

# Do Sophisticated Investors Interpret Earnings Conference Call Tone

## Differently than Investors at Large? Evidence from Short Sales

Benjamin M. Blau<sup>1</sup>, R. Jared DeLisle<sup>2</sup>, S. McKay Price<sup>3</sup>

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### Abstract

Recent research finds that investors, broadly defined, react to the linguistic tone of quarterly earnings conference calls; there is a positive relation between firms' stock returns and call tone (a measure of "sentiment" related word tabulations). However, this type of soft information can be subtle, context-specific, and difficult to interpret. Moreover, the literature suggests cross-sectional variation in information processing skills among investors. Thus, we test whether sophisticated investors interpret earnings conference call tone differently than investors at large by examining short selling activity and its relation to earnings conference call tone. We find that short sellers target firms with simultaneous high earnings surprise and abnormally high management tone. The combination of positive earnings surprise and unusually positive tone strengthens short sellers' return predictability. This result indicates that short sellers interpret revealed "inflated" call language by managers more completely than naïve investors. The incomplete stock price reaction by naïve investors due to the lack of reliability they place on this soft information results in overpricing of the stock. However, it also suggests that managers are unable to maintain prolonged overvaluation of their stock by striking an overly optimistic posture in the interactive conference call disclosure forum since short sellers' trades provide additional price discovery.

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<sup>1</sup>(Corresponding Author) Utah State University, Department of Economics and Finance, Jon M. Huntsman School of Business, Logan, UT 84322, phone: 435-797-2340, fax: 435-797-2301, email: ben.blau@usu.edu

<sup>2</sup> Utah State University, Department of Economics and Finance, Jon M. Huntsman School of Business, Logan, UT 84322, phone: 435-797-0885, fax: 435-797-2301, email: jared.delisle@usu.edu

<sup>3</sup>Lehigh University, Perella Department of Finance, College of Business and Economics, Bethlehem, PA 18015, phone: 610-758-4787, fax: 610-882-9415, email: smp210@lehigh.edu

“There is no greater impediment to the advancement of knowledge than the ambiguity of words.”  
Thomas Reid, Scottish philosopher

## **1. Introduction**

The efficient markets hypothesis suggests that market participants react to newly available firm-specific information. Historically, empirical work in this area has focused on “hard” information such as earnings surprises, equity offerings, repurchases, or insider trades. Signals of this sort are easily quantified. Nonetheless, as technology and regulation have evolved, it has become increasingly common for managers to engage in an ongoing dialogue with the investment community; most notably, managers use quarterly earnings conference calls where additional qualitative, or “soft”, information is revealed to the market place (Frankel, Johnson, and Skinner 1999; Bowen, Davis, and Matsumoto 2002; Bushee, Matsumoto, and Miller 2004; NIRI 2004; Kimbrough 2005; Bethel 2007; Gomes, Gorton, and Madureira 2007; Kimbrough and Louis 2011; Matsumoto, Pronk, and Roelofsen 2011). A unique feature of conference call signals is that they can be more subtle in how they are conveyed and, thus, more difficult to interpret. Indeed, the word choices of call participants may be highly nuanced as managers seek to wave the company flag without overstepping and exposing themselves to potentially negative repercussions.

Consequently, recent research finds that the linguistic tone (a measure of “sentiment” related word tabulations) of the call matters to investors, as there is a positive relation between firms' stock returns and this type of soft information (Rogers, Van Buskirk, and Zechman 2011; Larcker and Zakolyukina 2012; Price, Doran, Peterson, and Bliss 2012). However, to date, these relations have only been examined using data which capture the general market reaction, without differentiating by investor ability. To our knowledge, no study has investigated the extent to

which soft information is heterogeneously processed among investors with differing prowess, even though theoretical and empirical analyses suggest that this should be the case (Kandel and Pearson 1995; Malmendier and Shanthikumar 2007). Such an inquiry is particularly important following the implementation of Regulation Fair Disclosure (Regulation FD) given literature which finds lower average firm-specific information quality, and greater informational complexity, in an environment where disclosures are simultaneously available to all investors (Ahmed and Schneible 2007; Gomes et al. 2007).<sup>1</sup>

Sophisticated investors may be better skilled at interpreting soft information and value the firms more correctly than unsophisticated traders. If conference call tone is better understood by sophisticated investors, we should observe trades by these investors that assist in the price discovery process. This paper investigates the relation between the tone of earnings conference calls and the trades of short sellers, a group of investors regularly identified as sophisticated (e.g., Asquith and Meulbroek 1995; Dechow, Hutton, and Meulbroek 2001; Desai, Ramesh, Thiagarajan, and Balachandran 2002; Boehmer, Jones, and Zhang 2008; Diether, Lee, and Werner 2009b; Drake, Rees, and Swanson 2011). Specifically, we examine the extent to which call tone impacts the daily volume of short selling activity while controlling for the hard information in the earnings releases.

Profitable short sellers borrow shares from lenders and trade in anticipation of declines in stock prices; a position that arguably requires more investing skill as short positions are exposed to unlimited losses and high equity borrowing costs. Consequently, the majority of short sales are generally believed to be informed trades (Diamond and Verrecchia 1987). Supporting this notion, Dechow et al. (2001) and Drake et al. (2011) find short sellers are proficient at using

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<sup>1</sup> See Bethel (2007) for an overview of historical changes in disclosure regulation including the adoption of Regulation FD in 2000.

financial accounting-related fundamental information to identify and target overpriced stocks that experience negative future returns. We posit that short sellers are also proficient at processing qualitative information, and will base their trading decisions on both the hard and the soft information associated with quarterly results and the corresponding conference calls.

Furthermore, we hypothesize that short sellers will interpret abnormally high call tone as a signal of poor future performance and more heavily short such firms. Our logic stems from the Kartik et al. (2007) model of strategic communication which suggests that, in equilibrium, managerial language is inflated and naïve receivers are deceived. Thus, management may either knowingly or unknowingly use overly-positive linguistic tone that mitigates negative news or over-emphasizes good news.

An anecdotal example describing such a scenario with inflated talk can be seen in a *Fortune Magazine* article recounting the first quarter 2008 Lehman Brothers earnings conference call and a corresponding short seller analysis:

...sitting in a conference room with just a speakerphone and one colleague... [Lehman Brothers CFO Erin Callan] fielded two dozen questions and assuaged suspicions that Lehman's assets were worth billions less than the firm claimed. Callan succeeded, and Lehman's stock price jumped 15% in an hour, lifting the firm's market value by more than \$4 billion. ...[Immediately following the call, Lehman CEO Dick Fuld] said, 'The only complaint I have is that [Callan] shouldn't have hung up on the call. Because as long as [she was] on there, the stock kept coming up.'

--Patricia Sellers, Editor at Large, *Fortune Magazine*<sup>2</sup>

I'd like to review Lehman Brothers' last quarter. Presently, Greenlight is short Lehman... Lehman announced a \$489 million profit in the quarter. On the conference call that day, Lehman CFO Erin Callan used the word 'great' 14 times, 'challenging' 6 times; 'strong' 24 times, and 'tough' once. She used the word 'incredibly' 8 times. I would use "incredible" in a different way to describe the report.

--David Einhorn, Short Seller, Greenlight Capital<sup>3</sup>

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<sup>2</sup> [http://money.cnn.com/2010/03/08/news/companies/erin\\_callan\\_lehman.fortune/index.htm](http://money.cnn.com/2010/03/08/news/companies/erin_callan_lehman.fortune/index.htm). This example is also referenced by Larcker and Tayan (2010) and Tan et al. (2014).

<sup>3</sup> From Mr. Einhorn's May 21, 2008, address at the Ira W. Sohn Investment Research Conference while commenting on his short position in Lehman Brothers. <http://www.foolingsomepeople.com/main/TCF%202008%20Speech.pdf>

Kartik et al. (2007) show that inflated talk (and therefore, unusually high call tone) should be considered "bad news." Unlike situations where management is unchallenged, such as with paper filings and press releases, the question and answer portion of earnings calls allows for a more appropriate level of tone since analysts and other stakeholders can dispute or corroborate statements made in the introduction portion of the call. We identify the change in tone from the introduction to the questions and answer session as the revealed inflated talk, or the abnormal tone. Conference calls are unique in that they provide a setting for the amount of inflated talk to become public knowledge. Therefore, if short sellers are indeed sophisticated and possess superior information processing skill, then their trades corresponding to calls with inflated talk will provide incremental information about the true prices of the stocks.

Using a sample of roughly 1,300 conference calls from 2005 to 2006, we find short sellers target earnings conference calls with high abnormal linguistic tone. This result establishes the abnormal tone of conference calls as a channel of information short sellers consider. Moreover, in further analysis we show that abnormal tone affects short selling only when there is a positive earnings surprise. Yet, Price et al. (2012) find positive two-day cumulative abnormal returns (CARs) for firms with positive earnings surprises regardless of call tone.<sup>4</sup> Given that short sellers are pursuing firms with high abnormal call tone (inflated talk) but positive CARs, short sellers can only be deemed sophisticated (meaning they process information with above-average skill) if their trades add to price informativeness by predicting negative returns.

Similar to existing literature, we find short selling can generally predict negative stock returns. However, in support of the notion that short sellers are good processors of information, we find substantially higher negative returns when short sellers target firms with inflated talk and positive earnings surprise. These results suggest that short sellers interpret call tone and identify

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<sup>4</sup> In untabulated results, we confirm Price et al.'s (2012) findings in this respect.

inflated talk better than the market in general, particularly when firms have positive earnings surprises. In other words, the market underreacts to abnormally high tone (bad news) in firms with positive earnings surprise (good news) and allows the price of the stock to rise too high. The results suggest that investor underreaction to abnormal tone is related to the reliability they place on soft information relative to hard information. Consistent with the hypotheses that short sellers are superior processors of information and add to the price discovery process, we show short sellers use the abnormal tone to identify the mispricing and target the overpriced stocks.

