VALUE OF CONFERENCE CALLS:

CONTENT AND TIMING

By KE XU

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Dr. Dan Palmon

and approved by

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Dr. Dan Palmon

_____

Dr. Bharat Sarath

_____

Dr. Li Zhang

_____

Dr. Ari Yezegel

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ABSTRACT OF THE DISSERTATION

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Dissertation Director: Dr. Dan Palmon

This dissertation consists of three essays investigating the information value of conference calls, the value implication in different trading periods, and the change in management disclosure behavior after shareholder litigation.

The first essay studies the functional meaning of word usage in conference calls. I document evidence that managers' use of contrastive words improves disclosure informativeness as it provides more value-relevant information to investors. Further, the analyses show that the use of contrastive words explains some of the instances in which share prices react positively to unfavorable earnings news. Finally, I find that disclosure reported after the contrastive word "but" is more informative than disclosure communicated before. Overall, the results support the conjecture that the informativeness of conference alls comes largely from its interpretation role.

In the second essay, I document that conference calls significantly facilitate trading activity and improve price discovery in the after-hours market, which is characterized by extremely low liquidity and noisy information environment. Further, I show that informative signals of after-hours conference calls are largely incorporated into

returns in after-hours as opposed to in the following regular hours, which suggests selective benefit for after-hours participants and underestimated effect of after-hours conference calls in the prior literature. Finally, I find that after-hours conference calls cause larger market reaction than regular hours conference calls, and this difference is attributable to more informed trades in after-hours. Overall, the results suggest that it is important to account for after-hours trading to understand the value and implication of the disclosed information in conference calls.

The third essay examines how managers' qualitative disclosure changes after shareholder litigation. Qualitative information and forward-looking statements are often considered too soft to be material and actionable. However, I find evidence that after litigation managers use more negative tone in their overall and forward-looking statements, which suggests that managers concern that disclosure in optimistic tone will impose them to a higher litigation risk. In addition, as news media increase managers' exposure to litigation risk, I show that media coverage facilitates the changing process in qualitative disclosure, which provides additional evidence that outside information environment influences management disclosure behavior.

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1.1 Introduction

It has become increasingly common for managers to organize conference calls after earnings announcements. During conference calls, managers disclose information and describe the performance of the company to stakeholders (Bushee et al. 2003). In particular, during the Q&A sessions of conference calls, managers answer questions from analysts to help investors understand the implications of the latest financial and operational results on firm performance, and investors actively respond to the disclosed information in the discussions (Matsumoto et al. 2011; Kimbrough and Louis 2011). Given the importance of conference calls, researchers use textual analysis and apply the findings in the psychology and linguistic literature to measure the qualitative features of conference calls to understand their effect on market reactions (Price et al. 2012; Allee and Deangelis 2015).

Following this line of research, yet different from prior studies which mostly discuss tone (e.g. Loughran and McDonald 2011) or readability (e.g. Li 2008) of disclosure, I examine a new and important dimension of disclosure, namely the function of the word usage. Specifically, I focus on the functional meaning of contrastive words based on the linguistic literature,[1] and hypothesize that the use of contrastive words indicates more

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[1] Contrastive words are chosen as the specific type of words with functional meaning because of their unique contrastive implication and prevalent usage in conference calls both in absolute and relative scale, as shown in the descriptive summary section. Analyzing all words with functional meaning as a whole is beyond the scope of this paper and I leave it to future studies.

corrective and unexpected disclosure about firms' performance.[2] Therefore, managers' use of contrastive words may enhance investors' ability to interpret corporate performance by increasing the "precision" of what the disclosed results imply. Given that earnings are arguably the most important performance measure, I examine whether the use of contrastive words is associated with disclosure informativeness that is useful for investors in interpreting earnings news and reducing uncertainties.

Moreover, data on earnings and security prices indicate that prices move in the opposite direction of earnings surprises in roughly 40% of the time around quarterly earnings announcements days (Kinney et al. 2002; Johnson and Zhao 2012). However, there is limited research explaining why such phenomenon exists (Kinney et al. 2002; Johnson and Zhao 2012). [3] This paper answers Johnson and Zhao's (2012) call for further research and directly explore this phenomenon by focusing on management disclosure using contrastive words, which offers relevant information contrary to the market's prior expectations. I hypothesize that stock prices react in the opposite direction to prior

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[2] Corrective function of contrastive words is used to adjust previously under-realized or misinterpreted perception. For example: "I contend it (our problem) is not demand generation **but** how do we make sure that that demand is well-served" (from Tesla 2014 2nd quarter conference call). In this message, the problem is identified as the latter, but not the former statement. Counter expectation use of contrastive words highlight the unexpected information. For instance: "Non-Pro revenue declined 22%, **but** with several points better than expected" (from Microsoft 1st quarter conference call). This disclosure first recognize a bad news, and then introduce unexpected good news. Please find Appendix 1.7.1 for more detailed examples and discussions.

[3] Kinney et al. (2002) first document this phenomenon using sample from 1992 through 1997. Johnson and Zhao (2012) provide more evidence on the prevalence of this phenomenon using sample during 1985-2005. I apply the same method based on a sample from Jan 2000 to Dec 2014. Abnormal returns is three-day value weighted adjusted returns around earnings announcement dates, while earnings surprise is measured as actual earnings per share (EPS) minus latest IBES summary EPS, scaled by the price at last quarter end. Negative (positive) earnings surprise is accompanied by positive (negative) abnormal returns 13% (24%) of the time. Or measured differently, below (above) median analyst forecast is accompanied by positive (negative) abnormal returns 19% (19%) of the time.

disclosed earnings news partially due to unexpected information introduced by contrastive words during conference calls.

In addition, while the existing literature focuses on informativeness of disclosure, this paper examines the variation in informativeness within the disclosure content. I apply the functional meaning of contrastive words discussed in the linguistic literature to understand the message that managers intend to communicate, which is also the relatively more important information during conference calls. It is hypothesized that some part of managers' disclosure is more informative than other parts of the disclosure, and tested by decomposing disclosure before and after the most representative contrastive word "but" and analyzing how stock prices react differently to these two segments of disclosure.

I find that taking managers' use of contrastive words into account enhances existing earnings-return models' ability to explain market reaction to earnings news. This finding suggests that disclosure informativeness, in the form of non-financial supplementary information, plays an important role in market participants' interpretation of firm performance. In addition, I find that, by using contrastive words, managers provide investors with unexpected information that contradict prior unfavorable earnings news and result in positive market reaction. This result highlights the functional implication of contrastive words and the importance of managers' interpretation of performance results. Consistent with the linguistic literature, I further show that stock prices react more strongly to the tone of disclosure made after the contrastive word "but" compared with the tone of disclosure before "but". This result provides evidence on the existence and importance of disclosure informativeness variation within the disclosure content.

This paper contributes to the literature in three ways. First, it investigates a new dimension of text information that focuses on functional meaning, as opposed to the word meaning (e.g. Loughran and McDonald 2011) or text complexity (e.g. Li 2008). Halliday et al. (2014) point out that functional implication, together with word meaning, are the two main components of any disclosure.[4] It also contributes to the contrarian returns to earnings news literature by showing that managers' use of contrastive words, which convey unexpected information, can explain the underexplored phenomenon that share prices react positively to unfavorable earnings news. Third, I provide the first direct empirical evidence that the informativeness of Q&A sessions is due to the interpretation feature of discussion by explicitly testing the difference in disclosure informativeness within the disclosure content.

The rest of the paper is organized as follows: Section 1.2 reviews relevant literature and develops hypotheses; Section 1.3 discusses the sample, methodology, and descriptive summary; Section 1.4 presents results on the informativeness of contrastive words; and Section 1.5 offers conclusion.

1.2 Literature review and hypothesis development

In general, managers hold conference calls because the informativeness of financial statements is low (Tasker 1998) or the demand for information by investors is high (Bushee et al. 2003). As a result, conference calls have become an important voluntary disclosure medium routinely held by firms following earnings announcements to communicate with analysts and investors (Matsumoto et al. 2011). Analysts benefit from conference calls as

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[4] See more discussions about functional implication in Section II.

they develop their earnings forecasts (Bowen et al. 2002), which in turn help investor incorporate information into share prices. Investors also directly react to information disclosed in conference calls (Frankel et al. 1999; Kimbrough 2005; Kimbrough and Louis 2011). The importance of conference calls is partly due to the regulatory mandate imposed by Regulation Fair Disclosure (Reg FD) and advances in technology (e.g. online webcast, transcript, and audio), which essentially make conference calls publicly available simultaneously to all investors (Bushee et al. 2004). These findings suggest that conference call serve as an important disclosure channel to reduce information asymmetry and improve disclosure informativeness (Brown et al. 2004).

Conference calls offer investors a chance to assess firm performance through the eyes of management, and generally consist of two parts: the managers' presentation session and the Q&A session between managers and analysts. In the presentation session, managers usually highlight the previous quarter's performance and express their views on the firm's future potential. The guidance provided by managers is protected under the Safe Harbor Provisions (SEC 1995) to encourage managers to provide more useful information. In the Q&A session, analysts focus on certain perspectives of previous or future performance and ask managers questions to elicit additional information or the managers' opinions. Managers, then, explain or elaborate on the issues raised by the analysts' questions. Different from the formal and scripted disclosures in the managers' presentation sessions or regulatory filings, information discussed in Q&A sessions is verbal, interactive, and spontaneous, which suggests that the disclosed information is timely, relevant, and less likely to be intentionally misleading under analysts' scrutiny.

Recent studies find that investors react to the information disclosed in the Q&A sessions more strongly relative to the corresponding presentation sessions (Matsumoto et al. 2011). Mayew et al. (2013) also find that by participating in conference calls, analysts improve their forecasts. Collectively, these findings indicate that the information value of conference calls is concentrated in the Q&A sessions and it is due to analysts' active involvement. However, it is unclear in the literature how managers provide useful information to analysts and investors. Therefore, I focus on the Q&A sessions of conference calls and examine the informativeness of managers' answers to analysts' questions.

While the accounting literature largely uses quantitative measures to assess the informativeness of disclosures, some studies exploit the effect of qualitative disclosure features by applying textual analysis. This line of research is motivated by continuing concern about the informativeness of financial information and consecutive regulatory efforts to increase management disclosure and improve disclosure informativeness. Based on the psychology and linguistic literature, researchers developed various qualitative measures focusing on different aspects of textual disclosure, such as tone (Loughran and McDonald 2011), readability (Li 2008), and text similarity (Brown and Tucker 2011). These qualitative indicators are found to be informative for investors in different disclosure media: SEC filings (Feldman et al. 2010; Lee 2012), earnings releases (Davis et al. 2012), conference calls (Price et al. 2012), and Internet media (Tetlock et al. 2008; Antweiler et al. 2004). Overall, these studies indicate that the qualitative features of disclosure play an important role beyond traditional quantitative measures, and provide supporting evidence

that qualitative measures using textual analysis have construct validity in the capital market research setting.

Different from prior studies which examine word meaning or word complexity of disclosure, this paper investigates the functional meaning (or structural implication) of disclosure. Halliday et al. (2014) demonstrate the importance of and the difference between the two main components of disclosure: word meaning focus on the text in its own right, whereas functional implication answer the question "what the text reveals about the system of the language". They also state that these two functions are complementary for any disclosure to make sense. The functional meaning of contrastive words, with extensive attention to the word "but", have been a topic of continuing interest in the linguistic literature (Vicente 2010). Lakoff's (1971) seminal paper on this topic distinguishes between two major functions of "but": corrective opposition (e.g. John is tall, but Bill is short) and counter expectation (e.g. John is tall, but he's not good at basketball).[5]

Mann and Thompson (1992) illustrate the corrective opposition function as an underlying mechanism in which the two narrative segments connected by "but" share the same linguistic structure but differ in semantic meaning. Asher (2005) supports this view and suggests that this rule is a necessary condition for using corrective contrastive words. Therefore, under the corrective opposition function, the use of contrastive words effectively points out two pieces of relevant information and highlights their difference to help listeners/readers incorporate information by comparison.

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[5] In addition to these two main functions, Umbach (2005) brought that topic switching is another function of "but". It is argued that the narrative segment after "but" presents an additional topic that is closely related to the original one; and the new topic brings additional relevant information to the discussion. While these functions describe different uses of the contrastive words, they are not exact mutually exclusive when used in communication.

For the counter expectation function, Winter and Rimon (1994) elaborate the implied logic under the counter expectation feature of "but". For the two narrative segments connected by "but" (P but Q), the first segment (P) triggers an expectation (if P then R), yet the second segment refutes this expectation by claiming or implying a statement inconsistent with the first expectation (if P then not R). Gärdenfors (2005) provides similar views on the counter expectation function of "but", and argues that the expectation generated in the first narrative segment requires prior knowledge and provides a benchmark against which the second part is compared. Therefore, the counter expectation function emphasizes the interpretation role of contrastive words and suggests that speakers apply this function to provide listeners with additional informative signals or elaborations on the discussed topic.

Some other linguistic studies illustrate the importance and the reason to use contrastive words. Spooren (1989) takes the first and second conjuncts connected by contrastive words in a dialogue as a whole, and treats contrastive word as a discourse operator that signals to hearers how to build a discourse representation of the information based on the speaker's opinion. The individual necessity and importance of the first and second conjuncts is also discussed in the literature. Spenader and Maier (2009) argue that it is necessary to have the first conjunct to constrain the inferences that could be made based on the context to help hearers correctly identify the implication that contradicts the second conjunct. Thomas and Matheson (2003) point out that the first conjunct acts as concession that facilitates alignment and helps clarify misunderstandings, since the effect of conceding is to indicate that the conceded content is uncontroversial between the speaker and hearers.

To examine the purpose and importance of the second conjunct, Spooren (1989) uses an experiment to show that the use of contrastive conjunctions leads subjects to interpret the second conjunct as more consistent with the speaker's message than the first conjunct. Winter and Rimon (1994) share the same view and suggest that the main point of a contrastive statement is to communicate the second conjunct and its implication. In addition, the authors show that the set of contrastive conjunctions (e.g. although, nevertheless, and yet) share similar semantic principles for implication in natural language. Arguing from a different angle, Spenader and Maier (2009) claim that speakers use contrastive conjunctions to deny previously disclosed unintended inferences that could create confusion.

In summary, the linguistic literature indicates that speakers use contrastive words to facilitate the hearers' understanding of disclosed information and that the usefulness is due to the semantic structure of contrastive dialogue. More specifically, the first conjunct of contrastive dialogue helps hearers exclude unwanted alternative implications and keeps speaker and hearers "on the same page", and the second conjunct of contrastive dialogue highlights the core element of disclosure about which hearers were uncertain or have unexpected views. Taken together, I assume that the use of contrastive words indicates higher informativeness in discussions.

In the context of conference calls, since the market generally favors more discussions during conference calls as opposed to less (Hollander et al. 2010), and managers' deceptive disclosures have negative implications for subsequent market reaction (Larcker and Zakolyukina 2012), managers have incentives to convey a sufficient amount of truthful information to meet investors' demand. In particular, during the Q&A sessions

of conference calls, the questions asked by analysts essentially represent information asymmetry between managers and outside investors, and managers answer these questions to reduce such information asymmetry by disclosing additional information and further elaborating their views. Therefore, the more informative discussion by mangers would suggest higher disclosure informativeness and result in lower market uncertainties.

Given that the market already received news in the earnings release (typically one day before or on the same day before the corresponding conference call), if conference calls are incrementally informative due to the use of contrastive words, as a consequence, the market would react more strongly to existing earnings news and resolve more uncertainties about the implication of the earnings news. Hence, with the focus on the effect of contrastive words, I investigate the following hypotheses:

H1.1: The use of contrastive words is positively correlated with the extent to which stock price reacts to earnings news.

H1.2: The use of contrastive words is positively correlated with the reduction in uncertainty after conference calls.

Contrarian share price response to earnings news is an intriguing and underexplored phenomenon in the literature. Kinney et al. (2002) propose that this phenomenon is because of the S-shaped earnings surprise-return relation as first shown by Freeman and Tse (1992), and due to the large variation in returns around the each level of earnings surprises. From a different angle, Johnson and Zhao (2012) suggest that the observed contrarian returns is due to "noise" relating to how the earnings are measured and "noise" in the reaction to the announced earnings. I take a different approach and examine

this phenomenon from the point of view on management disclosure and linguistic functionality.

According to the linguistic literature, counter expectation is a major function of contrastive words (Winter and Rimon 1994; Gärdenfors 1994), managers use contrastive words to not only better communicate with market participants, but also offer them valuable information that is contrary to the market's prior expectation. In other words, after managers answer analysts' questions, the market incorporates unexpected information from the managers' explanation that has a counter expectation meaning and therefore reacts partially opposite to the prior news (e.g. earnings news). Assuming that the managers' objective is to maximize firm value, only (no) firms with unfavorable (favorable) news would use counter expectation information to guide investors to react positively (negatively). Therefore, with emphasis on the counter expectation function of contrastive words, I test the following hypothesis:

H2: The use of contrastive words partially explains the phenomenon in which earnings news is unfavorable, but the market reacts positively.

The linguistic literature suggests that the major intention and more important part of "but" related disclosure is to emphasize the content after "but" (Spooren 1989; Spenader and Maier 2009; Thomas and Matheson 2003) because it reveals and highlights corrective and unexpected information.[6] In the context of conference calls, it is expected that the

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[6] The reason that I only focus on the word "but" instead of the full list of contrastive words is that "but" symbolically represent contrastive words, as linguistic literature mostly focus on the word "but" when discussing the function and meaning of contrastive words. Coincidentally, I observe that more than 95% of

disclosure made after "but" is more informative than the disclosure made before "but". I investigate the disclosure tone before and after "but", given that tone is arguably the most widely accepted measure for text content. Prior literature shows that market prices react positively to disclosure tone (Loughran and McDonald 2011; Feldman et al. 2012). Based on these findings, it is expected to observe investors reacting more strongly to tone after "but" than to tone before "but". Or stated differently, the tone measure adjusted for the difference in disclosure content before and after "but" better measures the true meaning of the managers' tone. Therefore, I test the importance of contrastive words with the following hypothesis:

H3: Share price reaction to disclosure tone is stronger for disclosures made after "but" than for disclosures made before "but".

1.3 Sample selection and research design

1.3.1 Data

SeekingAlpha.com (SA) is one of the largest investment-related media website in the US and records conference call transcripts for more than 3,000 firms. Accounting researchers previously used SA to obtain samples for textual analysis (Chen et al. 2014; Allee and Deangelis 2015). Following the same approach in Allee and Deangelis (2015), I use a Python script to collect 52,341 conference call transcripts corresponding to 3,321 unique

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contrastive words in the sample are "but", which is not surprising in the sense that "but" is the most commonly used word in verbal discussion for contrastive meaning.

firms identified by official ticker from SA between January 2008 and December 2014.[7] Each conference call is separated into three sections: a list showing participating managers and analysts, the managers' presentation session, and the Q&A session between managers and analysts. Conference calls are included in the sample only if the Python script is able to detect all three sections. The information collected from SA about each conference call includes the following items: stock ticker, conference call publication date,[8] main text, and the identities of participating managers and analysts. Since the focus is to identify informative disclosure indicators during the Q&A sessions of conference calls, and because previous literature has shown that informative content is mainly concentrated in the Q&A sessions not the management presentation sessions, I use the list of participant names to extract managers' answers and analysts' questions from the Q&A sessions. In order to do this, I require at least one person from the list of participating managers to be identified in the Q&A session. To ensure that the analyses only contain managers' answers, I remove all HTML tags, special characters and comments by operator. I also constrain that txt files containing managers' answers for each conference call being greater than one kilobyte to make sure that managers' responses contain at least a certain level of informative content. 50,911 transcripts were left after this process.

After merging with Compustat by ticker, fiscal year, and fiscal quarter, 47,358 transcripts remain in the sample. the sample is matched with IBES based on ticker and conference call publication date by SA, conditional on the conference call date occurring

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[7] I choose 2008 as the earliest year because there are significantly fewer conference call transcripts available on SA before 2008. The sample ends in 2014 because the IBES data used to merge with the transcript sample is only available through that year.

[8] SA claims that they aim to publish earnings transcripts 6 hours after the call has finished for a 1 hour call.

on the same day or the next day after an earnings release,[9] resulting in 42,605 observations. 10,361 observations are lost from the sample when merging with CRSP to calculate abnormal returns with the requirement that stock price is higher than $5 and the market capitalization is higher than $10 million at the time of the conference call. The final sample consists of 30,387 firm-quarter observations for 2,487 unique firms, after excluding outliers at the one-percent level in terms of unexpected earnings, abnormal industry-adjusted returns, and the use of contrastive words.[10] The sample size, however, varies among empirical tests depending on data requirements. Table 1.1 Panel A describes the sample generation process and Table 1.1 Panel B shows the yearly distribution of the test sample. Approximately 60% of these transcripts are concentrated in 2012 through 2014.[11]

[Insert Table 1.1 here.]

1.3.2 Measure

Specific attributes of disclosure are measured by self-constructed dictionaries using textual analysis in the accounting literature (Kravet and Muslu 2013; Merkley 2013). I follow the standard method of textual analysis and construct a dictionary of words that characterize the contrastive use of verbal language, and simply count the number of appearance of contrastive words/phrases: "but", "however", "nevertheless", "nonetheless", "although",

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[9] Matched sample using this matching criteria represent 85% of total conference call date-earnings release date pairs. I also require this matching criteria to maintain reasonable test power by focusing on short term stock price changes (-1, +1) window around conference calls.

[10] The regression results are similar when I winsorize instead of trim outliers.

[11] Increasing observations in recent years reflect the fact that SA expands firm coverage over time.

"on the other hand", and "in spite of". This dictionary is developed based on Winter and Rimon (1994), who indicate that these contrastive words share similar pragmatic principles.[12] Since the length of managers' answers varies across firms and quarters, the numbers of contrastive words is scaled by the total number of words in the managers' answers.[13] I name this measure as *Flip*. See Appendix 1.7.1 for examples of the use of contrastive words, and Table 1.1 Panel C for the distribution of contrastive words in the final sample.

To understand the meaning of contrastive words, I also identify the use of contrastive words at the dialogue level, with each dialogue representing an "analyst asking – manager answering" pair,[14] by using the speaker's identity information obtained from the conference call participant list. A dialogue pair is defined as an individual manager's answers to an individual analyst's questions until the next analyst starts a new question. There are two reasons why dialogue level data is needed. First, in this way I can better identify and separate contrastive word-related disclosure by reducing the risk of misidentifying disclosures made by two different managers when a contrastive word is used at the beginning of the disclosure by the second manager, especially when the previous speaking manager and the currently speaking manager address different analysts' questions in a conference call. Second, the dialogue level data enables us to compare

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[12] Phrases containing the word "but", yet without contrastive meaning (e.g. not only … but also…) are not counted as contrastive words in the sample. Confounding strings such as "contribute" (having the letters "but" within the word) are also not counted as contrastive words.

[13] This total number of words is determined after excluding generic words like "I", "is", and "to". The generic words list is from Loughran and McDonald (2011).

[14] As analysts typically ask questions in turns, a dialogue pair starts when an analyst ask his/her first question, and ends when it turns to the next analyst to ask another question. Follow-up questions asked by the same analyst and answered by the same manager is counted as one "dialogue".

analyst's and manager's attitude (e.g. tone) towards the same topic in a dialogue, and helps us examine how contrastive words by managers play a role in interpreting the implications of the performance results when analysts and managers have different views on the same topic.

In the test for the structural implication of contrastive words, I focus on the word "but" since it represents about 95% of total contrastive words in the sample. For each manager's answer at the dialogue level, disclosure before "but" and disclosure after "but" are separately identified. This disclosure unit is one sentence if "but" is in the middle of the sentence (approximately 75% of the time), and is two sentences if "but" is at the beginning of the second sentence (approximately 25% of the time). For each answer given by a manager, I calculate the *Tone* measure for both disclosure before and after "but" and disclosure that is unrelated to "but".[15] In this way, I separate the original *Tone* measure into three new tone measures by calculating *Tone* for the three separate parts and then aggregate them to the conference call level: tone before "but" (*Tone_BeforeBut*), tone after "but" (*Tone_AfterBut*), and tone unrelated to "but" (*Tone_NoBut*).[16] In robustness test, I also separate disclosure unrelated to "but" into pseudo before and after parts by dividing such sentences with more than ten words into two equal halves, and measure the tone of the individual parts (*Tone_BeforeNoBut* and *Tone_AfterNoBut*). See Appendix 1.7.2 for examples of disclosure content before and after "but", and how the two parts show different meanings.

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[15] In rare cases, when there are two or more "but"'s in a disclosure unit, I take the content before the first "but" as disclosure before "but", and the content after the last "but" as disclosure after "but".

[16] *Tone_NoBut = Tone - Tone_BeforeBut - Tone_AfterBut*

The method used in this study differs from prior research (e.g. Kravet and Muslu 2013; Merkley 2013) in several ways. First, prior studies usually exclude contrastive words from the text sample because this type of words lack semantic meaning. However, since the focus of this paper is the structural implication of contrastive words, these words are included in the analysis. Second, some earlier papers count words of interest at the sentence level instead of at the word level to avoid duplicate counting. However in this study, because managers' answers are usually brief and concise, in most cases there is at most one contrastive word in a sentence. Therefore, the decision to measure at the word versus sentence level does not significantly affect the inferences. Third, some studies use the raw measure without scaling because they use text that contains a significant portion of boilerplate and non-changing disclosure (e.g. 10-Ks). In contrast, I scale the measure by the total number of words. Scaled measures better control for the effect of the amount of information because of differences between formal disclosure (10-Ks) and verbal discussion (Q&A). Fourth, some studies use change values from previous periodic documents, because the documents (10-Ks/10-Qs) remain largely unchanged over time. However, I use raw values because the disclosure content of interest (Q&A sessions of conference calls) is hardly scripted beforehand and therefore largely changes from period to period.

1.3.3 Research design

This study first examines how share prices react to disclosure informativeness as reflected by the use of contrastive words. Market reaction is measured by abnormal returns three days around the conference call (*CAR*). Abnormal returns are calculated as the raw return minus its corresponding industry return on the same day. Industry returns are obtained from

Professor Kenneth French's data library, and I use the Fama-French 48 industry classification. The main results are unaffected by the choice of abnormal returns when I use other return models (CAPM, three-factor, and four-factor Fama-French model) or calculate returns using different approaches (standardized, and buy-and-hold return). Quantitative disclosure content is measured by unexpected earnings (*UE*), which is actual earnings reported prior to or at the conference call date minus the consensus analyst forecast, scaled by stock closing price as of the previous quarter's fiscal quarter-end date. I use the latest median summary analyst forecast from the IBES summary database prior to the conference calls as the measure for expected earnings. The results hold if I use the summary or detailed IBES files.[17] Disclosure informativeness is measured as the total number of times managers use contrastive words in answering analysts' questions, divided by the total number of words in managers' answers to analysts' questions (*Flip*).

It is worth noting that, conventionally, when researchers apply textual analysis, they exclude a set of simple words (e.g. "a", "to", and "I") from the full text to count the total number of words. This is due to the concern that these words do not contain informative content, and so need to be filtered out. However, contrastive words like "but", "however", and "although" are also excluded as part of this filter set. Since the focus is to measure disclosure informativeness by observing the use of contrastive words, I filter out all other simple words except for those words in the contrastive words dictionary in calculating the total number of words. Outliers are excluded from the sample with respect

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[17] Earnings expectation using detailed estimates takes the median of all latest updated analysts' forecasts prior to the conference call date. Using the latest 5 analysts' forecast yields similar results.

to abnormal returns, unexpected earnings, and use of contrastive words at the one percent level on both sides.[18]

I test H1.1 and examine stock price changes to disclosure informativeness incremental to the reaction to unexpected earnings using the following OLS regression model:

$$CAR = \alpha + \beta_1 UE + \beta_2 Flip + \beta_3 UE \times Flip + \varepsilon \qquad (1.1)$$

For the purpose of more easily interpreting the results, I follow Hollie et al. (2012)'s approach, and first assign each firm-quarter into deciles based on *UE* by calendar year and quarter, then subtract one from the *UE* decile values, divide by 9 and subtract 0.5, as is often done in the post earnings-announcement drift literature. This step transforms the original *UE* measure into decile ranking from -0.5 to +0.5. The coefficient on *UE* (β_1) represents the returns on a hedge portfolio that holds long (short) positions in shares of companies within the top (bottom) decile of unexpected earnings. Similarly, I make the same adjustment for *Flip* and interact it with *UE*. The coefficient on the interaction term *UE*Flip* (β_3) measures the extent to which stock prices change in reaction to disclosure informativeness, as represented by the use of contrastive words, in addition to market reaction to unexpected earnings. Because the use of contrastive words indicates that managers disclose more relevant and explanatory information to help market participants interpret unexpected earnings, I expect the coefficient β_3 to be positive and statistically different from zero.

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[18] I also winsorize instead of trim outliers for sensitivity test, and the results remain statistically the same.

Flip itself is also added into the regression from an econometric point of view to allow the possibility that contrastive words themselves contain valuable information. However, since the goal is to investigate the functional meaning of disclosure as opposed to the effect of disclosure quantity, there is no prediction on the sign of coefficient β_2. I also add a set of control variables in the regression to control for other qualitative or quantitative factors that were found to be informative to the market, as shown in the following regression model. For example, I control for *Tone* and *Readability*, since they convey signals incremental to current earnings and have predictability of future earnings (Feldman et al. 2010; Li 2008). I also control for firms' quantitative factors based on financial and market information (e.g. *Size, Market-to-Book Ratio, and management guidance*). More details about control variables are discussed in the following section. All continuous control variables are adjusted in the same way that *UE* and *Flip* are adjusted. Empirical results in all specifications control for industry, and year-quarter fixed effect, and standard errors are clustered at the firm level to control for serial correlation.[19] For further robustness test, I also control for firm-fixed effects in the regression, as recent research finds that managers' speaking style varies and investors interpret managers' speaking style differently (Davis et al. 2015; Lee 2016).

$$CAR = \alpha + \beta_1 UE + \beta_2 Flip + \beta_3 UE \times Flip + \beta_4 \sum Control + \beta_5 UE \times \sum Control + \varepsilon \ (1.2)$$

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[19] I repeat the analyses using standard errors clustered at both firm and quarter and find that the results are similar. P-value is marginally more significant using both firm and year-quarter clustered regression than just firm clustered.

Following the argument in H1.1 and H1.2, I further investigate the cross-sectional difference in the effect of contrastive words. The value of disclosure in mitigating information asymmetry is presumably higher for firms with greater uncertainty. Therefore, if managers use contrastive words to help investors understand earnings news, investors investing in firms with larger uncertainty would benefit more and react to managers' disclosures to a greater extent. Therefore, I separate the sample into two subsamples by median value (by year and quarter) based on firms' uncertainty level, in terms of innovation (intangibles, R&D), operating uncertainty (earnings volatility, absolute value of accruals), and visibility (S&P 500 listed or not). I run the main regression (1.1) for both high and low uncertainty subsamples and compare the difference in the effect of contrastive words in enhancing earnings-price relation. It is predicted that β_3 is significantly larger for the high uncertainty subsample than it is for the low uncertainty subsample.

