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INSTITUTIONAL INVESTOR INATTENTION AND ACQUISITION OF
FIRM-SPECIFIC INFORMATION DURING CONFERENCE CALLS

by

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A thesis submitted in partial fulfillment of the
requirements for the Doctor of Philosophy
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Thesis Supervisor: Professor Daniel W. Collins

I dedicate my thesis to my loving parents, Mahn Geum Ohn and Eunsook Lim, and my better half, Yaera Jeon. Thank you for your advice, patience, and support.

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ABSTRACT

Earnings conference calls are salient sources of firm-specific information where investors can . In this paper, I find that institutional investors participate more actively in earnings conference calls held by firms that receive less attention than their peers prior to conference calls. I construct a measure of relative inattention using the Bloomberg Heat Score, which captures the aggregate search activities of institutional investors at the firm level. Using a broad set of earnings conference call transcripts, I identify participants affiliated with institutional investors and their dialogue to examine the association between institutional investors' inattention and their activities during earnings conference calls. I show that institutional investors appear more often, ask more questions, and request more guidance in conference calls held by firms that receive less attention before the calls. Collectively, the results indicate that institutional investors compensate for the lack of firm-specific information with conference call participation, despite potential costs of publicly revealing their information acquisition.

PUBLIC ABSTRACT

Earnings conference calls are salient sources of firm-specific information that investors can attend to inquire firm managers directly. The main focus of this study is how institutional investors—the most dominant group in the U.S. capital market that provides investment vehicles for other investors—rely on earnings conference calls to gather firm-specific information. I find that institutional investors participate more actively in earnings conference calls held by firms on which institutional investors collectively lack firm-specific research (i.e., institutional investors are inattentive) prior to conference calls. Using a broad set of earnings conference call transcripts, I identify participants affiliated with institutional investors and their dialogue to examine the association between institutional investors' inattention and their activities during earnings conference calls. I show that institutional investors appear more often, ask more questions, and request more guidance in conference calls held by firms that receive less attention before the calls. Collectively, the results indicate that institutional investors compensate for the lack of firm-specific information with conference call participation, despite potential costs such as increased risk of other investors front-running after observing the institutional investors.

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CHAPTER 1
INTRODUCTION

The growth of institutional ownership over the past two decades has changed the landscape of the U.S. capital markets (Blume and Keim, 2012; Clark and Monk, 2017). Collectively, institutional investors now own 70% of all U.S. public shares.[1] Of greater relevance to this study, institutional investors have reallocated their capital away from active and toward passive funds, causing a shift in the composition of their holdings (Stambaugh, 2014; Appel et al., 2016). While passive institutional investors arguably have less incentives to actively seek private information for gaining information advantage, prior studies document that these institutions continue to demand firm-specific information to affect corporate governance or to enhance liquidity (Boone and White, 2015; Bird and Karolyi, 2016). These studies, however, are silent on how institutional investors with diverse portfolios allocate their time and effort to gather firm-specific information.

The aim of this paper is to shed light on this issue by examining the information-acquisition strategies of institutional investors observed during a salient public information event, namely earnings conference calls. Examining the information-acquisition strategies of institutional investors enhances our understanding of how firms-specific information is incorporated into asset prices via trading in a new market environment where the role of institutional investors is becoming more dominant. Information

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[1] Kara Stein, SEC Commissioner, *"The Markets in 2017: What's at Stake"* (speech, Washington D.C., Feb. 24, 2017)

gathering of institutional investors affects their reaction to news and, in turn, the diffusion of firm-specific information (Ben-Rephael et al., 2017). By using earnings conference calls as a setting in which institutional investors' information gathering activities become partially observable, this paper provides preliminary evidence to the literature that examines the roles served by institutional investors in setting prices in capital markets.

This paper focuses on identifying whether institutional investors' information gathering through participating in conference calls substitutes or complements their information acquisition prior to conference calls. The relation between information gathering through conference call participation and prior acquisition of firm-specific information is ambiguous *ex ante*; in their survey of buy-side analysts, Brown et al. (2016) document various sources—pubic and private—that institutional investors use to gather firm-specific information. Earnings conference calls is one of the more useful public sources, preferred to management earnings guidance, recent earnings performance, and sell-side analyst reports. Earnings conference calls also provide qualitative (soft) information that can be incrementally useful to quantitative (hard) information (Mayew and Venkatachalam, 2012). These findings suggest that earnings conference calls can substitute other forms of firm-specific information gathering. Nevertheless, anecdotal evidence suggests that some buy-side analysts are reluctant to ask questions in public settings such as earnings conference calls because this can reveal their information-acquisition strategies and can impose costs on institutional investors such as increased risks of front running (Brunnermeier and Pedersen, 2005).