We contribute to the literature by showing that short sellers not only process the hard quantitative information in earnings releases, but they also focus on the soft qualitative information in the language of earnings conference calls. Inflated talk by managers in these calls attracts short selling, especially when the firm has experienced a positive earnings surprise and investors contemporaneously receive opposing signals about firm value. Further, our findings indicate that short sellers are able to improve their profitability by using abnormal tone and thus add to price discovery. The mispricing by general investors of stocks with positive earnings surprise and large levels of inflated talk follows the notion that naïve investors place less reliability on their interpretation of inflated talk than on the hard information of earnings surprise and, therefore, act more on the hard information. This finding supports that of Atiase et al. (2005), in which investors act on information they deem more reliable over information which may not be as certain. Our results are consistent with the literature establishing short sellers as sophisticated investors that are proficient at processing public information, and short sales as information-based trades that add to price informativeness.

The rest of the paper is organized as follows. In Section 2, we discuss the existing literature around linguistic analysis, earnings conference calls, and short selling, as well as the

primary hypotheses. The sample data is described in Section 3. Empirical tests and their results are reported in Section 4. Section 5 concludes.

## **2. Related literature and testable hypotheses**

### ***Linguistic Analysis***

Hales et al. (2011) observe that “language is, in fact, the medium through which companies communicate much of the information on their past and projected future performance”.

Techniques which extract meaning from written or spoken communication have been developed over many decades (Krippendorff 2004) and, with advances in computing capacity and accessibility, the examination of linguistic signals has grown substantially in the accounting and finance literatures recently. Tetlock (2007), Core et al. (2008), Li (2008), Tetlock et al. (2008), Kothari et al. (2009), Li (2010), Hales et al. (2011), Lehavy et al. (2011), Loughran and McDonald (2011), Rogers et al. (2011), Davis et al. (2012), Davis and Tama-Sheet (2012), Gurun and Butler (2012), Kuhnen and Niessen (2012), Larcker and Zakolyukina (2012), Price et al. (2012), Twedt and Rees (2012), Huang et al. (2014), and Fiordelisi and Ricci (2014), among others, extract linguistic content through various forms of computer-aided textual parsing.

The most common technique is to utilize software platforms which identify each word within a given text and then categorize those words according to a predefined word list (or “dictionary”). The process of word recognition and categorization results in a frequency tabulation of certain types of words (e.g., positive words or negative words) relative to the total word count in the text. Such textual analysis methods allow for the examination of the otherwise-hard-to-quantify soft information conveyed through the particular words chosen by message senders. While most of the aforementioned studies extract the linguistic tone (e.g., positivity

and/or negativity) of a specific text based communication, this technology enables researchers to investigate the more subtle features of any medium through which the information content is more than just a set of numerical results. However, given the burgeoning size of this wide-ranging body of work we do not summarize it in its entirety here, but instead mention only a few brief examples.

Tetlock (2007) analyzes the linguistic features of a widely read *Wall Street Journal* column as it relates to market movements and finds that high media negativity predicts downward pressure on stock indices. At the firm level, Kothari et al. (2009) show that negative (positive) linguistic content in the business press results in increased (decreased) cost of capital and returns volatility. Feldman et al. (2010), Loughran and McDonald (2011), and others, find value relevant textual information in 10-K and 10-Q filings which is orthogonal to financial measures such as earnings and accruals. Twedt and Rees (2012) find that the textual tone of financial analyst reports contain significant information content beyond the reports' earnings forecasts and recommendations. Davis et al. (2012) establish that managers use language in earnings press releases to convey signals regarding future expectations incremental to the actual earnings figure; and the market, broadly defined, responds to the linguistic signals. Altogether, this arguably well-developed body of work clearly demonstrates that soft information can impact the valuation of firms.

With respect to our examination of inflated talk in earnings conference calls and the information processing capacity of sophisticated traders, a few additional linguistic tone oriented studies are particularly relevant. Davis and Tama-Sheet (2012) find some evidence which suggests that managers increase their use of optimistic language in earnings press releases when they feel it is to their advantage to establish such a tone. Moreover, Huang et al. (2013) show that



managers' strategic use of press release tone is effective in manipulating general investors' perceptions. In an experimental setting Tan et al. (2014) find evidence that, in comparison to early MBA students, more seasoned MBA students are less likely to be overly influenced by positive language sentiment after reading four paragraphs of an earnings release where readability is low (i.e. in a context where information may be obfuscated). However, Rogers et al. (2011) show that unusually optimistic statements in earnings announcements increase the likelihood of subsequent shareholder litigation. In the context of earnings conference calls, Price et al. (2012) demonstrate that the broad market reaction, which is generally attributable to uninformed traders, is positively (negatively) related to conference call linguistic tone that is positive (negative) in nature. While, using financial restatements subsequent to earnings conference calls to classify calls as either truthful or deceptive, Larcker and Zakolyukina (2012) show that deceptive CEOs use significantly more (fewer) extreme positive emotion (negative emotion) words during the calls.

### ***Earnings Conference Calls and Inflated Talk***

Our tests concentrate on earnings conference calls for several reasons. First, conference calls are an extensively used, important information source. The National Investor Relations Institute (NIRI) states that fully accessible webcast conference calls are second only to news releases to wire services as the most widely used means for disseminating corporate information to investors (NIRI, 2004). Second, conference calls contain information which is orthogonal to that which is conveyed in corporate filings and press releases, and ordinary (uninformed) investors react to such information (Frankel et al. 1999; Brown et al. 2004; NIRI 2004; Kimbrough 2005; Price et al. 2012; among others). Third, recent literature finds cross-sectional variation in the level of

managerial deception in earnings conference calls (Larcker et al. 2012). Fourth, and perhaps most importantly, when compared to the static nature of formal documents and filings, the conference call information environment is dynamic. Here, “static” refers to how the information is released; that is, documents such as annual reports, press releases and news articles are written and released without giving outside stakeholders the opportunity to challenge their content. Conference calls are not scripted in the same sense, as there is an exchange of dialogue. The interactive, or "dynamic", nature of the call may lead to additional pertinent information about the firm. For instance, Bagnoli and Watts (2005) and Chapman and Steenburgh (2011) find the level of accounting conservatism and intent of earnings management, respectively, are revealed in earnings conference calls.

Quarterly earnings conference calls are structured such that there are two distinct sections, an introductory portion and a discussion session. First, like press releases and filings, call introductions are uninterrupted, where managers essentially read a script that has been prepared beforehand. It is in this section that managers have the unimpeded opportunity to set the tone of the call; this provides managers with the opportunity to inflate good news (or mitigate bad news) as they see fit. Given the first-mover advantage managers have in starting the call and establishing the tone, the introductory section tone then functions as a baseline tone level for a given call. Second, the subsequent interactive question-and-answer (Q&A) session enables analysts to drill deeper or probe for more nuanced information (Matsumoto et al. 2011; Price et al. 2012). The spontaneity of the unscripted discussion component creates an additional layer of complexity that is not found in other one-sided sources of information. While managers may have limited influence over the linguistic tone of the discussion portion of the call, it is considerably less than the complete control they exercise over the introductory portion of the call

(Mayew 2008). Consequently, the Q&A tone can potentially deviate greatly from the original tone they attempt to set (Brockman, Li, and Price 2014; Chen, Nagar, and Schoenfeld 2014). The difference between the two (i.e. the departure of the tone in the Q&A session from the baseline tone) represents the "abnormal" tone. Intuitively, the abnormal tone is indicative of how much inflated talk management uses in the introduction relative to the more realistic tone in the Q&A session.

The equilibrium in Kartik et al.'s (2007) model suggests that informed senders can use inflated language to mislead naïve receivers. The conditions for this equilibrium are "(i) it is costly for the sender to misrepresent information, due to legal, technological, or moral constraints, or (ii) receivers may be credulous and blindly believe the sender's recommendation." In the context of public corporations, this scenario could materialize anytime managers, who have superior information about the firm, address an audience containing naïve investors.

Earnings conference calls, in particular, fit the precise circumstances outlined in the Kartik et al. model. In the introduction portion of the call, managers have opportunity to inflate good news, and typically invoke the Safe Harbor provisions of the Private Securities Litigation Reform Act of 1995 to give them more latitude in making forward-looking and/or uncertain statements. However, they are liable to be sued if they go so far as to present fraudulent information. Additionally, since fair disclosure laws (e.g., Regulation FD) mandate calls must be public, managers have the attention of both unsophisticated investors, whom Malmendier and Shanthikumar (2007) find exhibit investing naïveté, and sophisticated (or "skilled") investors. Thus, the conditions surrounding earnings conference calls satisfy both conditions (i) and (ii) listed above. Naïve investors in the model would blindly believe the manager's inflated talk and bid the price of the stock above its fundamental value. Huang et al. (2013) find evidence using

earnings press releases that suggests this is the case, where overly positive announcement tone incites an inordinately optimistic immediate stock price response to the announcement. However, through the Q&A session, which allows stakeholders to challenge or confirm management's statements, the amount of inflated talk management undertakes in the introductory session is revealed to the public. Aforementioned studies find that investors receive incremental information via call tone, but if investors at large have difficulty fully interpreting inflated talk, they may not correctly value the associated stock and allow it to become overpriced. Under such conditions, informed short sellers might take advantage of this overpricing and increase their short position.

### ***Short Sellers as Sophisticated Investors***

Diamond and Verrecchia (1987) reason that since the proceeds from short sales are not available for use by investors, they would not short sell for liquidity reasons. Additionally, contrary to long positions, short positions are exposed to unlimited losses. Thus, the majority of short sales should not be noise trades, but rather informed trades. Supporting this assertion, an extensive number of studies, including Asquith and Meulbroek (1995), Desai et al. (2002), Asquith et al. (2005), Desai et al. (2006), Boehmer et al. (2008), Diether et al. (2009b), and Drake et al. (2011), indicate short sellers can predict stock returns by showing an inverse relation between short sales and future returns. Thus, there is strong evidence that short sellers are well-informed or sophisticated investors.

In addition to predicting returns, some studies suggest short sellers are exceptional at anticipating events. For example, Safieddine and Wilhelm (1996), Efendi and Swanson (2009), Christophe et al. (2010), Henry et al. (2010), Henry and Koski (2010), Karpoff and Lou (2010),

Kecskés et al. (2012), Liu and Swanson (2012), and Khan and Hai (2013) find short sellers foresee events such as earnings surprises, financial misconduct, insider sales, analyst downgrades, credit rating downgrades, mergers, repurchases, and seasoned equity offerings. Furthermore, Cassell et al. (2011) show short interest is positively associated with audit risk.