I test H1.2 directly by examining whether managers provide supplementary information in their answers during Q&A session of conference calls to resolve market uncertainty by using contrastive words. In alignment with the finding in Bowen et al. (2002) that conference calls reduce disagreement among analysts, I expect that market uncertainty decreases to a greater extent if managers provide more relevant and useful information, proxied by the use of contrastive words. I employ three variables to measure the change in market uncertainty: change in bid-ask spread, change in return volatility, and change in analyst recommendation dispersion, each calculated as (standard deviation/mean from) 30 days after conference calls minus (standard deviation/mean from) 30 days before conference calls. I regress each uncertainty change proxy on the raw values of *Flip* and a

set of financial control variables. [20] I also add market uncertainty level before the conference call as a control for the information environment prior to the conference call. The regression model is specified as follows and I expect the coefficient on *Flip* (β_1) to be negative.

$$\text{Uncertainty\_Change} = \alpha + \beta_1 \text{Flip} + \beta_2 \sum \text{Control} + \varepsilon \qquad (1.3)$$

In H2, I test whether the use of contrastive words helps explain the contradictory relationship between market reactions and unexpected earnings. There are two possible contradictory scenarios: unexpected earnings are unfavorable (favorable) but market reaction is positive (negative). Assuming that managers prefer higher stock prices over lower ones, knowing that contrastive words have implication for counter expectation, managers have the incentive to use contrastive words and revise negative market perceptions towards positive views when the firm performance is poor. Therefore, for the subsample of firm-quarters with positive market reactions despite unfavorable unexpected earnings, I expect that the use of contrastive words plays a role in explaining this contradiction, as shown by the coefficient β_3 being negative and statistically different from zero. Due to widely cited evidence of the walk-down to beatable analyst expectations (Richardson et al. 2004), I use the median value of unexpected earnings as cutoff for favorable and unfavorable earnings news. I also use zero earnings as an alternative cutoff for favorable and unfavorable earnings news in robustness test. Since I use decile adjusted

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[20] I use raw value instead of decile adjusted value for this test only, and that is because the decile adjusted value used for interpreting results in the sense of hedge returns does not fit well the interpretation for market uncertainty changes.

unexpected earnings in regression, the interpretation of coefficient β_3 is the same when the subsample is selected based on forecast errors or zero earnings.

Moreover, to establish a more direct link between the use of contrastive words and the nature of earnings related disclosure, I identify cases where the word "earnings" is mentioned either before or after the most representative contrastive word "but". Then I partition the subsample based on the place "earnings" is mentioned and the tone of the corresponding part. In this way, I can infer whether managers actually point out favorable or unfavorable earnings in their discussion and introduce unexpected information using the contrastive word "but" to guide market perception. Similarly, with the use of median or zero as the benchmark to test the counter expectation function of contrastive words, I expect to observe a negative coefficient on β_3 for the subsample with "earnings" mentioned before "but" and the tone of this part is negative.

To mitigate the self-selection bias in subsample tests, I also use the full sample and add a dummy variable (*Un_Pos*) that equals one when unexpected earnings are unfavorable but share prices react positively and zero otherwise. This dummy variable is interacted with other variables in the main regression (1.1) with the variable of interest being β_7 in the following model (2.1), and I expect it to be negative and significant. In the full sample analysis, I also construct four dummy variables indicating the place "earnings" is mentioned (before or after "but") and the tone of this corresponding part (positive or negative), and interact each of them with the interaction term in the main model (1.1) as shown in the following model (2.2). *E_Before_Neg* identifies the cases where managers recognize unfavorable earnings yet use contrastive word "but" to introduce unexpected

information that show a different view than the unfavorable earnings news. The expected

sign for β_5 in this model is negative.

$$CAR = \alpha + \beta_1 UE + \beta_2 Flip + \beta_3 UE{\times}Flip + \beta_4 Un\_Pos + \beta_5 UE{\times}Un\_Pos$$
$$+ \beta_6 Flip{\times}Un\_Pos + \beta_7 UE{\times}Flip{\times}Un\_Pos + \varepsilon \qquad (2.1)$$

$$CAR = \alpha + \beta_1 UE + \beta_2 Flip + \beta_3 UE{\times}Flip + \beta_4 UE{\times}Flip{\times}E\_Before\_Pos$$
$$+ \beta_5 UE{\times}Flip{\times}E\_Before\_Neg + \beta_6 UE{\times}Flip{\times}E\_After\_Pos$$
$$+ \beta_7 UE{\times}Flip{\times}E\_After\_Neg + \varepsilon \qquad (2.2)$$

In addition, I measure how earnings news is interpreted by focusing on the tone of

analysts' questions. Brockman et al. (2015) document that share prices react strongly to

analysts' tone, and even more so than to managers' tone. I incorporate the counter

expectation function of contrastive words and test if managers can reverse price reactions

to negative perceptions observed in analysts' questions by disclosing positive information

in their answers. I construct a dummy variable *Contra_Tone* to indicate that analysts' tone

is negative but managers' tone is positive for the same discussion topic,[21] and interact it

with analysts' tone (*Tone_Analyst*) and *Flip* in the following regression (2.2). I expect β_9

to be negative and it represents how managers guide share price upward by using

contrastive words to answer and make positive disclosure when faced with negative

perception by analysts.

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[21] I use the dialogue level data to measure tone by managers and analyst to ensure that the topic of discussion is the same between analyst and managers, but only their perceptions about the discussed topic is different. Then I aggregate the data to conference call level for analysis.

$$CAR = \alpha + \beta_1 UE + \beta_2 Flip + \beta_3 UE \times Flip + \beta_4 Tone\_Analyst + \beta_5 Contra\_Tone$$
$$+ \beta_6 Tone\_Analyst \times Flip + \beta_7 Contra\_Tone \times Flip$$
$$+ \beta_8 Tone\_Analyst \times Contra\_Tone$$
$$+ \beta_9 Tone\_analyst \times Contra\_Tone \times Flip + \varepsilon \qquad (2.3)$$

To test H3, I examine the difference in informativeness of disclosure before and after "but" within the disclosure content, using the following regression model:

$$CAR = \alpha + \beta_1 UE + \beta_2 Tone\_NoBut + \beta_3 Tone\_BeforeBut$$
$$+ \beta_4 Tone\_AfterBut + \varepsilon \qquad (3.1)$$

$$CAR = \alpha + \beta_1 UE + \beta_{2\_1} Tone\_BeforeNoBut + \beta_{2\_2} Tone\_AfterNoBut$$
$$+ \beta_3 Tone\_BeforeBut + \beta_4 Tone\_AfterBut + \varepsilon \qquad (3.2)$$

Where in model (3.1) *Tone_NoBut*, *Tone_BeforeBut*, and *Tone_AfterBut* correspond to the tone of disclosure unrelated to the word "but", the tone of disclosure before "but", and the tone of disclosure after "but". *UE* and the three tone measures are transformed into deciles to help interpret the results in the sense of hedge returns. In alignment with the linguistic literature, which suggests that content after contrastive words is the real focus of the speaker and is more informative than content before contrastive words, I expect that β_4 is significantly greater than β_3. In order to preclude the alternative explanation that communication emphasis is normally placed at the end of the sentence regardless of the functional implication of contrastive words, I further divide the sentences with more than ten words and unrelated to "but" into pseudo before and after halves with tone of each part measured separately, and test whether the tone in after part (*Tone_AfterNoBut*) is more informative than the tone in the before part

(*Tone_BeforeNoBut*). Significant difference between before and after parts for disclosure related to "but" and insignificant difference for disclosure unrelated to "but" would suggest the informative variation within the disclosure content is attributable to the functional implication of contrastive words, but not due to the end-of-sentence conjecture.

In robustness test, I further separate the three tone measures (*Tone_NoBut*, *Tone_BeforeBut*, and *Tone_AfterBut*) into their corresponding positive and negative components, since Loughran and McDonald (2013) show that the extent that stock prices react to tone related words more strongly for negative words than for positive words. With the focus on negative words, I test the difference in stock price reaction to negative words after "but" versus negative words before "but" in the following model, with all independent variables adjusted in the same way in the previous regression models. I predict that β_7 is significantly smaller than β_5.

$$
\begin{aligned}
CAR = {} & \alpha + \beta_1 UE + \beta_2 Pos\_NoBut + \beta_3 Neg\_NoBut + \beta_4 Pos\_BeforeBut \\
& + \beta_5 Neg\_BeforeBut + \beta_6 Pos\_AfterBut + \beta_7 Neg\_AfterBut + \varepsilon \qquad (3.3)
\end{aligned}
$$

If contrastive words do play a role in helping investors understand the tone of disclosure, can the tone measure be improved based on the implication of contrastive words? To test this hypothesis, I focus on the difference in β_3 in the following two regressions to examine whether excluding tone before "but" improves the tone measure with respect to its relationship with share price reaction:

$$
CAR = \alpha + \beta_1 UE + \beta_2 Accrual + \beta_3 Tone + \varepsilon \qquad (3.4)
$$

$$
CAR = \alpha + \beta_1 UE + \beta_2 Accrual + \beta_3 ToneWithoutBefore + \varepsilon \qquad (3.5)
$$

Where the first model is specified in the same way as in Feldman et al. (2010)[22],

and *ToneWithoutBefore* is measured as (*Tone - Tone_BeforeBut*). The expected result is

that β_3 in model (3.4) is significantly greater than β_3 in model (3.3).

1.3.4 Control variables

In the main regression (model 1.1), I separately estimate the model that includes a number

of variables that are routinely controlled for in the previous literature. The first set of

control variables highlights several qualitative features of disclosure: tone, uncertainty,

specificity, and readability. I control for the tone of managers' answers because prior

literature finds that disclosure tone in 10-K/10-Q is associated with the market reaction

beyond the effect of unexpected earnings and accruals (Feldman et al. 2010). *Tone* is

measured as the difference between the number of positive words and the number of

negative words, divided by the total number of words. The positive and negative words

dictionary is from Loughran and McDonald (2011). I control for uncertainty and specificity

of managers' answers because prior literature shows that these two features in IPO filings

are correlated with IPO underpricing (Loughran and McDonald 2013; Leone et al. 2007).

Uncertainty is measured as the proportion of uncertainty words to the total number of

words, and the uncertainty words dictionary is also from Loughran and McDonald (2011).

Specificity is defined as the proportion of number of dollar sign in total number of words.

I also control for the readability of managers' answers since readability, as a disclosure

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[22] This model adds Accruals as an additional control variable. Considering that by the time of conference call, analyst and outside investors may not have information about accruals, I find same results when excluding Accrual from the model. All independent variables are also adjusted to [-0.5, +0.5] decile value.

quality measure, is related to market uncertainty and earnings persistence (Li 2008; Loughran and McDonald 2014). Based on prior literature, I use the Fog Index (Miller 2010; Lee 2012) as the measure for *Readability*.[23]

I use another set of variables to control for quantitative features of firm characteristics: firm size (measured by the log of market capitalization), market-to-book ratio (market value of equity divided by book value of equity), ROA (current earnings divided by the previous year's total asset), R&D (divided by previous year's total asset), intangibles (divided by previous year's total asset), earnings persistence (earnings volatility in prior five quarters), segments (number of segments), loss dummy (equal to one if earnings are negative and zero otherwise), and guidance dummy (equal to one if any type of management guidance is provided by the firm, e.g. earnings guidance, sales guidance, and zero otherwise). These variables control for firms' fundamental differences: size, growth, profitability, innovation, business nature, and management guidance.

1.3.5 Descriptive statistics

In order to develop a sense of how contrastive words are used in disclosure, I compare the use of contrastive words to that of the other two types of words most often used in the textual analysis literature: *Tone* and *Uncertainty*. For the firms in the final sample, I collect text from the corresponding MD&A section of 10-Ks from the SEC EDGAR database and managers' presentation during conference calls from SA, and calculate the proportion of these three types of words out of the total number of words. Different from the tone value

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[23] The Fog Index is increasing in the difficulty level of reading, meaning that a high score for the Fog Index means that the text is difficult to read. An alternative readability proxy suggested by Loughran and McDonald (2014) is also used for robustness tests, as measured by the natural log of file size (in kilobytes).

(Positive - Negative) that I use in the regression analysis, tone count (Positive + Negative) is used in this section to illustrate the difference in tone related word usage relative to contrastive word usage.

Table 1.2 Panel A shows that managers use more contrastive words in the Q&A sessions of conference calls (1.79%), than they use in 10-Ks (0.24%) and in the presentation sessions of conference calls (0.41%).[24] This is possibly because 10-Ks and managers' presentations during conference calls are highly scripted whereas managers' answers during conference calls are generally spontaneous. It is also possible that, due to the nature of Q&A, managers are more likely to use words that help interpretation, such as contrastive words, and that managers can revise market expectations by using contrastive words. When comparing the usage of the three types of words in managers' answers, tone words (4.50%) appear more frequently than contrastive words (1.79%) or uncertainty words (1.41%), but the use of these three types of words is in close magnitude. However, considering that the tone dictionary (Loughran and McDonald 2011) contains more than 2,000 words and the contrastive words dictionary used in this paper has only seven phrases with 95% being "but", it is safe to conclude that contrastive words, especially "but", is frequently used in managers' answers during conference calls. In unreported descriptive results, I compare the use of contrastive words and the use of some representative causation words (Dikolli et al. 2016), which also have explanatory meaning but lack contrastive meaning such as "because", and "since". I find that the contrastive word "but" (1.71%) is used significantly more often than causation words (e.g. "because" 0.49%; "since" 0.55%)

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[24] Bold numbers are for highlighting and comparison purpose in all tables.

in conference calls. These descriptive statistics support choice I focus on the use of contrastive words in managers' answers during conference calls.

I also break down all tone related words into three parts by their position relative to the contrastive word "but": tone of disclosure without "but", tone of disclosure before "but", and tone of disclosure after "but", with each representing 75%, 11%, and 12% of total tone-related word usage, respectively. When I compare these numbers (11% and 12%) with those for causation words, tone related words usage before and after causation words (e.g. "because", "since") are virtually close to zero. These statistics reveal that a considerable portion of the tone-related disclosure is made either before or after the word "but", and these two parts are of similar magnitude.

Table 1.2 Panel B provides summary statistics on contrastive words and other qualitative attributes and firm characteristic in the sample. The sample median use of contrastive words (*Flip*) by managers in Q&A session is 1.75% with mean value of 1.79%. Consistent with the prior literature on meeting-or-beating analysts' forecasts, the median and mean of unexpected earnings are positive, 0.05% and 0.07% respectively. The corresponding three-day abnormal return is also positive, with a median of 0.08% and a mean of 0.19%. Different from the prior literature, the mean and median of tone values are positive in the sample. This is probably because managers generally express optimistic views during conference calls or because managers are protected by the Safe Harbor Provision during conference calls. They, therefore, appear to disclose information in a less conservative way than they would in official filings. Focusing on the difference between the tone before and after "but", I observe that the tone after "but" has a higher value than the tone before "but", which suggests that disclosures made after "but" are more optimistic

than disclosures before "but". Since firms for which SA provide conference call transcripts tend to be large companies, firm size in the sample is skewed toward large firms, with overall median profitability about 2% of total assets and intangible assets about 11% of total assets.

Table 1.2 Panel C shows correlation among the major variables in the analysis. *Flip* is not significantly correlated with three-day *CAR* and is marginally negatively correlated with *UE*. This supports the conjecture that the contrastive words themselves do not affect the results of news (e.g. unexpected earnings), but they work as a disclosure informativeness indicator that plays a role in confirming, correcting, illustrating, and providing expectations during the discussion (e.g. explanations to unexpected earnings). *Flip* is strongly associated with other qualitative measures based on text. The negative relationship with *Tone* is probably because questions raised by analysts typically involve negative or uncertain news, so managers need to focus and elaborate on such news. The positive relationship with *Uncertainty* could be due to the nature of conference calls in which managers commonly express their expectations about future performance when answering questions (will, might, could etc. are recognized as uncertain words). The positive relationship with *Specificity* is consistent with the expectation that the use of contrastive words introduces more informative disclosure. *Flip* is negatively correlated with *Readability*, which suggests that the use of contrastive words improves the ease of communication between managers and investors. Because most of the qualitative attributes are correlated with *Flip*, I control for them in the main regression model.

[Insert Table 1.2 here.]

1.4 Empirical results

Table 1.3 presents the main result from regression model (1.1) for abnormal returns around conference calls regressed on unexpected earnings, use of contrastive words, and the intersection of these two variables. Recall that coefficients on the variables can be interpreted as the return from a hedge portfolio that goes long on shares of firms in the top decile and short on shares of firms in the bottom quintile with respect to the corresponding variable. And note further that earnings results are typically released to the market one day before or on the same day as the conference calls, so the market not only reacts to unexpected earnings, but also reacts to information newly disclosed by managers during the conference calls in a way that the informativeness of such disclosure determines the level of market reaction to the earnings news.

Table 1.3 Panel A shows the extent that the market reacts to the information contained in managers' answers given that earnings news has been released to the market. Consistent with prior literature, in column 1, β_1 is positive and significantly associated with stock price reaction. Information disclosed in earnings yield 6.5% in returns. More importantly, the coefficient of the interaction term (β_3) is also positive and significantly related to market reaction. This suggests that stock prices react positively to information communicated in managers' answers and this reaction is incremental to the reaction to unexpected earnings, implying that market participants get additional supplementary information from managers' answers about the original earnings surprise. These results also support the conclusion that contrastive words are used as an informativeness signal that indicates higher disclosure informativeness, and its effect is economically significant.

Excess returns based on this informativeness signal yields 1.0% abnormal returns on top of abnormal returns from unexpected earnings. Panel A, columns 2-4 present the association between stock price reaction and informative disclosure by using contrastive words, conditional on other qualitative attributes of disclosure and financial information. Note that the coefficient of the interaction term between unexpected earnings and the use of contrastive words remains positive and statistically significant. This implies that the use of contrastive words measures the informativeness of management disclosure that are absent from financial and qualitative measures. Column 5 adds firm-fixed effects to the regression to control for firm specific effect (e.g. managers' speaking style). The coefficient on the interaction term (β_3) remains positive and significant, suggesting that the results are not driven by firm- or manager- specific factors.

[Insert Table 1.3 here.]

Table 1.3 Panel B shows that the effect of contrastive words (β_3) is significantly larger for firms with greater uncertainty: higher intangibles, higher R&D (from innovation perspective), higher earnings volatility, higher absolute accruals (from operation perspective), and firms that are not included in the S&P 500 (from visibility and news coverage perspective). The results suggest that the effect of contrastive words is concentrated in firms with higher levels of uncertainty. This is also consistent with the expectation that the use of contrastive words improves disclosure informativeness, and its effectiveness is more prominent when investors have greater uncertainty about the firm.

Table 1.3 Panel C shows that the use of contrastive words (β_2) is negatively correlated with the change in market uncertainty (after versus before conference calls), consistently across the three uncertainty measures (bid-ask spread, return volatility, and dispersion in analyst recommendations). These results support the expectation that market uncertainty is reduced to a greater extent when managers provide more explanatory information to market participants during conference calls, especially when managers answering analysts questions using more contrastive words. From investors' perspective, these results can also be interpreted as investors' better understanding management disclosure when information is structured using contrastive words, which leads to a greater extent of reduction in market uncertainty.

Table 1.4 presents regression results that highlight use of contrastive words to introduce unexpected expectations. In Table 1.4 Panel A, firm-quarters are divided into two-by-two (total of 4) subsamples based on the favorableness of earnings surprise (*UE* above median vs. below median) and the nature of news perceived by the market (*CAR* positive vs. negative), and it reports the proportion of each subsample relative to the full sample. Substantial cases of conference calls have contradicting earnings news and stock price changes. More specifically, 20% (19%) of conference calls disclose unfavorable (favorable) earnings news but have positive (negative) stock price changes. From this descriptive statistics, one can state that it is unlikely that unexpected earnings can alone explain stock price changes. I focus on the subsample with unfavorable earnings news but positive stock price changes because it is expected that the counter expectation use of contrastive words can help explain the inconsistent relationship between earnings news and stock price reaction. In addition, with the assumption that managers have incentives to

maintain and boost stock price, only firms with negative earnings news are motivated to use contrastive words to reverse market perception. Therefore, I conduct the same analysis using model (1.1) for the four subsamples.

[Insert Table 1.4 here.]

Table 1.4 Panel B shows that the coefficient on the interaction term is only significant for the positive reaction subsamples. This result is consistent with prior findings in the literature that the market reacts to bad news to a greater extent than to good news in a way that investors view good news without supplementary information as "cheap talk" (Hutton et al. 2003). In this analysis, I find that for the favorable-positive reaction sample, stock prices react to earnings to a larger extent if managers use more contrastive words in their disclosure, suggesting that contrastive words bring corrective and explanatory information. On the other hand, in the unfavorable news-positive reaction sample, the coefficient on the interaction term is negatively correlated with the stock price reaction.[25] This result suggests that the use of contrastive words by managers changes investors' opinion of unfavorable earnings news, and helps investors absorb supplementary information from managers' discussion and eventually take positive views about the company. Note that in this scenario, *UE* does not have any loading on stock price movement, but the interaction term does. This suggests that in order for investors to

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[25] When zero is used as alternative cutoff for favorable and unfavorable earnings news, I get basically the same result that, only for the subsample with unfavorable earnings news yet positive market reaction, the interaction term between earnings news and the use of contrastive words are significantly negative. For brevity, I only report the subsample results using median analyst consensus as cutoff for favorableness.

understand how firms are performing, earnings numbers alone are insufficient and additional supplementary information from managers is needed.

Table 1.4 Panel C reports subsample regression results based on whether the word "earnings" is mentioned before or after the contrastive word "but" and based on whether the "earnings" related part has positive or negative tone. Only the subsample with "earnings" mentioned before "but" accompanied with negative tone about the "earnings" related disclosure has significant coefficient for the interaction term between earnings news and the use of contrastive words. I interpret this finding as being consistent and a more direct result of the counter expectation use of contrastive words. It provides evidence to the cases that when managers recognize unfavorable "earnings" and use contrastive word "but" to introduce unexpected favorable information, such information lead to positive share price reaction.

Table 1.4 Panel D reports regression results using the full sample to mitigate the self-selection issue in the subsample test. I introduce a dummy variable (*Un_Pos*) to represent the scenario that earnings news are unfavorable but stock prices react positively, and interact it with other variables in the main regression (1.1). Column 1 shows that the coefficient on the interaction term (β_7) is significantly negative, which supports the results in the subsample test that managers can revise market perception about unfavorable earnings news to positive price reaction by using contrastive words to disclose more supplementary information that contradict prior unfavorable earnings news. Note that the coefficient on the interaction term (β_3) remains positive and significant, which can be interpreted as the corrective opposition function and counter expectation function of

contrastive words coexist in management disclosure and each plays an important role in helping investors understand the earnings news.

I further investigate whether managers simply manipulate market perception during conference calls rather than provide truthful useful information to the market. In column 2 of Table 1.4 Panel C, I test if there is any reversal in stock prices after managers use contrastive words to disclose supplementary information. I use the post-earnings announcement drift (*PEAD*) in the window (+2,+60) relative to conference call as the dependent variable, and find that neither coefficient β_3 or β_7 is statistically significant, which suggests that there is no reversal in stock price due to information introduced in contrastive word related disclosure. In other words, managers generally disclose truthful and useful information in their answers, and the market is not misled by managers' false information in their disclosure.

Column 3 of Table 1.5 Panel C reports the full sample regression result considering the word "earnings" is mentioned before or after "but" and the corresponding tone of the "earnings" related disclosure using model (2.2). Only β_5 in this model is significant and negative, which confirms previous results in Table 1.4 Panel C and suggests that even when managers discuss unfavorable earnings, they also follow the discussion by using contrastive words to disclose unexpected information that eventually result in positive share price reaction despite the unfavorable earnings news.

Building on the discussion concerning the use of contrastive words to revise unfavorable earnings news, I also examine how managers' disclosure revise negative perceptions of earnings news by analysts' questions. I use model (2.3) and identify tone in analysts' questions (*Tone_Analyst*) and the cases where analysts tone is negative but

managers' tone is positive (*Contra*). In column 4 of Table 1.4 Panel D, I find consistent results compared to Brockman et al. (2015) that analysts' tone (β_4) is strongly positively correlated with price movement. More importantly, I find that β_9 is significantly negative, which suggests that when managers disagree with analysts who hold negative views about the firm, managers use contrastive words to build positive views about the firm and investors incorporate such information by reacting in the opposite direction of negative analysts' tone.

Different from the measures used in prior research that explain the contrarian stock price response to earnings news,[26] the measure in this paper based on the use of contrastive words is less vulnerable to potential endogeneity concerns as managers' answers in Q&A is spontaneous and unscripted. Overall, these results highlight the importance of providing explanatory information from managers to help investors understand firm performance. It also suggests that the use of contrastive words not only represents an indicator of informative disclosure, but also has explanatory power to an underexplored phenomenon that stock prices react positively to unfavorable earnings news.

Table 1.5 presents results on stock price changes corresponding to the tone in different disclosure locations in managers' answers with focus on the comparison between the tone of disclosures before and after "but".[27] Table 1.5 Panel A shows a descriptive summary of the positive and negative tone components for each of the three *Tone* measures (unrelated to "but", before "but", and after "but"). Managers use the word "but" to structure

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[26] Kinney et al. (2002) use variance in returns corresponding to a given level of earnings news to explain the phenomenon, while Johnson and Zhao (2012) relate the phenomenon to market-based measures (return volatility) and earnings property (discordant revenue change).

[27] Note that the reason I only use the contrastive word "but" in this test is because "but" represent 95% of contrastive words in the sample.

tone-related disclosures about 25% of the time. In terms of positive tone and negative tone, as shown, there are about 11% (12%) positive or negative tone-related disclosures before (after) "but".

[Insert Table 1.5 here.]

Table 1.5 Panel B, shows the regression results using the tone values measured at different positions (*Tone_NoBut*, *Tone_BeforeBut*, and *Tone_AfterBut*) and *UE* as independent variables regressed on stock price reaction. All the *Tone* measures are adjusted to [-0.5, +0.5] decile value as is the single tone value in previous analyses, so the coefficients on the variables represent hedge return on trading strategies of going long (short) on the top (bottom) decile of the corresponding variables. I focus on the difference between β_3 and β_4 in regression model (3.1), which represents the difference in the informativeness of the two disclosure conjuncts connected by the contrastive word "but". Consistent with findings using this measure, all three *Tone* measure are positively correlated with stock price change. However, coefficient β_3 is not statistically significant whereas coefficient β_4 is and the difference between β_3 and β_4 is significant, indicating that disclosures made after (before) the contrastive word is (is not) informative, and this difference in informativeness is statistically significant. This result is consistent with the prediction that disclosure content after "but" is more influential than disclosure content before "but" for the market to understand earnings results, as the linguistic literature suggests that the more important and informative part comes after the "but" word (Spooren 1989; Thomas and Matheson 2003). To make the disclosures before and after "but" more

comparable, in subsample tests I require that at least one tone-related disclosure is made both before and after the word "but". The second column reports the related results. This robustness test confirms the previous finding that tone-related disclosures after the contrastive word has higher disclosure informativeness than tone-related disclosure before contrastive word.

I also test the alternative explanation that more important information or emphasis of discussion is located at the latter part of communication regardless of the use of contrastive words by examining disclosure unrelated to "but". I compare the informativeness of the first half ("before") and the second half ("after") of such disclosure in model (3.2). Column 3 of Table 1.5 Panel B shows that the difference between tone in the "before" part and that in the "after" part for disclosure unrelated to "but" is insignificant, yet the difference between tone after and before "but" remain positive and statistically significant. In additional robustness tests, I measure tone before and after causation words "because", "since", and "if" separately and find no significant difference in the effect of tone on share prices before and after these causation words. For brevity, I omit the results from the table. These results rule out the alternative explanation that higher informativeness after contrastive words is mere emphasis-at-the-last phenomenon.

To further examine the relationship between the extent of stock price changes and the direction of tone, I separate each of the three tone measures into two components: positive (*Pos*) and negative (*Neg*), and use the modified regression model (3.2) to test whether the higher informativeness of disclosure after "but" compared to before "but" is derived from managers' use of positive tone or negative tone. Table 1.5 Panel C shows that the tone of disclosures after the contrastive word is more informative than the tone of

disclosures before the contrastive word. In particular, I find that this difference comes largely from differences in disclosures using negative tone, since the difference between coefficients β_7 and β_5 is positive and significant, but the difference between coefficients β_6 and β_4 is not significant. This result suggests that disclosures with negative tone made after the contrastive word is more informative than disclosures with positive tone. This is consistent with the interpretation in Loughran and McDonald (2011) that the tone of negative words has a more pervasive effect.

Given these results, I examine whether the *Tone* measure can be improved if the contrastive word "but" is taken into account. More specifically, I test whether share prices react to the tone of disclosures more strongly when the tone of disclosures before "but" is ignored. Table 1.5 Panel D shows the results from regression models (3.4) and (3.5) that the coefficient on the *ToneWithoutBefore* measure is significantly larger than the original *Tone* measure with the difference representing two basis point in excess returns, which suggests that understanding the implication of contrastive words can improve trading performance based on managers' tone in conference calls. In summary, I find that disclosure is more informative after contrastive words than before contrastive words, which in effect shows that there is informativeness variation within the disclosure content, and that it is important to account for such difference.

1.5 Conclusion

This study investigates whether disclosure informativeness signals released by managers in the Q&A sessions of conference calls help investors interpret earnings information more efficiently. By answering analysts' questions, managers provide corrective, and explanatory information and express their expectations in order to assist investors as they

comprehend the firms' latest performance and its implication for future performance. Such information improves disclosure informativeness, and investors react more strongly to earnings news when they receive timely, relevant, and informative disclosure. I measure the disclosure informativeness of conference calls by counting managers' use of contrastive words during their answers to analysts' questions, based on the findings in the linguistic literature that contrastive words provide corrective and counter expectation information that help listeners better understand the discussion topic (Mann and Thompson 1992; Spooren 1989; Spenader and Maier 2009). I use a self-constructed dictionary of contrastive words to build the measure of disclosure informativeness and test the relationship between short-term market reaction around the conference call date and the joint effect of earnings news and disclosure informativeness.

The results suggest that the disclosure informativeness based on the use of contrastive words in managers' answers is positively associated with the extent to which the market reacts to earnings news, after considering other qualitative disclosure attributes and financial information. I also find that disclosure informativeness sheds light on the underexplored phenomenon of positive market reaction to unfavorable earnings news. The results suggest that the use of contrastive words can provide favorable counter expectation information to reverse investors' perception of seemingly unfavorable financial performance. I further explicitly test the implication of contrastive words and find that disclosure after contrastive words is more informative than disclosure before contrastive words, especially for disclosure with an ex ante pessimistic view. I find that incorporating this difference in the importance of disclosures helps explain market reaction to earnings. The combined evidence indicates that investors behave as if they incorporate the

informative disclosure reflected in the managers' answers in the Q&A sessions of conference calls into their understanding of firms' latest performance.