Conference call participation also likely requires preliminary research for preparing questions (Kempf et al., 2017a). When these latter effects dominate, conference call participation will show a complementary relation with other sources of firm-specific information. In sum, it is an empirical question whether institutional investors' conference call participation substitutes or complements their information gathering prior to conference calls.

One challenge in this study is that firm-specific information acquired by institutional investors is not directly observable. To address this empirical challenge, I construct a firm-level measure of institutional investor inattention, which identifies firms that receive less attention from institutional investors prior to their conference calls. The rationale of this measure relies upon prior findings that institutional investors' attention is a main determinant of their information acquisition, especially regarding firm-specific information (Barber and Odean, 2008; Ben-Rephael et al., 2017; Peng and Xiong, 2006). To the extent that it correlates with institutional investors' firm-level information acquisition, this measure identifies firms that hold conference calls when institutional investors have been less active in gathering information on the firms that hold the calls. I measure institutional investor attention using the daily Bloomberg Heat Score that captures search activities on individual firms through the Bloomberg terminals—a tool widely used by institutional investors (Ben-Rephael et al., 2017). For each firm that held conference calls in quarters between 2012 and 2017, I aggregate the daily Bloomberg Heat Score for the period after the end of the earnings quarter until the day before the conference call (hereafter, the

pre-call period). To mitigate the concern that the measure is driven by unobservable firm, time, or industry factors, the firm-level inattention measure is constructed based on the relative attention among firms within peer groups, defined as industry peers that hold conference calls on the same day.

From 41,583 earnings conference calls transcripts between 2012 and 2017, I construct three proxies for institutional investors' information acquisition through conference calls. First, I calculate the number of participants that are affiliated with institutional investors. Each conference call transcript includes a list of participants and their affiliation. Applying a taxonomy similar to prior studies, I identify participants who have direct ties to institutional investors (Jung et al., 2018; Call et al., 2018). Second, I count the number of questions asked by participants affiliated with institutional investors by linking individual dialogues to each participant. To account for any mechanical effect that can be caused by changes in number of participants, I use the average number of questions per participant as the second proxy. Finally, I identify requests for future guidance to examine the content of information requested during earnings conference calls. This third proxy is based on a textual analysis adopted from prior studies that identify future guidance from earnings conference calls (Chuk et al., 2013; Chapman and Green, 2018). I predict a positive association between institutional investors inattention and the three proxies when information gathering through conference call participation and prior firm-specific information gathering are substitutes and a negative association when the two information-gathering activities are complements.

Overall, I find evidence consistent with institutional investors compensating for the lack of firm-specific information with the information gathered through conference call participation. My analysis reveals that institutional investor inattention is positively associated with the number of institution-affiliated participants on the call. A one-standard deviation increase in institutional investor inattention is associated with a 7.96% increase in the likelihood that a buy-side analyst appears in a given conference call and an 8.22% increase in the number of other institution-affiliated participants, relative to the sample means. A similar increase is not observed in conference call participation of sell-side analysts. In addition, I find that a one-standard deviation increase in institutional investor inattention is associated with a 7.56% increase in number of questions asked by institutional investors. Lastly, institutional investor inattention is positively associated with requests for future guidance from institutional investor participants. Collectively, my results provide evidence that institutional investors participate more actively in earnings conference calls held by firms to which they have paid less attention prior to the calls, despite potential costs of publicly revealing their information acquisition.[2]

In addition, I analyze daily trading activity of institutional investors to examine whether the trading patterns observed on days of the conference calls provide evidence consistent with the results on conference call participation. I use the daily trading volume recorded through the FINRA Trade Reporting Facility (TRF) and

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[2] All results are robust to inclusions of firm fixed effects. These findings, therefore, are not likely to be driven by unobservable firm-level factors that might affect participation.

adopt a methodology that categorizes TRF trades into retail and institutional trades (Boehmer et al., 2017). Consistent with evidence that conference call participation serves as a substitute for information gathered during the pre-conference call periods, I find that institutional investor inattention has a positive association with abnormal institutional trading volume on the conference call days. A one standard deviation increase in the measure of institutional investor inattention is associated with a 29.9% increase in abnormal institutional trading volume on the day of the conference call relative to the sample mean. This evidence suggests that firm-specific information gathered through conference call participation compensate for the lack of firm-specific information gathering prior to the conference call, thereby increasing institutional tradings on the day of the conference calls.

