausible deniability on intent. Given that managers prepare answers to likely questions, they can use them to provide indirect tips. Empirics, not theory, will reveal which part of the conference call will more powerfully predict firm fundamentals and elicit stock price reactions. Our analysis below addresses this question.

The follow-on question is which characteristics of the conference call, if any, investors (and analysts) should pay attention to. The literature has used linguistic tone (the relative frequency of negative and positive words), and we also use this measure. However, it is worth pausing and reflecting on why this crude variable might be useful. Once artificial intelligence advances sufficiently, it may be possible to address extensive details of the call. When a materially

---

Nagar and Rajan 2014), what the consequences of communication are for short-selling (Blau, DeLisle and Price 2015), how managers differ in their time horizon (Brochet, Loumiotis and Serafeim 2015), or how language barriers between managers and conference call listeners can affect the transparency of the communication (Brochet, Naranja and Yu 2016).

negative outlook is conveyed, for example, this is likely to be accompanied by the use of negative words, but analysts and investors may simply react to concrete numbers (e.g., decreased operating margin) by inputting them into their valuation spreadsheets. The point here is that “tone” provides a potential way to infer management’s information.<sup>8</sup> Far from all companies issue any earnings guidance. Indeed, only about a quarter of companies provide management forecasts for next quarter. Conference call tone may provide implicit (perhaps partially unconscious) guidance, and thus act as a substitute for explicit guidance. We will also see that even after analysts had three days to adjust their forecasts (presumably enough time to input all hard, verifiable information into their spreadsheets), conference call tone still predicts future earnings, suggesting that the word count picks up information beyond the descriptive words surrounding easy to process information.

Overall, a central thesis of this analysis is that -- whatever the source or the intent of the information disclosure -- management tone unexplained by past results and public information about a company’s future provides additional information about a company’s prospects.

### **2.3.2 Measuring tone of speech and tone of press releases**

Our principal independent variable is managerial tone. We identify it through written transcripts of conference calls. 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.<sup>9</sup> The robustness section below tests whether a much simpler approach using a much shorter, self-compiled word list that focuses on the most frequently used words yields similar results.<sup>10</sup>

---

<sup>8</sup> The goal here is to see whether a simple approach yields consistent results. We emphasize that counting negative words does not per se mean that tone will be taken as a negative.

<sup>9</sup> We use the August 2013 version from [http://www3.nd.edu/~mcdonald/Word\\_Lists.html](http://www3.nd.edu/~mcdonald/Word_Lists.html).

<sup>10</sup> Our primary analysis weights all words equally, thus ensuring comparability with the literature on conference calls. Jegadeesh and Wu (2013), by contrast, study 10-K filings to determine the weights on individual words endogenously by assessing their predictive power for short-term price movements. They also employ these weights

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 the tone of all management members jointly, and usually refer to these members collectively as the *manager*. We control for the CEO's identity with fixed effects. Thus, our analysis proceeds as if the CEO "sets the tone."

Our focus is on what managers say. We compute our negativity indicators separately for the manager's prepared presentation and for his answers, as these parts are fundamentally different. Presentations are prepared and reviewed in advance, whereas answers require some degree of improvisation. Questions from knowledgeable analysts may also be informative, and we therefore account for their negativity as well.

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

Similarly, from earnings press releases (obtained from the SEC's EDGAR system), we code *negativity in earnings press releases*. We control for the negativity of the earnings press release in all regressions. We winsorize all negativity measures 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. Of course, all these measures of tone are noisy.

---

obtained from this more sophisticated approach to determine the effect of words in IPO statements on IPO underpricing.

Table 3 shows that on average about 0.86% [0.75%] of all words used in presentations [answers] on conference calls are coded as negative; nearly twice as many, 1.68% [1.20%], are coded as positive. Both negative and positive words appear more frequently in presentations than in answers. The mean ratio of negative to positive words is significantly lower in presentations than in the improvised answers, 0.56 as opposed to 0.71. (Note that this mean ratio differs from the ratio of the mean frequency of negative and positive words.) We obtain 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 tilting answers toward negativity is likely the negative cast of analysts' questions. Analysts use 1.66 negative words per positive word. This strong downbeat tilt by analysts suggests that they 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.<sup>11</sup>

### **2.3.3 Tone surprise, tone disappointment, and tone delight**

We would expect poor earnings would lead managers to use more negative words, and good earnings to more positive words. Thus, to assess the implications of managerial tone, we focus on the excessive components of managerial tone after correcting for known results, that is, what we label *tone surprise*. To set the benchmark, we first estimate the normal level of conference call negativity justified by the company's past performance, the earnings press release, and future expected performance, after controlling for CEO fixed effects. This benchmark model is shown

---

<sup>11</sup> This result accords with Brockman, Li and Price (2015), 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.

in Table A-1 in the Supplementary Appendix, which we discuss momentarily. *Tone surprise*, which we label more formally as *residual negativity* is the difference between actual negativity and the fitted value. This variable is conceptually similar to abnormal tone (Huang, Teoh and Zhang 2014) and idiosyncratic tone (Blau, DeLisle and Price 2015), but differs in some respects. Most important, we control for the negativity of the earnings press release.

We denote residual negativity in presentations by RNP and residual negativity in answers by RNA. To facilitate interpretation, these residuals measures are standardized to have a zero mean and a standard deviation of one.

We focus in particular on the difference between *tone disappointment* and *tone delight*. *Tone disappointment* (excessive negativity) is defined as  $\text{Absolute RNP} * 1\{\text{RNP} > 0\}$  and  $\text{Absolute RNA} * 1\{\text{RNA} > 0\}$  for presentations and answers, respectively. Here,  $1\{\text{RN} > 0\}$  is an indicator variable that equals one if the corresponding residual negativity is positive, and zero if the residual negativity is negative. Analogously, *tone delight* (excessive positivity) is  $\text{Absolute RNP} * 1\{\text{RNP} < 0\}$  and  $\text{Absolute RNA} * 1\{\text{RNA} < 0\}$  for presentations and answers, respectively. Importantly, the means and standard deviations of tone disappointment and tone delight differ little (see Table 3), so that their coefficients can readily be compared.

Although we focus on the unexplained part of tone, it is worth considering whether the factors we control for relate to tone in plausible ways.

Table A-1 in the Supplementary Appendix shows that the earnings surprise for a quarter – actual earnings minus analyst expectations -- plays an important role in determining a manager's tone. (Similar results also hold when alternatively or additionally standardized unexpected earnings, SUE, are included.) This finding confirms the importance managers attach to beating the market's expectations, as Degeorge, Patel and Zeckhauser (1999) report. The change in earnings from the same quarter in the previous year matters only for tone in presentations.



As expected, the tone in presentations relates strongly to the negativity of the earnings press release. Also, a firm's stock return in the preceding quarter, as expected, correlates negatively with managerial negativity in presentations and answers. This relationship persists after controlling for general market performance, although poor overall market returns foster downbeat conference calls. (The main regressions include quarterly market returns and, therefore, not quarter dummies.) Greater uncertainty among analysts regarding the earnings of the past quarter produces more negativity.

We use the consensus forecast of analysts for quarter  $t+1$  earnings as of 1 day before the call in quarter  $t$  as a proxy for publicly available information regarding next quarter company performance. The brighter the future analysts predict for a company, the more positive/less negative are presentations. Similarly, managers of firms with significant growth options (high Tobin's  $Q$ ) speak more positively.

Industry norms also influence tone; financial firms are 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).

Tone responds strongly to recent stock returns and earnings. More negative questions elicit more negative answers.

Individual managers may have word choice propensities (Bamber, Jiang and Wang 2010; Davis, Ge, Matsumoto and Zhang 2015). Thus, columns (3) and (4) control for CEO fixed effects. The results prove similar, with the coefficients very close to the case with industry fixed effects.<sup>12</sup> The overall results are virtually the same when we include firm fixed effects. Industry-

---

<sup>12</sup> In results not reported, 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. Neither do proxies for general abilities of the CEO, as developed in Custódio, Ferreira and Matos (2013). Moreover, while incentives to

year fixed effects are included in columns (3), (6), and (9); results change little. Results below employ CEO fixed effects only, but the results also hold with industry-year fixed effects.

To parse the effects on negative and positive word use, we analyze frequencies looking at each category individually; see Table A-2 in the Supplementary Appendix. As would be expected, negative (positive) words become more (less) frequent when: a firm's stock price declines, its earnings fall short of the consensus forecast, or the economy worsens.

### 2.3.4 Additional examined characteristics of managerial speech

Several additional patterns of speech could be warning flags, and may be of separate interest.<sup>13</sup> Thus, we include them as explanatory variables. First, is *inconsistency in tone*, the absolute difference in negativity between presentations (prepared speech) and answers (improvised speech). Such inconsistency might also indicate that the manager is particularly forthcoming with information in the answers part. (We also consider the difference in negativity between presentations and the earnings press release below.) 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*. We also include the frequency of *financial* words (as identified in Matsumoto, Pronk and Roelofson (2011)). 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

---

increase the stock price (delta), computed as in Core and Guay (2002) are, per se, negatively related to negative tone, they become insignificant once other company variables and analyst forecasts are included. Results remain unchanged when including incentives in the estimation of tone surprises, but the sample size is slightly reduced, which is why we omit this variable from the main analysis.

<sup>13</sup> 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)).

should primarily announce and explain past results. Answers should clarify missed points, explain the current situation, or preview the future. Table 3 suggests that, 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 the future tense is relatively rare; fewer than 10% of verbs used in any of presentations, answers, and questions use the future tense, though much present tense discussion is implicitly about the future. If too few sentences in the presentation use 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, where the weights are the number of verbs in the two respective parts of the conference call.<sup>14</sup>

We winsorize these four speech characteristics variables at the 1 and 99 percent levels. In unreported analysis, the need to present poor results produces greater inconsistency in tone between presentations and answers, more uncertain words, more wrong tense use, and to some extent more complexity.<sup>15</sup>

---

<sup>14</sup> 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."

<sup>15</sup> 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) 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.

### 3 The Valuable Information Hypothesis

If managerial tone helps to predict earnings and uncertainty, stock market reaction to managerial tone in the appropriate direction would likely reflect rational information processing. We examine this conjecture in this section. Analyst and market reactions are the subject of Sections 4 to 6.

#### 3.1 *Future earnings*

The Valuable Information Hypothesis (VIH) holds that managers reveal information about future earnings of the company by choosing (purposefully or inadvertently) their tone. Given such conveyance, tone surprises, that is, unusual negativity, will predict earnings in the next quarter.

Although results from a number of studies partially speak to this hypothesis, the collective results to date are inconclusive; they appear to be context-dependent.<sup>16</sup> In light of the divergent findings in the literature, an investigation into the rationality of the stock market reaction to tone in conference calls requires, at the outset, that we assess the ability of tone in conference calls to predict future earnings.