In an effort to explain these predictive abilities, Christophe et al. (2010) and Khan and Hai (2013) imply that short sellers may be the beneficiaries of information leaks and Henry and Koski (2010) suggest short sellers manipulate prices. However, Drake et al. (2011), Engelberg et al. (2012), and Blau and Pinegar (2013) find that short sellers are merely better at processing public information than are naïve investors (and, in the case of Drake et al., even better than analysts issuing recommendations). Christensen et al. (2013) demonstrate short sellers will use incremental information in their investing decisions by providing evidence that short sellers use disclosed non-GAAP earnings metrics and pro forma statements to target firms. Notably, Blau et al. (2011), Engelberg et al. (2012), and Blau and Pinegar (2013) show short sellers act on public information *following*, not prior to, its release. These findings suggest that short sellers do not have an informational advantage prior to the news becoming publicly available, thus ruling out the notion that short sellers anticipate news.

The results showing the advanced information processing skill of short sellers support the findings of Kandel and Pearson (1995) and Malmendier and Shanthikumar (2007), who show information is not processed homogenously among investors. With respect to the speed at which investors incorporate information into their valuations, Hong et al. (2000) and Chan (2003) demonstrate investors react more slowly to firm-specific bad news than to good news. If short sellers are sophisticated, then they should unconditionally target the firms associated with bad news since naïve investors will allow them to become overpriced by not reacting quickly to the

news. Taking the findings in the linguistic analysis, earnings conference call, and short selling literature, in addition to the predictions of the Kartik et al. model, we propose the following hypotheses (stated in alternate form):

Hypothesis 1a. *Short sellers incorporate the tone of conference calls into their trading decisions by targeting high abnormal tone (inflated talk).*

Hypothesis 1b. *Short sellers do not anticipate high abnormal tone (inflated talk), but instead react to it when it becomes public.*

However, Atiase et al. (2005) find when investors receive two sources of information simultaneously, their reaction is most consistent with what they perceive as the more reliable information. It is reasonable to assume that soft information is inherently more difficult to interpret than hard information, and therefore investors at large may deem the earning surprise (hard information) more reliable than tone (soft information). If investors interpret abnormally high tone as bad news, but unreliable relative to hard information, then investors may underreact to inflated talk and allow the firm's stock to become overpriced when they simultaneously receive pleasing hard information. In this circumstance, short sellers should target inflated talk conditional on the firm experiencing a positive earnings surprise. Given the problematic nature of interpreting news with varying reliability, and if short sellers have superior skill in processing public information when compared to investors at large, we propose the following hypothesis (stated in alternate form):

Hypothesis 2. *Short sellers will target high abnormal tone (inflated talk) when there is contemporaneous good news in the form of positive earnings surprise.*

Engelberg et al. (2012) demonstrate that short sellers' trades are more profitable after news events. Additionally, Blau (2012) and Boehmer and Wu (2013) demonstrate that short selling is important to the price discovery process by speeding the incorporation of information into stock prices. If short sellers indeed have more information processing skill than the general investing public and target mispricing related to inflated talk, their trades related to abnormal tone should be particularly useful in predicting future negative returns, and thus add to the price discovery process. This leads to our final hypothesis (stated in alternate form):

Hypothesis 3. *Short sellers' trades will have an inverse relation with future returns when targeting high abnormal tone (inflated talk).*

### **3. Sample and variable descriptions**

The sample consists of a pseudo-random sample of earnings conference calls during 2005 and 2006. The selection of this particular period is due the availability of short sale transactions data. In a pilot program, the Securities and Exchange Commission adopted Regulation SHO, which required exchanges to provide short sale transactions data starting in January, 2005, with reliable data available through the end of December, 2006.<sup>5</sup> For each of the eight quarters in this study, we implement several filter rules to construct our conference call sample. We exclude real estate investment trusts (REITs), American depository receipts (ADRs), closed end funds, units,

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<sup>5</sup> Recent studies such as Diether et al. (2009a), Diether et al. (2009b), Boehmer and Wu (2013), and Engelberg et al. (2012), among others, use this distinctive dataset to investigate daily short selling volume.

financial firms (SIC 6000-6999), utilities (SIC 4900-4949), and firms with the Center for Research on Security Prices (CRSP) share codes other than 10, 11, and 12. Then, all firms in CRSP/Compustat files are independently sorted into terciles based on size and book-to-market equity (B/M) in order to ensure that the sample contains a cross section of firms with varying characteristics. Ten dividend paying and ten non-dividend paying firms are then randomly selected within each of the nine characteristic portfolios for each of the eight quarters, resulting in 1,440 stock-quarter observations. For each observation, conference call transcripts are hand collected from two sources, Fair Disclosure Wire and The American Intelligence Wire.

The remaining data used in this analysis are obtained from several sources. From CRSP, we obtain daily returns, prices, volume, and shares outstanding. We gather financial statement information from Compustat and analyst information from First Call. Using Thomson 13f filings, we obtain institutional holdings. The short sale data are obtained directly from the major exchanges (NYSE, NASDAQ, and AMEX) as well as the regional exchanges. These data consist of short sale transactions that we aggregate to the daily level. We are careful to include stocks that would be part of a representative sample of the universe of stocks listed on the U.S. exchanges. Besides the construction of our sample, as mentioned above, we do not place any other restrictions on the data. We recognize, however, that we might have several stocks that face binding short-sale constraints as D'Avolio (2002) mentions that approximately 10% of stocks fit into this category. Including these stocks in our sample would bias against finding evidence of our hypothesis as constraints might restrict the amount short selling during the post-earnings announcement period for stocks that have abnormal tone. We therefore choose to include these stocks. In our multivariate analysis, we attempt to control for the severity of short sale constraints by including institutional ownership, which is the fraction of institutional



holdings relative to shares outstanding. D'Avolio (2002) shows that of all the stock characteristics, institutional ownership seems to best represent the severity of short-sale constraints.<sup>6</sup>

After combining all of the data to the sample of conference calls we are left with 1,430 stock-quarter observations.<sup>7</sup> We then require 30 trading days before the first earnings announcement day in order to calculate an appropriate benchmark to determine abnormal levels of short selling activity.<sup>8</sup> This requirement restricts our sample to 1,318 stock-quarter observations.

Following the textual analysis techniques described previously, *Tone* is calculated using the number of words in a given conference call that can be categorized as either positive or negative, according to the word lists of Loughran and McDonald (2011).<sup>9</sup> Specifically, we use the ratio of (positive – negative)/(positive + negative) which provides a relative measure of call sentiment which considers both the optimistic and, potentially offsetting, pessimistic dimensions of the calls (e.g., Henry 2008; Price et al. 2012).

Table 1 reports statistics that describe our sample. In Panel A, we report summary statistics for earnings surprise (*Surp*), which is calculated as the difference between reported earnings during quarter *q* and earnings reported four-quarters earlier divided by the share price.<sup>10</sup>

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<sup>6</sup> As a measure of robustness, we eliminate the lowest priced stocks in our sample by excluding any stock with a price less than \$5. Doing so reduces our sample by approximately 3%. We then replicate our multivariate analysis and find results that are qualitatively similar to those reported in this paper.

<sup>7</sup> Because of data limitations, we eliminate 10 observations from our initial sample of 1,440 earnings announcements.

<sup>8</sup> The Regulation SHO data are available starting on January 3<sup>rd</sup>, 2005, so we are unable to calculate a benchmark using short selling data before this time period.

<sup>9</sup> Our results are robust to the use of various content analysis platforms, such as the General Inquirer and Diction, and their accompanying word classification lists, such as the Harvard IV-4 Psychosocial Dictionary (General Inquirer) and the Optimism Score (Diction), as well as the use of the earnings-release-specific dictionaries of Henry (2008).

<sup>10</sup> In order to avoid sample selection bias in our multivariate analysis, we choose to measure surprise as current earnings relative to past earnings. Similar measures of earnings surprise are used in Chan et al. (1996), Chordia and Shivakumar (2006), Sadka (2006), and Drake et al. (2011). We recognize that other measures of earnings surprise

We also partition the conference call into the introduction or the prepared comments portion of the earnings conference call and the question-and-answer portion of the call.  $Tone(Intro)$  is the tone of the introduction while  $Tone(Q\&A)$  is the tone of the question-and-answer portion of the call.  $Ab\_Tone$  is the difference in tone between the two sections; specifically,  $Tone(Intro)$  minus  $Tone(Q\&A)$ .  $Ab\_Tone$  represents the amount of inflated talk of management by capturing how much higher the call tone is for the uninterrupted introduction section of the call compared to the question and answer portion of the call, where participants can challenge management and set a tone more consistent with the true prospects of the firm. The average stock has a mean earnings surprise of 0.0617 and an overall tone of 0.2015. The tone of the introduction appears to be more positive than the tone of the Q&A portion of the call (0.3589 compared to 0.0763) with an average  $Ab\_Tone$  of 0.2757. This is expected given that the introduction of the call is prepared while the Q&A portion of the call is unscripted. We also report the total number of words in the call ( $Words$ ), the percentage of words that are considered positive ( $\%PosWords$ ), and the percentage of words that are considered negative ( $\%NegWords$ ). Further, for illustrative purposes we report these summary statistics for the introduction of the call ( $Words(Intro)$ ,  $\%PosWords(Intro)$ , and  $\%NegWords(Intro)$ ), as well as the Q&A portion of the call ( $Words(Q\&A)$ ,  $\%PosWords(Q\&A)$ , and  $\%NegWords(Q\&A)$ ). We find that the average conference call has 7,943 words, of which, 1.42% are considered positive while 0.93% are considered negative. When examining the introduction, the total number of words for the average call is 3,046, while the percentage of positive (negative) words is 1.75% (0.80%). The

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exist. One such measure is the scaled difference between actual earnings and consensus analyst forecast estimates. However, in using this measure, we lose approximately 400 stock-announcement observations and the firms that are excluded are smaller firms that likely have severe short-sale constraints. Nevertheless, we replicate our analysis using this alternative surprise measure and find our multivariate results to be qualitatively similar to those reported.

total number of words in the Q&A section of the average call is 4,902 while the percentage of positive (negative) words is 1.20% (1.02%).<sup>11</sup>

Panel B reports summary statistics for the trading activity on the earnings announcement call day. *Sh\_vol* is the amount of short sale volume that is executed on the event day while *Sh\_turn* is the percent of short volume relative to shares outstanding. We also report the level of non-short sale trade volume (*Non\_sh\_vol*) and the non-short volume as a percent of shares outstanding (*Non\_sh\_turn*). The mean announcement-day short volume is 774,306 while the mean short turnover is 0.5659. Further, the average stock has non-short volume of 2,185,548 and non-short turnover of 1.3589.