I also conduct two additional analyses that corroborate my main results. First, I predict and find that the positive association between institutional investor inattention and conference call participation is mitigated when institutional investors face higher potential costs of publicly revealing their information acquisition. I posit that institutional investors with short investment horizons (i.e., transient investors) are more likely to trade on private information advantages and thus have higher potential costs of participating in conference calls (Bushee, 1998). I conduct a cross-sectional analysis based on transient investor ownership to show that the positive association is less pronounced in firms that have transient investor ownership above the median. Second, I consider an alternative explanation for my main results. One concern is that the decision to participate in a given conference call can take place before the

pre-call period. Some firms announce their conference call schedules as early as several months before the calls. Consequently, investors know when these firms will hold a call and can allocate their time and effort accordingly. Thus, one alternative explanation for my results is that investors plan to be inattentive and accordingly allocate effort to other firms prior to the call. To address this concern, I examine investor inattention following conference calls and evaluate its association with the number of call participants. The alternative explanation would predict a negative association because institutional investors would regather attention after the call if conference call participation was the cause of inattention. Inconsistent with this alternative explanation, I find that post-call inattention is not associated with the number of institution-affiliated participants. The results from these two additional tests provide additional support that institutional investors compensate for the lack of firm-specific information gathering during the pre-call period by participating more in conference calls.

This study contributes to the extant literature that examines the preference of institutional investors for firm-specific information (Bushee and Noe, 2000; Ajinkya et al., 2005; Boone and White, 2015; Bird and Karolyi, 2016). Recent studies focus on exogenous shocks to institutional ownership to examine the changes in aggregate firm disclosures around these shocks (Boone and White, 2015; Bird and Karolyi, 2016).[3]

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[3] An example of such change is the annual reconstitution of the Russell 2000 index (Chang et al., 2015a; Boone and White, 2015; Bird and Karolyi, 2016; Appel et al., 2016). The Russell 1000/2000 cutoff provides a discontinuity in institutional ownership while firms immediately above and below the cutoff show similar traits regarding determinants of information quality.

Alternatively, this study focuses on an information event during which information gathering of institutional investors becomes partially observable. I document that institutional investors compensate for lack of firm-specific information acquisition prior to conference calls with conference call participation when their attention is likely constrained.

This study also contributes to the literature examining the determinants of buy-side analysts' information gathering activities. Contrary to conventional belief, recent studies find a non-trivial number of buy-side analysts participate in earnings conference calls (Call et al., 2018; Jung et al., 2018). Jung et al. (2018) find that buy-side participation increases when sell-side analyst coverage is low and dispersion in sell-side earnings forecasts is high, suggesting that the information environment of the firm is an important determinant of buy-side analyst conference call participation. I identify institutional investor inattention leading up to conference calls as another determinant that explains variations in the conference call participation of buy-side analysts.

Finally, this study extends the literature that suggests limited attention not only affects retail investors but also institutional investors. Recent studies focus on the potential consequences of institutional investor inattention including mutual fund performances (Fang et al., 2014) and corporate governance (Kempf et al., 2017a). This study focuses on the information-acquisition strategy of institutional investors following periods of institutional investor inattention. I show that increased reliance

on salient public events such as earnings conference calls is a potential avenue through which institutional investors compensate for inattention prior to the events.

The remainder of this paper is organized as follows. Chapter 2 reviews prior literature and develops my predictions. Chapter 3 describes my sample and methodology and Chapter 4 presents results of my empirical tests. Chapter 5 conducts additional analyses including a cross-sectional test. Chapter 6 provides concluding remarks.