This study contributes to the literature in several ways. First, it extends the line of research on disclosure informativeness by introducing a simple but effective linguistic measure and examining its role in affecting the way investors react to earnings news. This new dimension of useful non-financial information using textual analysis with specific focus on the functional implication of contrastive words differs from prior literature that exploits informative disclosure by observing word meaning (e.g. Loughran and McDonald 2011) or text complexity (e.g. Li 2008). Second, with a focus on the counter expectation function of contrastive words, this study sheds light on the effect of information in explaining the underexplored phenomenon of unfavorable earnings news accompanied by positive market reaction (Kinney et al. 2002; Johnson and Zhao 2012). This paper also provides insights into investors' demand for supplementary explanatory information beyond the mere earnings numbers to understand firm performance. Third, while a few papers (Hollander et al. 2010; Mayew and Venkatachalam 2012; Hobson et al. 2012) examine the informativeness of the Q&A sessions of conference calls from the perspective of detecting deceptions using information about managers' vocal pattern or absence of answering, this paper is the first (to my best knowledge) to use the underlying functional implications of disclosures to identify the relatively more informative parts of disclosures in managers' answers within conference calls. It supports the notion that Q&A sessions are an important disclosure medium and identifies features that make Q&A session more informative.

1.6 Tables

Table 1.1 Sample Generation and Variable Definition

Panel A: Sample generation

Number of conference call transcripts from SeekingAlpha.com (SA) with titles ending with "earnings call transcript" or other variations[23] and with three available sections (participant list, managers' presentation, and Q&A session between managers and analysts) from January 2008 to December 2014	52,341
Number of transcripts with managers' name identifiable and managers' answers containing at least 1 kilobyte of information (in txt file)	50,911
Merging with Compustat for financial information, matched based on official ticker, fiscal year, and fiscal quarter	47,358
Merging with IBES requiring available permno number in IBES-CRSP link table, unexpected earnings, and earnings release date, which is on the same day or one day before conference call publication date	42,381
Merging with CRSP, requiring market capitalization in excess of $10 million and per share price greater than $5.00 at the time of conference call	32,244
After trimming outliers with respect to *CAR, UE,* and *Flip* on both ends at 1% level	30,387

Panel A presents sample generation process for the tests. Panel B presents year distribution for all conference calls in the sample. Panel C shows word distribution within the list of contrastive words. Variable descriptions appear in Panel D.

[23] Vast majority of transcript on SA have title ending with "earnings call transcript". I manually read title names for all other transcripts to define the title matching pattern to identify conference call transcript.

Panel B: Year distribution

Year	Number of transcripts	Proportion to full sample
2008	2834	9.33%
2009	3220	10.60%
2010	2746	9.04%
2011	3140	10.33%
2012	4328	14.24%
2013	7324	24.10%
2014	6795	22.36%
Total	30,387	100.00%

Panel C: Contrastive word distribution

Word	Proportion to total words
But	95.2%
Although	2.2%
However	1.8%
On the other hand	0.4%
Nonetheless	0.1%
Nevertheless	0.1%
In spite of	0.1%
Total	100.00%

Panel D: Variable definition

Flip	Number of contrastive words divided by total number of words used by managers in Q&A session during conference call.
UE[24]	Unexpected earnings measured as actual earnings per share (EPS) minus the median analyst forecast, scaled by the share price as of previous fiscal quarter's end date.
CAR[25]	Three day cumulative abnormal returns measured as cumulated difference between raw return and industry return (based on Fama-French 48 industry classification) around conference call date.
Tone	Number of positive words minus number of negative words (based on Loughran and McDonald (2011) tone dictionary), divided by total number of words used by managers in Q&A session during conference call.
Tone_NoBut	Number of positive words minus number of negative words (based on Loughran and McDonald (2011) tone dictionary) that is not related to the word "But", divided by total number of words used by managers in Q&A session during conference call.
Tone_BeforeBut	Number of positive words minus number of negative words (based on Loughran and McDonald (2011) tone dictionary) that occur before the word "but", divided by total number of words used by managers in Q&A session during conference call.
Tone_AfterBut	Number of positive words minus number of negative words (based on Loughran and McDonald (2011) tone dictionary) that occur after the word "but", divided by total number of words used by managers in Q&A session during conference call.
Tone_Analyst	Number of positive words minus number of negative words (based on Loughran and McDonald (2011) tone dictionary), divided by total number of words used by analysts in Q&A session during conference call.
Uncertainty	Number of uncertain words (based on Loughran and McDonald (2011) uncertainty dictionary) divided by total number of words used by managers in Q&A session during conference call.
Specificity	Number of dollar signs divided by total number of words used by managers in Q&A session during conference call.
Readability	Fog index (a reading ease index based on number of word syllables and proportion of difficult words), with greater (smaller) value representing high (low) level of difficulty in reading the text.
Size	Log of market value of equity at fiscal quarter end.
M/B	Market value of equity divided by Book value of equity.
ROA	Earnings divided by total assets at fiscal quarter end.
R&D	R&D divided by total assets at fiscal quarter end.
Intangible	Intangibles divided by total assets at fiscal quarter end.
Earn_Vol	Standard deviation of quarterly earnings for past 5 quarters.
Segment	Number of segments (Customer based in Compustat Segment Database).
Loss	Dummy variable equal to one if earnings before extraordinary items is negative, and zero otherwise.
Guidance	Dummy variable equal to one if any type of management guidance is provided on the conference call date, e.g. earnings guidance, sales guidance, and zero otherwise.
Abs_Accruals	Absolute value of total accruals.
SP500	An indicator equal to one if the company is in the S&P 500 index based on CRSP classification when the conference call is held, and zero otherwise.
Diff_Rec_Disp	Earliest available analyst recommendation dispersion within 30 days after the conference call minus latest available analyst recommendation dispersion within 30 days before the conference call.
Diff_Spread	Average of daily bid-ask spread 30 days after the conference call minus average of daily bid-ask spread 30 days before the conference call.
Diff_Ret_Vol	Standard deviation of daily returns 30 days after the conference call minus standard deviation of daily returns 30 days before the conference call.

Un_Pos	Dummy variable equal to one if earnings news is unfavorable but price reaction is positive, and zero otherwise.
Contra_Tone	Dummy variable equal to one if the tone in analysts' questions is negative but the tone in managers' answers are positive, and zero otherwise.

[24] I also measure analysts' consensus forecast using IBES, the last available analyst's forecast, or the average of the last five forecasts. The choice of analyst forecast has little impact on changing the main results.

[25] I also use other return benchmarks to calculate abnormal returns: weighted average market return, predicted return based on CAPM model, and predicted return based on Fama-French three/four factor model. In addition, I include standardized CARs and buy-and-hold abnormal returns as alternative CAR measures. The choice of CAR measure does not significantly affect the main results.

Table 1.2 Descriptive Statistics

Panel A: Comparison cross sample and between measures

	Tone Related[26]	Uncertainty	Flip
MD&A in 10-K	4.37%	1.98%	0.24%
Managers' presentation	4.75%	1.37%	0.41%
Managers' answer during Q&A session	4.49%	1.41%	1.79%
Disclosure not related to the word "but"	3.37%		
Disclosure made before "but"	0.51%		
Disclosure made after "but"	0.56%		

Panel A compares the use of words by managers in three different disclosure venues: MD&A section of 10-K, managers' prepared presentation, and managers' answers to analysts' questions. For tone related disclosure, I separate the disclosure content into three parts by whether contrastive word "But" is used and the position of content relative to "But", and measure tone of the content for each of the three parts. Panel B presents descriptive statistics of the main variables used in the tests. Panel C presents the correlation coefficients for the main qualitative variables.

[26] Different from tone value used in the main analyses calculated as (Total number of positive words – Total number of negative words)/Total number of words, tone related word usage in this table is calculated as (Total number of positive words + Total number of negative words)/Total number of words.

Panel B: Summary statistics

Variable	N	Mean	Std Dev	Min	25th Pctl	Median	75th Pctl	Max
CAR	30387	0.19%	6.56%	-17.37%	-3.33%	0.08%	3.66%	18.18%
UE	30387	0.07%	0.59%	-2.13%	-0.05%	0.05%	0.21%	2.02%
Flip	30387	1.79%	0.56%	0.67%	1.39%	1.75%	2.15%	3.21%
Tone	30387	0.75%	1.35%	-2.57%	-0.10%	0.73%	1.58%	4.14%
Tone_NoBut	29966	0.53%	1.23%	-2.30%	-0.16%	0.52%	1.22%	3.41%
Tone_BeforeBut	29966	0.04%	0.29%	-0.70%	-0.12%	0.00%	0.20%	0.83%
Tone_AfterBut	29966	0.15%	0.32%	-0.60%	0.00%	0.13%	0.32%	1.05%
Uncertainty	30387	1.42%	0.62%	0.27%	0.98%	1.35%	1.77%	3.21%
Specificity	30387	0.60%	0.60%	0.00%	0.17%	0.44%	0.85%	2.70%
Readability	30387	8.36	1.74	5.49	7.20	8.05	9.18	13.83
Size	30316	8.05	1.55	4.84	6.96	7.99	9.07	11.94
M/B	29715	6.24	292.20	0.50	1.37	2.21	3.71	28.79
ROA	30220	2.09%	3.65%	-10.94%	0.85%	1.97%	3.37%	11.34%
R&D	30387	0.85%	2.00%	0.00%	0.00%	0.00%	0.88%	64.54%
Intangible	30155	18.58%	20.36%	0.00%	1.32%	11.12%	30.59%	76.12%

Variables are defined in Table 1.1 Panel D

Panel C: Correlation among qualitative variables (Pearson below and Spearman above)

	CAR	UE	Flip	Tone	Uncertainty	Specificity	Readability
CAR		0.31***	0.01	0.09***	-0.02***	-0.03***	-0.00
UE	0.23***		-0.02***	0.08***	-0.01	-0.04***	0.00
Flip	0.01	-0.01*		-0.09***	0.14***	0.02***	-0.06***
Tone	0.09***	0.06***	-0.09***		-0.23***	-0.14***	0.06***
Uncertainty	-0.01***	0.00	0.13***	-0.21***		0.11***	0.01**
Specificity	-0.02***	-0.03***	0.00	-0.14***	0.10***		-0.13***
Readability	-0.00	0.00	-0.05***	0.06***	0.01**	-0.13***	

Pearson (Spearman) correlation appear on the bottom-left (top-right) side.
*, **, *** Denote significance at the p <0.10, p < 0.05 and p < 0.01 levels, respectively.

Table 1.3 The Effect of Disclosure Informativeness Measured by Contrastive Words on Stock Price Reaction

Panel A: Regression results

Model	(1.1)	(1.2)	(1.2)	(1.2)	(1.2)
Intercept	0.002	0.002	0.002	0.002	
UE	0.065***	0.064***	0.065***	0.064***	0.069***
Flip	0.002*	0.003***	0.002	0.003***	0.002
Flip*UE	**0.010*****	**0.012*****	**0.012*****	**0.012*****	**0.009****
Tone		0.016***		0.015***	0.020***
Tone*UE		0.009**		-0.001	0.005
Uncertainty		-0.001		-0.001	-0.001
Uncertainty*UE		-0.006		-0.004	-0.006
Specificity		-0.001		-0.001	-0.003**
Specificity*UE		-0.006*		-0.002	-0.002
Readability		-0.003**		-0.003**	-0.005***
Readability*UE		-0.007*		-0.007**	-0.008**
Size			-0.006***	-0.006**	-0.049***
Size*UE			-0.034***	-0.034***	-0.043***
M/B			0.003	0.001	-0.018***
M/B*UE			0.012**	0.011**	0.017***
ROA			0.010***	0.010***	0.017***
ROA*UE			0.023***	0.023***	0.026***
R&D[27]			0.001	0.000	0.000
R&D*UE			0.003	0.004	0.006
Intangible			0.004**	0.002	-0.009**
Intangible*UE			0.024***	0.024***	0.026***
Earn_Vol			-0.001	-0.001	-0.001
Earn_Vol*UE			0.010	0.009	0.004
Segment			-0.001	-0.001	0.001
Segment*UE			0.009**	0.009**	0.011**
Loss			-0.003	-0.002	-0.001
Loss*UE			-0.010*	-0.010*	-0.001
Guidance			-0.000	-0.001	0.001
Guidance*UE			0.004	0.003	0.004
Year-Quarter, Industry Fixed	Yes	Yes	Yes	Yes	Yes
Firm Fixed	No	No	No	No	Yes
N of obs	30,387	30,387	29,346	29,346	29,346
R-square	10.1%	10.8%	11.4%	12.0%	22.5%

*, **, *** Denote significance at the $p < 0.10$, $p < 0.05$ and $p < 0.01$ levels, respectively.

This table presents the OLS regression results of the relation between CAR and the effect of contrastive words in explaining earnings news. The dependent variables are industry adjusted returns for the window (-1,+1) surrounding the conference call date. The independent variable of interest is the interaction term Flip*UE (Bold highlighted). Year-quarter and industry fixed effects are included as additional independent variables without showing. Standard errors are clustered by firm. The 1st through the 4th column show regression results without control variables, with qualitative control variables, with quantitative control variables, and with both qualitative and quantitative control variables, respectively. The 5th column adds firm-fixed effect in the regression model with both qualitative and quantitative as additional control.

[27] Only half of the sample firm-quarter observations have available R&D information. For those companies with unavailable R&D value, its value is set to zero to avoid substantial reduction in sample size and biased results from over-representing high R&D firms. Regression result remains basically the same if I only use the sample with available R&D.

Panel B: Subsample regression results separated by business complexity

Subsample	Intangible			R&D		
	Low	High	Difference	Low	High	Difference
Intercept	0.001	-0.003		0.032	0.107*	
UE	0.061***	0.070***		0.064***	0.070***	
Flip	0.002	0.002		0.006**	0.001	
Flip*UE	-0.000	**0.023***	0.023***	0.011	**0.035***	0.024**
Year-Quarter, Industry Fixed	Yes	Yes		Yes	Yes	
N of obs	15,072	15,083		7295	7305	
R-square	9.7%	11.8%		11.3%	9.6%	

Subsample	Earn_Vol			Abs_Accruals		
	Low	High	Difference	Low	High	Difference
Intercept	0.026	-0.006		0.004	0.005	
UE	0.049***	0.079***		0.059***	0.071***	
Flip	0.002*	0.002		0.001	0.004*	
Flip*UE	-0.003	**0.024***	0.027***	0.003	**0.018***	0.015**
Year-Quarter, Industry Fixed	Yes	Yes		Yes	Yes	
N of obs	15,102	15,116		14,909	14,925	
R-square	9.3%	11.3%		10.5%	10.6%	

Subsample	SP500		
	S&P 500	Non-S&P 500	Difference
Intercept	0.036	0.052	
UE	0.049***	0.071***	
Flip	-0.002	0.004*	
Flip*UE	-0.003	**0.013***	0.016***
Year-Quarter, Industry Fixed	Yes	Yes	
N of obs	9,528	20,859	
R-square	10.0%	10.5%	

*, **, *** Denote significance at the p <0.10, p < 0.05 and p < 0.01 levels, respectively.
This table presents the OLS regression results of the relation between cumulative abnormal returns and the effect of contrastive words in explaining earnings news partitioned by high and low uncertainty of firm performance. Uncertainty is based on level of intangibles, R&D, earnings volatility, total accruals, or whether being included in S&P 500, with each set of results showing in a sub-table. The dependent variable is industry adjusted returns for the window (-1,+1) surrounding the conference call date. The independent variable of interest is the interaction term Flip*UE (Bold highlighted). Year-quarter and industry fixed effects are included as additional independent variables without showing. Standard errors are clustered by firm. The last column shows the difference in the effect of contrastive words in explaining earnings news between in high and low uncertainty scenarios.

Panel C: The effect of contrastive words in reducing market uncertainties

Model (1.3)	Diff_Spread	Diff_Ret_Vol	Diff_Rec_Disp
Intercept	0.014***	0.005***	0.093***
Flip	**-0.025***	**-0.017***	**-0.292***
Abs_UE	0.084***	0.073***	-0.241
Size	-0.001***	-0.000***	0.003***
M/B	-0.000***	0.000***	-0.000
ROA	-0.014***	-0.012***	0.001
R&D[28]	0.007	0.002	0.005
Intangibles	-0.001***	-0.001***	-0.000
Earn_Vol	-0.114*	-0.115*	2.057**
Segment	0.000	0.000	0.000
Loss	0.001***	0.001***	0.001
Guidance	-0.000**	-0.000***	0.003
Ret_Vol	-0.098***	-1.026***	-0.100
Spread	-0.237***	0.529***	0.173
Rec_Disp	-0.000*	0.000	-0.137***
Year-Quarter, Industry Fixed	Yes	Yes	Yes
N of obs	24,239	24,239	22,734
R-square	41.1%	45.9%	7.2%

*, **, *** Denote significance at the $p < 0.10$, $p < 0.05$ and $p < 0.01$ levels, respectively.

This table presents the OLS regression results of the relation between change in market uncertainty and the use of contrastive words. Change in market uncertainty is proxied by three measures: earlies available analyst recommendation dispersion within 30 days after the conference call minus latest available analyst recommendation dispersion within 30 days before the conference call; average of daily bid-ask spread 30 days after the conference call minus average of daily bid-ask spread 30 days before the conference call; standard deviation of daily returns 30 days after the conference call minus standard deviation of daily returns 30 days before the conference call. All dependent and independent variables use raw values. The independent variable of interest is the Flip (Bold highlighted), which measures the extent of the use of contrastive words by managers when answering questions. Year-quarter and industry fixed effects are included as additional independent variables without showing. Standard errors are clustered by firm.

[28] Only half of the sample firm-quarter observations have available R&D information. For those companies with unavailable R&D value, its value is set to zero to avoid substantial reduction in sample size and biased results from over-representing high R&D firms. Regression result remains largely the same if I only use the sample with available R&D.

Table 1.4 The Effect of Contrastive Words on the Relationship between Earnings News and Stock Price Reaction

Panel A: Distribution of earnings news and stock price reaction

		Stock price reaction (CAR)	
		Positive (CAR > 0)	Negative (CAR < 0)
Earnings News (Unexpected Earnings)	Favorable (UE > Median)	31%	19%
	Unfavorable (UE < Median)	**20%**	30%

Panel B: Subsample regression results (positive CAR vs. negative CAR and favorable UE vs unfavorable UE)

		Stock price reaction (CAR)			
		Positive (CAR > 0)		Negative (CAR < 0)	
Earnings News (Unexpected Earnings)	Favorable (UE > Median)	Intercept	0.026***	Intercept	-0.024***
		UE	0.055**	UE	-0.015***
		Flip	-0.003	Flip	0.002
		Flip*UE	0.017*	Flip*UE	-0.014
	Unfavorable (UE < Median)	Intercept	0.030***	Intercept	-0.025***
		UE	-0.005	UE	0.067***
		Flip	-0.007**	Flip	0.002
		Flip*UE	**-0.017***	Flip*UE	0.006

Panel C: Subsample regression results ("earnings" mentioned before vs. after "but" and favorable vs. unfavorable tone about mentioned "earnings")

		Stock price reaction (CAR)			
		"earnings" before "but"		"earnings" after "but"	
Tone of "earnings" related part	Favorable (positive tone)	Intercept	0.034	Intercept	-0.002
		UE	0.067***	UE	0.073***
		Flip	-0.009	Flip	0.001
		Flip*UE	0.004	Flip*UE	-0.002
	Unfavorable (negative tone)	Intercept	0.003	Intercept	-0.002
		UE	0.071***	UE	0.041***
		Flip	-0.009	Flip	-0.002
		Flip*UE	**-0.082****	Flip*UE	-0.025

*, **, *** Denote significance at the p <0.10, p < 0.05 and p < 0.01 levels, respectively.
Panel A shows the sample distribution across favorable and unfavorable earnings news and positive and negative market reaction. Earnings news are regarded favorable (unfavorable) if unexpected earnings is above (under) median value. Market reaction is deemed positive (negative) if abnormal return is greater (smaller) than 0.
Panel B presents the OLS regression results of the relation between cumulative abnormal returns and the effect of contrastive words in explaining earnings news partitioned by the favorableness of earnings news and nature of market reaction. The dependent variable is industry adjusted returns for the window (-1,+1) surrounding the conference call date. The independent variable of interest is the interaction term Flip*UE (Bold highlighted). Year-quarter and industry fixed effects are included as additional independent variables without showing. Standard errors are clustered by firm.
Panel C shows the OLS regression using the same model but partitioned by whether "earnings" is mentioned before or after contrastive word "but", and the nature of the tone (positive or) in the part where "earnings" is mentioned.

Panel D: Counter expectation effect of contrastive words in revising negative earnings news and negative perceptions about earning news

Model	Expected sign	CAR (2.1)	PEAD (2.1)	CAR (2.2)	CAR (2.3)
Intercept		-0.016***	-0.004	0.002	-0.001
UE (β_1)		0.106***	0.061***	0.065***	0.062***
Flip (β_2)		0.003***	0.001	0.002*	0.001
UE* Flip (β_3)		0.007*	0.008	0.012***	0.011***
Un_Pos (β_4)		0.054***	0.028***		
UE* Un_Pos (β_5)		-0.104***	-0.075***		
Flip* Un_Pos (β_6)		-0.014***	-0.012		
UE*Flip*Un_Pos (β_7)	**-**	**-0.028*****	**0.024**		
UE*Flip*E_Before_Pos (β_4)				0.005	
UE*Flip*E_Before_Neg (β_5)				**-0.072****	
UE*Flip*E_After_Pos (β_6)				-0.028	
UE*Flip*E_After_Neg (β_7)				-0.052	
Tone_Analyst (β_4)					0.026***
Contra_tone (β_5)					0.002***
Tone_Analyst*Flip (β_6)					-0.000
Contra_Tone*Flip (β_7)					0.000
Tone_Analyst*Contra_tone (β_8)					-0.008***
Tone_Analyst*Contra_Tone* Flip (β_9)	**-**				**-0.022****
Year-Quarter, Industry Fixed		Yes	Yes	Yes	Yes
N of obs		30,387	28,603	29,855	29,855
R-square		30.1%	4.2%	10.2%	11.3%

*, **, *** Denote significance at the $p < 0.10$, $p < 0.05$ and $p < 0.01$ levels, respectively.

This panel presents the OLS regression results of the relation between cumulative abnormal returns and unexpected earnings when earnings news are unfavorable but share prices react positively. The dependent variable is industry adjusted returns for the window (-1,+1) surrounding the conference call date (CAR), and for window (+2,+60) in the post-earnings announcement period (PEAD). The independent variable of interest is UE*Flip*Un_Pos in column 1, UE*Flip*E_Before_Neg in column 3 and Tone_Analyst*Contra_Tone*Flip in column 4 (Bold highlighted). Year-quarter and industry fixed effects are included as additional independent variables without showing. Standard errors are clustered by firm. All regressions use the full sample.

Table 1.5 The Differential Effect of Disclosure Informativeness between Content before "but" and Content after "but"

Panel A: Descriptive statistics for detailed tone measure across three disclosure position: not related to "but", before "but", and after "but"

Variable	N	Mean	Std Dev	Min	25th Pctl	Median	75th Pctl	Max
Pos	30387	2.62%	0.99%	0.00%	0.72%	1.93%	2.52%	3.21%
Pos_NoBut	29966	1.95%	0.86%	0.00%	0.31%	1.36%	1.85%	2.44%
Pos_BeforeBut	29966	**0.28%**	0.24%	0.00%	0.00%	0.12%	0.24%	0.39%
Pos_AfterBut	29966	**0.36%**	0.27%	0.00%	0.00%	0.17%	0.31%	0.49%
Neg	30387	1.87%	0.81%	0.00%	0.47%	1.32%	1.76%	2.30%
Neg_Nobut	29966	1.42%	0.84%	0.00%	0.18%	0.95%	1.31%	1.77%
Neg_BeforeBut	29966	**0.24%**	0.21%	0.00%	0.00%	0.09%	0.20%	0.33%
Neg_AfterBut	29966	**0.20%**	0.20%	0.00%	0.00%	0.07%	0.17%	0.30%

Panel B: The effect of tone in different places on stock price reaction

	Expected sign	CAR		
		Full sample	Subsample	Full sample
Model		(3.1)	(3.1)	(3.2)
Intercept		0.002	-0.001	0.002
UE (β_1)		0.063***	0.064***	0.063***
Tone_NoBut (β_2)		0.013***	0.013***	
Tone_BeforeNoBut (β_{2_1})				0.005***
Tone_AfterNoBut (β_{2_2})				0.006***
Tone_BeforeBut (β_3)		**0.002**	**0.001**	**0.003****
Tone_AfterBut (β_4)		**0.005*****	**0.007*****	**0.008*****
Year-Quarter, Industry Fixed		Yes	Yes	Yes
N of obs		32,183	21,689	29,855
R-square		10.7%	10.9%	10.5%
Difference ($\beta_{2\_2} - \beta_{2\_1}$)	-			0.001
Difference ($\beta_4 - \beta_3$)	+	**0.004*****	**0.006*****	**0.004*****

, * Denote significance at the p < 0.05 and p < 0.01 levels, respectively.
Panel A shows descriptive statistics for detailed tone components (positive and negative) across the three parts of disclosure in managers' answers to analysts' questions: content not related to "But", content before "But", and content after "But".
Panel B presents the OLS regression results of the relation between cumulative abnormal returns and the effect of tone expressed in the three disclosure positions. The dependent variable is industry adjusted returns for the window (-1,+1) surrounding the conference call date. The independent variable of interest is Tone_BeforeBut and Tone_AfterBut (Bold highlighted). Year-quarter and industry fixed effects are included as additional independent variables without showing. Standard errors are clustered by firm. The first (second) column shows regression result using full sample (subsample with non-zero Tone_BeforeBut and Tone_AfterBut values). The last row of this panel presents the difference in the effect of disclosure tone between content after "But" and content before "But".

Panel C: The effect of positive and negative tone on stock price reactions across three disclosure position: not related to "but", before "but", and after "but"

Model (3.3)	Expected sign	CAR	
		Full sample	Subsample
Intercept		0.002	-0.003
UE (β_1)	+	0.063***	0.064***
Pos_NoBut (β_2)		0.007***	0.008***
Neg_NoBut (β_3)		-0.012***	-0.013***
Pos_BeforeBut (β_4)		**0.002**	**0.001**
Neg_BeforeBut (β_5)		**-0.001**	**0.000**
Pos_AfterBut (β_6)		**0.003***	**0.005***
Neg_AfterBut (β_7)		**-0.005***	**-0.005***
Year-Quarter, Industry Fixed		Yes	Yes
N of obs		30,387	23,943
R-square		10.7%	10.9%
Difference ($\beta_6 - \beta_4$)	+	0.002	**0.004***
Difference ($\beta_7 - \beta_5$)	-	**-0.006****	**-0.005****

*, **, *** Denote significance at the $p < 0.10$, $p < 0.05$ and $p < 0.01$ levels, respectively.
This panel presents the OLS regression results of the relation between cumulative abnormal returns and the effect of detailed tone (positive and negative) expressed in the three disclosure positions: content not related to "But", content before "But", and content after "But". The dependent variable is industry adjusted returns for the window (-1,+1) surrounding the conference call date. The independent variable of interest is Pos_BeforeBut, Neg_BeforeBut, Pos_AfterBut and Neg_AfterBut (Bold highlighted). Year-quarter and industry fixed effects are included as additional independent variables without showing. Standard errors are clustered by firm. The first (second) column shows regression result using full sample (subsample with non-zero Pos_BeforeBut, Neg_BeforeBut, Pos_AfterBut and Neg_AfterBut values). The last (second last) row of this panel presents the difference in the effect of negative (positive) tone between content after "But" and content before "But".

Panel D: Differential effect of tone on stock price reaction before and after excluding disclosure content before "but"

Model	CAR		Difference
	(3.4)	(3.5)	
Intercept	0.0025	0.0022	
UE (β_1)	0.0642***	0.0642***	
Accrual (β_2)	-0.0129***	-0.0128***	
Tone / Tone_WithoutBefore (β_3)	**0.0156***	**0.0159***	**0.00019***
Year-Quarter, Industry Fixed	Yes	Yes	
N of obs	29,834	29,422	
R-square	11.1%	11.1%	

*** Denote significance at the $p < 0.01$ levels.
This panel presents the OLS regression results of the relation between cumulative abnormal returns and the effect of original tone and modified tone respectively. Modified tone measure is calculated as original tone measure minus tone before "But". The dependent variable is industry adjusted returns for the window (-1,+1) surrounding the conference call date. The independent variable of interest is Tone/ Tone_WithoutBefore (Bold highlighted). Year-quarter and industry fixed effects are included as additional independent variables without showing. Standard errors are clustered by firm. The last column of this panel presents the difference in the effect of modified tone and original tone in its relation to cumulative abnormal returns.

1.7 Appendix

1.7.1 Examples of the use of contrastive words (by word function)

Corrective opposition

On August 2nd, 2012, Prudential Financial had a conference call discussing its second quarter result. An analyst from Raymond James asked a question about the decrease in managing assets and tried to figure out whether it is because of assets rebalancing or bad asset management performance. With the use of contrastive words "but", the manager first note that there is actually no asset outflow at institutional level. In the second "but" related disclosure, the manager highlights the reason for losing managing asset is because of low profitability of running some of the business but is not due to bad asset management performance. Overall, the manager suggested that the observed change is not performance driven and investors could resolve some uncertainties about future performance of the firm. One can even imply that the profitability of this company increases because it just gets rid of some unprofitable assets. This piece of information is also informative for investors. This example illustrates that managers use contrastive words to provide supplementary information and such information is relevant and useful for investors to reduce uncertainties.

Steven D. Schwartz - Raymond James & Associates, Inc., Research Division

Okay, Charlie, while I have you, the mention of outflows in equities, would you term that to be the program related? Maybe your clients changing what they want to do, going from something to something else? Or would you equate that more to performance related?

Charles Frederick Lowrey – COO & EVP

No, I think it's very much the former. It's not performance related. We actually had good performance across all the asset classes this quarter. I'll divide the flows into a couple of ways. **But** if you look at the institutional flows, as John said, they were reasonably balanced between, obviously, the inflows and the outflows. We've had very good inflows in the fixed income. The outflows were from equity. About half of it was from our quantitative side, QMA, and about half of it was from Jennison. **But** within the QMA, the interesting thing is there was one passive mandate for which we virtually got very, very little fees. And that was just a client moving out of that particular strategy. The others were more rebalancing, either from equities into fixed income or from domestic into global. So it was not performance related; it was really rebalancing of client assets.

Google held its 2012 3rd quarter conference call on October 18, 2012. One analyst from Goldman Sachs asked a question about sales proportion for different categories. The first "but" in the manager's answer shows the reluctance of the manager to disclose in detail, which itself is informative to the market (Hollander et al. 2010).[28] The second "but" emphasizes that the third type of sales among the three categories is significant and should not be neglected. The third "but" highlights the difference between the last category and the first two with respect to accounting recognition rules. One can see from this conversation that the answering manager uses the contrastive word "but" to disclose material information that is relevant to decision making but could have been ignored by investors. Therefore, this type of disclosure made by the manager is regarded as informative.