TABLE 4 ABOUT HERE

Table 4 strongly supports this first component of the VIH, namely that beyond publicly available information, tone predicts future earnings. Consider columns (1) and (2). They show

---

<sup>16</sup> Davis, Piger and Sedor (2012) (DPS) and Demers and Vega (2010) (DV) find that optimism in quarterly earnings press releases is a positive predictor for future earnings. By contrast, Huang, Teoh and Zhang (2014) (HTZ) find that abnormally positive tone in annual earnings releases predicts lower future earnings. HTZ explain this difference in results by pointing to a different sample composition and by noting that they use annual earnings press releases and look multiple years into the future releases while DPS and DV use quarterly earnings press releases and are concerned with predicting quarterly earnings. (See HTZ's footnotes 6 and 16.) Lee's (2015) investigation of the predictive power of spontaneity of managers controls for the overall tone of the conference call (pooling presentations, analyst questions, and answers), and finds a positive relationship between positive tone and future earnings. The frequency of negative words in 10-K filings has also been found to be positively correlated with positive future earnings surprises (Loughran and McDonald 2011).

that excessive negative tone in either presentations or answers predicts smaller future earnings, even after controlling for the negativity of the earnings press release and the consensus forecast in place at the time of the conference call (as well as a large set of other controls).<sup>17</sup>

Next we separately investigate abnormal negativity in residuals (tone disappointment) and abnormal positivity (tone delight). Presumably significant constraints operate on the negative side. That is, there are some things management should not (prefers not to) say about negative news, but which it could say comfortably about comparably positive news. If so, unusually negative statements would imply overpowering some constraints and inhibiting factors.<sup>18</sup>

The results in columns (3) and (4) show that tone disappointment in presentations and/or answers strongly signals lower future earnings. Though tone delight in presentations portends somewhat higher future earnings, the size of the effect is much smaller than that for unusually negative presentations. Additional results, not presented, document that the tone's prediction for the firm's performance extends to the medium-term horizon, namely up to earnings in the same quarter in the following year.

All these results obtain after controlling for the negativity of the earnings press release and for the negativity of analyst questions. Interestingly, unreported results show that if negativity of the conference call presentation is greater than the negativity of the press release – both of which are carefully prepared – this strongly predicts lower earnings.

Columns (5) to (8) develop these results further. Columns (5) and (6) add other speech

---

<sup>17</sup> Using 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, this approach allows us to conduct our investigation into possible asymmetric effects of positive and negative residual negativity.

<sup>18</sup> Our tests concern whether on average tone delight or tone disappointment has stronger predictive power. Managers who are about to receive stock options or a fixed value stock grant may prefer to understate how bright they expect the future to be. Future research may investigate this possibility of differentiating among managers. To the extent that the board decides to grant additional incentives based on the current level of incentives (Coles, Daniel and Naveen 2006), we can proxy for the potential role of this motivation by controlling for current equity-based incentives (Core and Guay 2002). The results remain unchanged, but the sample size is reduced due to data availability.

characteristics. Their main result is that tone surprises retain their predictive power. In firms where managers use more uncertain words, more strong modal words, more complex sentences, and more atypical tenses, lower future earnings follow on average.

Columns (7) and (8) expand the earnings-prediction model by taking into consideration the updated forecasts of financial analysts. Specifically, the post-call 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.<sup>19</sup> Importantly, the association between excessive negativity and future earnings still holds strongly, though the coefficients are smaller than in columns (5) and (6).

In sum, in line with the VIH, tone surprises strongly predict earnings even after accounting for the tone of the press release as well as for updated analyst expectations after the call.

### **3.2 *Uncertainty***

Greater uncertainty about a firm's future should drive up the discount rate that the market applies to those future earnings, and thus depress its stock price. Hence, we are concerned with how the tone in a manager's speech impacts (analyst) uncertainty following the conference call.

#### **TABLE 5 ABOUT HERE**

Table 5 documents that residual negativity predicts a greater standard deviation of forecasts regarding the next quarter. Consistent with the asymmetry found earlier, columns (3) and (4) show that tone disappointment has a greater absolute effect on uncertainty than tone delight.

---

<sup>19</sup> 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.

In addition, controlling for negativity, the degree of uncertainty, as reflected in the disparity in analysts' predictions, is greater when management uses more uncertain words, more strong modal words and more financial words.

Table A-3 in the Supplementary Appendix documents that the effects of tone surprises are also reflected in a greater revision frequency after the call. Moreover, that table shows that when management speaks excessively negatively, bid-ask spreads expand from just before to just after the call.

Collectively, these results imply that negative managerial tone predicts higher uncertainty.

#### **4 The Reasonable Market Response Hypothesis, Part 1 of 3: Appropriate Forecast Revisions**

The stock market requires an avenue for getting informed about tone. No doubt some stock market investors simply listen to the conference call directly, and respond. For a much larger audience of investors, it is likely that sell-side analysts, the professionals allowed to ask questions on these calls, are the messengers delivering this information.<sup>20</sup> That is, analysts read and report on the tea leaves that managers set forth with their words. Then this larger audience of investors can respond to what analysts say. Thus, if analysts' forecasts respond to tone, the market can react subsequently. The results from Section 3.2 already provide some evidence of the reaction of analysts as a group: First, we saw in Table 4 that after accounting for the updated consensus forecast after the conference call, the predictive power of tone surprises is reduced by about one half (though it remains strong). Second, we saw in Table 5 that negative managerial tone appears to sow uncertainty among analysts. In this section, we investigate the responses of individual

---

<sup>20</sup> Only analysts can ask question. Although there is some participation by buy-side analysts (Jung, Wong and Zhang 2015), only 5% of questions are asked by these analysts.

analysts.

The results in Table 6 make clear that analysts do react to tone surprises in the direction those surprises imply for future earnings.<sup>21</sup> Thus, they adjust their forecasts downward when the manager is negative, even controlling for observables (columns (1) to (3)). Recall that residual negativity is standardized to have a zero mean and a standard deviation of one. The coefficient of -2.086 in column (1) implies 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 2.09%, a sizable effect. Notably, these results obtain after controlling for negativity in the earnings press release and of the analysts' questions (both of which have the expected negative sign), as well as for our rich set of other speech characteristics. In results available on request, we find that analysts revise strongly negatively when the negativity of the conference call presentation exceeds the negativity of the earnings press release. (These results contrast with the findings in Mayew and Venkatachalam (2012), who find no association between linguistic tone and forecast revision activity.)

#### TABLE 6 ABOUT HERE

Interestingly, columns (3) and (4) show that analysts adjust more strongly following tone delight in presentation and answers, which suggests that their responses may tilt toward optimism, as might be expected given their sell-side situation. That tilt is reinforced given the

---

<sup>21</sup> Analysts sometimes hold private calls with management just after the public conference calls. Thus, analyst reports after conference calls often contain topics that were not discussed on the call (Huang, Leavy, Zhang and Zheng 2014). While Soltes (2014), in a detailed study of one firm, does not find that private meetings of analysts with managers lead analysts to issue more accurate earnings forecasts, Green, Jame, Markov and Subasi (2014) provide evidence that brokerage research accuracy does benefit from meetings with management. 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.



finding in Table 4 that tone disappointment in presentation is more informative than tone delight in answers, and that tone disappointment in answers is about as informative as is tone delight in answers.

Do analysts' forecasts accurately capture the tone of managers' speech? To answer that question, we relate errors in those forecasts to the magnitude of the managers' excessive negativity. Columns (5) and (6) of Table 6 show that when managers are excessively negative in presentations and answers, positive forecast errors (expectations are above actual earnings) become larger and possibly more frequent.

The central finding about the difference between tone delight and tone disappointment is reinforced: Critically, and in line with results from columns (3) and (4), columns (7) and (8) show that analysts on average under-react to disappointingly negative presentations and answers.<sup>22</sup>

Finally, there is also some evidence that analysts differ in their ability to distill managerial tone. Columns (9) and (10) of Table 6 show that generalist analysts – those covering many firms – draw inferences less effectively from managerial negativity than do analysts who study but a few firms.<sup>23</sup>

In sum, the results on future earnings and earnings forecasts are consistent with the idea that managerial tone conveys information regarding future earnings, and that analysts incorporate that information. However, while they give appropriate credence to tone delight, their estimates respond notably too little to tone disappointment.

---

<sup>22</sup> This finding is consistent with the finding in Table 4, that showed that even after controlling for updated average forecasts, tone disappointment in presentations and answers still tells us something about future earnings. In Table 5 we consider individual analysts as the units of observation and the dependent variable is the percentage forecast error. Thus, the two sets of analyses provide somewhat different perspectives. The finding that analysts do not fully incorporate all information from conference calls in their forecasts is consistent with the result in Bradshaw, Richardson and Sloan (2001) that analysts do not fully incorporate accruals into their earnings forecasts.

<sup>23</sup> All these results on analysts hold when we compute forecast error as a percentage of the stock price rather than as a percentage of earnings. These findings are available on request.

## 5 The Reasonable Market Response Hypothesis, Part 2 of 3: Price Persistence

### 5.1 *Immediate stock market reactions*

The ultimate test of the Rational Reactions Hypothesis is whether the market – as indicated by stock price movements -- not merely analysts, is able to read between the lines of managerial conference calls. Columns (1) to (4) of Table 7 measure 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.

TABLE 7 ABOUT HERE

As a baseline, columns (1) and (2) of Table 7 show that excessive negativity (in both presentations and answers) relates strongly negatively to the short-term stock market reaction around the earnings announcement. This is consistent with prior studies (e.g., Mayew and Venkatachalam (2012), Price, Doran, Peterson and Bliss (2012), and Lee (2015)).

Turning to our novel results, which separate the effects of abnormal negativity and abnormal positivity, see columns (3) and (4). The market's immediate response to tone delight is far stronger than to tone disappointment. For example, column (3) implies that a one standard deviation in tone delight in presentation leads to a positive 1.08% abnormal return, whereas tone disappointment leads to a short-run negative abnormal stock return of minus 0.57%. Column (4) shows a similar disparate results for answers.

These results apply after controlling for the tone of the earnings press release (whose negativity is, naturally, also negatively associated with the stock price reaction) and other speech patterns. Inconsistency in tone leads to negative short-term stock reactions, as does the use of

uncertain words. The share price also responds negatively to use of the wrong tense: 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, the market reacts favorably to the use of weak modal and financial words by managers.

Interestingly, when the answers section is longer, the market seems to sense trouble ahead (consistent with findings for uncertainty). This can be seen in the negative coefficient on the number of words management speaks in the Q&A part of the conference call. Finally, controlling for the previous quarter's tone surprise does not change results.

Overall, conference call tone surprises robustly determine immediate stock return reactions in the appropriate direction. Importantly, the market's immediate response to tone delight is much stronger than its response to tone disappointment.

## **5.2 *Excess returns over the next quarter***

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. Huang, Teoh, and Zhang (2014) examine earnings press releases, and identify such reversions. If initial movements are sustained, by contrast, this would suggest that the immediate reaction was rational. Using size-adjusted returns Price, Doran, Peterson and Bliss (2012) present evidence showing that conference calls produce such persistence. To investigate reversion, or its absence, we next analyze how stock prices behave in the quarter following a conference call. We use characteristics-adjusted excess returns (Daniel, Grinblatt, Titman and Wermers 1997), which allows us to control for momentum.

Given well known results from another arena, on post-earnings announcement drift

(PEAD), we might expect that even after the market responded to information from tone in conference calls, there would be further drift in the same direction.<sup>24</sup> That is, given that earnings announcements are relied on insufficiently, we might also expect under-reaction to information on earnings that is contained in tone. And any drift may be reinforced when there is tone disappointment, because, as Section 3 showed, analysts update their earnings forecasts insufficiently in response to tone disappointment.

Panels A and B of Figure 1 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 both graphs show a post-conference call drift (PCCD) that is partially associated with managerial tone. Second, both graphs indicate a stronger drift for the quintile with the strongest negative tone than for the quintile with the strongest positive tone. Third, looking at the most negative quintile for both, we see that the market's initial response to high negativity builds over three days. This is in contrast to the immediate one-day jump in the case of the earnings surprise.<sup>25</sup> That it takes three or more days for a negative response in stock prices to filter through is consistent with the idea that the nuggets of information available “between the lines” of conference calls are more difficult to identify and digest than the quantitative information in earnings announcements, and/or that analysts are somewhat reluctant to adjust forecasts downward.