CHAPTER 2
PRIOR LITERATURE AND EMPIRICAL PREDICTIONS

2.1   Institutional investors' demand for public disclosure

A large body of literature examines institutional investors and their demand for firm-specific information. (Bushee and Noe, 2000; Bushee et al., 2001; Ajinkya et al., 2005; Boone and White, 2015; Bird and Karolyi, 2016). Recent studies examine this link specifically within the context of passive institutional investors. Contrary to the belief that firm-specific information might not matter as much to passive investors as it does to active investors, these studies provide evidence that passive institutional investors continue to demand firm-specific information. Appel et al. (2016) show that firms improve their corporate governance after positive shocks to passive institutional ownership. They find that passive institutional investors exert influence on individual firms by forming large voting blocs. Their findings suggest that passive institutional investors are actively involved in improving firms' governance, despite their inability to freely accumulate or exit positions—the two traditional levers large shareholders use to influence mangers (Edmans, 2014). Their findings also suggest that while passive investors might have less incentives to improve individual stock performances by investing time to research those firms, they still have incentive to gather firm-specific information for other purposes such as enhancing corporate governance that improves corporate decision making.

Consistent with Appel et al. (2016), two studies document direct evidence that

passive institutional investors continue to demand firm-specific information. Bird and Karolyi (2016) find that increased institutional ownership encourages firms to increase informativeness of their 8-K filings. They find that firms' 8-K filings become more detailed and include more graphical quantitative information after positive shocks to passive institutional ownership. Bird and Karolyi attribute these findings to firms reacting to greater information demand from passive institutional investors. Using Bushee's (1998) classification of institutional investors—quasi-indexer, transient, and dedicated—Boone and White (2015) find that indexing institutions' (i.e., quasi-indexers') predilection for higher liquidity facilitates information production. Collectively, these studies provide evidence that passive institutional investors continue to demand firm-specific information, despite not changing their portfolio positions frequently.

Several studies focus on buy-side analysts who are agents that fill the information demand of institutional investors (e.g., Brown et al., 2016). Jung et al. (2018) and Call et al. (2018) specifically focus on buy-side analyst activities observed during earnings conference calls. Jung et al. (2018) find that buy-side analysts participate more in conference calls held by firms with lower sell-side analyst coverage and larger sell-side analyst forecast dispersion, consistent with institutional investors having greater information demand for firms with poor information environments. Call et al. (2018) find that buy-side analysts are more likely than other types of participants to appear first in a conference call transcript, consistent with firms prioritizing the information demand of these institutional investors. Collective evidence from studies on buy-side

analysts provides support that institutional investors demand firm-specific information.

2.2   Limited attention of institutional investors

The limited attention literature in behavioral finance examines the role of investor attention (or inattention) in asset pricing, stock returns, and corporate disclosures (Teoh et al., 1998; Hirshleifer and Teoh, 2003; Baker and Wurgler, 2013). This literature provides evidence suggesting that limited attention affects not only retail investors but also sophisticated investors such as institutional investors. Fang et al. (2014) document variation across mutual funds in their propensity to purchase media-covered stocks. The propensity to purchase media-covered stocks is negatively correlated with future performance, supporting the notion that some professional investors are more subject to limited attention and thereby rely on public media to make investment decisions. Kacperczyk et al. (2014) study the optimal allocation of attention over business cycles and find that professional investors who are able to pick better-performing stocks during expansions also time the market better in recessions. Thus, professional investors who possess the skill to better allocate their attention outperform other professionals in both market conditions.

Several studies adopt a new approach introduced by Kempf et al. (2017a) to document the consequence of institutional investor inattention on firm-level decisions. Kempf et al. exploits attention shifts across industries to quantify levels of institutional investor "distraction". The intuition behind their measure is that if a given

industry undergoes extreme economic events, it distracts investors' attention away from other industries. Kempf et al. construct a measure that captures institutional investor inattention at the firm level to show that distracted institutional investor exert less effort to monitor firms specifically regarding firms' acquisition and CEO compensation decisions. Abramova et al. (2017) and Basu et al. (2017) adopt their empirical approach to show that distracted institutional investors also affect firms' disclosure policies such as voluntary disclosure frequencies. These studies collectively show that attention is a limited cognitive resource even for sophisticated investors such as institutional investors.