Heather Bellini - Goldman Sachs

Can you give us an idea of the run rate that you are talking about, the $8 billion for mobile, can you give us an idea of what that is on a kind of same-store sales basis, you gave us the $2.5 billion run rate last year, what is the mobile advertising piece, I think that's something people are really interested in, so extra stuff from Google Play? The follow-up question I had for you was, what's the margin profile on the Google Play content revenue that you're recognizing?

Patrick Pichette - Senior Vice President and Chief Financial Officer

Okay. So on the $8 billion, so let me give you just a bit more information on it, **but** clearly we don't breakdown each of the categories, we just wanted to kind of give you a sense of proportion. A point that's important is, of the three categories I gave you, ads continues to be the bulk of it, the vast majority of it. And then on the case of the Google Play, it's important to note from a modeling perspective that everything's that's content, that is whether a book, a movie content is actually booked on our books on a gross basis.

Everything that is tied to apps is booked on a net basis, **but** it's still a huge kind of number in all cases. So without giving you, I just want to give you that, so that you don't start thinking that there is actually 8 billion that is book to revenue in our result that you see, **but** in fact, two of the three are there, the third one is done on a net basis, just because of our accounting rules. So and the vast majority is still ads.

Counter expectation

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[28] This type of contrastive word usage works against finding the expected relationship between disclosure informativeness and the extent of market reaction. With this in mind, I still find the hypothesized results.

Merck & Co. held its 2014 3rd quarter conference call on October 27th, 2014. In the Q&A session, an analyst from Jefferies asked a question about the current situation of certain medical product in the EU area and managers' plan to deal with this situation. The answering manager first cited that the company had sales growth for two products because of good performance in the EU area, which appears as good news. Then, the manager used "but" to introduce a bad news that competition in the market imposes downside pressure on sales, which is contrary to prior good news. Continuing this topic with "however", the manager said that, to mitigate this negative effect, the company plans to lower its product price in response to the market competition. This is somehow a good news in the sense that the firm will take actions to enhance performance. In this Q&A dialog, although the manager's answer using contrastive words does not affect firm performance for the quarter, it provides investors with useful information that can help investors to understand firm performance which otherwise investor may interpret earnings result differently without the additional information. This disclosure essentially alleviate certain uncertainties about future firm performance. In other words, the use of contrastive words implies high disclosure informativeness.

Jeff Holford – Jefferies

   I wondered if you can just give us a bit more color on what the biosimilar situation in Europe looks like, what you are really learning from the early stages of this and what you're going to take forward as access to biosimilars becomes more prevalent in Europe?

Roger Perlmutter - EVP and President, Merck Research Laboratories

   So if you look at Remicade and Simponi, as I said, we had about $775 million of sales about 9% growth. We continue to have growth with Remicade about 3%. That was driven by the core EU markets driven by gastro indications. **But** there was some offset due to biosimilar competition in the smaller markets. If you look at the biosimilar specifically, there has been relatively limited uptake of either biosimilar product or acceptance on tenders and formularies and what we've seen so far is there has been movement of the biosimilars, it's been limited to new patients only. **However** we have seen increase pricing pressures that are required in order for us to compete with the biosimilars. So we expect the pressure to continue into small markets this year and then we expect there to be some pricing pressure and new patients in the core EU markets after February 2015 loss of exclusivity.

Another example of counter expectation is MGM resort international's 2007 4th quarter conference call held on February 21st, 2008. One analyst inquired about the current performance of one area of this hospitality company. The manager answered that from all

perspective this division is underperformed. However, based on the managers' expectation, this business is going to perform well in the near future. Again, in this conversation, the manager used "but" to express positive views on future performance which is going to offset the bad news in current period. Following this conference call, the market didn't react significantly negatively to the bad news on earnings, which suggests that counter expectation disclosure provide useful information and mitigate the impact of prior the bad news on the market reaction.

Larry Klatzkin - Jefferies & Co.

Ok, good. Macau, January, February. How does that look right now? And what was the EBITDA in December? I realize it was probably a loss, given a short period in the start-up.

Terrence Lanni - Chairman & CEO

As far as the aspect of our In House operations, that will be kicking in. It's ramping up. We are probably running about 40% below in volume in that area, **but** it was a higher differential before, it's ramping up as we go along. The mass market is the area that we have seen has been weakest to date, not unexpectedly, because our competitors have the same situation when they first opened. That has to do with the mass market table games and the slots, and those continue to ramp up. We are running on the table game aspect down about 15% from where we had expected to be. And on slots we are more like, about, 35% down. **But** those, again, are ramping up in the weeks that have continued. And so far we are on budget, as far as the EBITDA is concerned.

1.7.2 Examples of tone before and after "but":

On Oct 25, 2012, Apple held its fiscal year 2012 4th quarter conference call. In the Q&A session, analyst Bill C. Shope from Goldman Sachs asked a question about whether the company was able to maintain production to meet high market demand. CEO Timothy D. Cook answered that he thought the production might not meet market demand perfectly, but he considered that there was no big problem in production.

Bill C. Shope - Goldman Sachs & Co.

Okay, great. Thanks. Can you walk through how you're thinking about the supply ramp for the iPhone 5 in the holiday quarter? And how does some of the challenges you're facing relative to the strong demand compared to the past iOS product launches?

Timothy D. Cook - Chief Executive Officer

It's difficult to predict when supply and demand will balance, **but** I'm feeling very confident on our ability to supply quite a few iPhones.

On Oct 24, 2013, 3M Company held its fiscal year 2013 3rd quarter conference call. Analyst Joe Ritchie from Goldman Sachs questioned whether the firm's year-to-year growth for this fiscal year was going to decrease because of its electronics business, and CFO David Meline answered that he felt pressure on the performance of this business area, but held a positive view of the business because of improving productivity and management.

Joe Ritchie - Goldman Sachs

Your guidance essentially imply that there will be a step down sequentially on a year-on-year growth perspective, just given some of the commentary that you had on the electronics business?

David Meline - Chief Financial Officer

So I think the Q4 will be a little bit more of a challenge for that business **but** very pleased with the progress both in terms of growth and the way they have been driving productivity in the underlying operation and taking the portfolio management to half and really improving that business.

On Apr 17, 2014, American Express held its fiscal year 2014 1st quarter conference call. One analyst Mark DeVries from Barclays asked whether investors would keep seeing unfavorable performance after the unfavorable performance this quarter, and questioned

whether the company could hit the EPS target for the year. CFO Jeff Campbell answered that the current unfavorable performance was not indicative of future performance, and that they could use other channels to meet the EPS target due to their flexible business model.

Mark DeVries - Barclays

Yes, thanks. Jeff I know you indicated that we shouldn't expect to see OpEx remain at this kind of down 4% year-over-year level going forward. But if you don't see a meaningful acceleration of billed business growth particularly with the modest headwind we have now from kind of higher tax rate is it reasonable to think you'll have to remain kind of well below the cap of 3% growth, if you want the hit the on average over time targets for EPS growth this year?

Jeff Campbell

So certainly I would stick to the remarks I made a few minutes ago that the 4% decline year-over-year you see in the first quarter is not indicative of what you would expect -- should expect the next couple of quarters, there were some timing items. **But** we are very committed to using the flexibility of our business model to achieve our earnings targets.

On Jan 28, 2015, Boeing hosted its fiscal year 2014 4th quarter conference call. Analyst Rob Spingarn from Credit Suisse raised a question about whether the company could reduce its unit production cost within a year. CFO Greg Smith answered that the production system has been improved a lot to lower production cost, which imposed short-term challenge but would be beneficial in the long run.

Rob Spingarn - Credit Suisse

I'm guessing airplanes are costing these days somewhere around $130 million. To get down to a breakeven level, I would imagine you need about another 20% cost reduction from here, give or take back to the envelope, can that be done inside of a year with the volume of airplanes we're talking about?

Greg Smith - Chief Financial Officer

We're continuing to invest in productivity as I talked about. As we get more mature with the production system, we see more opportunities to do things better and more efficiently but they taken in investment. So short-term investment -- short-term challenge **but** long-term significant gains for the program. And that's really where we got everybody focused.

Chapter 2 Attention: Conference Calls in After-Hours

2.1 Introduction

Firms normally hold conference calls after earnings announcements to discuss with analysts and investors about the latest firm performance and provide managers' view of the future performance. Conference calls have grown prevalence as one of the major disclosure channels, which improve investors' ability to interpret earnings news (Kimbrough 2005), reduce market uncertainty in assessing firms' future performance (Bowen et al. 2002), and convey value relevant information in addition to earnings news (Frankel et al. 1999). Therefore conference call is an important disclosure medium to mitigate information asymmetry between managers and investors, and investors actively react to the information disclosed during conference calls (Matsumoto et al. 2011).

These prior studies examine the effect of conference calls primarily by observing cumulative daily returns around conference call days (e.g. Frankel et al. 1999) or intra-day price change during the regular hours trading period 9:30 – 16:00 (e.g. Matsumoto et al. 2011). However, the conference call literature largely overlooks investors' reaction outside of the regular hours, also called the after-hours period. It is important to examine the market reaction to conference calls in after-hours because conference calls gradually shift from regular hours to after-hours in recent years (as shown in the subsequent section), and trading environment as well as investors' behaviors are significantly different in after-hours than that in regular hours (Barclay and Hendershott 2003). This means that the existing findings for the effect of conference calls in regular hours may not apply the same way in

after-hours. Therefore, how the market reacts to after-hours conference calls in time appears as the intriguing question.

Whereas the US major stock exchanges handle trades during regular hours, investors can still trade in after-hours through Electronic Communication Networks (ECNs),[1] which become increasingly competent in facilitating trades between investors relative to traditional exchange NASDAQ (Fink et al. 2006). However, distinct from trading in regular hours, trading in after-hours is characterized by low liquidity and noisy information environment (Barclay and Hendershott 2004). Therefore, due to the evidently high trading costs associated with after-hours trading and the lack of liquidity to infer valuable information from trading backed by private information, after-hours trading show very limited level of price discovery (Barclay and Hendershott 2003). Hence, conference calls in after-hours may lead to significantly less price discovery than calls in regular hours.

On the other hand, as firms tend to disclose material information more often in the after-hours period (Levi et al. 2016), recent studies find that when earnings are announced in after-hours, after-hours trading contributes to the price discovery process to a great extent (Jiang et al. 2012). These findings suggest that material information significantly changes the way investors behave in after-hours. While these studies largely focus on the role of earnings announcements in that process, the literature is silent on the role, if any, of

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[1] ECNs are a type of alternative trading system (ATS) registered with the Security and Exchange Commission (SEC) as broker-dealers that trade listed stocks and other exchange-traded products to facilitate trading of financial products outside traditional stock exchanges. For a list of current ECNs, see the following link provided by SEC (https://www.sec.gov/foia/docs/atslist.htm). To directly trade with an ECN, one must be an ECN subscriber which is typically a broker-dealer or certain institutional trader. Individual investors must have an account with a broker-dealer subscriber to place an order on an ECN indirectly. ECNs internally match limit orders placed by investors and an execution occurs when the price of a buy order and the price of a sell order intersect. Trading through ECNs does not require intermediary, and investors can trade through ECNs not only in after-hours, but also during regular hours. ECNs allow traders to post or hit firm quotes in after-hours very much the same way as during the regular hours

after-hours conference calls. Given that conference calls convey valuable signals to investors (Price et al. 2012; Brockman et al. 2015), trading price changes in after-hours may reflect the value implication of after-hours conference calls. Therefore, the first research question of this paper is whether and to what extent after-hours conference calls contribute to the price discovery process beyond the effect of earnings announcements.

If such contribution exists, a follow-up question is to what extent the information in after-hours conference calls is reflected in trading returns during the after-hours period relative to returns during the subsequent regular hours period. This question is motivated by Berkman and Truong (2009) who argue that event studies typically assigning event date as day 0 are incorrect when the event happens in the after-hours. It suggests the importance of assessing the collective and relative market reaction in after-hours and that in the following regular hours to understand when the market reaction takes place for after-hours event. This question is especially important given the fact that institutional investors largely dominate the after-hours trading and individual investors are generally discouraged to participate in the after-hours market (Barclay and Hendershott 2003). If information in after-hours conference calls is mostly realized in returns through after-hours trading, it implies that after-hours trading selectively benefit institutional investors. This has important implication for regulators to decide when firms should make their disclosure for all investors to react to the information. Therefore, I use tone as value relevant signal in after-hours conference calls (Price et al. 2012; Brockman et al. 2015) to explore when the information is reflected in share prices by comparing its correlation with returns in the after-hours period and that in the regular hours period next day.

Additionally, I question whether and how the market reacts differently to after-hours conference calls and to regular hours conference calls? Different from the prior question which focuses on after-hours conference calls and the associated contemporaneous and drift returns, this questions compares the cross-sectional difference in the contemporaneous market reaction to conference calls held in the two different trading periods. Provided that after-hours trading is dominated by institutional investors (Barclay and Hendershott 2003) and that institutional investors tend to make more informed trades (Boehmer and Kelley 2007), market reaction to after-hours conference calls would be different from that to calls in regular hours where there are more non-institutional investors, who tend to show lack of reaction (Cohen et al. 2002). Large variation in the timing of conference calls and distinct investor bases in the two trading periods allows me to explore the relation between market reaction and the level of investors being informed.

I find that after-hours conference calls improve price discovery and facilitate trading in the after-hours period. This suggests that after-hours conference calls provide material information and investors benefit from trading on the information in after-hours, regardless of the significantly high costs associated with after-hours trading. In addition, I show that the information signals conveyed in after-hours conference calls is almost fully reflected in the returns through after-hours trading, with nearly no drift left in the subsequent regular hours. This result highlights the importance of trading immediately in the after-hours period following after-hours conference calls. Last, I present evidence that investors react to conference calls to a larger extent if they are in after-hours than in regular hours, and this difference is attributable to more informed trades in after-hours presumably

by institutional investors. It indicates that investors' characteristic plays an important role in determining market reaction in after-hours.

This paper contributes to the literature in three ways. First, it extends the current line of research in the after-hours trading literature. Barclay and Hendershott (2003) document very limited price discovery through after-hours trading. However, Jiang et al. (2012) and Levi et al. (2016) provide evidence that after-hours earnings announcements contribute to the price discovery in the after-hours period to a great extent. I identify an additional important information source in after-hours, namely conference calls, which improve the price discovery role of after-hours trading beyond the effect of after-hours earnings announcements.

Second, I provide supporting evidence in the importance of accounting for after-hours trading when studying the effect of after-hours events (Berkman and Truong 2009). By research design which uses different returns windows to assess the importance in the timing of trading, I find that the information value of after-hours conference calls is largely reflected in the after-hours period. Moreover, this finding has important implications for regulators to decide whether after-hours trading selectively favor the group of investors who can participate in the market, as individual investors are normally discouraged to engage in after-hours trading.

Finally, this paper expands the understanding of the investors' characteristics in after-hours in determining market reactions. Barclay and Hendershott (2003) document high level of informed trading per trade in after-hours, but also observe low level of market reaction overall in the after-hours market. I reconcile with this finding by showing that higher level of informed trading is positively correlated with larger market reaction in after-

hours when material information is disclosed in the after-hours period. The results indicate the importance in the existence of material information in after-hours to allow informed traders to initiate large reaction.

The rest of the paper is organized as follows: Section 2.2 reviews relevant literature and develops hypotheses; Section 2.3 discusses the sample and methodology; Section 2.4 presents the findings on the effect of conference calls in after-hours; and Section 2.5 concludes.

2.2 Literature Review and Hypotheses Development

Conference calls emerge because the informativeness of financial statements is low (Tasker 1998) and the demand for information by investors is strong (Bushee et al. 2003). As a result, conference calls have become an important voluntary disclosure medium routinely held by firms following earnings announcement to communicate with analysts and investors (Matsumoto et al. 2011). Analyst benefit from conference calls in providing more accurate earnings forecasts (Bowen et al. 2002), which in turn help investor incorporate useful information. Investors also directly react to the information disclosed in conference calls (Frankel et al. 1999; Kimbrough 2005). The importance of conference calls is partially due to the regulatory mandate brought by Regulation Fair Disclosure (Reg FD) which essentially makes conference calls publicly available simultaneously to all investors (Bushee et al. 2004). These findings suggest that conference call is an important disclosure channel to reduce information asymmetry and improve disclosure informativeness.

Building on the prior literature on the effect of conference calls which mostly focus on returns (based on intra-day price or price at close) during regular hours (e.g. Matsumoto et al. 2011), I examine share price reaction to conference calls in the period of after-hours

trading. There are two reasons to separately examine the effect of conference calls in after-hours apart from that in regular hours. First, the trading environment and investors' behavior are distinct between in regular hours and in after-hours, as shown in the following discussion. Therefore, conclusions based on observation in regular hours may not apply in after-hours, and only by focusing on after-hours trading can I draw inferences about the effect of overlooked after-hours conference calls. Second, different from earnings announcements which mostly happen in after-hours, conference calls are roughly evenly distributed between in regular hours and in after-hours, as discussed in the subsequent statistic descriptive. This large variation in the timing of conference calls enables me to examine whether and why market reaction to the same type of information is different in the two trading periods (regular hours versus after-hours).

Comparing with regular hours trading (RHT), after-hour trading (AHT) is shown to be significantly less liquid, incur larger trading costs (Barclay and Hendershott 2004), and involve substantially higher price volatility, as well as less efficient price discovery (Barclay and Hendershott 2003). All these evidence suggest that the benefit of trading in the after-hours period based on the information available in after-hours may not be enough to compensate for the high trading cost of doing so. As a result, investors are largely discouraged to participate in the after-hours market, which in turn hinder the process of information being incorporated into the trading price, and result in limited price discovery in after-hours.

Considering that conference calls often disclose non-financial and unstructured "soft" information (Mayew and Venkatachalam 2009), which can be open to interpretation and difficult to quantify, evident lack of liquidity and large spread in the after-hours market

make it even more difficult for investors to have benchmarks for value implication of the disclosed information. Furthermore, for investors and analysts who actively participate in the conference calls, they form private information by combining answers by management to their asked questions with their own information set, and therefore benefit from the private information when the information is subsequently incorporated into the price (Mayew et al. 2013). In this sense, even investors obtain private information using publicly disclosed information in conference calls, the benefit of the private information is not realized since other investors may have not discovered this information, which may cause lack of market reaction during the after-hours conference call period. Therefore, share prices may not react to the information in after-hours conference calls as they proceed and consequently such conference calls may not contribute to the price discovery in the after-hours period.

On the other hand, while prior literature document very limited trading activity and price discovery through AHT in general, researchers find it increasingly important to account for AHT when material news are released in after-hours. As earnings being announced in after-hours become the norm for most firms, the timing of investors' reaction to after-hours earnings announcements has shifted from market open trades in early years (Francis et al. 1992; Greece and Watts 1996) to trades in the same after-hours period in more recent years (Jiang et al. 2012). Jiang et al. (2012) also document that AHT is heightened in days when earnings are announced and there is significant price discovery immediately after earnings announcements in after-hours. Additionally, Jain et al. (2015) and Levi et al. (2016) show supporting evidence of the role of AHT in improving price discovery when earnings are announced in after-hours.

The importance of AHT emerges as AHT window and trading venue expand (Barclay and Hendershott 2003), as well as corporate disclosure take place more often in after-hours over the past years (Berkman and Truong 2009). Figure 2.1 shows that conference calls gradually shift from regular hours to after-hours in recent years, which is similar to the trend observed in Jiang et al. (2012) for the change in the timing of earnings announcements. Given that conference calls provide additional useful information to investors (Matsumoto et al. 2011), and that managers see after-hours conference calls as an important disclosure medium following earnings announcements (Bushee et al. 2004), after-hours conference calls may also contribute to the price discovery in the after-hours period, in addition to the effect of earnings announcements. Analyzing AHT following after-hours conference calls has important implications for investors to decide whether to trade in after-hours to exploit the information value of after-hours conference calls, and for researchers to identify and differentiate market reaction to after-hours conference calls through AHT and through RHT. Therefore, the first hypothesis is stated as follows in the alternative form:

H1: After-hours conference calls contribute to the price discovery in the after-hours period.

[Insert Figure 2.1 here.]

Building on the first hypothesis, I further examine to what extent information in after-hours conference calls is reflected in share prices in the after-hours period to highlight the difference in the value implication of conference calls between AHT and RHT. To

quantify the information conveyed in conference calls, researchers use the tone measure developed by Loughran & McDonald (2011). Tone signal in conference calls is shown to be significantly correlated with market reaction over and above the effect of earnings news both in the contemporaneous period and in the post-announcement period (Price et al. 2012). Also, the effect of conference calls concentrate in the Q&A session relative to the management presentation session (Matsumoto et al. 2011), with even larger effect for analysts' tone than for managers' tone (Brockman et al. 2015). These evidence indicate that conference calls convey material information, and the tone measure captures the useful information.

However, trading in after-hours is overlooked in these previous studies which mostly examine the market reaction in the three-day (-1, +1) or two-day (0, +1) window around conference call days without differentiating AHT and RHT (Price et al. 2012; Kimbrough and Louis 2011; Lee 2015). Some other studies focus on intraday price and volume change only during regular hours (Frankel et al. 1999; Matsumoto et al. 2011) but not for after-hours. Since a large portion of conference calls take place in after-hours, to accurately measure price changes and abnormal volume, the event study needs to be adjusted to account for trading in the after-hours period (Berkman and Truong 2009). In other words, it is important to understand the timing and scale for which the value of the information in after-hours conference calls is realized.

There are two reasons why it is important. First, considering AHT only accounts for 3% of total trading volume (Jiang et al. 2012), if the value of the information disclosed in after-hour is largely realized in this period, then it implies that the vast majority of investors miss the timing of trading on the valuable information. This involves a similar

issue for the passage of Reg FD that firms used to selectively provide conference calls access to a small group of investors an analysts. Along with the fact that individual investors are normally discouraged to participate in the after-hours market, this has important implication for regulators to decide whether after-hours trading selectively benefit investors who can participate in this market and how should firms choose the time to disclose their information. Second, while post-earnings-announcement drift (PEAD) for earnings news and conference call tone is well documented in the literature (Livnat and Mendenhall 2006; Kimbrough 2005), little is known about to what extent the returns are realized in the after-hours where earnings or conference calls take place, and to what extent the returns drift to the subsequent regular hours. Therefore, for the purpose of quantifying the information value of after-hours conference calls realized in the after-hours period and comparing with that in the subsequent regular hours period, I investigate the following hypotheses:

H2.1: Trading based on the signals in after-hours conference calls generate positive returns.

H2.2: Trading returns based on the signals in after-hours conference calls concentrate in the after-hours period as opposed to in the subsequent regular hours period.

If information in conference calls is reflected in trading price both in after-hours and in regular hours as conference calls take place, the next question would be whether market reaction in these two trading periods is different, and if different why it is the case. These questions address the difference in the trading behaviors by investors between AHT

and RHT. A notable difference between after-hours market and regular hour market is that trading in after-hours is mostly dominated by institutional investors (Barclay and Hendershott 2003; 2008; Jain et al. 2015). Consistent with the view that institutional investors are more informed than other investors (Boehmer and Kelley 2007), Barclay et al. (2003) find that trading in after-hours through ECNs is more likely to be information driven rather than liquidity driven. In addition. Jiang et al. (2012) also provide anecdotal evidence that firms prefer releasing earnings news in after-hours and rely on the trading in after-hours to convey information to the general public, which suggests that trades in after-hours are more informed. These findings indicate that institutional investors play a dominant role in AHT, and their trades in after-hours are likely to be informed.

Assuming that institutional investors are better at collecting and understanding value-relevant news than other investors, when useful information in conference calls arrive in after-hours, these institutional investors would more effectively trade on the information (Nofsinger and Sias 1999). As a result, market reaction would be larger during the after-hours conference call period where institutional investors make informed trades than market reaction during regular hours conference call period where more non-institutional investors show lack of reaction to the information (Cohen et al. 2002). Moreover, based on prior literature that trading by institutional investors tend to be more informed (Boehmer and Kelley 2007), I expect that larger market reaction to after-hours conference calls are attributable to more informed trading, which leads to the following hypotheses:

H3.1: Investors' reaction is larger for after-hour conference calls than for regular hour conference calls.

H3.2: larger market reaction to after-hours conference calls is attributable to more informed trading.

An important related question raised in the literature is that whether firms strategically choose the timing of disclosure (e.g. earnings announcement, conference calls), in regular hours versus in after-hours. Early literature suggest that firms tend to release earnings news in after-hours when earnings news are unfavorable (Patell and Wolfson 1982), and when management forecast provide greater shocks (Baginski et al. 1995). However, Doyle and Magilke (2009) find no evidence of strategic timing behavior by these firms after controlling for firm specific effects. In addition, Jiang et al. (2012) document that earnings announcements in after-hours has become a common practice for most firms and this timing choice is stable. The authors also provide direct evidence by interviewing firm executives and confirm that firms release earnings in after-hours primarily to allow investors more time to disseminate and evaluate the news information.

As for conference calls, Bushee et al. (2003) find little evidence that managers opportunistically choose the time to hold their calls. Consistent with the findings in the prior literature, firms in the sample of this paper keep holding conference calls in the same trading period (BMO, RHT, or AMC) 87% of the time, and for those few (89 out 1820) firms change conference call timing, their earnings surprise and contemporaneous returns are not significantly different across different trading periods when conference calls take place. This suggests that the timing of conference calls is not likely to be affected by the nature of news and expected price reaction. Therefore, in this paper I do not treat the timing of firms' disclosure (earnings announcement and conference calls) as an endogenous choice, but focus on the value implication of the information disclosed in conference calls.

2.3 Sample selection and research design

2.3.1 Sample selection

Conference call transcripts are from SeekingAlpha.com, which is one of the largest investment theme website in the US and it records extensive amount of conference call transcripts for more than 3000 firms from 2006 to present. I extract transcript identifier (firm ticker, conference call publication date) and text content from the website using a Python script, and calculate the tone of conference calls in management discussion session and in Q&A session by managers and by analysts separately as informative signals of conference calls (Price et al. 2012; Brockman et al. 2015). Tone is measured based on the word dictionary designed by Loughran and McDonald (2011). I collect a total of 25,007 conference call transcripts with available identifier and tone values from June 2010 to December 2013.[2]

Using a similar approach, I extracted the end time and length (accurate at second level) of conference calls from EarningsCast.com, which provide audio tracks of conference calls from 2010 to present.[3] Conference call start time is implied by the end time and time length of the call. I also take ticker and conference call date from the website as identifiers. The total number of conference calls with valid time stamp is 23,160 from June 2010 to December 2013, among which 14,310 conference calls can be match with

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[2] This choice of date range is constrained by my access to other data used in this paper. EarningsCast.com, which provide conference call actual time stamp, starts in June 2010. Trade and Quote (TAQ), which provide trading information at second level, is available only until December 2013.

[3] SeekingAlpha.com also provide time information about the calls but it is the publication time by the website, which they claim to publish conference call transcripts 6 hours after the call has finished for a 1 hour call. Because of this delay of publication time from when the calls actually took place, I use time stamp from EarningsCast.com, which provides accurate information about when the calls are held.

SeekingAlpha sample.[4] To simplify the discussion for trading in after-hours versus in regular hours and focus on their differences, I limit the sample to conference calls with both start time and end time in the same after-hours/regular hours period, which result in 11,538 observations for the sample.

I collect quarterly earnings announcement date and time, as well as analysts forecast and actual earnings numbers from IBES. I match earnings announcements and subsequent conference calls by ticker and date on the condition that conference calls are held on the same day or the next day of earnings release, as firms normally hold conference calls closely after earnings announcements. After merging with IBES, 10,804 observations at firm-quarter level remain in the sample for subsequent analyses.

Trading information during regular hours and after-hours are from Trade and Quote (TAQ) database. Following Levi et al. (2016), I define trading periods in the following four time windows: before market opens (BMO 04:00 - 09:30), regular hours trading (RHT 09:30 -16:00), after market close (AMC 16:00 - 20:00), and overnight trading (OVR 20:00 - 04:00 +1).[5] I categorize the timing of earnings announcement into one of the four trading periods if the announcement time falls into the corresponding time window. In order to have a clear comparison in terms of the timing of conference calls, I identify

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[4] Incomplete match between the two websites is mostly due to different firm coverage.

[5] "+1" represents the next trading day. Trading hours vary across different stock exchanges, but for the main exchanges (e.g. NASDAQ/Island and NYSE/Acra) after-hours are 4:00 – 9:30 and 16:00 – 20:00. The BMO and AMC after-hours trading periods are longer in this paper than trading periods defined in some prior literature (e.g. Jiang et al. (2012) define BMO as 07:00 – 09:30 and AMC as 16:00 – 18:30). I choose wider after-hours boundary not only because exchanges have been expanding after-hours periods (Barclay and Hendershott (2003), but also because wider window allows me to classify more conference calls in after-hours with both the start and end time in the time range as normal conference call takes 1 – 2 hours. I also define after-hours following the same criteria in Jiang et al. (2012), and all results in this paper hold the same with 17% less observations for conference calls in after-hours.

conference calls in RHT if both start and end time of conference call are in the 09:00 - 16:00 window. In the same way, I assign conference calls to BMO (AMC) period if both start and end time of conference call are in the window 04:00 - 09:30 (16:00 - 20:00). After-hour trading (AHT) period is defined as the combination of AMC and the next day BMO periods, with trading in OVR period being ignored because of extremely thin trading activity in this period and firms rarely announce earnings and hold conference calls in this period.

[Insert Table 2.1 here.]

Table 2.1 presents the time distribution among trading periods for earnings announcements and for conference calls. Panel A confirms the previous finding that vast majority (about 90%) of earnings announcements take place in after-hours, with about half of them (48%) in BMO period and the other half (43%) in AMC period (Jiang et al. 2012). As for the timing of conference calls, Panel B shows that about half of them (48%) take place in regular hours and the other half (13% + 37%) in after-hours, within which most conference calls are held in AMC period. Panel C presents different timing relations between earnings announcements and corresponding conference calls conditional on when earnings are released. When earnings are released in BMO period, about three-quarters of conference calls are held in the following RHT period and the rest are mainly in the same BMO period. For those few earnings announcements made in RHT period, nearly all conference calls also take place in the same RHT period. When earnings are announced in AMC period, about three-quarters of conference calls happen in the same AMC period, and the rest are mostly held in the following RHT period. This statistics shows that there

is reasonable variation in the timing of conference calls conditional on the timing of earnings announcement, which enables me to conduct cross-sectional tests examining the difference in the effect of conference calls in different trading periods.

Because the focus of this paper is to analyze the timing of conference calls (e.g. in after-hours versus in regular hours), I isolate the effect of conference calls from that of earnings announcements by restricting the sample to the firm-quarters with earnings announcements in after-hours only, and compare the effect of conference calls between those take place in the same AHT period as their corresponding earnings announcements and those in the subsequent RHT period after earnings are announced in after-hours. For example, for earnings announcements in BMO period, I compare conference calls in the same BMO period with conference calls in the following RHT period. Similarly, for earnings announcement in AMC period, I compare conference calls in the same AMC period with calls in the next trading day RHT period.[6] This procedure generates the main sample for the analyses in this paper, which has 5134 (1085 BMO versus 4049 RHT) conference call observations for earnings announcements in BMO period, and 4279 (3319 AMC versus 960 RHT) conference call observations for earnings announcement in AMC period.