Panel C reports summary statistics for other firm characteristics. *Price* is the CRSP closing price on the announcement day. *Mkt Cap* is the market capitalization while *B/M* is the book-to-market value of equity ratio. *Rvolt* is the standard deviation of daily returns from day *t-60* to *t-11*, where day *t* is the announcement call day. *InstOwn* is the fraction of shares outstanding held by institutions and *Call\_An* is the number of analysts participating in the conference call.<sup>12</sup> *ROA* is the return on assets defined as the net income in quarter *q* scaled by the total assets. The mean announcement-day price and corresponding market capitalization are \$33.95 and \$6.878 billion. The average book-to-market value of equity ratio is 0.5425, while the average return volatility is 1.9557 percent. The mean institutional ownership and analyst coverage are 0.7466 and 7.60, respectively. The mean *ROA* is 1.4675 percent.

#### **4. Research design and results**

##### ***Event Study – Short Selling Surrounding Earnings Announcements and Conference Calls***

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<sup>11</sup> While our results use raw data, they are robust to Winsorizing the data at the 1% and 99% levels.

<sup>12</sup> The results are robust to replacing *Call\_An* with the number of analysts covering the stock (which is highly correlated with *Call\_An*).

Collver (2007) argues that traders with superior earnings-related information or any other private information expected to be disclosed on a conference call will likely trade a day or two prior to the announcement, whereas superior public information processors are likely to trade soon after an announcement and conference call. We begin by examining the behavior of short sellers during the 21-day period surrounding earnings announcements and their corresponding conference calls.<sup>13</sup> We partition the stock-announcement observations into positive and negative earnings surprises, respectively. We determine statistical significance in two ways. First, we estimate a measure of abnormal short selling, which is calculated by taking the difference between the short selling measure on a day during the event window and a benchmark. The benchmark is the average short selling measure from day  $t-30$  to  $t-11$ , where day  $t$  is the earnings announcement day. Statistical significance is therefore determined under the null hypothesis that the abnormal short selling is equal to zero.

Second, we standardize short selling for a particular stock by taking the difference between the short selling measure and the mean of that short selling measure across the time series. We then divide the difference by the standard deviation of the short selling measure across the time series. Standardizing short selling in this way allows each stock to have a standardized measure that is similarly distributed with a zero mean and a unit variance. Again, statistical significance is determined according to the null hypothesis that standardized short selling equals zero on a particular day.

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<sup>13</sup> For a vast majority of the sample conference calls are held on the day of the earnings announcement. Some calls are held the morning following an after-hours earnings announcement. For instance, after collecting time stamps on the conference calls, we find that approximately 23 percent of calls occurred afterhours. To make sure our results hold, we replicate parts of our analysis and conduct two robustness tests. First, we adjust the dependent variable to reflect the timing of these after-hour calls. On days when the call occurred after hours, the dependent variable is measured from day  $t+1$  to  $t+2$ . In a separate test, we simply exclude the after-hour calls. The conclusions that we draw regarding the effect of call tone on short selling behavior in these unreported tests are qualitatively similar to those reported in this paper, suggesting that our findings are robust to the timing of the conference calls.

Table 2 reports the results of the event study. In columns [1] through [3] we examine short turnover for positive earnings surprises and find that short turnover remains at relatively normal levels for the 10 days prior to the announcement day. In fact, columns [2] and [3] show that short selling is sometimes abnormally low from day  $t-10$  to  $t-2$ . Short selling then begins to increase on day  $t-1$  as both the abnormal short turnover and the standardized short turnover are positive and significant. Observing abnormal short selling on the day prior to positive news questions the level of informed trading by short selling during the pre-announcement period. However, the slight increase in short turnover from day  $t-2$  to  $t-1$  is small in comparison to the increase in short turnover on the event day. We find that short turnover surges on the call date, and on the days that follow the event day peaking on day  $t+1$ . These results indicate that short sellers react strongly to positive earnings surprises. Columns [4] through [6] provides the event study results for negative earnings surprises. Again, short turnover is abnormally low during the pre-announcement period, in general. There is a surge in short selling on the event day as short turnover increases to 0.5952 on day  $t$ . According to the standardized short turnover, the event-day short turnover is more than one standard deviation above the mean. Short turnover remains abnormally high during the few days of the post-announcement period. In general, the conclusions we draw in columns [4] through [6] are similar to the conclusions we draw in the earlier columns. While we have not yet examined the effects of abnormal tone, results in Table 2 are consistent with Hypothesis 1b insofar as they indicate that short sellers respond to, and do not anticipate, news on earnings announcement and conference calls days. This finding is consistent with the results in Engelberg et al. (2012) and Blau and Pinegar (2013) and demonstrates short sellers are using public information in their trading decisions.

### ***Portfolio Sorts - Post-Event Short Selling and Both Hard and Soft Information***

We initialize our analysis of Hypothesis 1a by sorting the sample by hard and soft information and examining the amount of short selling in each category. Table 3 reports post-announcement short selling across portfolios sorted by soft information alone (Panels A and B) and by hard and soft information together (Panels C and D) in order to examine the interaction between the two types of information.<sup>14</sup> Panel A reports the results for average short turnover from day  $t$  to  $t+1$  ( $Sh\_turn_{i,t,t+1}$ ) when the sample is sorted into quartiles based on the call tone in the introduction period of the call ( $Tone(Intro)$ ). There is similar short turnover in each  $Tone(Intro)$  group, and the difference in short turnover between firms in the highest and lowest quartiles is not significantly different than zero. Second, we sort all firms into quartiles based on  $Ab\_Tone$ . Panel B shows results similar to Panel A in that there does not appear to be significant differences in shorting activity across different groups of  $Ab\_Tone$ . Thus, in preliminary checks, there does not appear to be evidence to support Hypothesis 1a that short sellers take  $Tone$  into account when making investing decisions.

However, the results in Panels A and B could be masked by an effect associated with Hypothesis 2, which is that short sellers only use  $Tone$  under certain conditions with respect to hard information. In the first test of Hypothesis 2, we examine the differences in extreme quartiles based on sequential sorting on both  $Surp$  and  $Tone$  and report  $p$ -values from corresponding  $t$ -tests. Each double-sorted portfolio has roughly 80 observations. In Panel C, Column [1], we find that post-announcement short turnover decreases, but not monotonically, across increasing  $Tone(Intro)$  quartiles. In the fifth row of column [1] ( $QIV - QI$ ), we find that

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<sup>14</sup> The results in this and subsequent tables are robust to using an alternative window of day  $t+1$  to  $t+2$ . Further, we also examine cumulative abnormal returns for various event windows while sorting on  $Tone$  and earnings surprise. Our results are consistent with findings in Price et al. (2012) and show that both short-term and long-term earnings announcement returns increase monotonically across measures of  $Tone$ . These results are consistent whether we examine positive or negative earnings surprises.

the difference between extreme *Tone(Intro)* quartiles is -0.2322 and is statistically significant at the 10% level ( $p$ -value = 0.093). In columns [1] through [4], we do not find a monotonic relation between post-announcement short turnover and *Tone(Intro)*. However, the fifth row shows there is significantly more (less) short turnover in the highest (lowest) *Surp* group when *Tone(Intro)* is high compared to when it is low. In the fifth row of column [5], we find that the difference-in-differences is significantly positive (difference = 0.6073,  $p$ -value = 0.001). The positive difference in differences suggests that short sellers have an asymmetric preference for tone (soft information) that depends on the earnings surprise (hard information).

When examining post-announcement short turnover across *Surp* quartiles we find some evidence in the first row (Low *Tone* announcements) that short turnover is significantly higher in column [1] than in column [4] as the difference between extreme *Surp* quartiles in column [5] is -0.4706 ( $p$ -value = 0.002). However, we do not find significance for any of the other differences in column [5].

Finally, we sort the sample into quartiles by *Surp* and then sequentially sort into quartiles by *Ab\_Tone*. Panel D of Table 3 shows very similar results to those observed in Panel C. There is approximately 45% more short turnover in the high *Ab\_Tone* group (representing more revealed inflated talk) than in the low *Ab\_Tone* group in both the third and fourth quartile of *Surp* ( $p$ -values of 0.057 and 0.074, respectively). However, there is about 33% less short turnover ( $p$ -value = 0.061) between the high and low *Ab\_Tone* groups when *Surp* is the lowest.

The results in Table 3, Panels C and D provide some interesting inferences. First, we find that post-announcement short turnover is not always higher after announcements with negative earnings surprises. In fact, we find some evidence that post-announcement short turnover is higher after announcements with more positive surprise when the *Tone(Intro)* and *Ab\_Tone* of

the conference call is highest. Second, and perhaps more importantly, there is monotonically increasing differences in extreme *Tone* quartiles across increasing *Surp* quartiles which provides an important asymmetry in our results. While heavy short selling in stocks with both unfavorable hard information and unfavorable soft information is somewhat expected, the increase in short selling in stocks with both positive surprises and positive *Tone* is consistent with Hypothesis 2 and the results in Diether et al. (2009b) which suggest that some short sellers target stocks that are overvalued by the market. In our framework, announcements with both positive surprise and positive *Ab\_Tone* might lead to stock overvaluation as a result of management's inflated talk (Kartik et al., 2007), since the average investor may have difficulty interpreting the bad news represented by the revealed inflated talk and underreact to that bad news.

Results in Table 3 provide two contributions to the literature. First, our findings indicate that short sellers not only process hard information, but they also process the more subtle soft information as well. This result provides an extension to the conclusions drawn in Engelberg et al. (2012) by showing that short sellers process both hard and soft information in major firm-specific announcements. Second, theory in Kartik et al. (2007) indicates that strategic communication that misrepresents the truth should be considered bad news. Short sellers' asymmetric reaction to the tone of the communication in earnings conference calls seems to suggest that they interpret high abnormal tone (inflated talk) as particularly bad news when it is revealed in conjunction with positive earnings surprise. This is the first evidence suggesting that short sellers may be interpreting tone differently than general investors.