2.3   Empirical predictions

This section describes the theoretical framework and derives my empirical predictions. Consistent with prior literature, the premise of this paper is that institutional investors seek firm-specific information regardless of whether they are passive or active investors. The objective of this paper is to examine the information-acquisition strategies of institutional investors using earnings conference calls as a setting where institutional investors' information acquisition activity becomes partially observable.

A key conjecture in this paper is that institutional investors' attention is a main driver of their acquisition of firm-specific information. This conjecture relies on prior studies that show institutional investor attention is a main determinant of individual stock trading and how quickly prices incorporate firm-specific information (Barber and Odean, 2008; Ben-Rephael et al., 2017). To conceptualize how insti-

tutional investors allocate attention to individual firms, I adopt the framework of rational inattention economics that views attention as a costly resource (Sims, 2003; Kempf et al., 2017a; Kacperczyk et al., 2016). Based on this framework, I posit that institutional investors face an allocation problem of optimally distributing attention across firms held in their portfolio or under consideration for investment while being subject to constraints of costly attention. As a result of this attention-allocation process, some firms will receive relatively more attention while others will be relatively neglected (i.e., suffer from institutional investor inattention). I assume that institutional investors in the short-run conduct more (less) firm-level research on firms that receive relatively more (less) attention.

This paper predicts that information acquisition through conference call participation substitutes acquisition of firm-specific information during the pre-call period. Earnings conference calls provide several advantages that help institutional investors acquire information on firms for which they have previously conducted less information acquisition. Institutional investors can gather qualitative (soft) information such as management tone or voice through conference call participation in addition to quantitative (hard) information (Mayew and Venkatachalam, 2012). Also, the question and answer section within conference calls is structured so that participants can follow up on a question if management answers are deemed insufficient. These advantages of conference calls as an information gathering opportunity can incrementally benefit institutional investors when they have been less attentive in gathering firm-specific information prior to the calls. In this case, I posit that institutional

investors will actively participate in conference calls to compensate for the paucity of their prior information acquisition. Under the maintained assumption that the relation between attention and information acquisition in a given period is positive, I posit a positive association between prior inattention (i.e., less firm-specific information gathering during the pre-call periods) and conference call participation by institutional investors.

Prior evidence on buy-side analysts' preference over firm-specific information sources also supports the maintained prediction that prior information gathering and conference call participation are likely substitutes. Buy-side analysts, who exclusively work to fill the information demand of institutional investors, can use various information sources to gather firm-specific information. Brown et al. (2016) document that buy-side analysts find firms' 10-Ks and 10-Qs to be the most valuable public source of firm-specific information. Nevertheless, they also document that buy-side analysts view financial disclosures as a source that requires a significant investment of time and effort to distill relevant information. Earnings conference calls, on the other hand, provide salient information that likely requires less time to comprehend and are considered by buy-side analysts to be one of the most valuable public sources of both backward and forward-looking information about firms. Considering the saliency and the potential efficiency of earnings conference calls, I predict that earnings conference calls become more relevant to institutional investors who have allocated relatively less attention to firms during the pre-call period. This reasoning also supports the positive association between prior inattention and conference call participation.

As further described in Section 3.3 below, I measure information gathering of institutional investors through conference calls using three empirical proxies related to conference call participation. First, I count the number of participants associated with institutional investors by matching the participants' affiliations to institutional ownership (13f) filers. These are participants that asked at least one question in a earnings conference call who also have direct ties to institutional investors. Second, I calculate the average number of questions asked by participants associated with institutional investors. Finally, I calculate the average number of requests for future guidance posed by participants associated with institutional investors. I state my predictions in alternative forms as follows for each of the three proxies that are constructed from the earnings conference call transcripts.

P1a: *The number of conference call participants affiliated with institutional investors is positively associated with institutional investor inattention during the pre-call period.*

P1b: *The average number of questions asked by participants affiliated with institutional investors during conference calls is positively associated with institutional investor inattention during the pre-call period.*

P1c: *The average number of requests for future guidance posed by participants affiliated with institutional investors is positively associated with institutional investor inattention during the pre-call period.*

Prior studies show that institutional investors are less likely to trade in firms

to which they devote less attention (Fang et al., 2014; Kempf et al., 2017a). I conjecture that if institutional investors rely on earnings conference calls to compensate for paucity of their information acquisition, institutional investor inattention during the pre-call period would have a positive association with daily institutional trading volume on days of the conference calls, *ceteris paribus*. Thus, I state my prediction regarding abnormal institutional trading volume as follows (in alternative form).