#### FIGURE 1 ABOUT HERE

---

<sup>24</sup> Supplementary Figure A-1 shows that PEAD arises also in our sample: Companies in the highest quintile of the earnings-surprise experience an immediate positive stock price reaction, but their stock price drifts 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.

<sup>25</sup> 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 Supplementary Figure 1.

To control in addition for the earnings surprise, Panels C and D first sort firms into quintiles of the earnings surprise, with 5 being the most positive surprise and 1 the most negative. Then, within each earnings surprise quintile companies are further divided into quintiles of negativity, with Q5 the most negative. 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.<sup>26</sup> The same picture emerges as in Panels A and B. Very similar graphs appear if we sort directly on residual negativity.

Table 8 employs these double-sorted portfolios to examine the value-weighted average DGTW characteristic-adjusted excess returns from the day after the conference call until day 50. As can be seen, within each earnings surprise quintile, as expected, returns decrease with negativity.

#### TABLE 8 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), predicts 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 roughly an additional 50% to differences based on returns.

It is potentially important to control for additional variables. Columns (5) to (8) of Table 7

---

<sup>26</sup> 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.

therefore study the statistical significance of the post-call drift in the days 2 to 50 after the conference call when one also controls for other factors. Even with these controls (which include the negativity in the earnings press release, thereby isolating effects of conference call tone), we find that RNP and RNA on average explain the post-call drift. These results confirm, in a larger sample and using the arguably “tougher” benchmark of characteristics-adjusted excess returns, the findings of Price, Doran, Peterson and Bliss (2012).<sup>27</sup>

The stark difference between tone disappointment and tone delight presents the most intriguing finding in this table. Columns (7) and (8) suggest that on average the drift in additional excess returns after tone disappointment in presentation and answers is approximately double the size of the one realized in the immediate time window. This is consistent with the observation in Table 4 that even after controlling for updated earnings forecasts, residual negativity still helps to explain future earnings. By contrast, tone delight produces no post-call drift. Thus, the market appears to incorporate good news more quickly than bad news, as would be expected given that after the conference call analysts change their forecasts more strongly in response to excessive positivity than to excessive negativity (recall Table 5).<sup>28</sup> Table 7 also shows that firms where managers use atypical tenses tend to underperform significantly over the medium term. In results available on request, we also find that underperformance is predicted to occur when the conference call presentation out does the earnings press release on negativity.

Supplementary Table A-4 reports the results with CAR050 as the dependent variable. It shows that over the whole quarter stock prices react somewhat more strongly to tone delight in presentation than to tone disappointment. For answers, the market responds approximately

---

<sup>27</sup> We consider managers’ answers and analyst questions separately, while Price, Doran, Peterson and Bliss (2012) pool these two elements of the Q&A session. Brockman, Li and Price (2015) emphasize the role of analyst tone in explaining the drift.

<sup>28</sup> It is conceivable that the news directly from negative tone is never fully incorporated, but corporate performance, and thus stock prices, ultimately reflect that news.

similarly for both types of tone surprises. While excessive negativity predicts earnings and uncertainty more strongly than excessive positivity, we also saw that analysts under-react to tone disappointment, which may explain these stock return results.

In sum, even after controlling for the negativity of the press release and for the earnings surprise, firms with highly negative conference calls underperform the benchmark of firms with similar characteristics. These 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. It is especially excessively negative communication that is not quickly incorporated in prices.

## **6 The Reasonable Market Response Hypothesis, Part 3 of 3: Heterogeneity Across Firms**

We have shown 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 both the Valuable Information and the Reasonable Market Response Hypotheses. However, we sought an additional test of the RMRH. If it is valid, we should expect a stronger market response for firms in which managerial tone relates more strongly to future earnings and/or uncertainty.

Specifically, some firms are “cloudy,” meaning that objective information is less informative about their performance or prospects. Large (either positive or negative) earnings surprises are a marker of cloudiness. We hypothesize that in cloudy firms, the tone surprise should be particularly informative because there is more news to be explained. Therefore, in these firms we should observe stronger reactions of earnings, uncertainty, and stock returns.

Table 9 tests this hypothesis. Panel A includes interaction terms between the absolute

earnings surprise and the tone surprises. These interactions are significantly negative for earnings and stock returns, and significantly positive for uncertainty. This presents strong evidence in favor of the heterogeneity hypothesis.<sup>29</sup>

Similarly, in Panel B of Table 9, we document that it is in bad times – when the market return is in the lowest quartile – that tone surprises are particularly informative for future earnings and for uncertainty. And it is in these times that tone has the highest predictive power for the medium-term stock returns.

Overall, these findings show that the market reacts more strongly to tone for cloudy firms, those where tone more strongly predicts future earnings and 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.

## 7 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),<sup>30</sup> we find that analysts tend to be more sober in companies with a lot of “dedicated,” low-investment-turnover

---

<sup>29</sup> A potential concern with Table 9 is that the regressions include both the absolute earnings surprise (with which the tone surprise variables are interacted) and the earnings surprise decile (as a control variable). Omitting the earnings surprise decile does not change the results, however. Consistent with this observation, Supplementary Table A-5, where we instead conduct sample splits, yields the same result: In the firms in the highest absolute earnings surprise quartile, tone surprises very strongly predict lower future earnings, higher uncertainty, and more negative stock price reactions. (The standard deviations of tone surprises within the four “cloudiness” quartiles are very similar and close to 1, so that the coefficient sizes can be compared with each other.) By contrast, in the lowest earnings surprise quartile, residual negativity affects these quantities much less. Moreover, we conduct a different formal test in Supplementary Table A-6. The regressions presented there reveal that the stock market response to tone surprises is particularly pronounced (that is, the managerial-tone-response coefficient is particularly large) in those companies where tone surprises are particularly informative for future earnings and where they strongly impact analyst uncertainty. All these findings suggest that both negativity in presentations and in answers gets priced into stock prices, because either one predicts lower earnings and increases uncertainty.

<sup>30</sup> 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 identify tone patterns in 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 that indicated uncertainty. The complete list of chosen words in these three groups, arranged by their frequency, is shown in Table A-7 in the Supplementary Appendix. Most of the words on our word list also appear on the list of Loughran and McDonald (2011). There are some exceptions, such as the positive 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 replicated with this more restrictive word classification list.

**Earnings surprise.** Rather than using the earnings surprise decile, we also used the actual earnings surprise, divided by the stock price. Moreover, either instead of or in addition to the earnings surprise decile, we included standardized unexpected earnings (SUE). In all these variations, 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 firms hold conference calls within close

vicinity to the earnings announcement that address corporate events not directly related to earnings. Including these roughly 1,000 calls generally somewhat strengthens our results. (Results presented exclude these non-earnings calls, however.)

**Two-way clustering of standard errors.** In addition to clustering standard errors at the CEO level (as in the main analysis), we also clustered standard errors across periods. The results were sustained.

## 8 Conclusion

Managers conduct conference calls to accompany their earnings announcements. Stock prices respond to the words managers employ. The overarching hypothesis tested in this paper is that the market rationally extracts information embedded in managerial tone. Two hypotheses flow from this idea. The *Valuable Information Hypothesis* (VIH) holds that *tone surprise* in conference calls predicts a company's future performance over and above publicly available information, such as earnings, the earnings press release tone, and analyst expectations. This prediction is supported. Moreover, negativity magnifies uncertainty, as is reflected in larger variance in forecasts, more frequent forecast revisions, and increased bid-ask spreads. For both earnings and uncertainty, excessive positivity (*tone delight*) is less informative than excessive negativity (*tone disappointment*). Overall, the results on the VIH are consistent with the idea that managers leak information, whether purposefully or inadvertently.

The *Reasonable Market Response Hypothesis* (RMRH) states that market prices and analyst forecasts move in a rational direction given the information conveyed by managerial tone. This hypothesis has three sub-components, *Appropriate Forecast Revisions*, *Price Persistence*, and *Heterogeneity Across Firms*, which together trace the path from predictions about future performance to market response.

Consistent with the Appropriate Forecast Revisions Hypothesis, analysts respond to tone in the right direction, but tend to under-react to tone disappointment (excessive negativity). Consistent with the Price Persistence Hypothesis, after the initial response to the conference call, stock prices of companies drift further in the direction the tone suggested. Good news travels faster: the initial reaction to tone delight is stronger than the reaction to tone disappointment, and after controlling for various other factors there is a drift only after tone disappointment. Consistent with the Heterogeneity Across Firms Hypothesis, the market reacts more strongly to tone surprises in those firms where surprises more strongly predict future earnings and uncertainty.

Overall, this coherent set of results strongly supports the Rational Reactions Hypothesis: “Market participants rationally distill value-relevant information from managerial tone that is unexplained by past results and public information about a company’s future.” In other words, participants read “between the lines” to process the information that managers convey, purposefully or inadvertently, through their tone.

## References

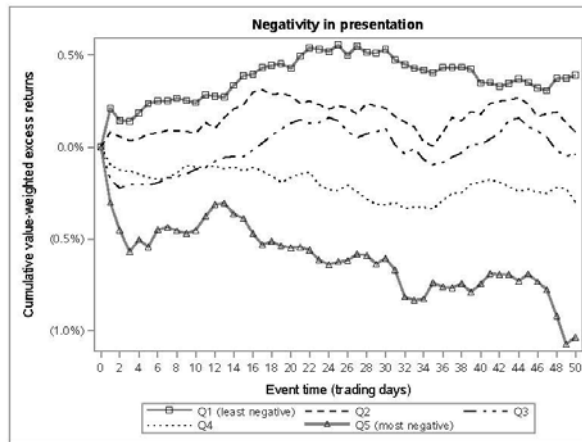
- Bamber, L.S., Jiang, J.X., and Wang, I.Y., 2010. What's My Style? The Influence of Top Managers on Voluntary Corporate Financial Disclosure. *The Accounting Review* 85, 1131-1162
- Bernard, V.L., and Thomas, J.K., 1989. Post-earnings-announcement drift: Delayed price response or risk premium. *Journal of Accounting Research* 27, 1-36
- Blau, B.M., DeLisle, R.J., and Price, S.M., 2015. Do Sophisticated Investors Interpret Earnings Conference Call Tone Differently than Investors at Large. *Journal of Corporate Finance* 31, 203-219
- Bodnaruk, A., Loughran, T., and McDonald, B., 2015. Using 10-K Text to Gauge Financial Constraints. *Journal of Financial and Quantitative Analysis* 50, 1-24
- Brochet, F., Loumrioti, M., and Serafeim, G., 2015. Speaking of the short-term: disclosure horizon and managerial myopia. *Review of Accounting Studies* 20, 1122-1163
- Brochet, F., Naranja, P.L., and Yu, G., 2016. The Capital Market Consequences of Language Barriers in the Conference Calls of Non-U.S. Firms. *The Accounting Review* forthcoming
- Brockman, P., Li, X., and Price, S.M., 2015. Differences in Conference Call Tones: Managers versus Analysts. *Financial Analysts Journal* 71, 24-42
- Buehlmaier, M.M.M., and Whited, T., 2014. Looking for Risk in Words: A Narrative Approach to Measuring the Pricing Implications of Financial Constraints. Working paper
- Bushee, B.J., 2001. Do Institutional Investors Prefer Near-Term Earnings over Long-Run Value. *Contemporary Accounting Research* 18, 207-246
- Chen, J., Demers, E., and Lev, B., 2012. Oh What a Beautiful Morning! The Effect of the Time of Day on the Tone and Consequences of Conference Calls. Working Paper
- Chen, J.V., Nagar, V., and Schoenfeld, J., 2014. Sources of Analyst Expertise. Working paper, University of Michigan
- Cohen, L., Lou, D., and Malloy, C., 2013. Playing Favorites: How Firms Prevent the Revelation of Bad News. Working paper
- Coles, J., Daniel, N., and Naveen, L., 2006. Managerial incentives and risk-taking. *Journal of Financial Economics* 79, 431-468
- Core, J.E., and Guay, W.R., 2002. Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. *Journal of Accounting Research* 40, 613-629
- Custódio, C., Ferreira, M., and Matos, P., 2013. Generalists vs. Specialists: Lifetime Work Experience and CEO Pay. *Journal of Financial Economics* 108, 471-492
- Daniel, K., Grinblatt, M., Titman, S., and Wermers, R., 1997. Measuring mutual fund performance with characteristic-based benchmarks. *The Journal of Finance* 52, 1035-1058
- Davis, A.K., Ge, W., Matsumoto, D.A., and Zhang, J.L., 2015. The Effect of Manager-Specific Optimism on the Tone of Earnings Conference Calls. *Review of Accounting Studies* 20, 639-673
- Davis, A.K., Piger, J.M., and Sedor, L.M., 2012. Beyond the numbers: Measuring the information content of earnings press release language. *Contemporary Accounting Research* 29, 845-868
- DeGeorge, F., Patel, J., and Zeckhauser, R., 1999. Earnings Management to Exceed Thresholds. *Journal of Business* 72, 1-33
- Demers, E., and Vega, C., 2010. Soft information in earnings announcements: News or noise? . Working Paper
- Engelberg, J., 2009. Costly information processing: Evidence from earnings announcements. Working Paper