### ***Multivariate Tests - Post-Event Short Selling and Both Hard and Soft Information***



In this section, we continue our examination of post-announcement short selling while conditioning on the quality of the soft information in the earnings conference call in a multivariate setting. In particular, we estimate the following equations using cross-sectional data and report the results in Table 4.

$$Sh\_turn_{i,t,t+1} = \beta_0 + \beta_1 Rvolt_{i,t-60,t-11} + \beta_2 Non\_sh\_turn_{i,t,t+1} + \beta_3 Ln(size_{i,t}) + \beta_4 B/M_{i,t} + \beta_5 InstOwn_{i,t} + \beta_6 Ln(Call\_An_{i,t}) + \beta_7 Surp_{i,t} + \beta_8 Tone_{i,t} + \varepsilon_{i,t,t+1} \quad (1)$$

and

$$Sh\_turn_{i,t,t+1} = \beta_0 + \beta_1 Rvolt_{i,t-60,t-11} + \beta_2 Non\_sh\_turn_{i,t,t+1} + \beta_3 Ln(size_{i,t}) + \beta_4 B/M_{i,t} + \beta_5 InstOwn_{i,t} + \beta_6 Ln(Call\_An_{i,t}) + \beta_7 Surp_{i,t} + \beta_8 Tone(Intro)_{i,t} + \beta_9 Ab\_Tone_{i,t} + \varepsilon_{i,t,t+1} \quad (2)$$

The dependent variable is short turnover from day  $t$  to  $t+1$  ( $Sh\_turn_{i,t,t+1}$ ), where day  $t$  is the earnings conference call day. Independent variables include the return volatility from day  $t-60$  to  $t-11$  ( $Rvolt_{i,t-60,t-11}$ ), the average non short ratio ( $Non\_sh\_turn_{i,t,t+1}$ ), the natural log of the market capitalization on the announcement day ( $Ln(size_{i,t})$ ), the book-to-market ratio ( $B/M_{i,t}$ ), the institutional ownership ( $InstOwn_{i,t}$ ), the natural log of the number of analysts participating in the conference call ( $Ln(Call\_An_{i,t})$ ), the earnings surprise ( $Surp_{i,t}$ ), and the tone of the earnings conference call (either  $Tone(Intro)_{i,t}$  or  $Ab\_Tone_{i,t}$  in equation (1), or both in equation (2)). Similar independent variables have been used in others studies when describing the level of short activity (Dechow et al., 2001; Christophe et al., 2004; Nagel, 2005; Boehmer et al., 2008; Diether et al., 2009b; and Engelberg et al., 2012). We control for conditional heteroskedasticity in the standard errors following White (1980). Our results are also robust to different econometric specifications that control for censoring in the dependent variables. For instance, the lower bound of  $Sh\_turn_{i,t,t+1}$  is zero. We therefore use both one-tailed Tobit regressions to control for the censoring of the dependent variables and find the results are qualitatively similar to those

reported in this table. Our results are also robust to controls for clustering in the error terms (Petersen 2009). Further, all multivariate tests from this point forward are robust an alternative post-announcement short selling window (day  $t+1$  to  $t+2$ ). Further, we include earnings announcement returns (for the 3-day window surrounding the earnings announcement) as a control instead of our measure of earnings surprise and find the results to be qualitatively similar.<sup>15</sup> If the estimate of  $\beta_8$  or  $\beta_9$  is statistically different than zero, then that would be evidence short sellers use *Tone* in their investing decisions and support Hypothesis 1a.

Columns [1] through [3] of Table 4 report the results from estimating equations (1) and (2). Column [4] presents the results from a model that also includes variables found by Drake et al. (2011) to impact short selling. Specifically, we include total accruals (*TACCR*), capital expenditures (*CAPEX*), and sales growth (*SG*) in the model specification. *TACCR* is defined as total accruals (earnings before extraordinary items and discontinued operations minus cash flow from operations) scaled by average assets at the end of quarter  $q$ . *CAPEX* is the sum of the preceding four quarters of capital expenditures ending in quarter  $q$  scaled by total assets. *SG* is the sum of sales growth over the previous four quarters. The requirement of these three variables substantially reduces the sample size, therefore we include them in only one model for robustness purposes. Further, in unreported results, we estimate variance inflation factors and find that all factors are below three, indicating that multicollinearity does not appear to be an issue.

Column [1] shows that short turnover is directly related to non-short turnover, book-to-market ratios, institutional ownership, and the number of analysts on the call. We also show that post-announcement short turnover is negatively related to market capitalization. Interestingly, we

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<sup>15</sup> In these unreported tests, we find that post-announcement short selling is inversely related to the magnitude of the earnings announcement return. While this result is rather intuitive, it does conflict with the idea that short sellers are contrarian in contemporaneous returns, which is documented generally in Diether, Lee, and Werner (2009b).

do not find that short turnover is related to the earnings surprise as the coefficient for the variable *Surp* is 0.0025 ( $p$ -value = 0.407). Nor do we find that the tone of the earnings conference call introductory session is related to post-announcement short selling as the estimate for *Tone(Intro)* is 0.0536 ( $p$ -value = 0.271). Results in column [2] show similar relations between short turnover and the control variables, however the estimated coefficient for *Ab\_Tone* is a highly significant 0.1741 ( $p$ -value = 0.000). In economic terms, a one standard deviation increase in *Ab\_Tone* increases short turnover by 0.0451, or 8% (15.5%) of the mean (median) short turnover. Taken together, the results in Columns [1] and [2] suggest that short sellers are not concerned with the tone of the introduction portion of the call as a stand-alone signal, but are very interested in the abnormal tone (or inflated talk) of the call.

Columns [3] and [4] present the results from equation (2), where both *Tone(Intro)* and *Ab\_Tone* are included in the model. Column [3] shows the *Ab\_Tone* coefficient is 0.2512 and highly statistically significant ( $p$ -value = 0.000). Thus, a one standard deviation increase in *Ab\_Tone* is associated with an increase in short turnover of 0.0651, or 11.5% (22.3%) of the mean (median) short turnover. Column [4] shows similar results, even after controlling for more accounting information and a reduced sample size. Column [3] shows an inverse relation between short turnover and *Tone(Intro)*, but this relation is not robust to including the extra controls shown in Column [4]. These results suggest that, after controlling for other factors that influence short turnover, short sellers target stocks with conference calls containing negative soft information in the form of abnormal tone, or inflated talk, and provides additional support for Hypothesis 1a.

## ***Multivariate Tests - Post-Event Short Selling and the Interaction of Hard and Soft Information***

In the previous section, we document that short sellers target earnings announcements with unfavorable soft information in the earnings conference call. In this section, we extend the previous tests and interact the earnings surprise with the tone of the conference call. Our motivation comes from Hypothesis 2 which suggests that short sellers' preference for negative soft information (high abnormal tone) is stronger for firms with positive earnings surprises. Since the revealed abnormal tone is inherently more difficult to interpret than the earnings surprise, bad news in the form of abnormal tone in the presence of positive earnings surprise may be deemed less reliable than hard information and, as a result, not receive the proper weight in the investors' decisions (Atiase et al. 2005). Underweighting the abnormal tone would bring about mispricing in the stock as the investors place too much weight on the positive news of unexpectedly high earnings. Overpricing of these stocks would motivate short sellers to target the underreaction to inflated talk (Diether et al. 2009b). To explore this hypothesis, we estimate the following equation:

$$Sh\_turn_{i,t,t+1} = \beta_0 + \beta_1 Rvolt_{i,t-60-t-11} + \beta_2 Non\_sh\_turn_{i,t,t+1} + \beta_3 Ln(size_{i,t}) + \beta_4 B/M_{i,t} + \beta_5 InstOwn_{i,t} + \beta_6 Ln(Call\_An_{i,t}) + \beta_7 PosSurp_{i,t} + \beta_8 Tone_{i,t} + \beta_9 PosSurp \times Tone_{i,t} + \varepsilon_{i,t,t+1} \quad (3)$$

As before, the dependent variables include short turnover from day  $t$  to  $t+1$  ( $Sh\_turn_{i,t,t+1}$ ). Independent variables include the same control variables in equations (1) and (2), as well as our different measures of *Tone* ( $Tone(Intro)$ ,  $Ab\_Tone$ , or both). *PosSurp* is an indicator variable that equals one if the earnings surprise is positive and zero otherwise. The variable of interest is the interaction between *PosSurp* and *Tone* (the effect of *Tone* conditional on positive earnings surprise). A positive and significant estimate of  $\beta_9$  would provide evidence supporting

Hypothesis 2. In this model, the estimate for *Tone* captures the effect of *Tone* on post-announcement short selling for observations with negative earnings surprises only. The interaction estimate captures the marginal effect of *Tone* conditional on positive earnings surprise. A positive interaction estimate suggests that short sellers' preferences for *Tone* are stronger for positive earnings surprises. However, if both  $\beta_8$  and  $\beta_9$  are positive and significant, then short sellers target abnormal tone regardless of earnings surprise. This result would be inconsistent with Hypothesis 2, but would still support Hypothesis 1a.

Table 5 reports the results from the estimation of equation (3). Column [1] reports the results when we include the tone of the introductory period of the conference call. The control variables produce estimates that are similar in both sign and magnitude to those in previous tables. When there is a positive earnings surprise (e.g., *PosSurp* = 1), short turnover decreases by 0.1051. *Tone(Intro)* produces an estimate that is not significantly different than zero (estimate = 0.0214, *p*-value = 0.779) indicating that for negative earnings surprises, short sellers do not necessarily target positive or negative tone. Further, the interaction estimate is statistically close to zero (estimate = 0.0814, *p*-value = 0.406). This suggests that short sellers do not use introduction session call tone by itself in their trading decisions, irrespective of the direction of the earnings surprise.

In column [2], we replace *Tone* with *Ab\_Tone*. Interestingly, we find very strong evidence short sellers use abnormal tone when the earnings surprise is positive (*PosSurp* × *Ab\_Tone* coefficient estimate = 0.1984, *p*-value = 0.035), but not when there are negative earnings surprises (*Ab\_Tone* coefficient estimate = 0.0509, *p*-value = 0.488). These results are robust to including both *Tone(Intro)* and *Ab\_Tone* in the same model and the inclusion of the three additional financial accounting variables. These results are highly

supportive of Hypothesis 2, and suggest short sellers believe general investors underweight the bad news contained in inflated talk when they simultaneously receive good news in the form of positive earnings surprise. This underreaction causes them to bid the price of the stock too high relative to short sellers' valuations, and provides the opportunity to short sellers to take advantage of the perceived overpricing.