2.3.2 Research design

Figure 2.2 presents the window specification for regular hours and after-hours in a timeline, and the structure and steps I take to investigate the three hypotheses in this paper. It also

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[6] I exclude the comparison between conference calls in BMO period versus those in RHT period for earnings announcements in AMC sample because BMO conference calls after AMC earnings announcements rarely happens (only 2% of the time).

shows how returns and trading volume are measured for earnings announcements and conference calls in regular hours and in different after-hours periods. All returns measures are calculated based on the last trading price in the specified period and the last available trading price immediate before the specified period. For example, when calculating earnings announcement associated after-hours returns with earnings released in AMC period, I use the last trading price before 20:00 minus the last trading price before 16:00 divided by the last trading price before 16:00.[7]

[Insert Figure 2.2 here.]

To test the relation between conference calls and price discovery in after-hours, I focus on the weighted price contribution (WPC) measure, which has been used in the finance literature (Cao et al. 2000; Barclay and Hendershott 2003). This measure captures the fraction of new information incorporated in to stock price in a short period relative to a longer full period, which is defined as:

$$WPC_i = \sum_{s=1}^{S}[(\frac{|Ret_s|}{\sum_{s=1}^{S}|Ret_s|})(\frac{Ret_{i,s}}{Ret_s})]$$

Where $Ret_{i,s}$ is the logarithmic return during period i (announcement to the end of the period) for stock s, and Ret_s is the logarithmic return from announcement to the subsequent regular hours close. The first term of WPC is the weighting factor for each stock. The second term is the relative contribution of the after-hours return during period i

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[7] When the last trading price before the specified period is not available for the day, I use the last trading price one business day before the examined day as benchmark.

comparing to the total return in the announcement-to-close period. For example, if earnings result is announced in BMO period, I calculate returns for the window starting from the earnings announcement time to the end of the BMO period (announcement to 09:30) and for the full trading period (after-hours + regular hours) starting from the announcement time to the subsequent close time (announcement to -16:00). The aggregate WPC for BMO period is weighted based on the absolute value of full period return. Similarly, for earnings announced in AMC period, WPC in the individual periods following the announcement (AMC, BMO, and RHT) are calculated using return during announcement - 20:00, 4:00 - 9:30 (next trading day), and 9:30 - 16:00 (next trading day) separately, and the full period return is measured from announcement to 16:00 on the next trading day close.

To test the effect of conference calls, the effect of earnings announcements needs to be controlled for, as conference calls closely follow earnings announcement in the same AHT period or in next day RHT period. Since most firms announce earnings results either in BMO or AMC period, I first separate the full sample into two subsamples based on the timing of earnings announcements. Then I test the difference in WPC across the trading periods (BMO/AMC versus RHT) between firms having conference calls in the same AHT period as earnings are announced and firms having conference calls in the next day RHT period. In this this approach, the timing of earnings announcements are the same (in the AHT period), but only the timing of conference calls differ (in AHT vs. in RHT). In the similar way WPC is measured, I also construct a measure of trading intensity, which is the fraction of number of trades across the trading periods (BMO/AMC versus RHT) relative to the overall number of trades in the announcement-to-close period. The expected results

are higher WPC and trading intensity in AHT period when conference calls also take place in the same AHT period after controlling for the effect of earnings announcements.

I also test the effect of conferences calls in price discovery during after-hours using the model specification following Jiang et al. (2012):

$$WPC_{AHT} = \alpha + \beta_1 * CC\_AHT + \beta_2 * ANALYSTS + \beta_3 * Abs\_SURPRISE$$
$$+ \beta_4 * VOLUME + \beta_5 * FIRM\_SIZE + \beta_6 * N\_ANNOUNCE$$
$$+ \beta_7 * AMC + \beta_8 * NYSE + \beta_9 * N\_REC\_REV + \beta_{10} * IOR + \varepsilon \qquad (1)$$

Where: *WPC*$_{AHT}$ is the buy-and-hold return during AHT period (announcement to the end of the period) relative to the buy-and-hold announcement-to-close return, weighted by the absolute value of the buy-and-hold announcement-to-close return. *ANALYSTS* is the number of analysts following the firm. *Abs_SURPRISE* is the absolute value of earnings surprise, measured as actual earnings minus analysts median forecast, scaled by stock price at the fiscal quarter end. *VOLUME* is the log of average of trading dollar volume during one month before earnings announcement. *FIRM_SIZE* is the log of the firms' total market capitalization. *N_ACCOUNCE* is total number of earnings announcements on the same day. *AMC* is equal to 1 if earnings are announced in AMC period, otherwise equal to 0 if earnings are announced in BMO period. *NYSE* is equal to 1 if the firm is listed on NYSE, otherwise equal to 0 if the firm is listed on NASDAQ. *N_REC_REV* is the number of analyst recommendation revision during the three day period around earnings announcements. *IOR* is the latest available proportional ownership owned by institutional investors before conference calls.

There are three changes to the original model in Jiang et al. (2012). First, I use absolute value of earnings surprise as opposed to raw value to capture the notion of the

amount of information instead of the direction of information. Second, I add two additional

independent variables (*N_REC_REV* and *IOR*) in the model, since Li et al. (2015) find that

analyst recommendation revisions closely around earnings announcements are

significantly associated with price reactions, and Barclay and Hendershott (2003; 2008)

document that AHT is mostly dominated by institutional traders. These two variables serve

as controls for the level of activities by analysts and by institutional investors. Third and

most importantly, I add the dummy variable *CC_AHT* to the model, which is the variable

of interest in this paper and the expected result is coefficient on this variable being positive.

To examine Hypotheses 2.1 and 2.2 for the information value of conference in

after-hours versus in regular hours, I apply the following regression model, as tone of

conference calls convey additional information to the market beyond earnings news and

analysts' tone has even larger impact than managers' tone (Price et al. 2012; Brockman et

al. 2015):

$$
\begin{aligned}
Ret_i = \alpha &+ \beta_1*SURPRISE + \beta_2*CC\_AHT + \beta_3*CC\_AHT*SURPRISE \\
&+ \beta_4*Tone\_MD + \beta_5*Tone\_QA\_M + \beta_6*Tone\_QA\_A \\
&+ \beta_7*CC\_AHT* Tone\_MD + \beta_8*CC\_AHT*Tone\_QA\_M \\
&+ \beta_9*CC\_AHT*Tone\_QA\_A + \varepsilon \qquad\qquad (2)
\end{aligned}
$$

Where: *Ret$_i$* represents one of the returns immediate following earnings

announcements in after-hours (*Ret$_{AHT}$*), in regular hours (*Ret$_{RHT}$*), and in the two periods

combined full period (*Ret$_{All}$*). The difference in the coefficients on the same independent

variables using different dependent variables (returns) reflect the difference in returns

realized in different trading periods (AHT vs. RHT), and also address the importance of

when to trade on the information for investors. CC_AHT is the defined as a dummy variable with value of 1 indicting conference calls taking place in after-hours, and 0 in regular hours. Tone is defined as positive words minus negative words using word dictionary from (Loughran and McDonald 2011) in management presentation session (MD), answers by managers in Q&A session (QA_M), and questions by analysts in Q&A session (QA_A) separately, and scaled by the total number of words in the corresponding session. Earnings surprise (*SURPRISE)* and tone values are adjusted to the scale from -0.5 to +0.5 to facilitate results interpretation, in a way that the coefficients represent the trading strategy of buying (selling) of top (bottom) decile of the corresponding variables following Hollie et al. (2012).[8] The interaction term *CC_AHT*SURPRISE* measures to what extent the existence of conference calls help the market incorporate earnings news, as conference calls facilitate provide supplementary information about firms performance. The interaction terms between *CC_AHT* and tone values test whether the information conveyed in conference calls is useful for trading strategies based on the tone values to generate positive returns in after-hours. The expected results of interest are positive coefficient for β_3 and β_8, and β_9 when dependent variable is *Ret$_{AHT}$*, and no significant results for these three coefficient when dependent variable is *Ret$_{RHT}$*.[9]

In addition, to tests how taking after-hours trading into account would change the understanding about the value implication of conference calls, I also compare returns in

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[8] SURPRISE and tone values are first assigned into decile values (1 to 10), and then subtracted by 1 from the decile values, followed by division by 9 and subtraction by 0.5. In the end, these variables are transformed into sequential numbers in the range between -0.5 and 0.5.

[9] Regressions in this analysis all control for industry and time fixed effects based on Fama-French 48 industry classification and year-quarter dummies. Standard errors are corrected by clustering at firm and year-quarter level.

after-hours and returns based on traditional approach which only focus on trading in the regular hours or trading in the full period (after-hours plus regular hours). Based on the information signals using earnings surprise in earnings announcements, managers' tone, and analysts' tone in conference calls, I construct daily updated trading portfolios that long stocks in the top decile signal and short stocks in the bottom decile, and hold the position only for the after-hours period or only for the regular hours period. Trading performance is accumulated over the sample period (June 2010 to December 2013) to compare the overall difference in the profitability of the returns between trading in after-hours and trading in regular hours.[10] The expected result is positive difference in return profitability between trading in after-hours and trading in regular hours.

To test Hypotheses 3.1, I compare the difference in the market reactions to conference calls between calls in after-hours and calls in regular hours, and hold the timing of earnings announcements constant. I use three market reaction proxies and they are all measured in abnormal form: absolute values of returns (*Diff_Abs_Ret*), trading frequency proportion (*Diff_Fre_Prop*), and trading dollar volume proportion (*Diff_Vol_Prop*), during the period from conference call start to conference call end. Consistent with previous returns measures, returns during conference call period is based on the last trading price in the conference call window and the last trading price before the conference call start time. Trading frequency (dollar volume) proportion are trading frequency (dollar volume) during the conference call start-to-end window relative to the overall trading frequency (dollar volume) in the trading period where conference calls take place (after-hours / regular hours).

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[10] If multiple firms release earnings news or hold conference calls on the same day, average return over such firms is used to measure the trading performance for the day.

I use scaled trading frequency and volume measure to control for the distinct difference in total trading frequency/volume between AHT and RHT. Benchmark values are the averages of returns, trading frequency proportion, and trading dollar volume proportion during the same conference call start-to-end period for the ten days around but excluding the conference call day. Differences in the market reactions between that measured on the conference call date and the ten days' average is used for comparison between conference calls in after-hours and other calls in regular hours. Since prior literature suggests that trading in after-hours is dominated by institutional investors who are presumably better at collecting and understanding information (Barclay and Hendershott 2003; 2008; Jain et al. 2015), the expected result is that market reaction is larger for conference calls in the after-hours period than for conference calls in the regular hours period.

In Hypotheses 3.2, I explore the reason for the difference in market reactions to conference calls in after-hours versus in regular hours, and investigate the relation between the level of market reaction and the level of informed trading. I use buy and sell imbalance (Lee and Ready 1991) during the conference call start-to-end period as the measure for the level of informed trading. This measure is widely used in the finance literature and it captures the difference in the total number of buy initiated trades and that of sell initiated trades, with the assumption that uninformed traders make equal level of buy trades and sell trades, whereas informed traders only trade in one direction (buy or sell).[11] Therefore higher level of difference between buys and sells scaled by the total number of trades

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[11] A trade is identified as buy (sell) initiated trade if the trading price is higher (lower) than the mid-point of bid and ask price. Following Henker and Wang (2006), I use 1 second lag to match price and quote. If the trading price is equal to the mid-point, then this trade is buy (sell) initiated trade if it is an up (down) tick from the last trade.

represent higher level of informed trades. This measure is formulized as follows and denoted as *Imbalance*. I also construct an alternative measure for the level of informed trading called *Imbalance_Seq*, which measures the difference in the number of trades in buy trends and that in sell trends. *Imbalance_Seq* is similar to *Imbalance* in that it measures different level of buys and sells, but different from *Imbalance*, it also captures the continuity of the trading sequence with higher value of *Imbalance_Seq* representing higher level of consecutive informed trades.

$$Imbalance = \frac{Abs(Buys - Sells)}{Total\ number\ of\ trades}$$

$$Imbalance\_Seq = Abs(Ave(\#\ of\ trades\ in\ buy\ trends) - Ave(\#\ of\ trades\ in\ sell\ trends))$$

I regress the market reaction variables on the imbalance measure, the dummy variable *CC_AHT* for conference calls in after-hours, and their interaction term, along with a set of control variables in the following regression, where *Market Reaction* is one of the three variables *Diff_Abs_Ret*, *Diff_Fre_Prop*, and *Diff_Vol_Prop*. Higher level of informed trading facilitate trading activity in after-hours and drive share prices moving towards the value implied by underlying information. Therefore, the expected result is β_3 being positive and significant in the following regression:

$$
\begin{aligned}
Market\ Reaction = {} & \alpha + \beta_1*CC\_AHT + \beta_2*Imbalance + \beta_3*CC\_AHC*Imbalance \\
& + \beta_4*ANALYSTS + \beta_5*Abs\_SURPRISE + \beta_6*VOLUME \\
& + \beta_7*FIRM\_SIZE + \beta_8*N\_ANNOUNCE + \beta_9*AMC \\
& + \beta_{10}*NYSE + \beta_{11}*N\_REC\_REV + \beta_{12}*IOR \\
& + \beta_{13}*Abs\_Tone\_QA\_M + \beta_{14}*Abs\_Tone\_QA\_A + \varepsilon \qquad (3)
\end{aligned}
$$

Table 2.2 shows descriptive statistics for the variables used in this paper presented in the order of the analyses. Panel A shows that there is no naturally positive or negative returns following after-hours earnings announcement in after-hours trading period and in the subsequent regular hours trading period. Panel B presents that the firms in the sample tend to be larger firms, with more analysts following, and with high institutional ownership.[12] Mean value of 0.47 for *CC_AHT* also shows that there is significant variation in the timing of conference calls. Panel C describes the tones values in conference calls. On average, tone in management presentation is more optimistic than tone in managers' answers in Q&A session, whereas tone in analysts' questions is more pessimistic. This observation is consistent with prior literature (Brockman et al. 2015). Panel D compares market reaction on conference call day and 10 days around it during the same conference call start-to-end period. On all three dimensions (absolute returns, trading frequency, and trading volume), market reaction on conference call date is significantly higher, which support the view that conference calls convey material useful information. Panel D also shows that buy-and-sell imbalance is high on conference call date during the start-to-end period.

[Insert Table 2.2 here.]

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[12] This is not surprising given that the sample firms in this paper are those covered by SeekingAlpha.com and EarningsCast.com. And these two websites presumably tend to cover firms with higher interest by investors.

2.4 Empirical result

Table 2.3 Panel A replicates findings in Jiang et al. (2012) and shows the difference between WPC in AHT period and WPC in RHT period when earnings are announced in BMO period (BMO sample) and in AMC period (AMC sample). For the BMO sample, WPC in BMO period is 0.36, which means that on the earnings announcement day, trading in BMO period following earnings announcement contribute 36% of the total announcement-to-close returns. The counterparty returns in RHT period contribute to the announcement-to-close returns in aggregation of 64%. On the other hand, for the AMC sample, WPC in AMC period, WPC in the subsequent BMO period, and WPC in the subsequent RHT period each accounts for 36%, 14%, and 52% respectively relative to the full announcement-to-close returns. The magnitude of WPC in after-hours and in regular hours are close to the numbers reported in Jiang et al. (2012), and they will be used as reference points to examine the effect of conference calls in improving price discovery in AHT period.

Table 2.3 Panel B presents the difference in WPC between firms holding conference calls in the same AHT period as earnings are announced and firms holding conference calls in the subsequent RHT period following earnings announcements in AHT period. This comparison controls for the timing of earnings announcements as earnings are all announced in after-hours, and focuses on the difference in the effect of conference calls between those in AHT period and others in RHT period. For the BMO sample, when conference calls are also in the same BMO period, WPC in BMO period is 0.42 and WPC in RHT period is 0.58. Compared with 0.35 and 0.65 when conference call are held in the subsequent RHT period, the difference between WPC in BMO (RHT) period is

significantly higher (lower) for firm-quarters having conference calls in the BMO period than those having conference calls in the subsequent RHT period. The difference of 0.07 in WPC is economically large given the baseline values is 0.36 for earnings announcements in BMO period. This result suggests that price movement is more concentrated in the period where firms hold conference calls. In other words, conference calls contribute to the price discovery not only in RHT period but also in AHT period.

Similar results are found for the AMC sample. When conference calls are also in the AMC period, WPC in AMC (RHT) period is significantly higher (lower) than when conference calls are in the subsequent RHT period. The difference in WPC in AMC period and WPC in RHT period are 0.25 and -0.23, which are even larger in economical magnitude compare to the BMO sample. This is consistent with the notion that trading in AMC period is normally less informed than trading in BMO period (Barclay and Hendershott 2003), however, when new material information arrive, AHT tend to be informed (Jiang et al. 2012) resulting in larger price discovery when conference calls take place in AMC period.[13]

With the same methodology, Table 2.3 Panel 3 presents results on the difference in trading intensity between firms having conference calls and earnings announcements in the same AHT period and firms holding conference calls in the subsequent trading period (RHT) after earnings are released (AHT). Trading intensity is calculated as the number of trades in the trading period divided by the total number of trades in the announcement-to-close window. Consistent with price contribution results, for the BMO sample, trading intensity is 0.53% higher for firms having conference calls in the same BMO period as

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[13] I set the returns value to zero if there is no trading during the period, especially for returns in after-hours, to avoid selection bias and overstated results.

earnings are released than firms having conference calls in RHT period. The difference is in the opposite direction when comparing trading intensity in RHT period. Note that trading in AHT normally accounts for only about 3% of total trading day volume (Barclay and Hendershott 2003), 0.53% difference is a nontrivial change. For the AMC sample, I find similar result that when conference calls are in the same period with earnings announcement, trading intensity is significantly higher. Once again, the difference in trading intensity is higher for the AMC sample than for the BMO sample.

[Insert Table 2.3 here.]

I also examine the role of conference calls in facilitating price discovery in after-hours controlling for other factors in a regression model based on Jiang et al. (2012). Dependent variable WPC_{AHT} is the price contribution portion in the AHT (AMC or BMO) period. The first column of table 2.4 shows the baseline regression result without considering the effect of conference calls, which shows generally consistent pattern with Jiang et al. (2012). The second column presents the same regression result adding a dummy variable (CC_AHT) indicating whether conference calls take place in the same after-hours period. The coefficient on CC_AHT is significantly positive, as well as R-square increases from near 7% to above 8% and coefficient on the intercept is no longer significant after the conference call dummy is added as additional factor. Moreover, since the literature suggest that after-hours trading is affected by analysts and institutional investors (Li et al. 2015; Barclay and Hendershott 2003), I add the number of analyst recommendation revisions and institutional ownership to the base model to reexamine the conference calls effect. The third column shows that, after considering activities by analysts and institutional investors,

the effect of conference calls still holds. These results support hypothesis 1 that conference calls in after-hours contribute to the price discovery of AHT.[14]

[Insert Table 2.4 here.]

Table 2.5 presents results for Hypothese 2.1 and 2.2 and quantify the value of conference calls in providing information during after-hours, and compares the return profitability between trading in AHT period and in RHT period based on earnings surprise from earnings announcements and tone sentiment from managers and analysts during the conference calls. Note that earnings surprise and tone values are adjusted to -0.5 to +0.5 scale, so that coefficient on these variables represent returns on trading strategies that long (short) the top (bottom) decile of the corresponding variable. The *CC_AHT* dummy variable is interacted with SURPRISE to capture the notion that conference calls provide supplementary information and help investors to interpret earnings news.

The first column of the table shows that, when returns in after-hours following earnings announcements is used as dependent variable,[15] the coefficient on earnings surprise is significantly positive, as well as the coefficient for the interaction term between earnings surprise and conference call dummy. This result suggests that earnings news is incorporated into price in the after-hours once earnings are announced, and moreover, if

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[14] In Untabulated test, I separate the full sample into two subsamples based on the level of analyst recommendation revisions and institutional ownership, the findings in Table 2 remain largely the same for each of the two subsamples. This again add additional evidence to the result that higher level of WPC associated with conference calls is not just driven by analyst activities or involvement by informed traders.

[15] I use raw returns as dependent variable, since there is no reliable market or industry returns in after-hours as benchmark.

the following conference call also takes place in the after-hours, it improves the process where earnings information is incorporated into price. In other words, from the point of view of return profitability, trading on after-hours earnings news in the after-hours period would generate 4% returns, and one can generate additional 1.7% returns if the conference call following earnings announcement also take place in the after-hours period. These are economically meaningful returns given that the trading strategy has a short holding period (only in after-hours), yet such returns in after-hours are largely overlooked in the prior literature.

I add tone sentiments conveyed in conference calls as additional information signals to the model. The three tone values measure tone by managers in presentation session, tone by managers in Q&A session, and tone by analysts in Q&A session. They are interacted with the conference call dummy variable *CC_AHT* to measure market reaction to conference call signals in the after-hours. The second column in Table 2.5 shows that coefficient for managers' tone and analysts' tone are positive and significant, as well as for the *CC_AHT*SURPRISE* variable. No significant result for managers' tone in presentation session and higher coefficient on analysts' tone than managers' tone are consistent with existing literature (Price et al. 2012; Brockman et al. 2015). The findings suggest that conference calls convey additional information beyond earnings news in after-hours, and such information is absorbed in price through AHT. Again, the magnitude of returns based on managers' and analysts' tone in Q&A session are non-trivial (1.3% and 1.6% respectively) and R-square improves from 9.06% to 11.56% after adding the tone variables. This add additional evidence to the importance of conference calls in AHT.

To compare the difference in AHT and RHT when earnings announcements and conference calls take place in after-hours, I replace the dependent variable in model (2) as returns in regular hours, which are measured as returns from immediate before regular hours to the end of the regular hours (Ret_{RHT}), and from the start of regular hours to the end of the regular hours ($Ret_{Open-Close}$). I use the same set of independent variables with earnings surprise and tone values. The results in the third and fourth columns show substantial drop in the coefficient for all the previously significant variables (S*URRISE, SURPRISE*CC_AHT*, managers' and analysts' tone in Q&A session). The difference for the coefficients between using after-hours returns (Ret_{AHT}) as dependent variable and using regular hours returns ($Ret_{RHT}/Ret_{Open-Close}$) as dependent variable is positive and significant. This suggests that, when earnings announcements and conference calls happen in after-hours, new information from these two sources are incorporated into price mostly in the after-hours period, and this leaves little information from conference calls and a small portion of information from earnings announcements to be reflected in the subsequent RHT period. In other words, AHT not only facilitate price discovery during after-hours, but also efficiently incorporate additional useful information. This has important implication for investors to trade on information from after-hours conference calls in the after-hours period, whereas waiting until the next regular hours to trade would miss a meaningful scale of returns (about 2% on earnings news, 1% on managers' tone in Q&A session, and about 1.5% on analysts' tone in Q&A session).

In the same spirit of the previous test, in order to assess the difference between considering and not considering after-hours returns in evaluating trading performance, I also use the full period returns (Ret_{ALL} and $Ret_{Close-Close}$, which covers both after-hours and

regular hours), as dependent variable and compare the coefficients with those using after-hours returns as dependent variable. The last two columns of Table 2.5 show that, when full period returns are used as dependent variables, the coefficient values are consistent with those in prior literature (Price et al. 2012; Brockman et al. 2015). However, when considering the returns during the after-hours within the full period (from after-hours announcement/conference call to regular hours close), a majority of the value from the information signals is realized in the after-hours period before the subsequent RHT period. In align with the argument by Berkman and Truong (2009), this paper provides additional evidence that the traditional way of measuring market reaction in academic research, treating AHT equally as RHT or only focusing on RHT, underestimate the effect of AHT and overestimate the effect of RHT when conference calls are held in after-hours.

[Insert Table 2.5 here.]

For the trading returns based on the useful information signals from earnings announcements and conference calls during after-hours, regular hours, and the full period (including after-hours and regular hours), Figure 2.3 presents the returns performance for each of the trading strategies over time. From the top to the bottom, each row shows the realized returns based on earnings surprise, managers' tone in Q&A session, and analysts' tone in Q&A session, respectively. Note that only observations with the signal value in the top or the bottom decile constitute the subsample underlying the graphs. I mimic the long (short) trading strategy by taking the returns (returns multiplied by -1) from the observations in the top decile (bottom decile) of the information signal. Each graph shows

the accumulated returns in the after-hours, in the regular hours, or in the full period separately. The first graph of each of the three rows show that trading returns in after-hours based on information signals consistently outperform trading returns in regular hours and in the full period in a large extent. Comparing to returns in after-hours, the returns in regular hours and in the full period is relatively neutral or dwarfed. This results once again suggest the importance of taking after-hours trading and returns into account, and highlight the high profitability of trading immediate in after-hours following after-hours earnings announcements and/or after-hours conference calls.

Table 2.6 Panel A presents the difference in the effect of conference calls between in after-hours and in regular hours. Recall that the *CC_AHT* dummy variable represents conference calls being held in after-hours (in AMC or BMO period). These two groups of conference calls have earnings announcement in the same after-hours period, but only differs in the timing of the conference call. For absolute returns, it is 1.19% if conference calls are in after-hours and 0.66% if conference calls are in regular hours. The difference is 0.53% and significant. I find consistent results with trading frequency proportion measure (5.99% more in after-hours) and trading dollar volume proportion measure (3.04% more in after-hours). These differences are economically significant as well, given the fact that trading volume in AHT period on average accounts for only about 3% of all trading day volume (Barclay and Hendershott 2003). Overall, the results indicate that investors' reaction to conference calls is larger when conference calls take place in after-hours, compared to when conference calls take place in regular hours. This is consistent with the notion in the literature that informed investors dominate after-hours market (Barclay and

Hendershott 2003; 2008; Jain et al. 2015) and trading in AHT period show a great extent of informed trading when material information arrives (Jiang et al. 2012).

Figure 2.3 also provide evidence on the difference in the effect of conference calls in terms of trading returns in different periods. The second and the third graph in each row compare the returns profitability using the three information signals. In all three cases with different trading signals, return in after-hours is higher when conference calls take place in after-hours than conference calls occur in the regular hours, and the difference is consistent and economically significant. Because the testing specification restricts earnings announcement happening in the after-hours for both samples, the observed difference is likely attributable to different disclosed information in after-hours conference calls or different trading behaviors by investors in after-hours compared to that in regular hours. In either case, it has implications for understanding to what extend the market incorporate conference calls' information in after-hours.

To investigate whether larger market reaction is due to different trading behavior in after-hours than that in regular hours, Panel A of table 2.6 also present the level of informed trades for conference calls in after-hours and for calls in regular hours measured during the start-to-end period of conference calls. It shows that trading during the after-hours conference call period exhibits a significantly higher level of buy and sell imbalance than conference calls in regular hours. Given that after-hours trading is mostly dominated by institutional investors, this finding suggests that larger market reaction to after-hours conference calls is related to higher level of informed trades by institutional investors. Table 2.6 Panel B shows significant and positive correlation between the three market reaction variables and the buy-and-sell imbalance measure, with the alternative buy-and-

sell measure showing positive but less significant correlation. Overall, the results support that higher level of informed trades is associated with larger market reaction.

I also examine this relation in regression test to control for other factors related to the nature and magnitude of unexpected information, and Table 2.6 Panel C presents the results. The variable of interest is the interaction term between *CC_AHT* and the imbalance proxies measuring the level of informed trading. It shows that coefficient for this term is positive and significant in all six specifications using the three market reaction variable and the two imbalance proxies as dependent variables. After controlling for factors that represent information quantity from earnings news (*Abs_SURPRISE*), tone sentiment from conference calls (*Abs_Tone_QA_M*, *Abs_Tone_QA_A*), along with other types of information (*N_ANNOUNCE* and *N_REC_REV*), the regression result suggests that higher level of informed trading contribute to the larger market reaction to after-hours conference calls.

[Insert Table 2.6 here.]

2.5 Conclusion

While early literature largely suggests that the overall trading activity in after-hours has limited impact on price discovery and hardly reflect investors' reaction, recent studies document that trading in after-hours show a great extent of price discovery and large investors' reaction when material information is released (Jiang et al. 2012; Levi et al. 2016; Jain et al. 2015). Since conference call is one of the major disclosure venues between managers and investors, given the fact that a significant portion of conference calls take

place in the after-hours period, I examines the incremental effect of after-hours conference calls in facilitating price discovery in after-hours, and its value implication across the two trading periods, after-hours and regular hours. In addition, I investigate the difference in the market reaction to calls in after-hours versus calls in regular hours, and its relation to investors' trading behaviors.

I find that conference calls contribute to price discovery and facilitate trading activity even when conference calls are held in after-hours. I also provide evidence that the value implication of the informative signals of after-hours conference calls is largely realized in the after-hours period, and that leaves almost no return drift in the subsequent regular hours period. In addition, I find that investors react to conference calls to a greater extent if conference calls are held in after-hours than for calls in regular hours, and this difference is associated with the difference in the level of informed trading between the two trading periods.

This paper contributes to the literature in the follow ways. First, it contribute to the underexplored after-hours literature (Jiang et al. 2012; Levi et al. 2016) by showing that after-hours conference calls convey material information and facilitate price discovery in the perceived inefficient after-hours market (Barclay & Hendershott 2004). Second, I contribute to the event study literature (Berkman and Truong 2009) by documenting that information in after-hours conference calls is realized in the after-hours period to a significant extent, which without careful consideration one could lead to incomplete and misleading inferences. Third, I expand the understanding of the relation between investors' behavior and market reaction (Berkman and Truong 2009) by employing

significant variation in the conference call timing and showing that larger market reaction is associated with higher level of informed trade in after-hours.

2.6 Tables

Table 2.1 Time distribution among trading periods

Panel A: Time distribution for earnings announcement

Time of Announcement	#	%
04:00–09:30 BMO (1)	5,227	48.38%
09:30–16:00 RHT (2)	794	7.35%
16:00–20:00 AMC (3)	4,625	42.81%
20:00–04:00 OVR (0)	158	1.46%
Total	10,804	100%

Panel B: Time distribution for conference call

Time of Call	#	%
Start and end btw 04:00–09:30 BMO (1)	1,372	12.70%
Start and end btw 09:30–16:00 RHT (2)	5,186	48.00%
Start and end btw 16:00–20:00 AMC (3)	4,046	37.45%
Other time (0)	200	1.85%
Total	10,804	100%

Panel C: Time distribution of earnings announcement conditional on earnings announcement

Time of Announcement	Time of Call	#	%
(1)	(0)	30	0.28%
	(1)	1,085	10.04%
	(2)	**4,049**	**37.48%**
	(3)	63	0.58%
(2)	(0)	53	0.49%
	(1) +1 day	15	0.14%
	(2)	71	0.66%
	(3)	**655**	**6.06%**
(3)	(0)	113	1.05%
	(1) +1 day	233	2.16%
	(2) +1 day	960	8.89%
	(3)	**3,319**	**30.72%**
Total (without OVR)		10,646	98.54%

Table 2.2 Descriptive Statistics by analysis

Panel A: Returns following Earnings Announcement in Different trading periods (for Table 2.3)

Variable	N	Mean	Std Dev	Min	25th Pctl	Median	75th Pctl	Max
$Ret_{BMO-BMO}$	5121	0.000	0.039	-0.554	-0.008	0.000	0.010	0.293
$Ret_{BMO-RHT}$	5121	0.000	0.050	-0.480	-0.023	-0.001	0.022	0.403
$Ret_{BMO-ALL}$	5121	0.000	0.064	-0.646	-0.029	-0.001	0.028	0.346
$Ret_{AMC-AMC}$	4276	-0.002	0.056	-0.869	-0.015	0.000	0.013	0.471
$Ret_{AMC-BMO}$	4276	0.001	0.034	-0.482	-0.006	0.000	0.010	0.600
$Ret_{AMC-RHT}$	4276	0.002	0.117	-0.281	-0.029	0.000	0.030	6.716
$Ret_{AMC-ALL}$	4276	-0.001	0.086	-0.611	-0.044	-0.001	0.045	0.743

Ret denotes for returns and the first part of the subscript represents the time period earnings are announced (BMO and AMC), and the second part of the subscript indicates the period for which returns are calculated. See Figure 2.2 for time references for each return period.
Price contribution for the period immediate after earnings announcement is calculated as the return during the AHT period (announcement to the end of the period) relative to the announcement-to-close return, whereas price contribution for the subsequent period(s) is calculated as the return during the subsequent period relative to the announcement-to-close return.