- Frankel, R., Johnson, M., and Skinner, D.J., 1999. An Empirical Examination of Conference Calls as a Voluntary Disclosure Medium. *Journal of Accounting Research* 37, 133-150
- Green, T.C., Jame, R., Markov, S., and Subasi, M., 2014. Access to management and the informativeness of analyst research. *Journal of Financial Economics* 114, 239-255
- Hoberg, G., and Lewis, C., 2014. Do fraudulent firms engage in disclosure herding? Working paper
- Hobson, J.L., Mayew, W.J., and Venkatachalam, M., 2012. Analyzing Speech to Detect Financial Misreporting. *Journal of Accounting Research* 50, 349-392
- Hollander, S., Pronk, M., and Roelofsen, E., 2010. Does Silence Speak? An Empirical Analysis of Disclosure Choices during Conference Calls. *Journal of Accounting Research* 48, 531-563
- Huang, A., Leheavy, R., Zhang, A., and Zheng, R., 2014. Analyst Information Discovery and Information Interpretation Roles: A Topic Modeling Approach. Working paper, Hong Kong University of Science and Technology and University of Michigan
- Huang, X., Teoh, S.H., and Zhang, Y., 2014. Tone Management. *The Accounting Review* 89, 1083-1113
- Jegadeesh, N., and Wu, D., 2013. Word Power: A New Approach for Content Analysis. *Journal of Financial Economics* 110, 712-729
- Jung, M.J., Wong, M.H.F., and Zhang, X.F., 2015. Buy-Side Analysts and Earnings Conference Calls. Working paper
- Kothari, S.P., Li, X., and Short, J.E., 2009. The Effect of Disclosures by Management, Analysts, and Financial Press on the Equity Cost of Capital: A Study Using Content Analysis. *The Accounting Review* 84, 1639-1670
- Larcker, D.F., and Zakolyukina, A.A., 2012. Detecting Deceptive Discussions in Conference Calls. *Journal of Accounting Research* 50, 495-540
- Lee, J., 2015. Can Investors Detect Managers' Lack of Spontaneity? Adherence to Pre-Determined Scripts during Earnings Conference Calls. *The Accounting Review* forthcoming
- Li, F., 2008. Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and Economics* 45, 221-247
- Li, F., 2011. Textual analysis of corporate disclosures: A survey of the literature. *Journal of Accounting Literature* 29, 143-165
- Li, F., Minnis, M., Nagar, V., and Rajan, M., 2014. Knowledge, compensation, and firm value: An empirical analysis of firm communication. *Journal of Accounting and Economics* 58, 96-116
- Livnat, J., and Mendenhall, R.R., 2006. Comparing the Post-Earnings Announcement Drift for Surprises Calculated from Analyst and Time Series Forecasts. *Journal of Accounting Research* 44, 177-205
- Loughran, T., and McDonald, B., 2011. When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *The Journal of Finance* 66, 35-65
- Loughran, T., and McDonald, B., 2013. IPO first-day returns, offer price revisions, volatility, and form S-1 language. *Journal of Financial Economics* 109, 307-326
- Loughran, T., and McDonald, B., 2014. Measuring Readability in Financial Disclosures. *The Journal of Finance* 69, 1643-1671
- Loughran, T., and McDonald, B., 2015. Textual Analysis in Finance and Accounting: A Survey. Working paper

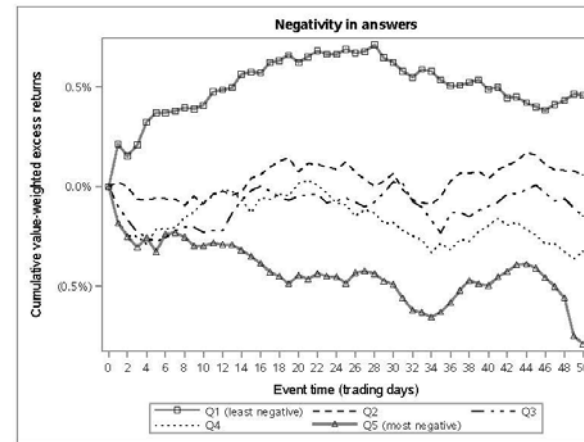
- Matsumoto, D., Pronk, M., and Roelofsen, E., 2011. What Makes Conference Calls Useful? The Information Content of Managers' Presentations and Analysts' Discussion Sessions. *Accounting Review* 86, 1383-1414
- Mayew, W.J., 2008. Evidence of Management Discrimination Among Analysts during Earnings Conference Calls. *Journal of Accounting Research* 46, 627-659
- Mayew, W.J., Sharp, N.Y., and Venkatachalam, M., 2013. Using earnings conference calls to identify analysts with superior private information. *Review of Accounting Studies* 18, 386-413
- Mayew, W.J., and Venkatachalam, M., 2012. The Power of Voice: Managerial Affective States and Future Firm Performance. *Journal of Finance* 67, 1-43
- Ober, S., Zhao, J.J., Davis, R., and Alexander, M.W., 1999. Telling it like it is: The use of certainty in public business discourse. *Journal of Business Communication* 36, 280-300
- Price, S.M., Doran, J.S., Peterson, D.R., and Bliss, B.A., 2012. Earnings conference calls and stock returns: The incremental informativeness of textual tone. *Journal of Banking and Finance* 36, 992-1011
- Soltes, E., 2014. Private interaction between firm management and sell-side analysts. *Journal of Accounting Research* 52, 245-272
- Tetlock, P., 2007. Giving content to investor sentiment: The role of media in the stock market. *Journal of Finance* 62, 1139-1168
- Tetlock, P.C., Saar-Tsechansky, M., and Macskassy, S., 2008. More than words: Quantifying language to measure firms' fundamentals. *The Journal of Finance* 63, 1437-1467
- Zhang, Y., 2008. Analyst responsiveness and the post-earnings-announcement drift. *Journal of Accounting and Economics* 46, 201-215

### Figure 1: Post-conference call drift

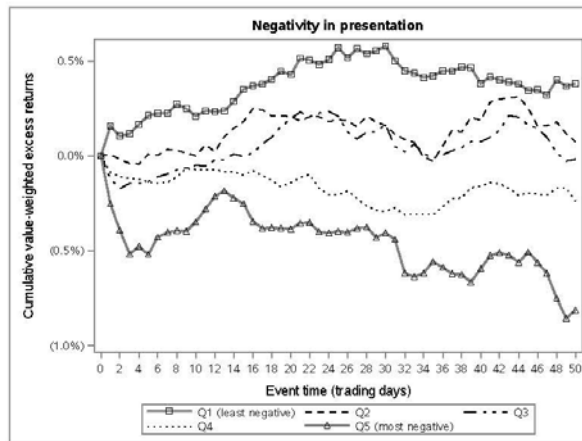
Each panel in this figure shows excess returns of five portfolios of stocks. Quintile portfolios were formed based on the variables noted in the caption of each figure. The graph shows, at each event time  $t$  (trading days), the cumulative value-weighted excess return of each portfolio from the time 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.



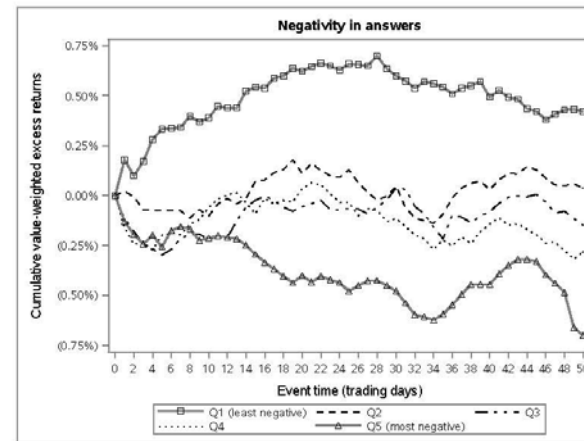
Panel A: Portfolios sorted by negativity in presentation



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**

<b>Variable Name</b>	<b>Definition</b>	<b>Source</b>
<i>Negativity in presentations, answers, analyst questions</i>	The ratio $(n-p)/(n+p+1)$ , where n and p are the numbers of negative and positive words used in the conference call, respectively. We compute negativity for presentations, answers, and analyst questions separately. In the primary analysis we use the word list of Loughran and McDonald (2011).	Authors' calculation
<i>Residual negativity (RN)</i>	Residual negativity in presentation (RNP) is the residual of regression (4) in Supplementary Table A-1. Residual negativity in answers (RNA) is the residual of regression (5) in Supplementary Table A-1. All residuals are standardized to have 0 mean and a standard deviation of 1.	Authors' calculation
<i>Tone disappointment</i>	Absolute RNP * $1\{RNP > 0\}$ and Absolute RNA * $1\{RNA > 0\}$ for presentations and answers, respectively. $1\{RN > 0\}$ 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.	Authors' calculation
<i>Tone delight</i>	Absolute RNP * $1\{RNP < 0\}$ and Absolute RNA * $1\{RNA < 0\}$ for presentations and answers, respectively. $1\{RN < 0\}$ is an indicator variable which is equal to one if the corresponding residual negativity is negative; it is zero if the residual negativity is positive.	Authors' calculation
<i>Negativity in earnings press release</i>	The ratio $(n-p)/(n+p+1)$ , where n and p are the numbers of negative and positive words used in the earnings press release, respectively	Authors' calculation
<i>Inconsistency in tone</i>	The absolute difference in negativity between presentations (prepared speech) and answers (improvised speech)	Authors' calculation
<i>% Uncertain words</i>	The percent uncertain words used by management, computed using the word list of Loughran and McDonald (2011)	Authors' calculation
<i>% Strong modal words</i>	The percent strong modal words used by management, computed using the word list of Loughran and McDonald (2011)	Authors' calculation
<i>% Weak modal words</i>	The percent weak modal words used by management, computed using the word list of Loughran and McDonald (2011)	Authors' calculation
<i>Complexity</i>	The words per sentence, calculated as a weighted average of presentation and answers	Authors' calculation
<i>Atypical tense</i>	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.	Authors' calculation
<i>% Financial words</i>	The percent financial words used by management, computed using the word list in Matsumoto, Pronk, and Roelofson (2011)	Authors' calculation