### ***Multivariate Tests - The Return Predictability of Post-Event Short Selling***

Thus far, our results provide evidence that short sellers carefully process the soft information contained in the earnings conference calls. We have yet to make any inference about whether short sellers' preferences for abnormal call tone affects their ability to predict negative returns or adds to price discovery. In other words, we have not identified that shorting high abnormal call tone is the "correct" approach to take in the sense that it currently is unknown if this is a profitable strategy. If short sellers use this tactic and the targeted firms do not suffer future negative returns (or they experience positive returns), then the short sellers misinterpret the abnormal tone and the stocks are not overpriced. In other words, such a result would suggest that naïve investors understand both the hard and soft information, the interaction between the two, and act accordingly. As mentioned previously, prior research shows a common negative relation between short selling and future returns (Senchack and Starks 1993; Aitken, Frino, McCorry, and Swan 1998; Dechow et al. 2001; Desai et al. 2002; Boehmer et al. 2008; Diether et al. 2009b). Engelberg et al. (2012) examine factors that drive the return predictability contained in short selling and find that the common negative relation between daily short selling and future returns is stronger on days with firm-specific announcements, like earnings announcements, compared

to non-event days. In this section, we examine the effect of the tone of the announcement on the return predictability in short selling using methods described by Engelberg et al. (2012).

In particular, we estimate the following equation using Fama and MacBeth (1973) regressions and panel data:

$$Ret_{i,t+2,t+j} = \alpha_i + \beta_{1,i} Ret_{i,t-1} + \beta_{2,i} Ret_{i,t-2} + \beta_{3,i} Sh\_turn_{i,t+1} + \beta_{4,i} INFLATE_{i,t} + \beta_{5,i} Sh\_turn_{i,t+1} \times INFLATE_{i,t} + \varepsilon_{i,t+2,t+j} \quad (4)$$

The dependent variable is the return for stock  $i$  from day  $t+2$  to  $t+j$ , where  $j = \{5 \text{ or } 20\}$ .<sup>16</sup> Like Engelberg et al., we include as independent variables one-day lagged returns ( $Ret_{i,t-1}$ ) and two-day lagged returns ( $Ret_{i,t-2}$ ). The independent variables of interest are short turnover for stock  $i$  from day  $t$  to  $t+1$ , a variable  $INFLATE_{i,t}$ , and the interaction between the two variables.

$INFLATE_{i,t}$  is an indicator variable which equals one if the earnings surprise is positive and  $Ab\_Tone_{i,t}$  is greater than the median  $Ab\_Tone$  and equals zero otherwise. Previous results in our analyses show short sellers target firms who fall under the conditions when  $INFLATE$  equals one. Thus, the interaction of  $Sh\_turn$  and  $INFLATE$  in model (4) will reveal if this strategy can predict negative returns. Specifically, if  $\beta_5$  is negative and significant then there is evidence supporting Hypothesis 3 that short sellers use abnormal tone to identify mispriced stocks and add to the price discovery process by shorting these stocks. We estimate 503 daily cross-section regressions and take the time-series mean of the coefficients as well as the standard errors. Similar to Engelberg et al., we use Newey and West (1987) standard errors with 20 lags when calculating the standard errors.

Table 6 reports the results from estimating equation (4). Columns [1] (dependent variable is  $Ret_{i,t+2,t+5}$ ) and [3] (dependent variable is  $Ret_{i,t+2,t+20}$ ) show the results when the  $INFLATE$

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<sup>16</sup> Engelberg et al. (2012) use 20-day returns. We also report returns from day  $t+2$  to  $t+5$ , similar to the time window in Diether et al. (2009b).

variables are omitted from the model, and demonstrate that short sellers are generally predictive of negative future returns as the coefficient estimate on *Sh\_turn* is negative and highly significant (estimates of -0.0008 and -0.0069 with p-values of 0.010 and 0.000, respectively). These results are not surprising in light of the plethora of studies discussed earlier which find short selling is indicative of future negative returns. In column [2], however, we find evidence that the interaction of *Sh\_turn* and *INFLATE* has a coefficient estimate that is negative and significant (estimate = -0.0112, *p*-value = 0.019). Shorting inflated talk results in negative returns an order of magnitude larger than short selling in general. These results suggest that when managers attempt to “inflate” their language, and it is revealed as abnormal tone, the stock of these firms become overpriced and are correctly targeted by short sellers. It appears that the general investing public does not process the abnormal tone of the call as well as short sellers, or else short sellers would not be able to use abnormal tone to identify the overpricing. Results in column [4], where the dependent variable are the returns from  $t+2$  to  $t+20$ , have an identical interpretation. The estimated coefficient of the interaction term is -0.0127 (*p*-value = 0.059) while the estimate on general short turnover is -0.0070 (*p*-value = 0.000). Thus, there is robust evidence supporting the hypothesis that the short selling of abnormal tone aids the price discovery process by helping them identify overpriced stocks. This additional price discovery might prevent firms from using inflated talk to gain prolonged overvaluation of their stock price.

## 5. Conclusion

This paper tests whether sophisticated investors interpret the qualitative (or “soft”) information in quarterly earnings conference calls and do so differently than the general investor population. With modern advances in communications technology and changes in the regulatory



environment, managers are increasingly engaging in an on-going dialogue with market participants through conference calls, a disclosure medium rich in difficult-to-interpret soft information. The literature establishes the soft information content of these conversational exchanges between management and stakeholders to be informative to the market, providing further disclosure beyond that contained in the accompanying numerically represented results (or “hard” information).

The interactive conference call forum provides management with the opportunity to inflate, or place unwarranted emphasis on, the hard information contained in the earnings release (Kartik et al. 2007). Moreover, extant literature implies that public information is heterogeneously processed among investors (Kandel et al. 1995). Additional studies show that, in general, investors react too slowly to bad news, while others show that they place too much emphasis on information which they deem reliable versus information they deem less reliable (e.g., Hong et al. 2000; Chan et al. 2003; Atiase et al. 2005). However, some literature suggests that short sellers, a subset of investors generally accepted to be sophisticated, possess superior information processing skills (Engelberg et al. 2012; Blau and Pinegar 2013). Thus, we use the unique setting of earnings conference calls to evaluate short sellers' interpretation of soft information (specifically, conference call linguistic tone) by examining their investing decisions. In earnings conference calls, the inflated talk of management is revealed via the tone of the question and answer session relative to the tone of the uninterrupted introductory session. This revelation is public, and the setting allows us to examine how this information is differentially processed among sophisticated investors (short sellers) and investors at large.

We contribute to both the disclosure and short selling literature by not only corroborating prior evidence of short sellers as skilled investors, but also by establishing a channel of

information used by short sellers previously unidentified by the literature. First, we establish that short sellers rely on the soft information in earnings announcements conference calls as pertinent information in valuing stocks. Consistent with literature that finds short selling to be reactionary, our results indicate abnormal short selling following earnings conference calls and not prior to them. In particular, we provide evidence that the abnormal tone of the conference call explains the level of short turnover during the post-event period.

Second, our results provide evidence that short sellers trade against inflated language, or target those earnings announcements with both positive surprises and high abnormal tone; whereas other less-sophisticated investors appear to underreact to abnormal tone when presented with positive earnings surprises. Overall, we find support for the hypothesis that difficult-to-interpret qualitative public information is heterogeneously understood, and acted upon, by short sellers and naïve investors. This is consistent with the notion that many investors have a difficult time fully interpreting the abnormal tone and place less reliability on it in deference to the positive earnings surprise. Third, the results from our analyses support the literature by showing short sellers are highly skilled information processors. Specifically, there is a strong negative relation between the amount of short selling and future returns when they target inflated talk, thus short sellers' trades around the conference calls are predictive of negative returns. These findings suggests that, because of the additional price discovery the short trades provide, managers are unable to maintain long-term overvaluation of their stock by striking an overly optimistic posture in the interactive conference call disclosure forum where inflated talk can be revealed.

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TABLE 1

## Summary Statistics

This table reports statistics that summarize the data used in the analysis. Panel A reports summary statistics for some of the information regarding the earnings announcements. *Surp* is the earnings surprise and is calculated as the difference between current earnings and last year earnings scaled by price. *Tone* is the tone of the entire conference call while *Tone(Intro)* is the tone of the introduction during the conference call. Similarly, *Tone(Q&A)* is the tone of the question-and-answer portion of the conference call. *Ab\_Tone* is the difference between *Tone(Intro)* and *Tone(Q&A)*, and represents the abnormal tone of management. *Words* is the total number of words in the conference call. *%PosWords* is the percentage of total words that are considered positive and *%NegWords* is the percentage of total words that are considered negative. We also estimate these summary statistics for the introduction portion and the questions and answers portion of the call. Panel B reports some statistics about the trading activity on the earnings announcement days. *Sh\_vol* is the short-sale volume on the announcement day, *Sh\_turn* is the short turnover (short volume divided by shares outstanding), *Non\_sh\_vol* is the non-short-sale volume on the earnings announcement day, and *Non\_sh\_turn* is the non-short turnover (non-short trading volume divided by shares outstanding). Panel C presents other firm-specific characteristics on the earnings announcement date. *Price* is the CRSP closing price on the earnings announcement day, *Mkt Cap* is the market capitalization, *B/M* is the book-to-market ratio, and *ROA* is the Return on Assets. *Rvolt* is the standard deviation of returns from day *t-60* to *t-11*, where day *t* is the earnings announcement day. *InstOwn* is the fraction of shares outstanding held by institutions and *Call\_An* is the number of analysts participating in the earnings conference call.