Panel B: Weighted Price Contribution and Firm Characteristics (for Table 2.4)

Variable	N	Mean	Std Dev	Min	25th Pctl	Median	75th Pctl	Max
WPC	9197	0.02	0.05	-0.87	0.00	0.01	0.04	0.68
CC_AHT	9197	0.47	0.50	0	0	0	1	1
ANALYSTS	9197	12.3	7.9	1.0	6.0	11.0	17.0	49.0
SURPRISE	9197	0.0007	0.0077	-0.0639	-0.0004	0.0005	0.0022	0.0532
VOLUME	9197	16.9	1.8	9.9	15.7	17.1	18.2	23.6
FIRM_SIZE	9197	14.8	1.6	9.6	13.8	14.9	15.9	20.2
N_ANNOUNCE	9197	52.8	40.3	1.0	17.0	47.0	86.0	150.0
AMC	9197	0.46	0.50	0.00	0.00	0.00	1	1
NYSE	9197	0.60	0.49	0	0	1	1	1
N_REC_REV	9197	0.23	0.56	0.00	0.00	0.00	0.00	10.00
IOR	9197	0.58	0.35	0.00	0.32	0.71	0.85	1

WPC is the price contribution scaled by the absolute value of the announcement-to-close return. The variable of interest is CC_AHT, which is set to 1 if conference call takes place in after hours. Other control variables are defined as follows. ANALYSTS is the number of analysts following the firm. Abs_SURPRISE is the absolute value of earnings surprise, measured as actual earnings minus analysts median forecast, scaled by stock price at the fiscal quarter end. VOLUME is the log of average of trading dollar volume during one month before earnings announcement. FIRM_SIZE is log of the firms' total market capitalization. N_ANNOUNCE is number of earnings announcements on the same day. AMC is equal to 1 if earnings are announced in AMC period, otherwise is equal to 0 if earnings are announced in BMO period. NYSE is equal to 1 if the firm is listed on NYSE, otherwise is equal to 0 if the firm is listed on NASDAQ. N_REC_REV is the number of analyst recommendation revision during the three day period around earnings announcements. IOR is the proportional ownership owned by institutional investors.

Panel C: Tone Values during Conference Calls and Returns in Different Trading Periods (for Table 2.5)

Variable	N	Mean	Std Dev	Min	25th Pctl	Median	75th Pctl	Max
Ret_{AHT}	9393	-0.001	0.053	-0.869	-0.013	0.000	0.015	0.479
Ret_{RHT}	9393	0.001	0.087	-0.480	-0.025	0.000	0.025	6.716
$Ret_{Open-Close}$	9393	-0.001	0.049	-0.352	-0.024	-0.001	0.022	0.357
Ret_{ALL}	9393	-0.001	0.075	-0.646	-0.035	-0.001	0.034	0.743
$Ret_{Close-Close}$	9393	0.001	0.076	-0.641	-0.033	0.000	0.036	0.748
Tone_MD	9368	0.014	0.014	-0.070	0.005	0.014	0.023	0.066
Tone_QA_M	9393	0.009	0.013	-0.076	0.001	0.009	0.017	0.101
Tone_QA_A	9220	-0.006	0.014	-0.090	-0.015	-0.007	0.002	0.099

See Figure 2.2 for time references for each return period. $Ret_{Open-Close}$ ($Ret_{Close-Close}$) is the alternative measure for Ret_{RHT} (Ret_{ALl}) and is calculated using the current day open (last day close) and the current day close trading prices. Tone values are defined as positive words minus negative words, divided by total number of words in management presentation session (MD), answers by managers in Q&A session (QA_M), and questions by analysts in Q&A session (QA_A).

Panel D: Market Reaction and Buy-and-Sell Imbalance during Conference Call Start-to-End Period (for Table 2.6)

Variable	N	Mean	Std Dev	Min	25th Pctl	Median	75th Pctl	Max
Abs_Ret_{CC}	9393	1.26%	2.12%	0.00%	0.12%	0.60%	1.59%	87.01%
$Ave\_Abs\_Ret_{CC}$	9393	0.35%	0.33%	0.00%	0.11%	0.29%	0.50%	3.76%
Diff_Abs_Ret	9393	0.91%	2.09%	-3.76%	-0.04%	0.24%	1.16%	87.01%
Fre_Prop_{CC}	9393	15.98%	15.50%	0.00%	6.25%	12.77%	21.00%	100.00%
Ave_ Fre_Prop	9393	10.69%	8.29%	0.00%	5.35%	10.10%	14.31%	94.29%
Diff_Fre_Prop	9393	5.29%	13.34%	-52.67%	-1.47%	1.56%	7.94%	88.00%
Vol_Prop_{CC}	9393	12.96%	13.47%	0.00%	3.32%	10.52%	18.16%	100.00%
Ave_Vol_Prop	9393	8.66%	8.01%	0.00%	1.72%	8.39%	13.00%	96.93%
Diff_Vol_Prop	9393	4.30%	11.46%	-65.93%	-0.99%	1.33%	6.93%	100.00%
Imbalance	6036	0.156	0.154	0	0.049	0.109	0.211	1
Imbalance_Seq	6061	0.655	0.884	0	0.190	0.429	0.828	24.100

See Figure 2.2 for time references in the period where absolute value of returns, trading frequency proportion, and trading dollar volume proportion are measured. The measures with proportion are trading frequency/dollar volume during the conference call start-to-end period relative to the trading frequency/dollar volume in the full period where conference calls are held. Variables with subscript represents returns, trading frequency, and trading dollar volume during the conference call start to end period. Variables with names start with Ave represents the average value of the calculated measure over the ten days around but excluding the conference call date during the same conference call start to end period. Variables with names start with Diff means the difference of the measure between conference call date and the average of the ten days around the call date.

Imbalance is the absolute value of the difference between the number of buy initiated trades and the number of sell initiated trades, scaled by the total number of trades following Lee and Ready (1991). Imbalance_Seq is the absolute value of the difference between the number of trades in buy trends and the number of trades in sell trends.

Table 2.3 The effect of conference calls in price discovery and trading intensity

Panel A: Weighted Price Contribution (WPC) in different trading periods

	Trading Period			
	Announcement to 09:30	Announcement to 18:30	7:00 to 9:30	9:30 to 16:00
WPC for BMO announcement				
	0.36			0.64
WPC for AMC announcement				
		0.36	0.14	0.52

Panel B: WPC in different trading periods, conditional on the timing of conference calls

	Trading Period			
	Announcement to 09:30	Announcement to 18:30	7:00 to 9:30	9:30 to 16:00
WPC for BMO announcement				
CC BMO (1)	0.42			0.58
CC RHT (2)	0.35			0.65
Difference (1) – (2)	**0.07 *****			**-0.07 *****
WPC for AMC announcement				
CC AMC (3)		0.41	0.14	0.48
CC RHT (2)		0.16	0.13	0.71
Difference (3) – (2)		**0.25 *****	0.01	**-0.23 *****

Panel C: Trading intensity in different trading periods, conditional on the timing of conference calls

	Trading Period			
	Announcement to 09:30	Announcement to 18:30	7:00 to 9:30	9:30 to 16:00
Trading Intensity for BMO announcement				
CC BMO (1)	0.0092			0.9908
CC RHT (2)	0.0038			0.9962
Difference (1) – (2)	**0.0053 *****			**-0.0053 *****
Trading Intensity for AMC announcement				
CC AMC (3)		0.0179	0.0084	0.9737
CC RHT (2)		0.0022	0.0013	0.9965
Difference (3) – (2)		**0.0157 *****	**0.0071 *****	**-0.0227 *****

*, **, *** Denote significance at the $p < 0.10$, $p < 0.05$ and $p < 0.01$ levels, respectively.

Panel A shows Weighted price contribution (WPC) in AHT period (including BMO and AMC) and RHT period, for firms announcing earnings in BMO period (BMO sample) and firms announcing earnings in AMC period (AMC sample). WPC is calculated as:

$$WPC_i = \sum_{s=1}^{S}\left[\left(\frac{|Ret_s|}{\sum_{s=1}^{S}|Ret_s|}\right)\left(\frac{Ret_{i,s}}{Ret_s}\right)\right]$$

Where $Ret_{i,s}$ is the buy-and-hold return during period i (announcement to the end of the period) for stock s, and Ret_s is the buy-and-hold announcement-to-close return.

Panel B presents difference in WPC in different trading periods between firm-quarters having conference calls in the same AHT period as earnings release and those having conference calls in the next RHT period.

Panel C presents difference in trading intensity in different trading periods between firm-quarters having conference calls in the same AHT period as earnings release and those having conference calls in the next RHT period. Trading intensity is measured as number of trades during the period divided by the total number of trade in the announcement-to-close window.

Table 2.4 The effect of conference calls in price change in after-hours

$$WPC_{AHT} = \alpha + \beta_1 \times CC\_AHT + \beta_2 \times ANALYSTS + \beta_3 \times Abs\_SURPRISE + \beta_4 \times VOLUME$$

$$+ \beta_5 \times FIRM\_SIZE + \beta_6 \times N\_ANNOUNCE + \beta_7 \times AMC + \beta_8 \times NYSE$$

$$+ \beta_9 \times N\_REC\_REV + \beta_{10} \times IOR + \varepsilon$$

Intercept	0.012*	0.008	0.009
CC_AHT		**0.013***	**0.012***
ANALYSTS	0.000***	0.000***	0.000**
Abs_SURPRISE	0.472***	0.477***	0.473***
VOLUME	0.009***	0.010***	0.008***
FIRM_SIZE	-0.010***	-0.011***	-0.009***
N_ANNOUNCE	-0.000**	-0.000**	-0.000
AMC	0.011***	0.005***	-0.005***
NYSE	-0.007***	-0.004***	-0.004***
N_REC_REV			0.016***
IOR			-0.002
N	9197	9197	9197
R square	6.98%	8.14%	11.52%

*, **, *** Denote significance at the $p < 0.10$, $p < 0.05$ and $p < 0.01$ levels, respectively.

This table presents the regression results for the effect of conference call in facilitating price discovery in AHT period. Dependent variable WPC_{AHT} is the buy-and-hold return during AHT period (announcement to the end of the period) relative to the buy-and-hold announcement-to-close return, weighted by the absolute value of the buy-and-hold announcement-to-close return. The variable of interest is CC_AHT, which is set to 1 if conference call takes place in after hours. Other control variables are defined as follows. ANALYSTS is the number of analysts following the firm. Abs_SURPRISE is the absolute value of earnings surprise, measured as actual earnings minus analysts median forecast, scaled by stock price at the fiscal quarter end. VOLUME is the log of average of trading dollar volume during one month before earnings announcement. FIRM_SIZE is log of the firms' total market capitalization. N_ANNOUNCE is number of earnings announcements on the same day. AMC is equal to 1 if earnings are announced in AMC period, otherwise is equal to 0 if earnings are announced in BMO period. NYSE is equal to 1 if the firm is listed on NYSE, otherwise is equal to 0 if the firm is listed on NASDAQ. N_REC_REV is the number of analyst recommendation revision during the three day period around earnings announcements. IOR is the proportional ownership owned by institutional investors.

Table 2.5 Value of conference call when trading on the signals of conference calls

$$Ret_i = \alpha + \beta_1 \times SURPRISE + \beta_2 \times CC\_AHT + \beta_3 \times CC\_AHT \times SURPRISE$$

$$+ \beta_4 \times Tone\_MD + \beta_5 \times Tone\_QA\_M + \beta_6 \times Tone\_QA\_A$$

$$+ \beta_7 \times CC\_AHT \times Tone\_MD + \beta_8 \times CC\_AHT \times Tone\_QA\_M$$

$$+ \beta_9 \times CC\_AHT \times Tone\_QA\_A + \varepsilon$$

	Ret_{AHT}		Ret_{RHT}	Ret_{Open_Close}	Ret_{All}	Ret_{Close_Close}
Intercept	-0.001	-0.002	-0.005	-0.003	-0.005	-0.003
SURPRISE	0.040***	0.038***	0.022***	0.015***	0.060***	0.063***
CC_AHT	-0.001	-0.002	0.001	0.001	-0.001	-0.002
CC_AHT*SURPRISE	**0.017***	**0.015***	-0.005	0.004	**0.016**	**0.021***
Tone_MD		0.006***	0.002	0.002	0.009***	0.010***
Tone_QA_M		0.003*	0.006**	0.005**	0.009***	0.008***
Tone_QA_A		0.010***	0.009***	0.008**	0.020***	0.020***
CC_AHT*Tone_MD		-0.003	0.005	-0.001	-0.002	-0.003
CC_AHT*Tone_QA_M		**0.013***	-0.009	0.000	**0.012**	**0.012**
CC_AHT*Tone_QA_A		**0.016***	-0.001	0.001	**0.016***	**0.018***
Year, Quarter, Industry Fixed	Yes	Yes	Yes	Yes	Yes	Yes
Year, Quarter, Industry Clustered	Yes	Yes	Yes	Yes	Yes	Yes
N	9384	9186	9186	9186	9186	9186
R square	9.06%	11.56%	1.70%	3.43%	13.20%	14.20%

*, **, *** Denote significance at the $p < 0.10$, $p < 0.05$ and $p < 0.01$ levels, respectively.

This table presents regression results for the value of conference calls when investors trade based on signals in conference calls.

Tone is defined as positive words minus negative words, divided by total number of words in management presentation session (MD), answers by managers in Q&A session (QA_M), and questions by analysts in Q&A session (QA_A). All continuous independent variables are adjusted to scale from -0.5 to +0.5 to facilitate results interpretation, in a way that the coefficients represent the trading strategy of buying (selling) of top (bottom) decile of the corresponding variables.

Table 2.6 Market Reaction to Conference Calls AHT vs. RHT

Panel A: Difference in the effect of conference calls in after-hours and in regular hours

Variable	CC_AHT = 1	CC_AHT = 0	Difference
Diff_Abs_Ret	0.0119	0.0066	**0.0053*****
Diff_Fre_Prop	0.0847	0.0249	**0.0599*****
Diff_Vol_Prop	0.0592	0.0288	**0.0304*****
N	4398	4995	
Imbalance	0.261	0.129	**0.132*****
Imbalance_seq	1.032	0.558	**0.475*****
N[16]	1238	4798	

*** Denote significance at the $p < 0.01$ level.

This table shows the difference in the investors' reaction to conference calls when conference calls are in AHT period and when conference calls are in RHT period. CC_AHT: indicator equals 1 if conference call is in after hours (AHT), and 0 in regular trading hours (RHT).

Diff_Abs_Ret: difference between absolute return during conference call start-to-end period on conference call date and average of absolute returns during the same start-to-end period for the 10 trading days around but excluding the conference call date.

Diff_Fre_Prop: difference between trading frequency during conference call start-to-end period on conference call date relative to total trading frequency in the full AHT (RHT) period on conference call date and average of trading frequency during the same start-to-end period relative to total trading frequency in the full AHT (RHT) period for 10 trading days around but excluding the conference call date.

Diff_Vol_Prop: difference between trading dollar volume during conference call start-to-end period on conference call date relative to total trading dollar volume in the full AHT (RHT) period on conference call date and average of trading dollar volume during the same start-to-end period relative to total trading dollar volume in the full AHT (RHT) period for 10 trading days around but excluding the conference call date.

Panel B: Correlation between Market Reaction and Imbalance (Pearson below and Spearman above)

	Diff_Abs_Ret	Diff_Fre_Prop	Diff_Vol_Prop	Imbalance	Imbalance_seq
Diff_Abs_Ret		0.35***	0.34***	**0.07*****	**0.01**
Diff_Fre_Prop	0.32***		0.84***	**0.06*****	**0.02***
Diff_Vol_Prop	0.34***	0.78***		**0.05*****	**0.01**
Imbalance	**0.09*****	**0.21*****	**0.13*****		**0.53*****
Imbalance_seq	**0.05*****	**0.18*****	**0.08*****	0.60***	

*** Denote significance at the $p < 0.01$ level.

This table shows the correlation table among the three market reaction variable and the two imbalance measures. Imbalance is the buy-and-sell imbalance measure from Lee and Ready (1991). Imbalance_Seq is alternative imbalance measure, calculated as Abs(Ave(# of trades in buy trends)-Ave(# of trades in sell trends))

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[16] Smaller number of observations are due to data requirement that at least 50 trades during the conference call start-to-end period to calculate imbalance measure.

Panel C: Market reaction to conference calls in AHT and in RHT and its relation to informed trades

$$Market\ Reaction = \alpha + \beta_1 \times CC\_AHT + \beta_2 \times Imbalance + \beta_3 \times \mathbf{CC\_AHC \times Imbalance}$$
$$+ B_4 \times ANALYSTS + \beta_5 \times Abs\_SURPRISE + \beta_6 \times VOLUME$$
$$+ B_7 \times FIRM\_SIZE + \beta_8 \times N\_ANNOUNCE + \beta_9 \times AMC + \beta_{10} \times NYSE$$
$$+ B_{11} \times N\_REC\_REV + \beta_{12} \times IOR + \beta_{13} \times Abs\_Tone\_QA\_M$$
$$+ \beta_{14} \times Abs\_Tone\_QA\_A + \varepsilon$$

	Diff_Abs_Ret		Diff_Fre_Prop		Diff_Vol_Prop	
Intercept	0.0281***	0.0293***	0.0936***	0.0921***	0.1297***	0.1256***
CC_AHT	0.0085***	0.0082***	0.1455***	0.1553***	0.1398***	0.1349***
Imbalance	-0.0047**		-0.0340***		-0.0470***	
CC_AHT*Imbalance	**0.0063****		**0.1462****		**0.0326***	
Imbalance_seq		-0.0016***		-0.0073***		-0.0099***
CC_AHT*Imbalance _Seq		**0.0021****		**0.0256****		**0.0107****
ANALYSTS	0.0000	0.0000	0.0005**	0.0005**	0.0008***	0.0008***
Abs_SURPRISE	0.0177	0.0172	-0.0687	-0.0707	-0.1283**	-0.1269**
VOLUME	0.0014***	0.0014***	-0.0060***	-0.0059***	-0.0006	-0.0002
FIRM_SIZE	-0.0031***	-0.0031***	0.0021	0.0020	-0.0065***	-0.0067***
N_ANNOUNCE	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
AMC	0.0002	0.0002	-0.0637**	-0.0629***	-0.0384***	-0.0384***
NYSE	-0.0010**	-0.0012**	0.0104***	0.0105***	0.0114***	0.0110***
N_REC_REV	0.0023***	0.0024***	-0.0082***	-0.0081***	-0.0056***	-0.0055***
IOR	0.0026	0.0025***	0.0171***	0.0176***	0.0072**	0.0067*
Tone_QA_M	-0.0329	-0.0323	0.0329	0.0518	0.0155	0.1607
Tone_QA_A	0.0569**	0.0570**	0.0935	0.0918	0.2150*	0.1880
N	5946	5941	6029	5941	5946	5941
R square	10.08%	10.24%	28.34%	28.51%	22.83%	22.81%

*, **, *** Denote significance at the p <0.10, p < 0.05 and p < 0.01 levels, respectively.
This table presents regression results for the association between market reaction and the level of informed trading. Market reaction is one of the three variables: Diff_Abs_Ret, Diff_Fre_Prop, Diff_Vol_Prop. Imbalance is the buy-and-sell imbalance measure from Lee and Ready (1991). Imbalance_Seq is alternative imbalance measure, calculated as Abs(Ave(# of trades in buy trends)-Ave(# of trades in sell trends))

2.7 Figures

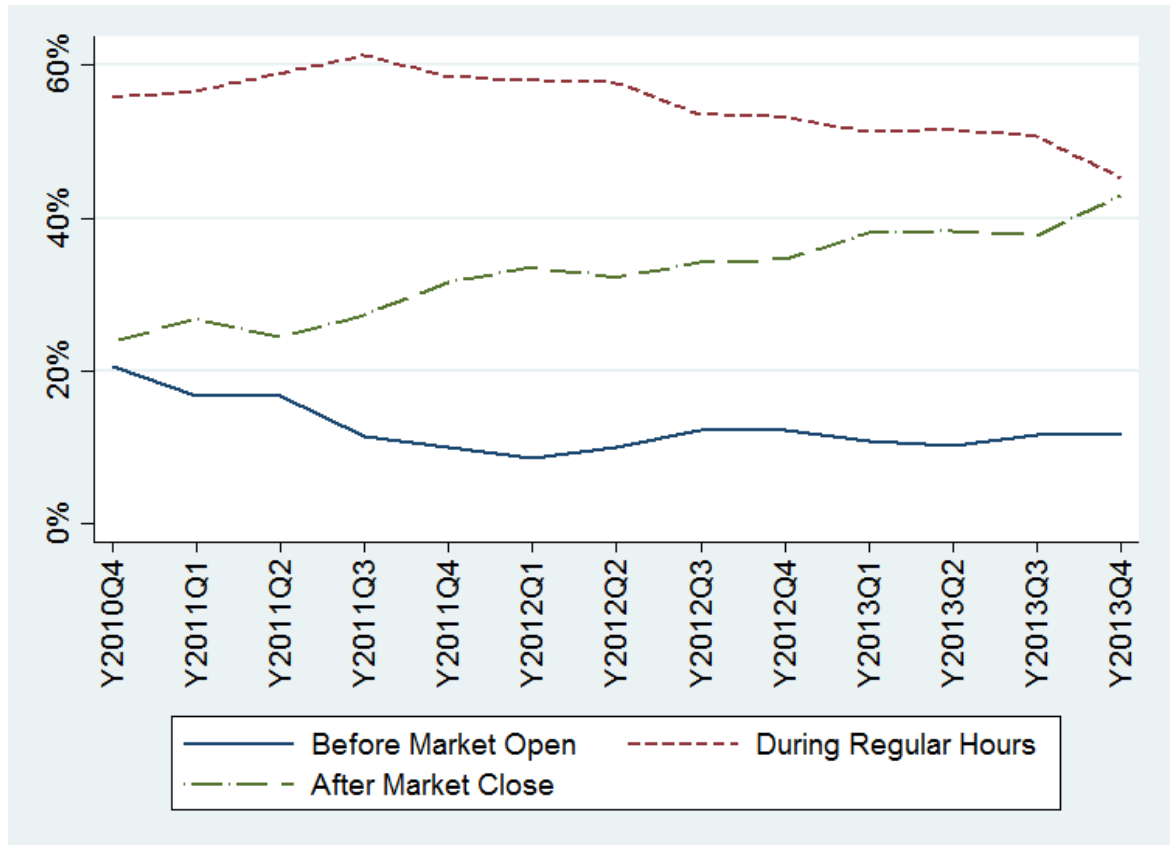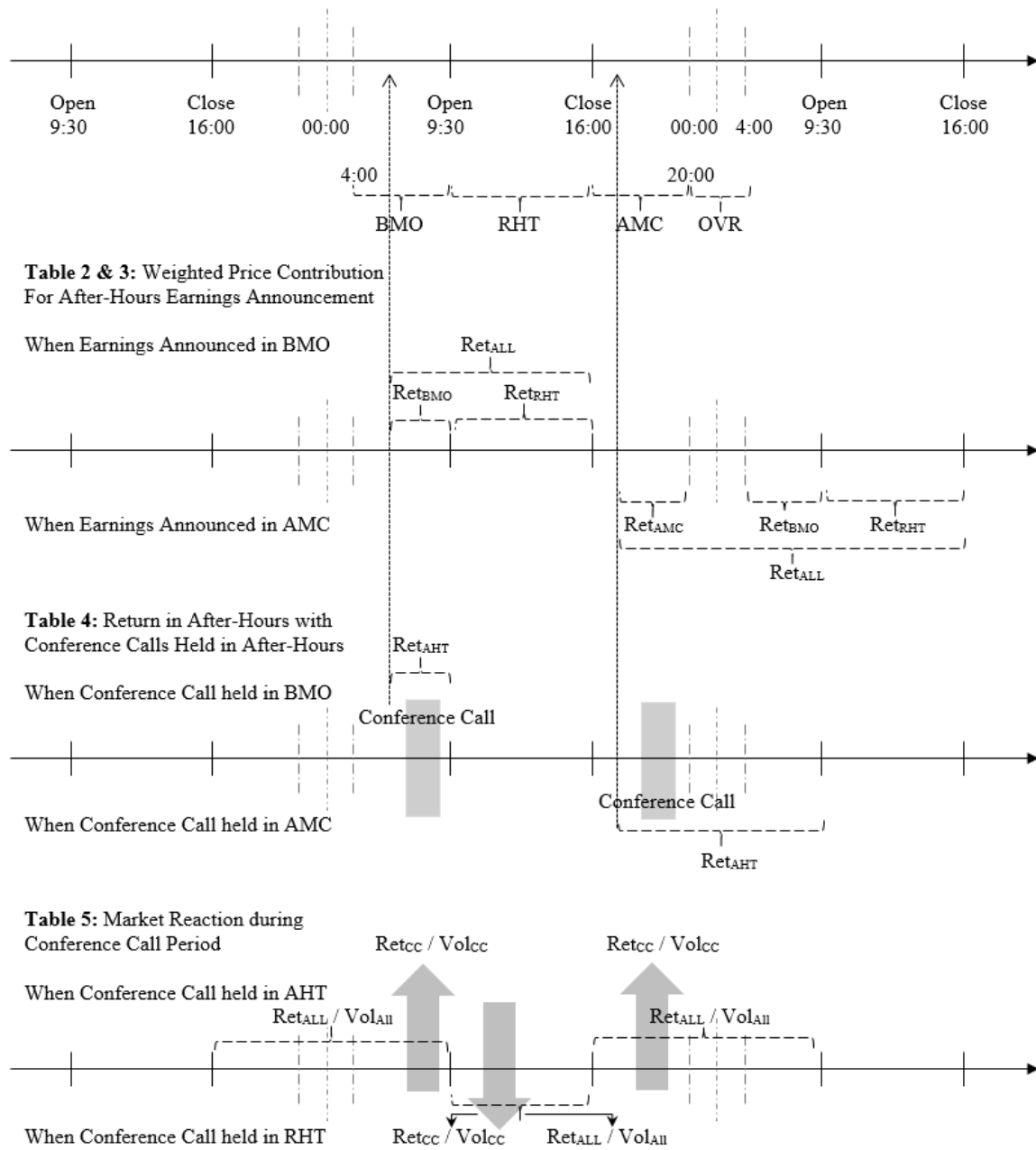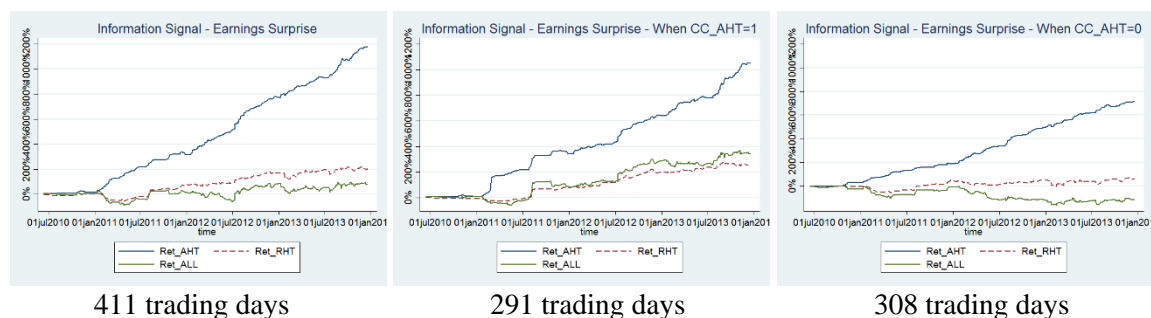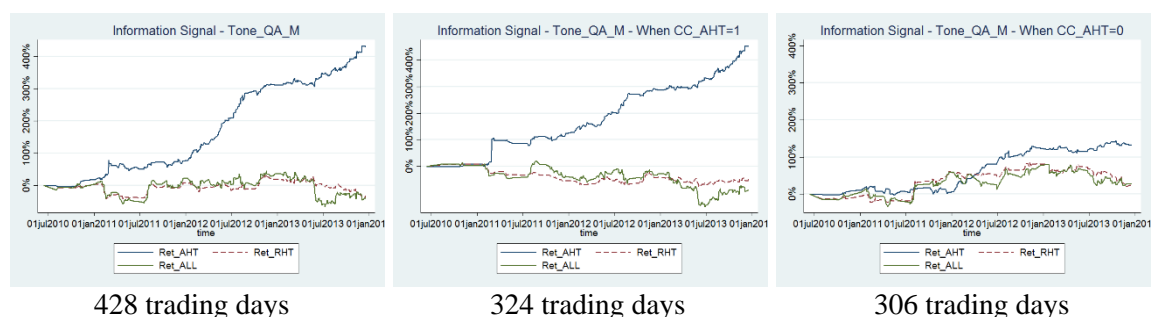**Figure 2.1 Proportion of Conference Calls in BMO, RHT, and AMC period**

Figure 2.2 After-Hours & Regular Hours Timeline

Figure 2.3 Returns in Different Windows following After-Hours Conference Calls

Returns based on earnings surprise

| 411 trading days | 291 trading days | 308 trading days |

Returns based on managers' tone in Q&A session of conference calls

| 428 trading days | 324 trading days | 306 trading days |

Returns based on analysts' tone in Q&A session of conference calls

| 418 trading days | 313 trading days | 306 trading days |
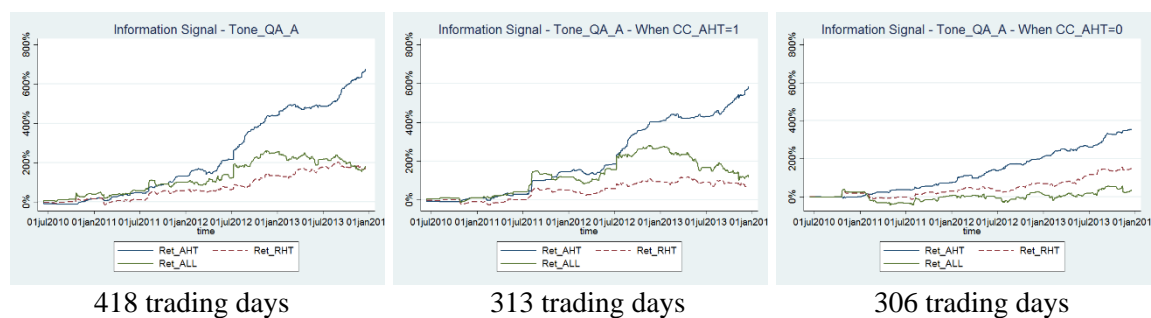
Chapter 3 Change in Qualitative Disclosure after Shareholder Litigation and the Role of News Media

3.1 Introduction

The debate over whether managers increase or decrease the level of disclosure to reduce litigation risk dates back to Skinner (1994) and Francis et al. (1994). While one side argues that more disclosure and early disclosure about negative news deter shareholder litigation (e.g., Skinner 1994; 1997; Field et al. 2005), the other suggests that the benefit of providing more disclosure is not enough to compensate for the cost of doing so (e.g., Francis et al.; Baginski et al. 2002; Cutler et al. 2016). Setting aside the contradicting findings in the literature, one consensus is that managers care about shareholder litigation risk and tend to adjust their disclosure behavior to reduce the risk (Core 1997; Cao and Narayanamoorthy 2011).