[continued on next page]



**Table 1: Variable Descriptions [continued]**

<b>Variable Name</b>	<b>Definition</b>	<b>Source</b>
<i>Stock return</i>	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
<i>Earnings surprise</i>	The difference between actual and consensus forecast earnings (the mean of the most recent analyst forecasts recorded in IBES during the 90 days before the quarterly earnings announcement), divided by the share price 5 days before the earnings announcement	IBES
<i>EPS growth since same quarter last year</i>	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
<i>Consensus forecast <math>t+1</math>, 1 day before call in <math>t</math></i>	The mean of the most recent analyst forecasts for quarter $t+1$ recorded in IBES during the 1 day before the earnings announcement for quarter $t$	IBES
<i>Market return</i>	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
<i>Monthly volatility</i>	The monthly stock volatility computed from monthly return data over the past 48 months	CRSP
<i>Ln (assets)</i>	The natural logarithm of total assets	Compustat
<i>Tobin's Q</i>	The ratio of the market value of assets to the book value of assets	Compustat
<i>Earnings in quarter <math>t+1</math></i>	Earnings per share in the next quarter	IBES
<i>Forecast change</i>	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
<i>Forecast error</i>	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
<i>Forecast error (price)</i>	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 share price 5 days before the earnings announcement instead of by the earnings in quarter $t+1$ , multiplied by 100	IBES
<i>Analyst experience</i>	The natural logarithm of the number of years an analyst has been in the IBES database	IBES
<i>Number of firms covered</i>	The number of firms an analyst covers	IBES

[continued on next page]

**Table 1: Variable Descriptions [continued]**

<b>Variable Name</b>	<b>Definition</b>	<b>Source</b>
<i>Pre-call forecast std. dev.</i>	The standard deviation of analysts' earnings forecasts for quarter $t$ that are outstanding the day before quarter $t$ 's earnings are announced	IBES
<i>Post-call forecast std. dev.</i>	The standard deviation of analysts' forecasts for earnings in the next quarter ( $t+1$ ) outstanding three days after the conference call	IBES
<i>Revision frequency</i>	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
<i>Change in bid-ask spread</i>	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
<i>CAR01</i>	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, Authors' calculation
<i>CAR250</i>	The 49 trading days $[2,50]$ cumulative DGTW characteristic-adjusted stock return in percent from 2 days after the conference call date through 50 days	CRSP, WRDS, Authors' calculation

**Table 2: Descriptive statistics for company characteristics and analyst behavior**

This table provides descriptive statistics for company characteristics and analyst behavior. All variables are defined in Table 1. We winsorize stock return, earnings surprise, EPS growth, Tobin's Q, earnings, forecast change, forecast error, CAR01, and CAR250 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, the 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	14278	2.05	13.11	-40.58	40.60
Earnings surprise	14287	0.00	0.00	-0.03	0.02
EPS growth since same quarter last year	14213	0.07	0.90	-3.82	4.69
Consensus forecast t+1, 1 day before call in t	14113	0.73	0.57	-0.31	3.01
Market return	14287	0.02	0.09	-0.33	0.29
Monthly volatility	14287	0.09	0.05	0.01	0.47
Ln (assets)	14284	3.00	1.41	1.00	5.00
Tobin's Q	14284	1.86	1.05	0.82	6.38
Earnings next quarter	14274	0.73	0.63	-0.75	3.31
Forecast change	138623	-1.88	20.78	-116.67	85.71
Forecast error	161348	-4.45	45.94	-216.67	229.63
Forecast error (price)	161611	-0.03	0.79	-2.77	4.46
Analyst experience	166637	1.89	0.73	0.00	3.43
Number of firms covered by analyst	179483	3.95	3.24	1.00	49.00
Pre-call forecast std. dev.	13992	0.05	0.07	0.00	0.50
Post-call forecast std. dev.	14167	0.06	0.08	0.00	0.47
Revision frequency	14264	0.55	0.78	0.00	4.92
Change in bid-ask spread	14263	-0.01	0.11	-1.15	1.10
CAR01 (Cumulative abnormal return [0; 1])	13075	0.08	5.11	-16.24	15.30
CAR250 (Cumulative abnormal return [2; 50])	13075	0.15	8.95	-28.99	27.89

**Table 3: Descriptive statistics for managerial tone and other communication characteristics**

This table provides descriptive statistics for managerial tone and other communication characteristics. All variables are defined in Table 1. We winsorize negativity as well as the percent uncertain words, the percent strong modal words, the percent weak modal words, complexity, and the percent atypical tense at the 1 and 99 percent levels.

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	-2.44	2.18
Residual negativity in answers (RNA)	13861	0.00	1.00	-2.07	2.80
Tone disappointment in presentation [Absolute RNP * 1 {RNP>0}]	13978	0.40	0.54	0.00	2.18
Tone delight in presentation [Absolute RNP * 1 {RNP<0}]	13978	0.40	0.63	0.00	2.44
Tone disappointment in answers [Absolute RNA * 1 {RNA>0}]	13978	0.40	0.64	0.00	2.80
Tone delight in answers [Absolute RNA * 1 {RNA<0}]	13978	0.40	0.53	0.00	2.07

[continued on next page]

**Table 3: Descriptive statistics for managerial tone and other communication characteristics [continued]**

Other communication patterns	Obs	Mean	Std. Dev.	Min	Max
Negativity in earnings press release	14288	-0.02	0.33	-0.80	0.71
Difference in negativity of presentation and answers	14260	-0.12	0.43	-2.35	2.47
Inconsistency in tone (absolute difference)	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
% Financial words	14288	2.09	0.66	0.85	4.02
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 4: Testing the Valuable Information Hypothesis, Part 1 of 2: Future Earnings**

This table presents panel regressions. The dependent variable is earnings per share in the 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 robust to heteroskedasticity. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Earnings in quarter t+1							
Residual negativity in presentation (RNP)	-0.044*** (-8.33)							
Residual negativity in answers (RNA)		-0.026*** (-5.28)						
Tone disappointment in presentation			-0.057*** (-6.55)		-0.054*** (-6.38)		-0.042*** (-5.06)	
Tone delight in presentation			0.028*** (3.45)		0.025*** (3.02)		0.017** (2.10)	
Tone disappointment in answers				-0.024*** (-3.19)		-0.022*** (-2.94)		-0.018** (-2.56)
Tone delight in answers				0.029*** (3.38)		0.026*** (2.98)		0.017* (1.92)
Consensus forecast for t+1, 1 day before call in t	0.682*** (9.46)	0.680*** (9.38)	0.682*** (9.45)	0.680*** (9.37)	0.681*** (9.42)	0.679*** (9.36)		
Consensus forecast for t+1, 3 days after call in t							0.739*** (9.93)	0.739*** (9.88)
Negativity in earnings press release	-0.046*** (-4.54)	-0.045*** (-4.44)	-0.045*** (-4.41)	-0.045*** (-4.45)	-0.042*** (-4.17)	-0.042*** (-4.16)	-0.023** (-2.48)	-0.023** (-2.47)
Negativity in analysts' questions	-0.074*** (-6.44)	-0.074*** (-6.35)	-0.074*** (-6.43)	-0.074*** (-6.36)	-0.069*** (-6.05)	-0.069*** (-5.99)	-0.050*** (-4.57)	-0.051*** (-4.54)

[continued on next page]

**Table 4: Testing the Valuable Information Hypothesis, Part 1 of 2: Future Earnings [continued]**

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Earnings in quarter t+1							
Ln(Words in the presentation)	-0.020 (-1.54)	-0.018 (-1.41)	-0.021 (-1.61)	-0.018 (-1.41)	-0.000 (-0.01)	0.001 (0.04)	0.007 (0.46)	0.007 (0.51)
Ln(Words in the answers)	-0.009 (-1.13)	-0.009 (-1.18)	-0.009 (-1.15)	-0.009 (-1.17)	-0.031*** (-2.60)	-0.030** (-2.52)	-0.022* (-1.95)	-0.021* (-1.91)
Inconsistency in tone					-0.023 (-1.49)	-0.019 (-1.06)	-0.013 (-0.87)	-0.016 (-0.93)
% Uncertain words					-0.072*** (-3.30)	-0.087*** (-3.84)	-0.052** (-2.56)	-0.063*** (-3.01)
% Strong modal words					-0.056*** (-2.85)	-0.059*** (-2.97)	-0.042** (-2.23)	-0.044** (-2.32)
% Weak modal words					0.069 (1.65)	0.076* (1.82)	0.039 (1.00)	0.046 (1.15)
Complexity (words per sentence)					-0.003** (-2.25)	-0.003** (-2.57)	-0.002* (-1.92)	-0.002** (-2.15)
% Atypical tense					-0.018** (-2.03)	-0.022** (-2.38)	-0.017** (-1.99)	-0.019** (-2.23)
% Financial words					-0.002** (-2.30)	-0.002* (-1.78)	-0.002** (-2.11)	-0.001* (-1.70)
Earnings in quarter t	0.134*** (3.58)	0.138*** (3.66)	0.135*** (3.58)	0.138*** (3.66)	0.133*** (3.56)	0.137*** (3.63)	0.093** (2.57)	0.095*** (2.61)
Earnings surprise decile	0.007*** (4.94)	0.007*** (4.82)	0.007*** (4.93)	0.007*** (4.81)	0.007*** (4.85)	0.007*** (4.74)	0.004*** (3.64)	0.004*** (3.53)
Market return in quarter t	0.232*** (7.42)	0.231*** (7.29)	0.231*** (7.40)	0.231*** (7.23)	0.217*** (6.95)	0.215*** (6.75)	0.168*** (6.06)	0.166*** (5.91)
Size quintile	0.005 (0.59)	0.004 (0.52)	0.005 (0.58)	0.004 (0.52)	0.002 (0.30)	0.002 (0.18)	-0.000 (-0.03)	-0.001 (-0.14)
Tobin's Q	0.015 (1.48)	0.015 (1.48)	0.015 (1.48)	0.015 (1.48)	0.015 (1.51)	0.015 (1.53)	0.011 (1.00)	0.011 (1.02)
Pre-call forecast standard deviation	-0.183* (-1.68)	-0.211* (-1.93)	-0.180* (-1.66)	-0.211* (-1.94)	-0.170 (-1.57)	-0.196* (-1.81)	-0.137 (-1.31)	-0.158 (-1.50)
Constant	0.241** (2.12)	0.241** (2.13)	0.272** (2.42)	0.249** (2.20)	0.473*** (3.62)	0.439*** (3.35)	0.455*** (3.02)	0.426*** (2.87)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,743	13,743	13,743	13,743	13,734	13,734	13,734	13,734
Adjusted R <sup>2</sup>	0.84	0.84	0.84	0.84	0.84	0.84	0.86	0.86

**Table 5: Testing the Valuable Information Hypothesis, Part 2 of 2: Uncertainty**

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 Supplementary Table A-3.) The explanatory variables are defined in Table 1. 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.