Panel A. Earnings Announcement Call Characteristics					
	<i>Mean</i>	<i>Median</i>	<i>Std. Deviation</i>	<i>Min</i>	<i>Max</i>
	[1]	[2]	[3]	[4]	[5]
<i>Surp</i>	0.0617	0.1146	4.2354	-65.4025	89.4737
<i>Tone</i>	0.2015	0.2067	0.1921	-0.4711	0.7037
<i>Tone(Intro)</i>	0.3589	0.3840	0.2535	-0.6000	0.9167
<i>Tone(Q&amp;A)</i>	0.0763	0.0857	0.2104	-0.7778	0.7500
<i>Ab_Tone</i>	0.2757	0.2801	0.2592	-0.9030	1.1084
<i>Words</i>	7,943	8,026	2,457	1,564	17,897
<i>%PosWords</i>	1.42	1.38	0.40	0.49	2.92
<i>%NegWords</i>	0.93	0.91	0.26	0.32	2.95
<i>Words(Intro)</i>	3,046	2,887	1,270	283	10,274
<i>%PosWords(Intro)</i>	1.75	1.69	0.63	0.26	4.13
<i>%NegWords(Intro)</i>	0.80	0.75	0.38	0.10	2.80
<i>Words(Q&amp;A)</i>	4,902	4,831	2,046	248	14,831
<i>%PosWords(Q&amp;A)</i>	1.20	1.18	0.37	0.12	2.71
<i>%NegWords(Q&amp;A)</i>	1.02	0.98	0.28	0.28	3.26
Panel B. Trading Activity on Earnings Announcement Call Days					
<i>Sh_vol</i>	774,306	233,830	2,275,358	0	40,776,373
<i>Sh_turn</i>	0.5659	0.2916	0.9498	0.0000	9.9890
<i>Non_sh_vol</i>	2,185,548	604,977	5,410,191	250	70,300,826
<i>Non_sh_turn</i>	1.3589	0.8089	1.7344	0.0029	14.9750
Panel C. Other Firm-Characteristics on Earnings Announcement Call Days					
<i>Price</i>	33.95	30.88	24.58	1.07	415.00
<i>Mkt Cap</i>	6,878,343,620	1,722,448,340	18,120,605,160	9,009,720	352,401,702,000
<i>B/M</i>	0.5425	0.3549	2.5188	0.0007	83.6216
<i>ROA</i>	1.4675	1.6248	3.2245	-19.8507	39.6076
<i>Rvolt</i>	1.9557	1.7877	0.8651	0.6069	7.6668
<i>InstOwn</i>	0.7466	0.7898	0.2353	0.0001	1.0000
<i>Call_An</i>	8.0709	8.0000	3.8196	1.0000	27.0000



TABLE 2

## Short Selling Surrounding Earnings Announcement Calls

The table reports short turnover surrounding earnings announcement calls for both positive earnings surprises (columns [1] through [3]) and negative earnings surprises (columns [4] through [6]). Besides report the raw measures of short turnover, we also calculate two additional measures of short-selling activity to test for statistical and economic significance. Abnormal short turnover is calculated as the difference between short turnover on a particular day during the event window and the average short turnover during a benchmark which we define as short turnover from day  $t-30$  to  $t-11$ . Standardized short turnover is obtained by scaling the difference between short turnover on a particular day during the event window and the mean short turnover activity during the entire time period by the standard deviation of the short turnover measure during the entire time period. This standardization procedure allow for each stock to have a standardized measure that is similarly distributed with a zero mean and a unit variance. \*\*\*, \*\*, \* denotes statistical significance at the 0.01, 0.05, and 0.10 levels.

	<i>Positive Earnings Surprise (N = 792)</i>			<i>Negative Earnings Surprise (N = 526)</i>		
	<i>Raw Short Turnover</i>	<i>Abnormal Short Turnover</i>	<i>Standardized Short Turnover</i>	<i>Raw Short Turnover</i>	<i>Abnormal Short Turnover</i>	<i>Standardized Short Turnover</i>
	[1]	[2]	[3]	[4]	[5]	[6]
$t-10, t-6$	0.2496	-0.0120**	-0.0530***	0.2787	-0.0220***	-0.1090***
$t-5$	0.2464	-0.0150*	-0.0540*	0.2703	-0.0310**	-0.1220***
$t-4$	0.2405	-0.0210**	-0.0810***	0.2731	-0.0280**	-0.1080***
$t-3$	0.2628	0.0011	-0.044	0.2879	-0.013	-0.0830***
$t-2$	0.2518	-0.0100	-0.0490*	0.2949	-0.006	-0.0820**
$t-1$	0.2821	0.0204**	0.0964***	0.3339	0.0327	0.0384
$t$	0.5464	0.2847***	1.1762***	0.5952	0.2940***	1.0439***
$t+1$	0.666	0.4043***	1.4409***	0.8429	0.5417***	1.6015***
$t+2$	0.3715	0.1098***	0.4919***	0.4499	0.1488***	0.4665***
$t+3$	0.3244	0.0627***	0.2911***	0.3577	0.0565***	0.2261***
$t+4$	0.2893	0.0276***	0.1584***	0.3368	0.0357**	0.1215***
$t+5$	0.2693	0.0076	0.0702***	0.3268	0.0256	0.0432
$t+6, t+10$	0.2537	-0.008	0.0001	0.2917	-0.01	-0.034

TABLE 3

## Post-Announcement Short Selling across Sorted Portfolios

In this table, we report post-announcement short selling across portfolios that are sorted in various ways. Panel A shows short turnover across portfolios sorted on the introduction of the tone. Panel B shows the post-announcement short turnover across portfolios sorted based on  $Ab\_Tone$  (which is the difference between  $Tone(Intro)$  and  $Tone(Q\&A)$ ). Panel C reports post-announcement short turnover across double sorted portfolios, first by earnings surprise and second by  $Tone(Intro)$ . Finally, Panel D shows post-announcement short turnover across double sorted portfolios, first by earnings surprise and second by  $Ab\_Tone$ . In the fifth row, we report the difference between extreme Tone quartiles along with corresponding  $p$ -values. In column [5], we report differences between extreme surprise quartiles along with corresponding  $p$ -values. \*\*\*, \*\*, \* denotes statistical significance at the 0.01, 0.05, and 0.10 levels.

Panel A. Average Short Turnover from Day $t$ to $t+1$ Across Quartiles based on $Tone(Intro)$					
	$Q\ I\ (Low)$ [1]	$Q\ II$ [2]	$Q\ III$ [3]	$Q\ IV\ (High)$ [4]	$Q\ IV - Q\ I$ [5]
$Sh\_turn_{i,t,t+1}$	0.6972	0.6273	0.6745	0.6902	-0.0069 (0.928)
Panel B. Average Short Turnover from Day $t$ to $t+1$ Across Quartiles based on $Ab\_Tone$					
$Sh\_turn_{i,t,t+1}$	0.6683	0.6359	0.6970	0.6907	0.0224 (0.768)
Panel C. Average Short Turnover from Day $t$ to $t+1$ Across Double-Sorted Quartiles based on $Surp$ and $Tone(Intro)$					
	$Q\ I$ ( $Low\ Surp$ )	$Q\ II$	$Q\ III$	$Q\ IV$ ( $High\ Surp$ )	$Q\ IV - Q\ I$
$Q\ I\ (Low\ Tone(Intro))$	0.9529	0.6795	0.4463	0.4823	-0.4706*** (0.002)
$Q\ II$	0.6380	0.5132	0.5672	0.6175	-0.0205 (0.879)
$Q\ III$	0.6902	0.7215	0.6652	0.5501	-0.1401 (0.284)
$Q\ IV\ (High\ Tone(Intro))$	0.7207	0.6863	0.6180	0.8574	0.1367 (0.433)
$Q\ IV - Q\ I$	-0.2322* (0.093)	0.0068 (0.963)	0.1717 (0.106)	0.3751*** (0.009)	0.6073*** (0.001)
Panel D. Average Short Turnover from Day $t$ to $t+1$ Across Double-Sorted Quartiles based on $Surp$ and $Ab\_Tone$					
	$Q\ I$ ( $Low\ Surp$ )	$Q\ II$	$Q\ III$	$Q\ IV$ ( $High\ Surp$ )	$Q\ IV - Q\ I$
$Q\ I\ (Low\ Ab\_Tone)$	0.9843	0.6068	0.3981	0.5491	-0.4352** (0.011)
$Q\ II$	0.8702	0.6712	0.4655	0.7573	-0.1129 (0.547)
$Q\ III$	0.6345	0.7165	0.7543	0.6056	-0.0289 (0.810)
$Q\ IV\ (High\ Ab\_Tone)$	0.6579	0.7147	0.5822	0.7882	0.1303 (0.219)
$Q\ IV - Q\ I$	-0.3264* (0.061)	0.1079 (0.391)	0.1841* (0.057)	0.2391* (0.074)	0.5655*** (0.002)

TABLE 4

## Cross Sectional Regressions

The table reports the results from estimating the following equation using cross-sectional stock-announcement data.

$$Sh\_turn_{i,t,t+1} = \beta_0 + \beta_1 Rvolt_{i,t-60,t-11} + \beta_2 Non\_sh\_turn_{i,t,t+1} + \beta_3 Ln(size_{i,t}) + \beta_4 B/M_{i,t} + \beta_5 ROA_{i,t} + \beta_6 InstOwn_{i,t} + \beta_7 Ln(Call\_An_{i,t}) + \beta_8 Surp_{i,t} + \beta_9 Tone(Intro)_{i,t} + \beta_{10} Ab\_Tone_{i,t} + \varepsilon_{i,t,t+1}$$

The dependent variable is short turnover from day  $t$  to  $t+1$  ( $Sh\_turn_{i,t,t+1}$ ), where day  $t$  is the earnings announcement call day. Independent variables include the return volatility from day  $t-60$  to  $t-11$  ( $Rvolt_{i,t-60,t-11}$ ), the average non short ratio ( $Non\_sh\_turn_{i,t,t+1}$ ), the natural log of the market capitalization on the announcement day ( $Ln(size_{i,t})$ ), the book-to-market ratio ( $B/M_{i,t}$ ), the return on assets ( $ROA_{i,t}$ ), the institutional ownership ( $InstOwn_{i,t}$ ), the natural log of the number of analyst on a given call ( $Ln(Call\_An_{i,t})$ ), the earnings surprise ( $Surp_{i,t}$ ), the tone of the earnings conference call introduction ( $Tone(Intro)_{i,t}$ ), and the difference between the tone of the introduction and the tone of the questions and answer section of the conference call ( $Ab\_Tone_{i,t}$ ). Column [4] reports the results from the model which also includes total accruals ( $TACCR$ ), capital expenditures ( $CAPEX$ ), and year-over-year sales growth ( $SG$ ). We control for conditional heteroskedasticity in the standard errors following White (1980). Our results are also robust to different econometric specifications that control for censoring in the dependent variables. For instance, the lower bound in columns [1] through [3] is zero. We use a one-tailed Tobit regressions to control for the censoring of the dependent variables and find the results are qualitatively similar to those reported in this table. \*\*\*, \*\*, \* denotes statistical significance at the 0.01, 0.05, and 0.10 levels.