P2: *The daily institutional investor trading volumes on conference call days is positively associated with institutional investor inattention.*

Given that prior studies that have suggested complementarity between prior information gathering and conference call participation, I consider it an empirical question whether institutional investors' conference call participation substitutes or complements their information gathering prior to conference calls. Kempf et al. (2017a), for instance, argue that the number of questions participants ask during a conference call will depend on how much time they previously spend on researching the call-holding firm. The mosaic theory advocated in several studies also suggests that information gathered from a single source is more likely to be valuable when considered in conjunction with information gathered through other sources (e.g., Bradshaw et al., 2015; Drake et al., 2016). Under these arguments, information gathering through conference call participation can have a positive relation with prior information gathering during the pre-call period. Such complementarity, therefore, will mitigate the predicted positive association between institutional investor inattention

(i.e., less firm-specific information gathering prior to conference calls) and conference call participation or even manifest in a negative association if it dominates substitution.

CHAPTER 3
SAMPLE AND RESEARCH DESIGN

This section describes my sample and the methodology used to test the predictions developed in the previous chapter. Section 3.1 briefly describes my data sources, Section 3.2 provides details on the institutional investor inattention measure, and Section 3.3 provides an overview of my research design. Section 3.4 summarizes descriptive statistics of the variables included in the tests of *P1a* through *P2*.

3.1   Sample construction

I begin my sample construction by identifying earnings conference calls available in the FactSet Events database for years between 2011 and 2017.[1] Each transcript of these conference calls contains a list of participants and their affiliations, a management discussion section, and a question and answer section where various participants ask questions to senior managers. I require each firm to have transcripts available for the previous four quarters to calculate the conference call participation proxies based on abnormal levels relative to the average over previous quarters. Additionally, related to the institutional investor inattention measure discussed in Section 3.2, the sample requires each conference call to have at least one other conference call of an industry peer held on the same day. These requirements, along with criteria described

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[1] I include transcripts only after 2011 to exploit the XML (eXtensible Markup Language) implemented in 2011. XML is a mark up language that facilitates data storage and transportation. When transcripts are generated with XML structures, names of participants and their affiliations appear consistently as long as they are entities included in the FactSet universe (e.g. LionShare, Institutional Ownership, Mutual Fund, and People database).

in Panel A of Table 1, results in a final sample of 41,583 earnings conference calls held by 3,316 unique firms from the first quarter of 2012 through the last quarter of 2017.

FactSet transcripts are particularly useful for identifying institutional investors and linking each dialogue to individuals.[2] More than 80 percent of participants' affiliations match the proper name field (*ENTITY_PROPER_NAME*) of the FactSet entity file, where I obtain the unique entity identifiers (*FACTSET_ENTITY_ID*). These unique identifiers are common to the FactSet Institutional Ownership (13F) database. Therefore, any entity that is not matched to a FactSet entity is unlikely to be an institutional investor. FactSet transcripts also ensure participants appear under consistent names each time their dialogue is recorded within a transcript. I use these names to link dialogues to each individual. There are in total 277,428 appearances from 2,320 different institutions that had 1,279,289 total exchanges with senior managers during the conference calls.[3]

Panel B of Table 1 presents the 277,428 appearances partitioned by institution type. First, I divide total appearances into 13F filers (105,572) and non-filers (171,856) based on the institutional ownership (Form 13F) filing history between 1990 and 2017. I view institutions with at least one 13F filing history during this

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[2] These advantages attribute to FactSet transcripts being generated with XML since 2011. I collect the transcript data through parsing text using python scripts since I do not have direct access to the XML feeds. The advantages mentioned here extend to text parsing. Appendix B provides an example of a transcript generated with XML.