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Post-call forecast standard deviation					
Residual negativity in presentation (RNP)	0.009*** (7.52)					
Residual negativity in answers (RNA)		0.007*** (5.65)				
Tone disappointment in presentation			0.010*** (5.30)		0.010*** (4.89)	
Tone delight in presentation			-0.008*** (-4.13)		-0.007*** (-3.72)	
Tone disappointment in answers				0.008*** (4.25)		0.009*** (4.26)
Tone delight in answers				-0.005*** (-2.80)		-0.005*** (-2.72)
Negativity in earnings press release	0.016*** (4.92)	0.016*** (4.96)	0.016*** (4.89)	0.016*** (4.91)	0.015*** (4.73)	0.015*** (4.59)
Negativity in analysts' questions	0.008*** (3.41)	0.007*** (3.04)	0.008*** (3.40)	0.007*** (3.05)	0.007*** (3.10)	0.006*** (2.69)
Ln(Words in the presentation)	0.013*** (4.08)	0.012*** (4.05)	0.013*** (4.09)	0.012*** (4.05)	0.013*** (3.76)	0.012*** (3.77)
Ln(Words in the answers)	0.004** (2.48)	0.004** (2.54)	0.004** (2.49)	0.004*** (2.59)	0.005** (2.10)	0.005* (1.91)
Inconsistency in tone					0.002 (0.50)	-0.011** (-2.56)
% Uncertain words					0.015** (2.57)	0.017*** (2.81)
% Strong modal words					0.009*** (3.20)	0.010*** (3.48)
% Weak modal words					-0.006 (-0.62)	-0.008 (-0.78)
% Financial words					0.000** (2.03)	0.001** (2.35)
Complexity (words per sentence)					0.002 (0.88)	0.002 (1.18)
% Atypical tense					-0.000 (-0.67)	-0.000 (-1.17)

[continued on next page]



**Table 5: Testing the Valuable Information Hypothesis, Part 2 of 2: Uncertainty [continued]**

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Post-call forecast standard deviation					
Monthly volatility in quarter t	0.045 (1.00)	0.044 (0.96)	0.045 (1.00)	0.045 (0.96)	0.042 (0.94)	0.042 (0.91)
Size quintile	0.000 (0.15)	0.000 (0.15)	0.000 (0.16)	0.000 (0.16)	0.001 (0.37)	0.001 (0.43)
Tobin's Q	-0.003*** (-3.00)	-0.003*** (-3.03)	-0.003*** (-3.00)	-0.004*** (-3.07)	-0.004*** (-3.05)	-0.004*** (-3.00)
Stock return in quarter t	-0.000*** (-5.02)	-0.000*** (-5.03)	-0.000*** (-4.99)	-0.000*** (-5.04)	-0.000*** (-4.70)	-0.000*** (-4.74)
EPS growth since same quarter last year	-0.002* (-1.67)	-0.002* (-1.65)	-0.002* (-1.67)	-0.002* (-1.65)	-0.002 (-1.62)	-0.002 (-1.60)
Earnings surprise decile	-0.001*** (-4.24)	-0.001*** (-4.23)	-0.001*** (-4.24)	-0.001*** (-4.23)	-0.001*** (-4.14)	-0.001*** (-4.12)
Market return in quarter t	-0.043*** (-7.24)	-0.043*** (-7.14)	-0.043*** (-7.24)	-0.043*** (-7.15)	-0.041*** (-6.96)	-0.041*** (-6.92)
Constant	-0.082*** (-2.63)	-0.080** (-2.58)	-0.083*** (-2.67)	-0.081*** (-2.60)	-0.120*** (-3.36)	-0.112*** (-3.15)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,950	13,950	13,950	13,950	13,941	13,941
Adjusted R <sup>2</sup>	0.64	0.64	0.64	0.64	0.64	0.64

**Table 6: Testing the Reasonable Market Response Hypothesis, Part 1 of 3: Appropriate Forecast Revisions**

This table presents panel regressions. The dependent variable in columns (1) to (4) is the forecast change in percent of earnings in quarter t+1. In columns (5) to (10), 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.

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Forecast change				Forecast error					
Residual negativity in presentation (RNP)	-2.086*** (-6.21)				2.543*** (3.14)				1.842** (2.19)	
Residual negativity in answers (RNA)		-1.344*** (-3.76)				2.516*** (3.04)				1.980** (2.35)
Tone disappointment in presentation			-1.369*** (-2.68)				4.474*** (3.67)			
Tone delight in presentation			2.992*** (5.01)				-0.090 (-0.07)			
Tone disappointment in answers				-0.913** (-2.31)				3.618*** (2.66)		
Tone delight in answers				1.873*** (2.85)				-1.175 (-1.04)		
Negativity in earnings press release	-2.422*** (-3.61)	-2.206*** (-3.30)	-2.508*** (-3.80)	-2.234*** (-3.33)	1.766 (1.01)	1.509 (0.87)	1.533 (0.88)	1.431 (0.83)	1.710 (0.98)	1.454 (0.84)
Negativity in analysts' questions	-4.117*** (-4.37)	-4.200*** (-4.27)	-4.122*** (-4.38)	-4.198*** (-4.27)	6.331*** (3.91)	5.921*** (3.76)	6.324*** (3.89)	5.929*** (3.76)	6.319*** (3.90)	5.917*** (3.75)
Analyst experience					-0.475*** (-3.45)	-0.459*** (-3.33)	-0.478*** (-3.47)	-0.461*** (-3.35)	-0.618*** (-4.34)	-0.610*** (-4.27)
Number of firms covered by analyst									0.187*** (2.98)	0.205*** (3.17)
RNP * Number of firms covered by analyst									0.174* (1.76)	
RNA * Number of firms covered by analyst										0.126 (1.36)

[continued on next page]

**Table 6: Testing the Reasonable Market Response Hypothesis, Part 1 of 3: Appropriate Forecast Revisions [continued]**

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Forecast change				Forecast error					
Ln(Words in the presentation)	-0.189 (-0.25)	-0.205 (-0.26)	-0.120 (-0.16)	-0.226 (-0.29)	-1.747 (-0.92)	-1.761 (-0.94)	-1.569 (-0.83)	-1.798 (-0.97)	-1.776 (-0.94)	-1.774 (-0.95)
Ln(Words in the answers)	-0.912 (-1.33)	-0.823 (-1.23)	-0.928 (-1.35)	-0.797 (-1.19)	-0.755 (-0.42)	-0.936 (-0.52)	-0.833 (-0.47)	-0.872 (-0.49)	-0.760 (-0.43)	-0.947 (-0.53)
Inconsistency in tone	-0.349 (-0.31)	2.147* (1.81)	-0.635 (-0.57)	2.020* (1.74)	2.795 (1.09)	-1.458 (-0.53)	2.035 (0.80)	-1.798 (-0.65)	2.775 (1.08)	-1.349 (-0.49)
% Uncertain words	-1.475 (-0.99)	-2.107 (-1.35)	-1.443 (-0.97)	-2.092 (-1.35)	0.307 (0.10)	0.466 (0.15)	0.421 (0.14)	0.485 (0.16)	0.274 (0.09)	0.427 (0.14)
% Strong modal words	-1.485 (-1.45)	-1.732* (-1.67)	-1.440 (-1.41)	-1.723* (-1.66)	-2.175 (-0.82)	-1.904 (-0.71)	-2.046 (-0.77)	-1.897 (-0.71)	-2.141 (-0.80)	-1.883 (-0.71)
% Weak modal words	4.042 (1.55)	4.393* (1.68)	4.102 (1.58)	4.326* (1.66)	-5.685 (-0.93)	-6.082 (-1.00)	-5.519 (-0.90)	-6.213 (-1.02)	-5.696 (-0.93)	-6.123 (-1.00)
% Financial words	0.966 (1.65)	0.799 (1.38)	0.948 (1.62)	0.789 (1.36)	-1.711 (-1.55)	-1.557 (-1.40)	-1.749 (-1.58)	-1.583 (-1.42)	-1.726 (-1.56)	-1.572 (-1.41)
Complexity (words per sentence)	-0.182** (-2.53)	-0.207*** (-2.85)	-0.183** (-2.54)	-0.208*** (-2.86)	0.183 (1.08)	0.218 (1.30)	0.181 (1.07)	0.216 (1.29)	0.186 (1.10)	0.222 (1.32)
% Atypical tense	-0.007 (-0.13)	0.015 (0.28)	-0.008 (-0.14)	0.016 (0.29)	0.105 (0.86)	0.076 (0.62)	0.103 (0.85)	0.077 (0.63)	0.106 (0.87)	0.077 (0.63)
Earnings surprise decile	0.675*** (7.82)	0.677*** (7.85)	0.675*** (7.81)	0.678*** (7.86)	-1.155*** (-6.02)	-1.154*** (-6.01)	-1.154*** (-6.01)	-1.152*** (-6.01)	-1.158*** (-6.05)	-1.155*** (-6.03)
Market return in quarter t	9.541*** (3.98)	9.390*** (3.94)	9.554*** (3.99)	9.343*** (3.92)	-30.410*** (-6.66)	-30.439*** (-6.61)	-30.302*** (-6.63)	-30.527*** (-6.63)	-30.025*** (-6.58)	-30.115*** (-6.55)
Size quintile	0.192 (0.58)	0.125 (0.37)	0.188 (0.57)	0.136 (0.41)	2.750*** (3.13)	2.812*** (3.22)	2.736*** (3.12)	2.835*** (3.25)	2.732*** (3.11)	2.785*** (3.19)
Tobin's Q	1.458*** (4.27)	1.419*** (4.33)	1.472*** (4.31)	1.406*** (4.31)	0.668 (1.00)	0.736 (1.13)	0.699 (1.05)	0.704 (1.08)	0.681 (1.01)	0.746 (1.14)
Pre-announcement rev. frequency for quarter t earnings					0.317 (0.26)	0.423 (0.35)	0.302 (0.25)	0.458 (0.38)	0.331 (0.27)	0.446 (0.37)
Constant	20.272** (2.44)	19.338** (2.28)	19.337** (2.28)	19.339** (2.27)	-10.915 (-0.52)	-7.005 (-0.33)	-13.694 (-0.64)	-9.249 (-0.44)	-11.067 (-0.53)	-7.378 (-0.35)
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	136,416	136,416	136,416	136,416	152,446	152,446	152,446	152,446	152,446	152,446
Adjusted R <sup>2</sup>	0.09	0.09	0.09	0.08	0.12	0.12	0.12	0.12	0.12	0.12

**Table 7: Testing the Reasonable Market Response Hypothesis, Part 2 of 3: Price Persistence**

This table presents panel regressions. The dependent variable in columns (1) to (4) 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 (5) to (8) is CAR250, the 49 trading days [2,50] cumulative DGTW characteristic-adjusted stock return in percent from 2 days after the conference call date through 50 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.