Securities laws provide the bases for shareholder litigation, and therefore regulate managers' disclosure behavior to protect shareholders' benefit. Arguably the two most important pieces of regulation that govern the management disclosure practice regarding securities fraud are the Rule 10(b)-5 of the Securities Exchange Act of 1934, and the Private Securities Litigation Reform Act of 1995. The first act prohibits managers from providing misleading or withholding material information to shareholders, and therefore serves as the legal foundation for shareholder litigations. The second piece of the regulation, on the other hand, enacts strict conditions for shareholders to file a litigation case to avoid frivolous lawsuits, and therefore provides managers with protections from making qualitative and forward-looking information while accompanied with meaningful cautionary statements.

However, due to the difficulties in accessing the materiality of disclosed information, identifying managers' intent to mislead or omit information, and establishing the causational relationship between the alleged misconduct and subsequent shareholder loss, it is not fully clear regarding qualitative disclosure and forward-looking statements when deciding if they are material and actionable. For example, even though qualitative disclosure is considered too soft to be material information, but SEC and the federal court warn that the tone of qualitative disclosure is still actionable (Palmiter 2008). Therefore, whether the PSLRA successfully protects managers from making voluntary disclosure in qualitative and forward-looking statements is in question. If it is not the case, managers would realize it when they get sued and adjust their disclosure practice to reduce the litigation risk for future.

Therefore, this paper examines whether managers change their way of providing qualitative and forward-looking statements after the shareholder litigations. To test this change, I use a difference-in-difference setting where I match sued firms with comparable control firms, and hypothesize that sued firms change their disclosure behavior regarding to qualitative and forward-looking statements to a greater extent relative to the matched firms. Unlike most of the existing literature which discusses the quantitative features of management disclosure (e.g. frequency, timeliness), this paper focuses on the textual content of management disclosure, especially in the use of optimistic and cautionary languages, which have been shown to be related to litigation risks in prior studies (Nelson and Pritchard 2007; Rogers et al. 2011). I expect that sued firms use less optimism language after shareholder litigation.

In addition, this study investigates how the dissemination of the litigation through news media plays a mediating role in influencing managers' disclosure behavior. Some prior studies show that news media can influence management behaviors by broadly disseminating the information (Dougal et al. 2012; Drake et al. 2014). The news media help capture the attention from shareholders who might join the plaintiff group. This would result in increased litigation costs for the sued firms. Moreover, as managers' personal wealth and reputation is influenced by the news media, wide media coverage incentivizes managers to react to litigation more strongly, which can lead to larger change in disclosure strategy compared to firms with less media attention. Therefore, I hypothesize that sued firms getting relative more coverage from the news media change their disclosure language in a more pessimistic way and use more cautionary words than those firms with media attention.

Overall, the findings are consistent with the hypotheses. Sued firms tend to use less optimistic words after shareholder litigation. While this paper does not directly test if shareholder litigation *causes* the changes of disclosure behaviors, these finding suggest that sued firms managers tend to adopt a more "conservative" disclosure strategy to mitigate litigation risk as if shareholders would use voluntary qualitative disclosures to allege them for material information misrepresentation or omission. In addition, I show that when the litigation cases get wide media coverage, managers' behavior changes with an even larger extent. This evidence supports the information dissemination role of news media, and reflects how outside information environment influence firms' own disclosure behaviors.

This paper contributes to the literature in three ways. First, it adds to the shareholder litigation literature by providing additional evidence on its effect on

management disclosure in qualitative and forward-looking statements. Although the literature documents abundant evidence of change in managers' disclosure in terms of quantitative features, there is limited evidence from managers' use of qualitative disclosure. As qualitative disclosure and forward-looking information plays an important and complementary role to the quantitative measures, The results fit into the literature by showing changes in management disclosure after shareholder litigation, not just about the quantity of information, but also about the way managers disclose in textual information.

Secondly, this study provides implications for the effectiveness of the regulation governing shareholder litigation, in particular the PSLRA. Since only material misstatements are deemed unlawful under Rule 10b-5, a recurring legal question is whether qualitative statements are material (O'Hare 1998). As plaintiffs often refer to qualitative and forward-looking statements in their complaints, the result suggests that shareholders and managers view considerable portion of the qualitative disclosure and forward-looking statements as material and actionable under the regulation. That means the PSLRA doesn't fully protect managers from using qualitative and forward-looking statements against litigation risk. This has implications for regulators to provide clearer guidance on the materiality about the disclosed qualitative and forward-looking information. It also has implications for managers to carefully and closely follow the safe harbor provision of the PSLRA to avoid litigation risk (e.g. disclose forward-looking information accompanied with cautionary statements).

Finally, this paper extends the literature regarding the value of the news media by presenting the effect of media coverage on managers' disclosure choice. Many prior studies demonstrate the correlation between media coverage and the market reactions, but whether

news media influences management disclosure behaviors has not yet been widely explored. Dai et al. (2015) point that the role of media in influencing corporate governance is more likely to evident when 1) it reduce information asymmetry; 2) there is high litigation risks; 3) the event influence management's personal wealth and reputation. The research setting in this paper provides a good opportunity to examine the value of new media coverage in influencing management disclosure decision based on the above conditions. This paper adds evidence to the literature that the outside information environment changes the way managers provide disclosure.

The remainder of this paper is ordered as follows. Section 3.2 summarizes the relevant literature and develop the hypotheses, Section 3.3 presents the methodology, sample, and descriptive statistics, Section 3.4 discusses the results, and Section 3.5 concludes.

3.2 Related Literature and Hypothesis Development

3.2.1 Shareholder Litigation

Under the Rule 10(b)-5 of the Securities Exchange Act of 1934, companies are prohibited from providing false statements or withholding material relevant information. If management engages in any type of such deceptive behavior, shareholders can file a lawsuit against the firm and its managers for intentionally misleading or hiding material information that causes them loss in stock purchase or sale. This rule governs managers' disclosure behavior, and serves as a cornerstone of the capital market that allows investors to rely on the information to make investment decisions, which in turn help move the capital to its optimal uses. According to a review research for shareholder litigation in

2015[1], there were about 150 to 250 litigation cases each year during 1996 to 2015 with few exceptions, among which about half of them were settled and the average (median) settlement amount is 55 (8) million dollars. These evidence suggest that shareholder litigation is not uncommon and the associated cost is economically meaningful.

On the other hand, to discourage frivolous securities litigation and to meet the increasing need for forward-looking information, the Private Securities Litigation Reform Act of 1995 (PSLRA) is established to impose strict requirements for plaintiffs when filing shareholder litigations by requiring the following three key evidence: 1) the defendant made material misstatements or omissions; 2) the defendant knowingly misled or withheld information; and 3) the alleged misstatements or omissions led to the loss for which the plaintiff seek to recover damage. Shareholders are prevented from taking legal action if they cannot provide the evidence. This act is designed to provide a legislative safe harbor for managers to protect them from liability for providing forward-looking information (e.g., revenue forecast, plans for future operations), but only if they provide meaningful cautionary statements identifying important factors that could cause actual results to differ materially from their forward-looking statements. The PSLRA offers management an inventive to disclose risk factors that could be related with future outcomes. By analyzing high technology firms Johnson et al. (2001) find a substantial increase in both the frequency of firms issuing earnings and sales forecasts under the PSLRA.

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[1] By Cornerstone Research: http://securities.stanford.edu/research-reports/1996-2015/Settlements-Through-12-2015-Review.pdf

3.2.2 Relation between Shareholder Litigation and Management Disclosure

How shareholder litigation changes the way managers provide disclosure has been widely discussed in the literature, and there are two types of views in the literature. The first type argues that managers provide more disclosure when litigation risk is high, since revealing bad news in advance might provide preemptive effects for a negative earnings surprise. Skinner (1994) first shows the evidence that firms issue bad news in a timely way to preempt the subsequent large negative market reaction. Skinner (1997) and Field et al. (2005) find consistent results that disclosure deters litigation, after controlling for the endogenous relation between litigation and disclosure. In accordance with these findings, the literature shows that negative earnings guidance become warnings when firms face high litigation risk (Cao and Narayanamoorthy 2011) and when the firms actually get sued (Billings et al. 2014). Survey evidence also suggests that managers' timely negative disclosure works as a mechanism to avoid potential litigation (Graham et al. 2005).

The second view argues that managers would disclose less given the high litigation risk. Francis et al. (1994) find that sued firms tend to warn more than "at risk" firms, so it suggests that voluntary disclosure of bad news might not deter shareholder litigation. Baginski et al. (2002) suggest the same using an international setting where litigation risk is lower in Canada than in the US, and finds Canadian firms disclose less than comparable US firms. A more recent working paper also shows that more frequent management disclosures lead to higher likelihood of settlement, in support of the argument that more disclosure allows plaintiffs to present more information against the firm and managers (Cutler et al. 2016). From a more practical point of view, it is reasonable to argue that managers may disclose less due to the difficulty in defending unclearly specified terms, for

example, "what information is material?", "how to avoid truthful projecting being viewed as intentionally misleading when turned out to be wrong?", and "better not to provide forecast if no update is regarded as information omission".

One shared conclusion in these two views is that managers are aware of the litigation risk (Core 1997), that they learn from the alleged previous disclosure practices and that they adjust to a new level of disclosure after litigation (Cao and Narayanamoorthy 2011). Also, to the point that litigation involves with managers' personal wealth (Dai et al. 2015) and reputation (Kim and Skinner 2012) there are reasons to believe that litigation changes the way managers provide disclosure.

Yet, the vast majority of the literature examines the relationship between litigation and disclosure through the quantitative disclosure or its timeliness point of view. Only a handful of papers show that managers change their disclosure in response to litigation through the qualitative features. Nelson and Pritchard (2007) examine managers' use of cautionary language and find that firms with higher litigation risk provide disclosure in a more cautious way. Other research indicates that plaintiffs tend to target companies where managers describe their firm's performance in a more favorable tone (Rogers et al. 2011). This paper fills in the gap of the literature from the angle of qualitative and forward-looking information and examine how they are impacted by shareholder litigation.

That qualitative disclosure has grown its importance in the literature in addition to the effect of quantitative factors (Loughran and McDonald 2011, 2013). In the context of shareholder litigation, on one hand plaintiffs often cite qualitative statements in their complaint (Rogers et al. 2011), suggesting that they view these statements as material misrepresentation or omission. On the other hand, under the PSLRA, forward-looking

statements expressing management sentiment are generally considered as immaterial. Yet the SEC and federal courts have treated forecasts and general expressions of optimism as actionable under the federal securities law (Palmiter 2008). As such, it is unclear whether managers change their way of providing qualitative disclosure in the event of shareholder litigation, especially for the forward-looking statements. In summary, even though forward-looking statement is protected under the PSLRA and qualitative statements is often considered as immaterial, still shareholders file lawsuits based on management qualitative statements. Therefore, I examine how managers change their disclosure behavior after the litigation with focus on managers' tone, as it is the most recognized qualitative feature. Given that companies with overly optimistic tone are more likely to be sued (Rogers et al. 2011) and assuming managers learn from the experience of being sued and therefore adjust the way of providing disclosure after litigation, I have the following hypothesis and separately test for manager' overall disclosure and disclosure specific to the qualitative forward-looking statements:

H1: Sued firms provide more pessimistic disclosure after litigation.

3.2.3 Relationship between Management Strategic Disclosure and New Media

A number of studies have examined whether news media, as outside information source, plays a role in financial market and corporate governance. Investors utilize the news media when making a decisions if they consider it to be reliable and accurate (Zingales 2000), if it gets their attention (Ahern and Sosyura 2015), and if it reduces the costs for information

gathering (Bloomfield 2012). In this line of research, many studies have examined the value of news media in the form for 1) value creating and 2) news dissemination.

Studies have demonstrated news media's dissemination role by establishing a strong correlation between news media activity and stock market reaction (Fang and Peress 2009; Tetlock 2007; Tetlock et al. 2008). For instance, Kothari et al. (2009) show that favorable news content is associated with a decrease in the cost of capital, stock return volatility, and analyst forecast dispersion. In addition, recent evidence show that media coverage drives stock trading activities (Dougal et al. 2012; Drake et al. 2014; Engelberg and Parsons 2011; Peress 2014).

There are two different views on the role of news media between information creation versus information dissemination. Some studies indicate that the news media reduce information asymmetries by providing new content for investors. For example, Pollock and Rindova (2003) show supporting evidence when IPO takes place, and Miller (2006) reaches the similar conclusion in the accounting irregularity news setting. On the other hand, most of the studies in the area suggests that news media primarily play the role in disseminating information broadly instead of creating new information. Bushee et al. (2009) and Li et al. (2011) find that wide dissemination of firms' periodic reports reduces information asymmetry controlling for firm initiated same disclosure. Some other studies analyze the value of news media in its relation to managers' personal wealth. Chang and Suk (1998) and Dai et al. (2005) show that broad spread of insider trading news mitigates the profitability of insider trading. Core et al. (2008) present news media's ability in identifying excess CEO compensation and Kuhnen & Niessen (2012) show decreases in CEO compensation after news coverage about the excess compensation. All these papers

support the value of news in disseminating material information, and suggests that managers have incentives to factor the news media coverage in their behavior.

Since shareholder litigations are one of the major company events which news media can easily identify and disseminate to a wide audience, managers are likely to be aware of the extent to which the litigation news has been spread to the market. If the news media help shareholders (especially those not acting as plaintiffs) understand the litigation, these shareholders can then join any class action for additional settlement coverage, which will result in higher litigation costs for the firm and the managers. Due to this reason, managers have the incentive to change their disclosure behavior to avoid future additional litigation costs. Therefore, this study seeks to provide additional evidence on the role of the news media in influencing management quantitative disclosure behaviors when firms get sued by the shareholders, with the hypothesis as follows:

H2: Managers change their disclosure after litigation to greater extent when media attention is high.

3.3 Reach Method

3.3.1 Research Design

This study examines how shareholder litigation affects management disclosure, which was examined in Rogers and Van Buskirk (2009) from the standpoint of *quantitative* disclosure. Therefore, I follow the research design in Rogers and Van Buskirk (2009), but focus on the *qualitative* aspects of disclosure. Following the research design in the literature enables

us to interpret the results in comparison to existing findings and allow us to implement the difference-in-difference design as discussed in the following.

Shareholder litigation cases are identified by violation of Rule 10(b)-5 of the 1934 Securities Exchange Act alleged by shareholders as plaintiffs. In such cases, plaintiff specify the damage window, or the period during which the managers of the defendant firm allegedly intentionally misled or hid material information, which causes the shareholders to buy shares at an inflated price and subsequently lead to a loss in the investment. In order to examine the change in managers' disclosure behavior related to shareholder litigation, I designate four periods that cover the full course from the period before litigation to the period after litigation: *Pre-Damage Period*, *Damage Period*, *Suit Filing Period*, and *Post-Filing Period*.

Figure 3.1 Time line of Shareholder Litigation

Damage Period starts and ends on the alleged beginning and end dates of management misconduct respectively. This is the period where managers are accused for providing misleading or hiding material information from shareholders. *Pre-Damage Period* is a one-year length period before the starting date of the alleged misconduct. Due to the fact that managers are likely to strategically change their disclosure behavior during the *Damage Period* (as they are accused by the plaintiff) and therefore not representing the normal level of disclosure, *Pre-Damage Period* serves as the benchmark period assuming that there is no abnormal disclosure behavior during this period (at least according to the plaintiff, or otherwise this period would be included in the *Damage Period*). *Suit Filing*

period starts on the date when the lawsuit is filed and ends on the date three months after the filing date following the literature. This period is separated out to allow for the possibility that managers take a reasonable amount of time to learn lessons from previous disclosing behavior, which causes the lawsuit, to prevent future alike litigation. *Post-Filing Period* is the time window with one-year length after the end of the *Suit Filing Period*. This is the period expected to show different disclosing behaviors for the managers after they learn from the litigation and adjust to a new level of disclosure. The change in the disclosing behavior is reflected by the difference between the *Post-Filing Period* and the *Pre-Damage Period*.

Since economic performance is likely to influence the way managers disclose, and shareholder litigation is typically triggered by large stock price drop, it means that, to mitigate the effect on disclosure from economy wide and firm performance related factors, a control group with similar firm characteristics and performance should be applied as the benchmark for comparison. Therefore, I follow the Rogers et al. (2011) approach by matching each sued firm with a firm without shareholder litigation that is in the same SIC two-digit industry, sharing the same size decile rank before the *Damage Period*, having the same amount of earnings announcements and experiencing the closest stock returns during the proximate *Damage Period*.[2] I then assign pseudo-*Damage Period* to the matched firms based on the time period it is measured, and followed by assigning matched firms pseudo-*Pre-Damage Period*, pseud-*Filing Period*, and pseudo-*Post-Filing Period* using

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[2] Rogers et al. (2011) adjust the original method in Rogers and Van Buskirk (2009) by measuring the *Damage Period* from the first earnings announcement date before the starting point of the alleged misconduct to the first earnings announcement date after the end point of the alleged misconduct. It is because often times in the filed complaint, plaintiff refer to the misleading or missing material information from earnings announcement related disclosures. I also follow this approach for matching sued and non-sued firms.

corresponding firms' damage period dates and filing date. In this way, I can better assess the effect of litigation on disclosure in a difference-in-difference setting by comparing changes in matched firms' disclosure (from before alleged misconduct to after adjusting to new disclosure practice) between sued firms and matched firms. I formalize the process in the following regression model:

$$
\begin{aligned}
\text{Disclosure\_Proxy} = \alpha &+ \beta_1 \times \text{Damage\_Period} + \beta_2 \times \text{Suit\_Filing\_Period} \\
&+ \beta_3 \times \text{Post\_Filing\_Period} \\
&+ \beta_4 \times \text{Pre\_Damage\_Period} \times \text{Matched} \\
&+ \beta_5 \times \text{Damage\_Period} \times \text{Matched} \\
&+ \beta_6 \times \text{Suit\_Filing\_Period} \times \text{Matched} \\
&+ \beta_7 \times \text{Post\_Filing\_Period} \times \text{Matched} + \beta_i \times \text{Controls} + \varepsilon \qquad (1)
\end{aligned}
$$

In this model, each of the four periods is denoted as a dummy variable with one indicating that the disclosure is made in the corresponding period, and zero otherwise. *Matched* is also a dummy variable representing whether it is sued firm or matched firm. *Pre_Damage_Period* is omitted from the regression model to avoid multicollinearity, and therefore the implicit benchmark is the disclosure level for the sued firm before the damage period. For this reason, change in sued firms' disclosure is represented by β_3, while change in matched firms' disclosure is represented by $(\beta_7 - \beta_4)$. I focus on the difference between the two $[\beta_3 - (\beta_7 - \beta_4)]$ to test the effect of litigation.

I include additional control variables following Rogers and Van Buskirk (2009), including size measured as the log of market capitalization at the fiscal quarter end, Book-to-Market ratio at the fiscal quarter end, the number of analysts corresponding to the reporting quarter, and the economic wide control variables that takes the mean value of the

interested disclosure proxy in test from all firms with available information except the sued and matched firms in the specified period. As the name tells, the economic wide control variable attempt to control for the macro economic factors that change the way managers disclose all together.

I choose conference calls as the disclosure medium mainly for two reasons. First, conference call is one of major disclosure channels that managers provide voluntary disclosure (Bushee et al. 2003). Normally conference calls are held on quarterly basis and have two sessions: management presentation session where managers highlight the key performance results in the past quarter, and Q&A session in which analysts directly ask managers questions followed by managers' immediate answers. Given the limited time during a conference call and the very fact that questions asked by analysts essentially represent information asymmetry, the content of conference calls is of great importance to shareholders (Frankel et al. 1999; Kimbrough 2005). Second, as shareholder litigations typically involve forward-looking statements, conference call is one of main venues managers provide forward-looking information. Based on a search of random 100 shareholder litigation complaint, 47 of them explicitly mentioned that information discussed during conference calls are intentionally misleading or missing. Although about half the litigation cases do not refer to conference calls in the complaint file, it is likely that alleged misconduct influence the way managers provide disclosure during conference calls (e.g. being more uncertain when providing misleading forward-looking information). Therefore, conference calls are closely relevant to the shareholder litigation.

I measure the qualitative feature of management disclosure mainly through their disclosure tone to analyze the change in management sentiment, both in management

presentation session, and in Q&A session. I follow the fast expanding literature in textual analysis and use the Loughran and McDonald (2011) dictionary for positive and negative words, and measure the disclosure tone by taking the difference between the number of positive words and the number of negative words, scaled by the total number of words. In addition, I also measure the tone of the forward-looking statements in the two sessions, as forward-looking statements are often the main discussion for alleged misconduct. I identify forward-looking statements using two different methods, following Li (2010) and Muslu et al. (2013), with each having a different dictionary for forward-looking expressions.

I also measure managers' use of uncertain words using the uncertainty words dictionary from Loughran and McDonald (2011) to assess the level of certainty regarding to the disclosed information. Under the protection of the PSLRA, managers are less exposed to litigation risk if they use cautionary language whiling disclosing forward-looking information. As Nelson et al. (2007) document that firms with higher litigation risk tend to use more cautionary language, I expect firms change their disclosure behavior around the alleged damage period. Besides, since the plaintiff needs to provide evidence of managers' intension of providing or hiding material information, managers' use of uncertainty words can work as a conservative disclosure approach to avoid absolute certainty that may be subject to subsequent litigation. I follow Loughran and McDonald (2013) and measure uncertainty words usage by counting the number of uncertainty words, scaled by the total number of words in the disclosure session (management presentation or Q&A). The same method is applied to measure the use of uncertainty words in the forward-looking information.

Since Q&A session is the relative more important component of a conference call (Matsumoto et al. 2011), I investigate the change in the disclosure environment by focusing on the interaction between managers and analysts and count the number of questions asked by analysts. Assuming financial analysts are the experts in gathering and analyzing firms' value relevant information and serve in the interest of shareholders, if shareholders allege disclosure misconduct by managers, it is reasonable to expect analyst being aware of the incident and adjusting the way they gathering and processing information disclosed by managers. Asking managers more questions is one way for analysts to be cautious in examining the disclosed information. Therefore, I measure the intensity of analysts' questions by the number of question marks divided by the total number of words in analysts' questions. Presumably more questions asked by analysts also lead to more disclosure made by managers, as managers generally provide detailed relevant information when being asked and analysts tend to ask more follow-up questions if managers didn't fully address analysts' previous questions.

This paper not only examines how litigation changes managers' disclosure behavior, but also investigates how outside dissemination of the litigation news plays a mediating role in the process. I identify shareholder litigation related news using Thomson Reuters News Archive data, which record every news produced or retransmitted by Thomson Reuters, including business, politics, social issues, among many other topics. Thomson Reuters is one of the most read and used business media, and the News Archive data has been used in prior literature (e.g. Heston and Sinha 2014) as reliable source for textual analysis. I search the entire archive for any news that has entity identifier corresponding to the sued firms' official ticker during the specified period and that the

news content matches both of the following key words searching criteria: 1. At least one of the two words "securities" and "shareholder" appears in the news content, 2. At least one of the following phrases "fraud" "class action" "lawsuit" "litigation" "settlement" in the news content. I specify this searching criteria for news content based on two reasons. First, to alleviate the concern of identifying non-shareholder litigation (e.g. patent litigation, product litigation), I strictly require "securities" and "shareholder" mentioned in the news. 2. The choice of using news content, rather than the two other types of news (alert and headline) in the archive data, is because alert and headline normally summarize the event in short sentence with a few words, which does not provide enough textual information for the analysis. In this way, I measure the media attention by counting the number of shareholder litigation related news in each of the four periods, and use the following model for regression analysis.

$$
\begin{aligned}
\text{Disclosure\_Proxy} = {} & \alpha + \beta_1 \times \text{Damage\_Period} + \beta_2 \times \text{Suit\_Filing\_Period} \\
& + \beta_3 \times \text{Post\_Filing\_Period} \\
& + \beta_4 \times \text{Pre\_Damage\_Period} \times \text{Media\_Attention\_Proxy} \\
& + \beta_5 \times \text{Damage\_Period} \times \text{Media\_Attention\_Proxy} \\
& + \beta_6 \times \text{Suit\_Filing\_Period} \times \text{Media\_Attention\_Proxy} \\
& + \beta_7 \times \text{Post\_Filing\_Period} \times \text{Media\_Attention\_Proxy} \\
& + \beta_i \times \text{Controls} + \varepsilon \quad\quad\quad\quad\quad (2)
\end{aligned}
$$

Similar to the previous model, this model uses dummy variables to indicate one of the four periods to facilitate the interpretation of the disclosure behavior change cross the full course of litigation. Each of the period dummy variable is also interacted with the media attention variable obtained from the news archive data. But different from the

previous model, this regression only uses sued firms to avoid the difficulty in interpreting the three-way interaction after adding matched firms (sued vs matched × period indicator × media attention). β_4 through β_7 are the variables of interest and they measure the incremental changes in the corresponding period associated with the effect of media coverage. Since I choose not to use matched firms as benchmark which loses control for economy wide and performance related factors, I add a list of control variables to mitigate the omitted variables problem. The choice of the control variables is based on Huang et al. (2014) which develop a model for the normal level of disclosure tone using firm wide characteristics, and Rogers et al. (2011) which analyze the relation between the tone and firm characteristics in determining shareholder litigation risk.

I include the following set of variables in the regression to control for different factors that might be correlated with both the disclosure behavior and media coverage, and measure them right before the damage period begins to mitigate the endogeneity problem: 1) performance variables: Lag earnings (net income deflated by total assets at earnings announcement date), Lag returns (90 days stock returns), Loss (dummy variable with 1 representing net loss, and 0 otherwise), Earnings Change (from previous corresponding fiscal quarter), and Unexpected Earnings (actual earnings per share minus analysts' consensus scaled by stock price at canlendar quarter end); 2) firm characteristics: Lag Size (log value of market capitalization), Age (the number of years appearing in the CRSP data), Segment (number of segments by business, and by geographic areas); 3) growth and uncertainty: Lag Book-to-Market (book-to-market ratio), Lag Return Volatility (returns volatility during the 90 days before the beginning of damage period), and Lag Earnings Volatility (earnings volatility for the last five quarters' earnings).

3.3.2 Sample Selection

I use shareholder litigation data from Stanford Securities Class Action Clearinghouse, which provide information about the sued firms' name and official ticker, the starting and end date of the alleged damage period, the date of the filing, and other relevant information. I include only the cases that is disclosure related as indicated by violation of 10(b)-5 of 1934 Securities Exchange Act, and during the period between 2008 and 2012. I use the matching criteria discussed in the research design section to find matched firms, and require both the sued firms and matched firms have available data from Compustat, CRSP, and IBES.

I collect conference calls transcripts from two sources: SeekingAlpha.com and Factiva, both of which have been used in the literature to get textual data. Managers and analysts are identified using the participants list at the start of the conference calls, and aggregate the conference call information into three parts by speakers' identity and the session separation mark: management presentation, analysts' questions in the Q&A sessions, and managers' answers in the Q&A sessions. I measure the qualitative disclosure variables for management presentation session and managers' answer in Q&A session. And I also select and limit to the forward-looking statements using Li (2010) and Muslu et al (2013) approaches separately in each part to measure the qualitative disclosure variables to focus on the change in disclosure particularly in forward-looking statements. Then I aggregate the firm-conference call level data to the firm-period level data following the specification in regression model (1) by taking the mean value of the qualitative disclosure variables, after winsorizing the outliers at the 1% level on both sides.

It is worth noting that not all firms have conference calls in all four periods in the model. To make sure that the sued-matched firm comparison is meaningful, I require that only the sued-matched pair where both have available data in any of the four period is included in the final sample. The final sample consists of 192 shareholder litigation cases, corresponding to 192 matched firms with total of 1182 firm-period level observations for hypothesis 1 (using regression model (1)), and 563 observations for hypothesis 2 (using regression model (2)).

[Insert Table 3.1 here.]

Table 3.1 Panel A shows the year distribution of the litigations, where the number of litigations are fairly spread across the years, with 2008 having relatively more cases. This is probabaly due to the financial crisis in 2008 which causes substantial loss in share values which leads to higher incidences of shareholder lawsuits. Panel B presents the industry distribution for the 192 sued firms. Consistent with the sample in Rogers and Van Buskirk (2009) and in Rogers et al. (2011), Chemicals industry get sued the most in the sample, and Business Service industry and Electronics industry are also the major targets of shareholder lawsuits. Panel C shows the matching results comparing several key performances, growth, and firm characteristics. All (most of) the differences between the sued firms and matched firms are not significantly different by mean (median). This provides evidence that this study has a fair comparison between the sued firms and the matched firms with performance, growth, and firm characteristics reasonably controlled for.

[Insert Figure 3.2 here.]

Panel A of Figure 3.2 plots the change in managers' tone in the presentation session and in the Q&A session between sued firms and matched firms. Several observations emerge from the pattern. First, managers tone in the presentation session and in the Q&A session change in a similar way that managers' tone decreases from *Prior Damage Period* to *Suit Filing Period*, and increases from *Suit Filing Period* to the *Post Filing Period*. Second, comparing to the matched firms, sued firms show notably larger changes in disclosure behavior over the course of the litigation. This gives us additional confidence that the matched firms I find are reasonable benchmark against sued firms. Third, looking close into the individual period comparing the sued firms relative to the matched firms, I can see managers are generally more optimistic even before the alleged damage period in the *Prior Damage Period*, and adjust their disclosure behavior in the damage period to the "normal" level of disclosure, and show noticeable decrease in disclosure tone during the *Suit Filing Period* (possibly under the pressure of litigation), and finally reverse back to more optimistic tone in the *Post Filing Period* without significantly exceeding the "normal" level represented by the matched firms. These changes show interesting patterns and allow us to further test the change in managers' disclosure by comparing the *Prior Damage Period* and the *Post Filing Period*. Fourth, managers' tone in the Q&A session is considerably more negative compared to their tone in the presentation session. This indirectly shows the monitoring role of analysts by asking possibly scrutinizing questions that lead to managers' use of more negative tone, which

provide evidence that analysts' involvement changes managers' disclosure behavior and lend us the credibility that the number of analysts' questions can serve as a proxy for managers' disclosure in the later test.