[3] Jung et al. (2018) describe that the number of dialogues overstates the number of questions asked since each dialogue may start with a "Hello" and end with a "Thank you."

period as institutional investors. Brokerage firms are the most frequent participants, constituting 91.59% of 13F filers and 68.82% of non-filers (96,696 and 118,275, respectively). The composition of other types of institutional investors is similar to that of Call et al. (2018), with hedge fund managers (3.48%) appearing most often followed by investment advisers (3.41%), private banking or wealth management (0.53%), and mutual funds (0.44%). These four types of institutions reappear in the non-filer group because the SEC filing requirement only applies to institutions that have over $100 million of equity (Section 13(f) securities) assets under management. Therefore, non-filing investors consist of small investors that have not yet met the $100 million filing threshold. The choice to view only 13F filers as institutional investors can leave out institutional investors that does not meet the size threshold. This choice, nonetheless, prevents identifying small retail investors as institutional investors. The summary statistics in Panel B is consistent with findings in prior studies that a nontrivial number of institutional investors participate in conference calls, while the majority of conference call participants are likely sell-side analysts (Jung et al., 2018; Call et al., 2018).

3.2 Bloomberg Heat Score and construction of institutional investor inattention

A key conjecture in this paper is that institutional investors' attention is a main driver of their acquisition of firm-specific information. This assumption allows me to address the empirical challenge that institutional investors' acquisition of firm-

specific information prior to conference calls is not directly observable. I construct a firm-level measure of institutional investor inattention by comparing among peer groups the level of firm-specific research conducted by institutional investors during pre-call period from the end of the earnings quarter until the day before the conference call. The peer groups are defined as groups of industry peers that hold conference calls on the same day.

I use the Bloomberg Heat Score introduced by Ben-Rephael et al. (2017) to capture the levels of abnormal attention that institutional investors devote to individual firms. The Heat Score is determined by search activities conducted on individual stocks through the Bloomberg terminals. Bloomberg tracks the number of times stock-specific articles are read or searched through its terminals. Terminal users can either read an article without knowing that it is related to a specific stock or search for a stock-specific article by typing a company's ticker symbol followed by the function "CN" (Company News). To differentiate between the two activities, Bloomberg assigns a value of one when an article is read and a value of ten when an article is actively sought. These values are aggregated every hour into a stock-level figure that Bloomberg converts into an abnormal attention score. The abnormal attention score is constructed by comparing the average hourly values over the previous 8 hours to all hourly values of the same stock during the previous 30 days. Bloomberg converts the 8-hour rolling average into a firm-level score of 0 if the rolling average is in the lowest 80% of the 30-day hourly values. A score of 1, 2, 3, or 4 are assigned in a similar fashion if the rolling average is between 80% and 90%, 90% and

94%, 94% and 96%, or greater than 96% of the previous 30-day hourly values. The Bloomberg historical daily data provides the daily maximum score (Item: RQ369, *NEWS_HEAT_READ_DMAX*) for each stock. I transform the daily firm-level Heat Scores into their corresponding conditional means and aggregate the daily means over the pre-call period. This measure captures the the short-term abnormal institutional investor attention devoted to each firm prior to its conference call. Figure 1 depicts how Bloomberg constructs the daily Heat Scores and how each daily score is converted into its conditional mean before the aggregation.

After aggregating daily Heat Scores for the pre-call period, the main variable of interest, *INATTENTION*, requires another step that involves identifying peer groups within which each firm's aggregated Heat Score (*HEAT SCORE*) is compared to that of its peers. Peer firms are defined as firms within the same Fama-French 12 industry that hold earnings conference calls on the same day (Fama and French, 1997).[4] This second step attempts to mitigate the concern that firm-level inattention measure can be driven by unobservable firm, time, or industry factors. Prior studies find that various factors can affect how institutional investors allocate their attention to individual firms (Ben-Rephael et al., 2017; Kempf et al., 2017a; Fang et al., 2014). If unobservable factors affect both the firm-level inattention measure and institutional investors' conference call participation, the association between the two variables can lead to incorrect inferences. To mitigate this concern, I construct the *INATTENTION*

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[4] The Fama-French 12 classification is chosen for consistency with prior inattention studies (Kempf et al., 2017a; Basu et al., 2017; Abramova et al., 2017).

measure based on relative attention among peer firms within each group. Specifically, to calculate institutional investor inattention during the pre-call period for a given firm i holding a conference call, I take the difference between firm i's *Heat Score* and that of all peer firms to calculate the *INATTENTION* measure as:

$$INATTENTION_{i,t} = \sum_{c \in C}(HEAT\ SCORE_{c,t} - HEAT\ SCORE_{i,t}) \qquad (3.1)$$

where C denotes a set of peer firms and *HEAT SCORE* denotes conditional mean values corresponding to the pre-call period.