Dependent variable:	(1) CAR01	(2) CAR01	(3) CAR01	(4) CAR01	(5) CAR250	(6) CAR250	(7) CAR250	(8) CAR250
Residual negativity in presentation (RNP)	-0.556*** (-6.21)				-0.437*** (-2.83)			
Residual negativity in answers (RNA)		-0.412*** (-4.23)				-0.292* (-1.69)		
Tone disappointment in presentation			-0.308** (-2.41)				-0.620*** (-2.79)	
Tone delight in presentation			0.885*** (5.83)				0.195 (0.72)	
Tone disappointment in answers				-0.220 (-1.53)				-0.536** (-2.23)
Tone delight in answers				0.652*** (4.14)				-0.013 (-0.05)
Negativity in earnings press release	-0.458** (-2.18)	-0.419** (-1.99)	-0.485** (-2.31)	-0.427** (-2.03)	-0.620 (-1.58)	-0.589 (-1.50)	-0.601 (-1.52)	-0.578 (-1.47)
Negativity in analysts' questions	-2.378*** (-9.47)	-2.351*** (-9.35)	-2.376*** (-9.48)	-2.349*** (-9.35)	-0.448 (-1.11)	-0.447 (-1.07)	-0.449 (-1.11)	-0.449 (-1.08)
Ln(Words in the presentation)	0.354* (1.69)	0.355* (1.71)	0.369* (1.76)	0.351* (1.69)	0.755** (2.03)	0.753** (2.02)	0.744** (2.00)	0.758** (2.04)
Ln(Words in the answers)	-0.418** (-2.53)	-0.371** (-2.28)	-0.419** (-2.54)	-0.357** (-2.18)	-0.485 (-1.47)	-0.450 (-1.36)	-0.484 (-1.47)	-0.469 (-1.41)
Inconsistency in tone	-0.762** (-2.55)	0.043 (0.14)	-0.856*** (-2.86)	-0.011 (-0.03)	0.275 (0.47)	0.871 (1.40)	0.343 (0.59)	0.939 (1.50)
% Uncertain words	-0.214 (-0.54)	-0.344 (-0.87)	-0.208 (-0.53)	-0.342 (-0.86)	0.799 (1.11)	0.680 (0.96)	0.794 (1.10)	0.676 (0.96)
% Strong modal words	0.369 (1.25)	0.314 (1.06)	0.382 (1.30)	0.320 (1.08)	0.816 (1.41)	0.776 (1.35)	0.806 (1.39)	0.767 (1.33)
% Weak modal words	1.369* (1.79)	1.444* (1.88)	1.366* (1.78)	1.426* (1.86)	1.275 (0.84)	1.331 (0.88)	1.277 (0.84)	1.354 (0.90)
Complexity (words per sentence)	-0.034 (-1.58)	-0.039* (-1.80)	-0.035 (-1.59)	-0.039* (-1.81)	-0.042 (-0.97)	-0.046 (-1.05)	-0.042 (-0.96)	-0.046 (-1.05)
% Atypical tense	-0.026* (-1.88)	-0.020 (-1.47)	-0.026* (-1.88)	-0.020 (-1.45)	-0.072*** (-2.65)	-0.068** (-2.49)	-0.072*** (-2.65)	-0.068** (-2.50)
% Financial words	-0.040 (-0.30)	-0.070 (-0.53)	-0.041 (-0.31)	-0.072 (-0.55)	0.252 (1.07)	0.227 (0.96)	0.252 (1.07)	0.229 (0.97)

[continued on next page]

**Table 7: Testing the Reasonable Market Response Hypothesis, Part 2 of 3: Price Persistence [continued]**

Dependent variable:	(1) CAR01	(2) CAR01	(3) CAR01	(4) CAR01	(5) CAR250	(6) CAR250	(7) CAR250	(8) CAR250
Size quintile	-0.521*** (-4.99)	-0.529*** (-5.14)	-0.517*** (-4.95)	-0.525*** (-5.08)	-1.465*** (-7.74)	-1.472*** (-7.81)	-1.468*** (-7.77)	-1.477*** (-7.84)
Tobin's Q	-0.434*** (-3.77)	-0.442*** (-3.86)	-0.434*** (-3.76)	-0.448*** (-3.92)	-1.141*** (-4.98)	-1.147*** (-5.04)	-1.142*** (-4.98)	-1.138*** (-5.01)
Market return in quarter t	-1.541** (-2.44)	-1.542** (-2.43)	-1.543** (-2.44)	-1.573** (-2.49)	5.286*** (4.48)	5.277*** (4.47)	5.287*** (4.48)	5.316*** (4.50)
Earnings surprise decile	0.556*** (25.29)	0.556*** (25.24)	0.556*** (25.35)	0.557*** (25.25)	0.005 (0.15)	0.005 (0.15)	0.005 (0.14)	0.004 (0.14)
EPS growth since same quarter last year	-0.037 (-0.56)	-0.035 (-0.53)	-0.036 (-0.55)	-0.034 (-0.51)	0.082 (0.73)	0.084 (0.75)	0.081 (0.73)	0.082 (0.74)
Stock return in quarter t	-0.010* (-1.91)	-0.010* (-1.92)	-0.009* (-1.84)	-0.010* (-1.92)	-0.036*** (-3.93)	-0.036*** (-3.95)	-0.036*** (-3.96)	-0.036*** (-3.95)
Monthly volatility in quarter t	-3.071 (-1.58)	-3.019 (-1.55)	-3.093 (-1.60)	-2.972 (-1.52)	8.070* (1.92)	8.105* (1.93)	8.086* (1.92)	8.045* (1.91)
Constant	4.038** (2.19)	3.567* (1.93)	3.697** (2.00)	3.315* (1.79)	7.154* (1.90)	6.847* (1.81)	7.405* (1.95)	7.169* (1.89)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,797	12,797	12,797	12,797	12,797	12,797	12,797	12,797
Adjusted R <sup>2</sup>	0.19	0.19	0.19	0.19	0.09	0.09	0.09	0.09

**Table 8: 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 50.

<b>Earnings surprise</b>	<b>Panel A: Negativity in presentation</b>				
	Q1 (least negative)	Q2	Q3	Q4	Q5 (most negative)
Q1 (lowest)	-0.45%	-1.06%	-0.88%	-1.86%	-1.99%
Q2	0.47%	0.09%	-0.78%	-0.43%	-0.48%
Q3	0.41%	-0.03%	-0.04%	-0.46%	-0.57%
Q4	0.73%	-0.64%	1.36%	0.12%	-0.75%
Q5 (highest)	2.00%	0.61%	0.59%	0.35%	0.03%

<b>Earnings surprise</b>	<b>Panel B: Negativity in answers</b>				
	Q1 (least negative)	Q2	Q3	Q4	Q5 (most negative)
Q1 (lowest)	-1.01%	-1.44%	-0.55%	-0.48%	-2.56%
Q2	-0.11%	0.24%	-0.21%	-0.37%	-0.40%
Q3	0.43%	0.49%	-0.49%	-0.38%	-0.68%
Q4	0.87%	0.35%	0.35%	0.32%	-1.21%
Q5 (highest)	1.76%	0.55%	0.47%	1.06%	0.08%

**Table 9: Testing the Reasonable Market Response Hypothesis, Part 3 of 3: Heterogeneity across firms**

This table presents summary results of panel regressions. In panel A, tone surprises are interacted with the absolute mean earnings surprise. In panel B, tone surprises are interacted with market return in the previous quarter. We run regressions equivalent to those in columns (1) and (2) of Table 4, columns (1) and (2) of Table 5, columns (1) and (2) of Table 7, and columns (1) and (2) of Supplementary Table A-4, 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

Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Earnings		Post-call forecast std. dev.		CAR01		CAR050	
Residual negativity (RN) measure:	RNP	RNA	RNP	RNA	RNP	RNA	RNP	RNA
Residual negativity (RN)	-0.031*** (-6.03)	-0.019*** (-3.51)	0.004*** (3.54)	0.003** (2.40)	-0.499*** (-5.45)	-0.272*** (-2.64)	-0.818*** (-4.57)	-0.377** (-1.98)
RN * Absolute earnings surprise	-0.053*** (-4.24)	-0.027** (-2.20)	0.010** (2.36)	0.011*** (2.68)	-0.730*** (-3.67)	-0.782*** (-3.81)	-1.036*** (-2.73)	-1.727*** (-4.57)
Absolute earnings surprise	0.018 (1.23)	0.012 (0.79)	0.045*** (8.38)	0.045*** (8.85)	1.597*** (7.03)	1.593*** (6.68)	2.530*** (4.83)	2.655*** (5.21)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,743	13,743	13,950	13,950	12,797	12,797	12,797	12,797

Panel B	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Earnings		Post-call forecast std. dev.		CAR01		CAR050	
Residual negativity (RN) measure:	RNP	RNA	RNP	RNA	RNP	RNA	RNP	RNA
Residual negativity (RN)	-0.045*** (-9.00)	-0.027*** (-4.94)	0.009*** (7.29)	0.008*** (5.72)	-0.563*** (-6.28)	-0.425*** (-4.38)	-1.011*** (-6.04)	-0.790*** (-4.09)
RN * Market return	0.125*** (4.63)	0.065** (2.03)	-0.027*** (-4.41)	-0.022*** (-3.62)	0.343 (0.57)	0.579 (0.98)	2.733** (2.48)	3.563*** (3.13)
Market return in quarter t	0.204*** (7.00)	0.213*** (7.08)	-0.038*** (-6.92)	-0.040*** (-7.05)	-1.614*** (-2.64)	-1.610*** (-2.63)	2.611** (2.10)	2.712** (2.17)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,743	13,743	13,950	13,950	12,797	12,797	12,797	12,797

## **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.*

Figure A-1: Post-earnings announcement drift

Table A-1: Negativity in the tone of conference calls

Table A-2: Frequencies of negative and positive words in conference calls

Table A-3: Additional Tests of the Valuable Information Hypothesis, Part 2 of 2: Uncertainty

Table A-4: Medium-term excess returns

Table A-5: Additional Test of the Reasonable Market Response Hypothesis, Part 3 of 3: Heterogeneity Across Firms

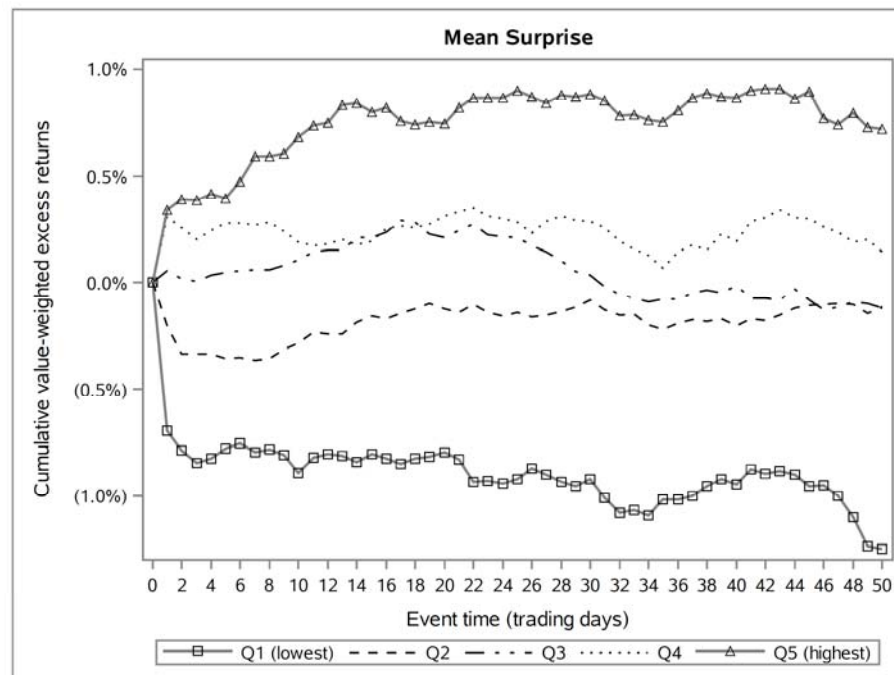
Table A-6: Additional Test of the Reasonable Market Response Hypothesis, Part 3 of 3: Heterogeneity Across Firms