Panel B of Figure 3.2 shows the managers' disclosure tone in their forward-looking statements for the sued firms, which is captured by forward-looking phrases specified in Li (2010) and Muslu et al. (2013). There are two points to make in this graph. First, the two forward-looking statements measure produce consistent patterns even though the Li (2010) method identify a few more cases compared to Muslu et al. (2013) method. Therefore, he results in this paper is not due to any specific choice of the identification method, although I find that using Li (2010) method generally yield more significant results. Second, the change in the disclosure behavior is very similar to what is observed in the overall disclosure behavior, which suggests that managers change their disclosure practice not only in the forward-looking statements, but also in the non-forward-looking statements, which is consistent with Cazier et al. (2016). This could add to the argument that even though Private Securities Litigation Reform Act protect managers in disclosing forward-looking statements to a certain extent, litigation also imposes pressure on managers in their forward-looking statements.

3.4 Empirical Results

Table 3.2 presents the regression results for hypothesis 1. The model specification is directly borrowed from Rogers and Van Buskirk (2009) with only changes in the dependent variables, which include managers' tone in the presentation session and in the Q&A session, and managers' tone in the forward-looking statements in these two periods. One thing worth mention is that the economy-wide control variable is the corresponding disclosure

practice for all firms expect the sued and matched firms in the same time period aggregated by mean.[3] As it refers, this variable controls for the economic wide factors that influences all firms at the same time, along with the firms' fundamental factors: Size, Book-to-Market ratio, and the number of analysts coverage.

[Insert Table 3.2 here.]

As noted in the previous section, I apply this difference-in-difference setting and test the changes in managers' disclosure behavior by comparing the difference between β_3 and $\beta_7 - \beta_4$, which respectively represent changes for sued firms and for matched firms. An F-test is performed to examine if the change for sued firms is significantly different from the change in matched firms. The results show that managers use significantly more negative expressions both in the presentation session and in the Q&A session. I find consistent results for the forward-looking statements as well in the two disclosure sessions. The magnitude of effect by litigation is also worth mention, which represents roughly 70% change compared to the normal level.

These findings suggest that, after the shareholder litigation, managers change their way of disclosure toward using more pessimistic language as if they learn from the litigation that more conservative disclosure is more likely to protect them from disclosure litigation. This is consistent with the finding in Rogers et al. (2013) that more optimistic disclosure is more likely to cause shareholder litigation. The additional evidence

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[3] I use a sample with 63,896 conference calls by 3326 unique firms from Jan 2006 to Sep 2015 to construct the economic wide control variables.

complements the relation chain from disclosure to litigation and then to disclosure by showing changes in managers' disclosure behavior in the latter part.

[Insert Table 3.3 here.]

Table 3.3 presents the results for the media effect on managers' disclosure behavior. Note that I use sued firms only for this analysis and the variables of interest are the interaction variables between the media attention proxy and the four periods dummies, which capture the additional change in managers' disclosure behavior associated with media attention. Panel A shows that, in managers' presentation for both overall tone and the forward-looking statements related tone, more media attention is associated with more negative management disclosure especially in the *Suit Filing Period* and the *Post Filing Period*. I interpret this result as that broader news coverage of the shareholder litigation put additional pressure on the managers to change their disclosure behavior toward using more conservative language to prevent the adverse effect from litigation consequences. This result also adds to the argument that news media influence firms' outside information environment and affect management disclosure.

Panel B shows the result for media effect on managers' use of uncertainty words, both in the overall language and in forward-looking statements. I find media coverage only plays a role during the *Damage Period* and is associated with more uncertain statements. This change of managers' behavior can be viewed as pre-emptive cautionary choice of disclosure, which is consistent with the finding in Nelson et al. (2007) that firms with higher litigation risk tend to use more meaningful cautionary words. The result also

suggests that using more cautionary statements does not prevent managers being sued. This calls into question that whether the PSLRA clearly protect managers making forward-looking statements. On caveat of this analysis is that I do not observe the cases where managers successfully use cautionary statements to deter litigation risk. Therefore, it bring the question that whether managers from the sued firms provide *enough* cautionary statements. Another limitation of the analysis is that the economic effect is very limited.

Panel C presents the results for the media effect on the number of questions' asked by analysts. Using the same model, I find significantly more analysts questions in the *Suit Filing Period* both in overall questions and questions regarding to forward-looking events. It is worth noting that *Suit Filing Period* is the period when shareholder submit the complaint and when the litigation cases is most visible. I interpret the result as when the litigation breaks out, analysts involve in the process by asking managers more question, either to confirm information disclosed by managers before the suit filing or being more cautious about the disclosed information to draw inferences for firms' future performance. The economic magnitude is meaningful in a moderate scale as the additional more questions asked by analysts represent 5% of all the questions. Since there is no effect during the *Damage Period*, it suggests that analysts only take a reactive role in the shareholder litigation. I also check the textual content in analysts' questions regarding to litigation. Most of time, the questions are about the expected settlement amount of the litigation. This may suggest that financial analyst expertise in analyzing firm performance but not specialize in assessing the outcomes of the litigation. Overall, this results provide additional observation in how media coverage changes the way financial analysts gather

information in the event of litigation, which also shows how media coverage can implicitly change the disclosure environment of sued firms.

3.5 Conclusion

This paper investigate how managers change their way of providing qualitative disclosure after shareholder litigation. As qualitative disclosure is regarded as an important piece of value relevant information, shareholders demand managers to provide such material information fully and truthfully. In the event that managers misrepresent or hide material information, shareholders can sue the firm based on the Rule 10(b)-5 of the 1934 Securities Exchange Act, which supposedly has an impact on shaping management disclosure practice when facing litigation risk. On the other hand, the PSRLA protect managers from litigation risk when providing forward-looking statements, which decreases managers' need to react to shareholder litigation. Therefore, it is not clear whether and how managers respond to shareholder litigation in their qualitative disclosure. I examine this question in a difference-in-difference setting and focus on the change in managers' qualitative disclosure especially forward-looking statements after firms getting sued by shareholders. Moreover, since news media play an important role in disseminating value relevant news and the market rely on the news dissemination in reducing information asymmetry, news media could influence managers' disclosure behavior when firms' litigation news are covered by media. I test this relation by observing litigation related news and its association with the change in managers' disclosure behavior.

The results show that after shareholder litigation sued firms use more pessimistic language in qualitative disclosure including forward-looking statements than matched firms. On one hand, it suggests that shareholder litigation works as a governance tool to

prevent managers from providing excess optimistic disclosure. On the other hand, it calls into the question that whether the PSRLA successfully protect managers from litigation risk when making forward-looking statements. I also find that when the litigation has high news media coverage, managers change their disclosure behavior to a larger extent. The change is not only reflected in relatively more negative disclosure and more use of cautionary language, but also reflected in disclosure environment as analysts ask managers more questions after litigation. These findings indicate that the dissemination of litigation news by outside media is an important factor in the relation between management disclosure and shareholder litigation.

This paper contributes to the literature in three ways. First, while the prior literature focuses on the quantitative information in the relation between management disclosure and shareholder litigation, this paper provides evidence that managers also change their qualitative disclosure after shareholder litigation. Second, as this paper presents changes in the forward-looking statements after litigation, it has implication for regulators to consider how to provide better guidance to help managers provide forward-looking statements. Third, the results suggest the dissemination role of news media when firms get shareholder litigation in facilitating the change in managers' disclosure behavior. This has the implication for market participants to understand how outside information environment influence managers' disclosure decisions.

3.6 Tables

Variable Name	Description
Tone (MD / QA_M / QA_A)	Number of Positive words minus the number of negative words, divided by the total number of words in the respective section: MD represents management presentation session, QA_M means managers' answers in the Q&A session, and QA_A means analysts' questions in the Q_A session
Uncer(MD / QA_M / QA_A)	Number of uncertainty words divided by the total number of words in the respective session
FLS (Li / Muslu)	The number of forward-looking statements identified at sentence level divided by the total number of sentences in the respective session. Li (Muslu) means I identify forward-looking statements using the Li (2010) (Muslu et al. (2013)) method.
Ques	Questions asked by analysts, measured as the number of question marks divided by the total number of words
Count (Alert Lit / Body Liti)	The number of news related to shareholder litigation using searching criteria described in the method section, in the news alert section, and in the news text body section, respectively
Matched	1 if the firm is a matched firm; 0 otherwise
Pre_Damange_period	1 if the conference call is in the Pre Damage Period, which is one year length period before the start of the Damage Period; 0 otherwise
Damange_period	1 if the conference call is in the Damage Period, which is specified in the plaintiff complaint file; 0 otherwise
Suit_filing_period	1 if the conference call is in the Suit Filing Period, which is 90 after the Suit Filing date; 0 otherwise
Post_filing_period	1 if the conference call is in the Post Filing Period, which is one year length period after the end of the Suit Filing Period; 0 otherwise
Economy-Wide Control	Average value of the disclosure proxy in test from all other conference calls expect from the sued of matched firm during the specified period
Book-to-Market	Book-to-Market Ratio for the fiscal quarter
Numest	Number of analysts following corresponding to the reporting quarter
Size	Log of market capitalization for the fiscal quarter
Lag Return Volatility	Standard deviation of days returns in the 90 days period before the specified period
Lag Earnings Volatility	Standard deviation of earnings scaled by total assets for the last 5 quarters
Age	Number of years the firm appears in the CRSP data
Segments_Business	Number of business segments during the fiscal year
Segments_Geo	Number of geographic segments during the fiscal year
Loss	1 if the quarter has negative earnings; 0 otherwise
Earnings Change	Change in earnings scaled by total assets relative to last fiscal quarter's value
Unexpected Earnings	Actual earnings per share minus the analysts' consensus before announcement, scaled by the stock price at the fiscal quarter end

Table 3.1 Descriptive Statistics

Panel A - Distribution of Lawsuits by Year

Year	Number of cases	Percentage
2008	52	27%
2009	35	18%
2010	35	18%
2011	40	21%
2012	30	16%
Total	192	100%

Panel B - Distribution of Lawsuits by Industry (two-digit SIC)

Two-Digit SIC Code	Number of cases	Percentage
28: Chemicals and Allied Products	23	12%
38: Measurement, Analysis, and Control Instruments	19	10%
73: Business Services	18	9%
60: Depository Institutions	15	8%
80: Health Services	10	5%
36: Electronics and Other Electronic Equipment	9	5%
35: Industrial & Commercial Machinery, Computer & Equipment	7	4%
13: Oil and Gas Extraction	6	3%
37: Transportation Equipment	6	3%
63: Insurance Carriers	6	3%
Industries representing less than 3 percent of lawsuits	73	38%
Total	192	100%

Panel C – Comparison between Sued and Matched Firms

Variable	Sued Firms (N = 192)		Matched Firms (N = 192)		P-value for difference	
	Mean	Median	Mean	Median	Mean	Median
Window Return	-0.094	-0.179	-0.163	-0.318	0.53	<0.01
Lag Size	7.703	7.704	7.900	7.798	0.30	0.40
Lag Book-to-Market	0.558	0.484	0.498	0.349	0.28	<0.01
Lag ROA	0.007	0.018	0.007	0.019	0.94	0.74
Lag Earnings Growth	-0.002	-0.001	0.001	0.000	0.81	0.25
Lag Sales Growth	0.287	0.081	0.352	0.154	0.70	<0.01
Lag Loss Indicator	0.193	0	0.193	0		1.00

Panel D - Descriptive Statistics

Variable	N	Mean	Std Dev	Min	25th Pctl	Median	75th Pctl	Max
Tone_MD	562	0.009	0.015	-0.047	0.000	0.010	0.018	0.053
Tone_FLS_Li_MD	562	0.012	0.017	-0.051	0.002	0.013	0.023	0.063
Tone_FLS_Muslu_MD	562	0.009	0.033	-0.167	-0.006	0.006	0.028	0.124
Uncer_QA_M	551	0.016	0.006	0.000	0.012	0.016	0.019	0.068
Uncer_FLS_Li_QA_M	551	0.024	0.010	0.000	0.017	0.022	0.028	0.106
Spec3_QA_A	549	0.057	0.014	0.000	0.049	0.057	0.064	0.106
Spec3_FLS_Li_QA_A	549	0.064	0.018	0.000	0.054	0.063	0.075	0.167
Count_Alert_Liti	563	0.163	0.717	0	0	0	0	10
Count_Body_Liti	563	3.176	20.586	0	0	0	0	343
Lag Earnings	563	-0.008	0.057	-0.300	-0.008	0.005	0.020	0.085
Lag Return	563	-0.027	0.224	-0.669	-0.132	-0.006	0.087	0.985
Lag Size	563	14.698	1.934	10.750	13.253	14.577	16.156	19.002
Lag Book-to-Market	563	0.768	0.756	0.038	0.292	0.540	0.916	3.699
Lag Return Volatility	563	0.036	0.021	0.008	0.022	0.031	0.045	0.119
Lag Earnings Volatility	563	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Age	563	2.708	0.909	0.693	2.168	2.833	3.367	4.407
Segments_Business	563	1.376	0.534	0.693	1	1	1.665	2.890
Segments_Geo	563	1.174	0.400	0.693	1	1	1.193	2.708
Loss	563	0.230	0.393	0.000	0	0	0.333	1
Earnings Change	563	-0.006	0.030	-0.117	-0.012	-0.001	0.003	0.119
Unexpected Earnings	563	-0.008	0.037	-0.219	-0.002	0.000	0.002	0.056

This table provides descriptive statistics for the disclosure proxies media attention proxies and control variables.

The abbreviations for the disclosure proxy variables follow the following descriptive: Tone represents the number of positive words minus the number of the negative words divided by the total number of words in the respective session: MD means management presentation session, QA_M represents managers' answers in the Q&A session, QA_A represents analysts' questions in the Q&A session. FLS means forward-looking statements. Li means following the method for identifying forward-looking statement in Li (2010) as the number of forward-looking sentences divided by the total number of sentences. Muslu means following the method for identifying forward-looking statement in Muslu et al. (2013). Ques stands for questions asked by analysts measured by the number of questions marks divided by the total number of words in the Q&A session. Count Alert (Body) Liti means the number of news alerts (body content) from Thomson Reuters that matches the litigation news searching criteria, which is satisfying both of the following key words can be searched in the respective text: 1. At least one of the two words "securities" and "shareholder" appears in the news content, 2. At least one of the following phrases "fraud" "class action" "lawsuit" "litigation" "settlement" in the news content. Lag for the control variables means the last quarter's value. Earnings is the earnings number divided by the total assets. Return is the stock returns from the beginning to the end of the period. Size represents the log value of market capitalization, Lag Return Volatility is the standard deviation of 90 days period returns before the period starts. Lag Earnings Volatility is the prior 5 quarters' earnings standard deviation. Age the number of year in CRSP data. Segments are measured by number of business and number of geographic areas. Loss is dummy indicator or loss. Earnings change is relative to the same fiscal quarter in the last year. Unexpected Earnings is actual EPS minus consensus EPS, deflated by price at quarter end.

Panel E - Correlation Matrix

	Tone_FLS_Li (MD)	Tone_FLS_Muslu (MD)	Uncer (QA_M)	Uncer_FLS_Li (QA_M)	Ques (QA_A)	Ques_FLS_Li (QA_A)	Count (Alert Liti)	Count (Body Liti)
Tone (MD)	0.80***	0.47***	-0.27***	-0.12***	0.06	0.08*	-0.10**	-0.20***
Tone_FLS_Li (MD)		0.39***	-0.23***	-0.12***	0.06	0.06	-0.06	-0.08*
Tone_FLS_Muslu (MD)			-0.18***	-0.13***	-0.01	-0.01	0.04	-0.10**
Uncer (QA_M)				0.77***	0.04	0.04	-0.01	0.13***
Uncer_FLS_Li (QA_M)					0.05	0.03	-0.03	0.06
Ques (QA_A)						0.77***	0.05	-0.07
Ques_FLS_Li (QA_A)							0.04	-0.06
Count (Alert Liti)								0.30***

***, **, *Indicate that the coefficient is statistically different from 0 at the 1%, 5%, and 10% levels, respectively (two-tailed tests). This table provides correlation matrix for the disclosure proxies and media attention proxies.

The abbreviations follow the following descriptive: Tone represents the number of positive words minus the number of the negative words divided by the total number of words in the respective session: MD means management presentation session, QA_M represents managers' answers in the Q&A session, QA_A represents analysts' questions in the Q&A session. FLS means forward-looking statements. Li means following the method for identifying forward-looking statement in Li (2010) as the number of forward-looking sentences divided by the total number of sentences. Muslu means following the method for identifying forward-looking statement in Muslu et al. (2013). Ques stands for questions asked by analysts measured by the number of questions marks divided by the total number of words in the Q&A session. Count Alert (Body) Liti means the number of news alerts (body content) from Thomson Reuters that matches the litigation news searching criteria, which is satisfying both of the following key words can be searched in the respective text: 1. At least one of the two words "securities" and "shareholder" appears in the news content, 2. At least one of the following phrases "fraud" "class action" "lawsuit" "litigation" "settlement" in the news content.

Table 3.2 Change in Managers' Disclosure Behavior

Disclosure_Proxy = α + β₁×Damage_Period + β₂×Suit_Filing_Period + β₃×Post_Filing_Period
+ β₄×Pre_Damage_Period × Matched + β₅×Damage_Period × Matched
+ β₆×Suit_Filing_Period × Matched + β₇×Post_Filing_Period × Matched
+ βᵢ×Controls + ε

		Tone_MD	Tone_QA_M	Tone_FLS _Li_MD	Tone_FLS _Li_QA_M
	Intercept	0.025***	0.018***	0.029***	0.025***
β_1	Damange_period	-0.004**	-0.005***	-0.004*	-0.005**
β_2	Suit_filing_period	-0.009***	-0.007***	-0.008***	-0.009***
β_3	Post_filing_period	-0.006***	-0.004**	-0.003	-0.005***
β_4	Matched_pre_damage_period	-0.003	-0.003*	-0.002	-0.004*
β_5	Matched_damage_period	0.000	0.001	0.000	0.000
β_6	Matched_suit_filing_period	0.004***	0.002	0.005**	0.003
β_7	Matched_post_filing_period	0.002	0.000	-0.001	0.002
β_8	Economy-Wide Control	1.019***	1.509***	0.967***	1.367***
β_9	Book-to-Market	-0.004***	-0.003***	-0.003***	-0.003***
β_{10}	Numest	0.000***	0.000***	0.000***	0.000
β_{11}	Size	-0.002***	-0.001***	-0.002***	-0.001***
F-Test	($\beta_3 - (\beta_7 - \beta_4)$)	-0.010***	-0.007*	-0.004	-0.011***
	N of obs	1179	1182	1179	1157
	Adj R-square	16.0%	10.6%	7.5%	7.5%

***, **, *Indicate that the coefficient is statistically different from 0 at the 1%, 5%, and 10% levels, respectively (two-tailed tests). This table provides details on the changes in managers' optimistic tone of earnings-related conference calls using multi-variate regression for each disclosure variable.
Variables are described in "variable description" table.
The p-value for change in disclosure for sued firms is taken from the regression results and is a test of Post-Filing Period =0. The p-value for change in disclosure for matched firms is an F-test comparing the estimated coefficient for Matched_post-Filing Period to the estimated coefficient for Matched_pre-Damage Period. The p-value for the Incremental Change for Sued Firms is an F-test comparing the Post-Filing Period to (Matched_post-Filing Period-Matched_pre-damage_period)

Table 3.3 Media Effect on Managers' Disclosure Behavior

Panel A – Change in disclosure tone

Disclosure_Proxy = α + $\beta_1 \times$ Damage_Period + $\beta_2 \times$ Suit_Filing_Period + $\beta_3 \times$ Post_Filing_Period
+ $\beta_4 \times$ Pre_Damage_Period $\times$ Media_Attention_Proxy
+ $\beta_5 \times$ Damage_Period $\times$ Media_Attention_Proxy
+ $\beta_6 \times$ Suit_Filing_Period $\times$ Media_Attention_Proxy
+ $\beta_7 \times$ Post_Filing_Period $\times$ Media_Attention_Proxy
+ $\beta_i \times$ Controls + ε

	Media Attention Proxy		Count_Body_Liti	
	Disclosure Proxy	Tone_MD	Tone_FLS_Li_MD	Tone_FLS_Muslu_MD
	Intercept	0.0163**	0.0223***	0.0226
β_1	Damage_Period	-0.0033**	-0.0033	-0.0047
β_2	Suit_Filing_Period	-0.0056***	-0.0048**	-0.0107**
β_3	Post_Filing_Period	-0.0047***	-0.0025	-0.0058
β_4	Pre_Damage_Period × Media_Attention_Proxy	-0.0004	-0.0006	-0.0019
β_5	Damage_Period × Media_Attention_Proxy	-0.0001***	0.0000	-0.0001
β_6	Suit_Filing_Period × Media_Attention_Proxy	-0.0015***	-0.0010**	-0.0019*
β_7	Post_Filing_Period × Media_Attention_Proxy	-0.0002***	-0.0003**	-0.0000
β_8	Lag Earnings	-0.0047	-0.0076	-0.0318
β_9	Lag Return	0.0065**	0.0067**	0.70890.0025
β_{10}	Lag Size	0.0000	-0.0005	0.55560.0006
β_{11}	Lag Book-to-Market	-0.0015*	-0.0001	0.79080.0006
β_{12}	Lag Return Volatility	-0.1211***	-0.1261**	-0.1260
β_{13}	Lag Earnings Volatility	3.4814	4.7160	-2.3348
β_{14}	Age	-0.0028***	-0.0017*	-0.0073***
β_{15}	Segments_Business	0.0012	0.0013	0.0054
β_{16}	Segments_Geo	0.0073***	0.0061**	0.0017
β_{17}	Loss	-0.0011	-0.0009	-0.0029
β_{18}	Earnings Change	0.0450**	0.0103	0.1186**
β_{19}	Unexpected Earnings	0.0328**	0.0416**	0.0391
	N of obs	562	562	562
	Adj R-square	29.3%	13.8%	7.7%

***, **, *Indicate that the coefficient is statistically different from 0 at the 1%, 5%, and 10% levels, respectively (two-tailed tests). This table provides details on the changes in managers' optimistic tone of earnings-related conference calls using multi-variate regression for each disclosure variable.

Panel B – Change in in the use of uncertainty words

	Media Attention Proxy	Count_Body_Liti	
	Disclosure Proxy	Uncer_QA_M	Uncer_FLS_Li_QA_M
	Intercept	0.01839***	0.03846***
β_1	Damage_Period	0.00062	0.00113
β_2	Suit_Filing_Period	0.00149	0.00279*
β_3	Post_Filing_Period	-0.00022	-0.00090
β_4	Pre_Damage_Period × Media_Attention_Proxy	0.00003	0.00026
β_5	Damage_Period × Media_Attention_Proxy	0.00004**	0.00005**
β_6	Suit_Filing_Period × Media_Attention_Proxy	0.00023	0.00027
β_7	Post_Filing_Period × Media_Attention_Proxy	0.00004	0.00003
β_8	Lag Earnings	0.01370*	0.01457
β_9	Lag Return	.00033	0.00064
β_{10}	Lag Size	-0.00018	-0.00074**
β_{11}	Lag Book-to-Market	0.00061	0.00065
β_{12}	Lag Return Volatility	-0.00360	-0.04581
β_{13}	Lag Earnings Volatility	0.30686	0.48594
β_{14}	Age	0.00061*	-0.00031
β_{15}	Segments_Business	-0.00098	0.00257*
β_{16}	Segments_Geo	0.00059	0.00042
β_{17}	Loss	0.00163	0.00057
β_{18}	Earnings Change	-0.00288	-0.01375
β_{19}	Unexpected Earnings	0.01905**	0.02871**
	N of obs	551	551
	Adj R-square	3.1%	2.3%

***, **, *Indicate that the coefficient is statistically different from 0 at the 1%, 5%, and 10% levels, respectively (two-tailed tests). This table provides details on the changes in managers' usages of uncertain words during earnings-related conference calls using multi-variate regression for each disclosure variable.

Panel C – Change in in the number of questions asked analysts

	Media Attention Proxy	Count_Alert_Liti	
	Disclosure Proxy	Ques_QA_A	Ques_FLS_Li_QA_A
	Intercept	0.0856***	0.0931***
β_1	Damage_Period	-0.0010	-0.0007
β_2	Suit_Filing_Period	-0.0005	-0.0013
β_3	Post_Filing_Period	-0.0011	-0.0026
β_4	Pre_Damage_Period × Media_Attention_Proxy	-0.0133*	-0.0127
β_5	Damage_Period × Media_Attention_Proxy	0.0008	-0.0023
β_6	Suit_Filing_Period × Media_Attention_Proxy	0.0027**	0.0040**
β_7	Post_Filing_Period × Media_Attention_Proxy	0.0010	0.0007
β_8	Lag Earnings	-0.0095	-0.0034
β_9	Lag Return	0.0028	0.0054
β_{10}	Lag Size	-0.0021***	-0.0023***
β_{11}	Lag Book-to-Market	0.0026***	0.0031***
β_{12}	Lag Return Volatility	-0.0296	-0.0516
β_{13}	Lag Earnings Volatility	0.2574	2.7350
β_{14}	Age	-0.0001	0.0005
β_{15}	Segments_Business	-0.0003	0.0017
β_{16}	Segments_Geo	0.0022	0.0011
β_{17}	Loss	--0.0010	0.0007
β_{18}	Earnings Change	-0.0033	.0064
β_{19}	Unexpected Earnings	0.0138	0.0024
	N of obs	549	549
	Adj R-square	8.6%	6.5%

***, **, *Indicate that the coefficient is statistically different from 0 at the 1%, 5%, and 10% levels, respectively (two-tailed tests). This table provides details on the number of questions from analysts during earnings-related conference calls using multi-variate regression for each disclosure variable.
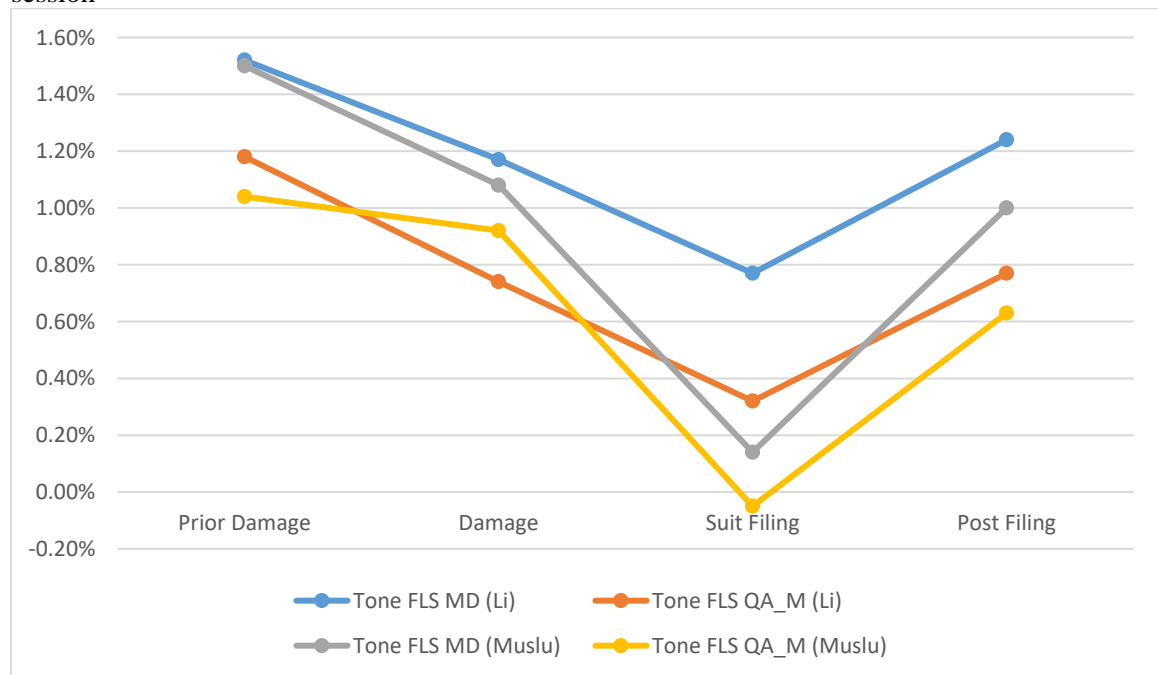
3.7 Figures

Figure 3.2 Change in Disclosure Behavior (Univariate Test)

Panel A - Tone by managers in presentation session and Q&A session of conference calls
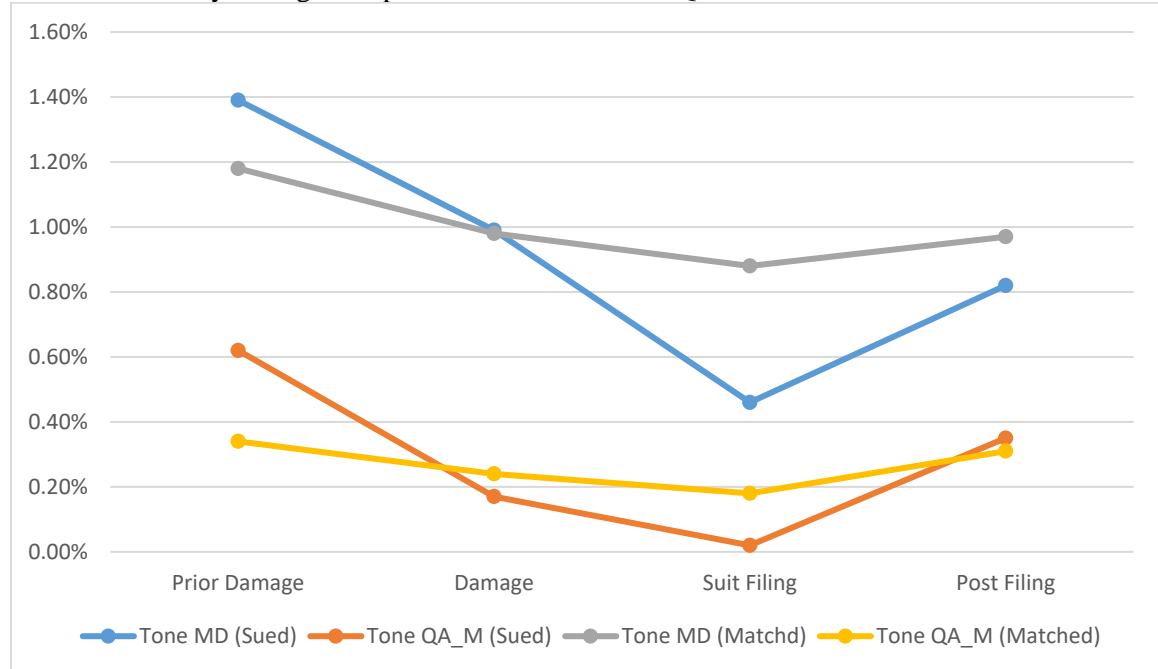
Panel B - Tone by managers in their forward-looking statements in the presentation and Q&A session

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