	$Sh\_turn_{i,t,t+1}$			
	[1]	[2]	[3]	[4]
<i>Intercept</i>	0.0090 (0.953)	0.0060 (0.968)	0.0013 (0.993)	0.1971 (0.413)
<i>Rvolt<sub>i,t-60,t-11</sub></i>	0.0166 (0.338)	0.0160 (0.354)	0.0155 (0.367)	-0.0137 (0.593)
<i>Non_sh_turn<sub>i,t,t+1</sub></i>	0.4218*** (0.000)	0.4211*** (0.000)	0.4215*** (0.000)	0.4606*** (0.000)
<i>Ln(size)</i>	-0.0476*** (0.000)	-0.0495*** (0.000)	-0.0472*** (0.000)	-0.0603*** (0.000)
<i>B/M</i>	0.1721*** (0.000)	0.1727*** (0.000)	0.1708*** (0.000)	0.0149 (0.816)
<i>InstOwn</i>	0.2252*** (0.000)	0.2277*** (0.000)	0.2259*** (0.000)	0.3024*** (0.001)
<i>Ln(Call_An)</i>	0.1884*** (0.000)	0.1889*** (0.000)	0.1873*** (0.000)	0.1658*** (0.001)
<i>Surp</i>	0.0025 (0.407)	0.0027 (0.352)	0.0032 (0.284)	0.0036 (0.436)
<i>Tone (Intro)</i>	0.0536 (0.271)		-0.1226* (0.059)	-0.1045 (0.283)
<i>Ab_Tone</i>		0.1741*** (0.000)	0.2512*** (0.000)	0.2139** (0.024)
<i>ROA</i>	0.0021 (0.625)	0.0019 (0.652)	0.0025 (0.562)	0.0094 (0.183)
<i>TACCR</i>				-0.5738 (0.113)
<i>CAPEX</i>				0.0002 (0.616)
<i>SG</i>				0.0508 (0.374)
N	1,318	1,318	1,318	972
Adjusted R <sup>2</sup>	0.6158	0.6185	0.6190	0.6314

TABLE 5

## Cross Sectional Regressions

The table reports the results from estimating the following equation using cross-sectional stock-announcement data.

$$Sh\_turn_{i,t,t+1} = \beta_0 + \beta_1 Rvolt_{i,t-60,t-11} + \beta_2 Non\_sh\_turn_{i,t,t+1} + \beta_3 Ln(size_{i,t}) + \beta_4 B/M_{i,t} + \beta_5 ROA_{i,t} + \beta_6 InstOwn_{i,t} + \beta_7 Ln(Call\_An_{i,t}) + \beta_8 PosSurp_{i,t} + \beta_9 Tone(Intro)_{i,t} + \beta_{10} PosSurp_{i,t} \times Tone(Intro)_{i,t} + \beta_{11} Ab\_Tone_{i,t} + \beta_{12} PosSurp_{i,t} \times Ab\_Tone_{i,t} + \varepsilon_{i,t,t+1}$$

The dependent variable is short turnover from day  $t$  to  $t+1$  ( $Sh\_turn_{i,t,t+1}$ ), where day  $t$  is the earnings announcement call day. Independent variables include the return volatility from day  $t-60$  to  $t-11$  ( $Rvolt_{i,t-60,t-11}$ ), the average non short ratio ( $Non\_sh\_turn_{i,t,t+1}$ ), the natural log of the market capitalization on the announcement day ( $Ln(size_{i,t})$ ), the book-to-market ratio ( $B/M_{i,t}$ ), the return on assets ( $ROA_{i,t}$ ), the institutional ownership ( $InstOwn_{i,t}$ ), the natural log of the number of analyst on a given call ( $Ln(Call\_An_{i,t})$ ), an indicator variable capturing positive earnings surprise ( $PosSurp_{i,t}$ ), the tone of the earnings conference call introduction ( $Tone(Intro)_{i,t}$ ), the interaction between  $PosSurp$  and  $Tone(Intro)$ , the difference between the tone of the introduction and the tone of the questions and answer section of the conference call ( $Ab\_Tone_{i,t}$ ), and the interaction between  $PosSurp$  and  $Ab\_Tone$ . Column [4] reports the results from the model which also includes total accruals ( $TACCR$ ), capital expenditures ( $CAPEX$ ), and year-over-year sales growth ( $SG$ ). We control for conditional heteroskedasticity in the standard errors following White (1980). Our results are also robust to different econometric specifications that control for censoring in the dependent variables. For instance, the lower bound in columns [1] through [3] is zero. We use a one-tailed Tobit regressions to control for the censoring of the dependent variables and find the results are qualitatively similar to those reported in this table. \*\*\*, \*\*, \* denotes statistical significance at the 0.01, 0.05, and 0.10 levels.

	$Sh\_turn_{i,t,t+1}$			
	[1]	[2]	[3]	[4]
<i>Intercept</i>	0.0479 (0.753)	0.0575 (0.704)	0.0429 (0.777)	0.2732 (0.259)
<i>Rvolt<sub>i,t-60,t-11</sub></i>	0.0182 (0.289)	0.0176 (0.305)	0.0172 (0.314)	-0.0134 (0.599)
<i>Non_sh_turn<sub>i,t,t+1</sub></i>	0.4208*** (0.000)	0.4203*** (0.000)	0.4209*** (0.000)	0.4596*** (0.000)
<i>Ln(size)</i>	-0.0448*** (0.000)	-0.0450*** (0.000)	-0.0435*** (0.000)	-0.0571*** (0.000)
<i>B/M</i>	0.1695** (0.000)	0.1697*** (0.000)	0.1689*** (0.000)	0.0053 (0.935)
<i>InstOwn</i>	0.2285** (0.000)	0.2283*** (0.000)	0.2275*** (0.000)	0.2922*** (0.002)
<i>Ln(Call_An)</i>	0.1720*** (0.000)	0.1668*** (0.000)	0.1652*** (0.000)	0.1459*** (0.004)
<i>PosSurp</i>	-0.1051** (0.015)	-0.1273*** (0.001)	-0.1011** (0.019)	-0.1582** (0.017)
<i>Tone (Intro)</i>	0.0214 (0.779)		-0.0233 (0.817)	-0.0775 (0.611)
<i>PosSurp×Tone(Intro)</i>	0.0814 (0.406)		-0.1222 (0.351)	0.0091 (0.963)
<i>Ab_Tone</i>		0.0509 (0.488)	0.0642 (0.507)	0.0218 (0.883)
<i>PosSurp×Ab_Tone</i>		0.1984** (0.035)	0.2784** (0.027)	0.2853* (0.070)
<i>ROA</i>	0.0064 (0.134)	0.0062 (0.141)	0.0062 (0.143)	0.0134* (0.058)
<i>TACCR</i>				-0.6017* (0.096)
<i>CAPEX</i>				0.0002 (0.738)
<i>SG</i>				0.0655 (0.252)
N	1,318	1,318	1,318	972
Adjusted R <sup>2</sup>	0.6174	0.6206	0.6208	0.6333

TABLE 6

## Return Predictability in Short Sales Conditioned on Inflated Tone

The table reports the results from estimating the following equation using Fama and MacBeth (1973) regressions.

$$Ret_{i,t+2,t+j} = \alpha_i + \beta_1 Ret_{i,t-1} + \beta_2 Ret_{i,t-2} + \beta_3 Sh\_turn_{i,t,t+1} + \beta_4 INFLATE_{i,t} + \beta_5 Sh\_turn_{i,t,t+1} \times INFLATE_{i,t} + \varepsilon_{i,t+2,t+j}$$

The dependent variable is the return for stock  $i$  from day  $t+2$  to  $t+j$ , where  $j = \{5 \text{ or } 20\}$ . Columns [1] and [2] present results using  $Ret_{i,t+2,t+5}$  as the dependent variable. Columns [3] and [4] present results using  $Ret_{i,t+2,t+20}$  as the dependent variable. Similar to Engelberg et al. (2012), we include as independent variables one-day lagged returns ( $Ret_{i,t-1}$ ) and two-day lagged returns ( $Ret_{i,t-2}$ ). The independent variables of interest are short turnover for stock  $i$  from day  $t$  to  $t+1$  ( $Sh\_turn_{i,t}$ ), and the interaction of  $Sh\_turn_{i,t}$  and  $INFLATE_{i,t}$ .  $INFLATE$  is equal to one if the tone of  $Ab\_Tone$  is greater than the median on the announcement day and the earnings surprise is positive; zero otherwise. We estimate 503 daily cross-section regressions and take the time-series mean on the coefficients as well as the standard errors. We also use Newey and West (1987) standard errors with 20 lags when calculated the standard errors.  $p$ -values from the Newey and West standard errors are reported in parentheses.  $p$ -values for the interaction estimates are based on one-tailed  $t$ -tests. \*\*\*, \*\*, \* denotes statistical significance at the 0.01, 0.05, and 0.10 levels.

	$Ret_{i,t+2,t+5}$		$Ret_{i,t+2,t+20}$	
	[1]	[2]	[3]	[4]
<i>Intercept</i>	0.0011* (0.054)	0.0012* (0.053)	0.0070*** (0.000)	0.0070*** (0.000)
$Ret_{i,t-1}$	-0.0284** (0.037)	-0.0284** (0.038)	-0.0072 (0.625)	-0.0071 (0.630)
$Ret_{i,t-2}$	0.0151 (0.346)	0.0150 (0.348)	0.0081 (0.609)	0.0082 (0.606)
$Sh\_turn_{i,t,t+1}$	-0.0008*** (0.010)	-0.0008*** (0.009)	-0.0069*** (0.000)	-0.0070*** (0.000)
$INFLATE_{i,t}$		0.0052** (0.027)		0.0064** (0.040)
$Sh\_turn_{i,t,t+1} \times INFLATE_{i,t}$		-0.0112** (0.019)		-0.0127* (0.059)