Table A-7: Alternative word classification by groups



### Supplementary Figure A-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.



**Supplementary Table A-1: 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, 4, and 7) and in answers (column 2-3, 5-6, and 8-9). 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, columns (7) to (9) add industry-year 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)	(7)	(8)	(9)
Dependent variable: Negativity in	Presentations	Answers	Answers	Presentations	Answers	Answers	Presentations	Answers	Answers
Stock return in quarter t	-0.001*** (-8.49)	-0.002*** (-10.29)	-0.001*** (-4.44)	-0.001*** (-7.57)	-0.001*** (-9.30)	-0.001*** (-5.15)	-0.001*** (-7.37)	-0.001*** (-8.09)	-0.001*** (-4.67)
EPS growth since same quarter last year	-0.016*** (-6.08)	-0.006*** (-2.61)	0.001 (0.29)	-0.014*** (-5.79)	-0.006*** (-2.68)	-0.001 (-0.46)	-0.009*** (-4.15)	-0.003 (-1.53)	-0.000 (-0.04)
Earnings surprise decile	-0.011*** (-12.59)	-0.006*** (-7.74)	-0.001 (-1.13)	-0.010*** (-15.86)	-0.007*** (-9.57)	-0.002*** (-3.38)	-0.010*** (-16.25)	-0.007*** (-9.83)	-0.002*** (-3.86)
Monthly volatility quarter t	-0.058 (-0.58)	0.183** (2.08)	0.214*** (2.80)	-0.049 (-0.48)	0.030 (0.32)	0.108 (1.24)	0.004 (0.03)	0.044 (0.39)	0.086 (0.81)
Pre-call forecast std. dev.	0.349*** (5.66)	0.270*** (5.11)	0.090** (2.11)	0.346*** (7.70)	0.242*** (6.43)	0.117*** (3.39)	0.218*** (5.24)	0.149*** (4.06)	0.072** (2.07)
Consensus forecast for t+1, 1 day before call in t	-0.022** (-2.52)	-0.008 (-1.10)	0.004 (0.62)	-0.033*** (-3.81)	-0.014* (-1.76)	-0.003 (-0.43)	-0.019** (-2.32)	-0.001 (-0.17)	0.004 (0.58)
Negativity in earnings press release	0.274*** (19.06)	0.090*** (7.20)	-0.016 (-1.58)	0.265*** (21.38)	0.097*** (10.82)	0.018** (2.11)	0.239*** (20.56)	0.086*** (10.00)	0.017** (2.14)
Negativity in presentation			0.335*** (20.21)			0.257*** (21.07)			0.235*** (19.29)
Negativity in analysts' questions			0.246*** (25.90)			0.208*** (24.25)			0.202*** (23.65)
Ln(words in the presentation)	-0.051*** (-3.62)			-0.023* (-1.85)			-0.029** (-2.48)		
Ln(words in the answers)		-0.026*** (-3.92)	-0.025*** (-4.56)		-0.019*** (-2.93)	-0.022*** (-3.70)		-0.011 (-1.61)	-0.015** (-2.58)

[continued on next page]

**Supplementary Table A-1: Negativity in the tone of conference calls [continued]**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable: Negativity in	Presentations	Answers	Answers	Presentations	Answers	Answers	Presentations	Answers	Answers
Market return in quarter t	-0.216*** (-10.28)	-0.188*** (-8.83)	-0.077*** (-3.89)	-0.197*** (-10.49)	-0.178*** (-8.92)	-0.098*** (-5.13)	-0.187*** (-9.20)	-0.157*** (-7.25)	-0.096*** (-4.54)
Size quintile	-0.014*** (-3.49)	-0.009** (-2.49)	-0.002 (-0.81)	-0.040*** (-7.83)	-0.030*** (-6.72)	-0.015*** (-3.80)	-0.024*** (-4.70)	-0.015*** (-3.21)	-0.007* (-1.70)
Tobin's Q	-0.024*** (-4.22)	-0.015*** (-2.88)	-0.006 (-1.33)	-0.038*** (-4.66)	-0.011* (-1.74)	0.002 (0.41)	-0.036*** (-4.93)	-0.020*** (-3.33)	-0.005 (-0.99)
Constant	0.216* (1.92)	0.045 (0.80)	0.052 (1.15)	0.074 (0.70)	0.087 (1.49)	0.059 (1.15)	0.019 (0.19)	-0.086 (-1.41)	-0.052 (-0.94)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	No	No	No	No	No	No	Yes	Yes	Yes
Observations	13,743	13,743	13,743	13,743	13,743	13,743	13,743	13,743	13,743
Adjusted R <sup>2</sup>	0.328	0.183	0.361	0.564	0.421	0.503	0.592	0.443	0.512

**Supplementary Table A-2: 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) and in answers (columns 3-4). The explanatory variables are defined in Table 1. 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)
	Presentation	Presentation	Answers	Answers
	negative	positive	negative	positive
Dependent variable:	frequency	frequency	frequency	frequency
Stock return in the quarter	-0.001*** (-3.54)	0.002*** (7.68)	-0.001*** (-7.27)	0.002*** (6.84)
EPS growth since same quarter last year	-0.027*** (-6.98)	0.011** (2.28)	-0.011*** (-3.39)	0.004 (1.18)
Earnings surprise decile	-0.013*** (-11.41)	0.016*** (12.78)	-0.005*** (-6.14)	0.009*** (9.66)
Monthly volatility in the quarter	0.168 (1.05)	0.594*** (2.63)	0.068 (0.64)	0.064 (0.41)
Pre-call forecast dispersion	0.696*** (9.21)	-0.326*** (-3.78)	0.366*** (5.27)	-0.189*** (-3.49)
Consensus forecast for t+1, 1 day before call	-0.355*** (-10.53)	0.180*** (4.72)	-0.189*** (-7.09)	0.177*** (5.55)
Negativity in earnings press release	-0.074*** (-8.18)	0.034*** (3.03)	-0.025*** (-4.54)	0.046*** (6.04)
Market return in previous quarter	-0.079*** (-6.12)	-0.019 (-1.44)	-0.033*** (-4.58)	-0.026*** (-2.60)
Constant	1.661***	1.342***	1.460***	0.330
Other firm-level controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes
Observations	13,721	13,721	13,712	13,712
Adjusted R <sup>2</sup>	0.58	0.62	0.38	0.45

### Supplementary Table A-3: Additional Tests of the Valuable Information Hypothesis, Part 2 of 2: Uncertainty

This table presents panel regressions. The dependent variable in columns (1) to (4) 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 (5) to (8), 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 5, but the coefficients are not shown to conserve space. The regression for the change in bid-ask spreads includes the level of the bid-ask spread before the call as a control variable. 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.

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Revision frequency				Change in bid-ask spreads			
Residual negativity in presentation (RNP)	0.052*** (7.38)				0.008*** (5.33)			
Residual negativity in answers (RNA)		0.043*** (5.83)				0.006*** (3.27)		
Tone disappointment in presentation			0.067*** (6.28)				0.009*** (3.62)	
Tone delight in presentation			-0.033*** (-2.67)				-0.007*** (-2.66)	
Tone disappointment in answers				0.046*** (4.21)				0.007*** (2.78)
Tone delight in answers				-0.039*** (-3.24)				-0.005 (-1.61)
Negativity in earnings press release	0.035** (1.99)	0.033* (1.86)	0.033* (1.89)	0.033* (1.85)	0.012*** (3.02)	0.011*** (2.90)	0.012*** (3.00)	0.011*** (2.90)
Negativity in analysts' questions	0.045** (2.56)	0.039** (2.22)	0.045*** (2.58)	0.039** (2.22)	0.002 (0.42)	0.001 (0.32)	0.002 (0.42)	0.001 (0.32)
Other speech patterns	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,586	13,586	13,586	13,586	13,969	13,969	13,969	13,969
Adjusted R <sup>2</sup>	0.41	0.41	0.41	0.41	0.31	0.31	0.31	0.31

### Supplementary Table A-4: Medium-term excess returns

This table presents panel regressions. The dependent variable is CAR050, the 51 trading days [0,50] cumulative DGTW characteristic-adjusted stock return in percent from the conference call date through 50 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 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 robust to heteroskedasticity. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01.

Dependent variable:	(1) CAR050	(2) CAR050	(3) CAR050	(4) CAR050
Residual negativity in presentation (RNP)	-0.949*** (-5.58)			
Residual negativity in answers (RNA)		-0.701*** (-3.64)		
Tone disappointment in presentation			-0.820*** (-3.18)	
Tone delight in presentation			1.119*** (3.85)	
Tone disappointment in answers				-0.748*** (-2.71)
Tone delight in answers				0.642** (2.02)
Other speech patterns	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes
Constant	13.123*** (3.24)	12.494*** (3.10)	12.898*** (3.16)	12.536*** (3.11)
Observations	12,797	12,797	12,797	12,797
Adjusted R <sup>2</sup>	0.19	0.19	0.19	0.19

**Supplementary Table A-5: Additional Test of the Reasonable Market Response Hypothesis, Part 3 of 3:**

**Heterogeneity Across Firms**

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 the standard firm-level control variables. Thus, we run regressions equivalent to those in columns (1) and (2) of Table 4, columns (1) and (2) of Table 5, and columns (1) and (2) of Table 7, 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

Dependent var.	Expl. var.	Quartiles of absolute earnings surprise			
		Q1 (lowest)	Q2	Q3	Q4 (highest)
Earnings in quarter t+1	RNP	-0.024***	-0.047***	-0.044***	-0.089***
		(-5.15)	(-6.06)	(-5.79)	(-5.57)
	RNA	-0.017***	-0.014***	-0.025***	-0.054***
		(-3.97)	(-2.73)	(-3.63)	(-4.39)
Post-call forecast std. dev.	RNP	0.004**	0.006***	0.011***	0.017***
		(2.29)	(4.35)	(6.61)	(5.75)
	RNA	0.003***	0.003**	0.004***	0.015***
		(4.12)	(2.21)	(2.96)	(5.45)
CAR01	RNP	-0.760***	-0.652***	-0.627***	-1.137***
		(-5.28)	(-3.64)	(-3.52)	(-5.44)
	RNA	-0.404***	-0.615***	-0.701***	-0.799***
		(-3.02)	(-4.37)	(-4.28)	(-4.20)

### Supplementary Table A-6: Additional Test of the Reasonable Market Response Hypothesis, Part 3 of 3:

#### Heterogeneity Across Firms

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. 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 fall into the bottom five percent of the absolute earnings surprise and the 20th 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. *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.

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 indicates 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 this approach encounter an errors-in-variables problem, which biases the coefficients towards zero. This implies that any results we secure will be understated. 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 level of the portfolios used to calculate *Sensitivity of future earnings* and *Sensitivity of post-call forecast std. dev.* and are robust to heteroskedasticity. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

[continued on next page]



**Supplementary Table A-6: Additional Test of the Reasonable Market Response Hypothesis, Part 3 of 3:**  
**Heterogeneity Across Firms [continued]**

	(1)	(2)	(3)	(4)
Dependent variable:			CAR01	
Residual negativity (RN) measure:	RNP	RNA	RNP	RNA
Residual negativity (RN)	-0.499*** (-4.42)	-0.480*** (-5.62)	-0.519*** (-3.95)	-0.420*** (-6.92)
Sensitivity of future earnings to RN	3.245 (1.11)	0.412 (0.09)		
RN * Sensitivity of future earnings to RN	-3.730*** (-3.10)	-4.244** (-2.56)		
Sensitivity of post-call forecast std. dev. to RN			18.694 (1.14)	14.708 (1.64)
RN * Sensitivity of post-call forecast std. dev. to RN			-18.146 (-1.71)	-24.485*** (-4.48)
Negativity in earnings press release	-0.809*** (-5.07)	-0.807*** (-4.95)	-0.814*** (-4.92)	-0.812*** (-5.20)
Firm-level controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
CEO fixed effects	Yes	Yes	Yes	Yes
Observations	13,075	13,075	13,075	13,075
Adjusted R <sup>2</sup>	0.15	0.15	0.15	0.15

**Supplementary Table A-7: 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.

<b><u>Positive</u></b>		<b><u>Negative</u></b>		<b><u>Uncertain</u></b>	
growth	improvements	decline	volatility	think	reasonable
good	confident	risks	weakness	may	plans
strong	successful	risk	problem	expect	efforts
opportunities	stronger	loss	lost	anticipate	preliminary
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