INATTENTION is defined so that higher values are associated with institutional investors paying relatively less attention to a given firm i and more attention to its peers. In terms of my main predictions, I predict that higher levels of *INATTENTION* will be associated with institutional investors being more active in company i's conference call. Figure 2 demonstrates the construction of *INATTENTION* by using an example of AT&T Inc. and T-Mobile Inc., the two industry peers within Telecommunication—seventh industry of Fama-French 12 classification—that held their conference calls on October 22, 2016.

3.3   Research design

My tests examine the relation between the *INATTENTION* measure and proxies of institutional investors' conference call participation. A major strength of my design is that both the inattention and the conference call participation proxies are measured at the firm level for each quarterly conference call. Consistent with the construction of the *INATTENTION* measure, all tests compare institutional investors'

conference call participation among industry peers that hold conference calls on the same day. I use the following OLS regression to test my main predictions:

$Conference\ Call\ Participation_{i,t} =$

$$\beta_1 \cdot INATTENTION_{i,t} + \sum_{k \in K} \beta_k \cdot Z_{i,t,k} + Fixed\ Effects + \varepsilon_{i,t}$$

(3.2)

where i represents each conference call holding firm, t represents conference call date, and Z_k indicates a set of k control variables. *Conference Call Participation* denotes the main dependent variables constructed for each conference call included in the sample—number of participants that are affiliated with institutional investors, number of questions asked by participants affiliated with institutional investors, and number of requests for future guidance posed by participants affiliated with institutional investors. I normalize each dependent variable by subtracting the time-series average over the 4 previous quarters. The normalization eliminates the stale component of each proxy that is unlikely to be associated with the transient effects of inattention.

Equation (3.2) includes industry-by-date fixed effects to analyze variations within peer groups defined for constructing the *INATTENTION* measure. These fixed effects also address a potential concern that institutional investors can shift attention to other industries during certain periods (Kempf et al., 2017a). Potential causes of these idiosyncratic shifts across industries include concentration of major economic events (Harford, 2005), release of industry-specific information (Hui and Yeung, 2013), or interdependence of one industry with others (Ahern and Harford, 2014). While *INATTENTION* is intended to capture relative institutional investor

inattention within peer groups, time-varying industry-level changes can become omitted confounds if they simultaneously affect institutional investors' conference call participation. The within-peer-group design mitigates this potential concern that the association is driven by time-varying industry-level changes.

I also check whether each result is robust to adding firm fixed effects. Firm fixed effects address the concern that institutional investors' preference over firm-specific information sources can vary across firms. Similar to other mediums of voluntary disclosure, the amount of information disclosed through conference calls is likely determined by a number of firm-specific factors (Frankel et al., 1999; Bowen et al., 2002; Brown et al., 2004; Bushee et al., 2001, 2004; Beyer et al., 2010). If investors perceive conference calls held by certain firms to be more useful and informative, they might participate in their conference calls rather than engage in thorough research on these firms. To the extent *INATTENTION* correlates with firm-specific investor preference for obtaining information through earnings conference calls, the relation between *INATTENTION* and active participation in conference calls can simply be mechanical. Firm fixed effects mitigates this concern by controlling for time-invariant firm-specific factors that affect the usefulness of a firm's conference calls.

Equation (3.2) also includes several control variables that are likely associated with both *INATTENTION* and conference call participation. The first set of controls relates to investor attention proxies used in prior studies. The first attention-related variable is termed *K_DISTRACT* and refers to the Kempf et al. (2017a) inattention measure discussed in Section 2.2, which exploits attention shifts across

industries to quantify levels of institutional investor "distraction". The next variable, *RETAIL_DIST*, controls for *retail* investor inattention (Barber and Odean, 2008; Tetlock, 2011; Blankespoor et al., 2018). The calculation of *RETAIL_DIST* mirrors that of *INATTENTION* in equation (3.1) but substitutes the *HEAT SCORE* with news coverage. The second set of controls are conference call characteristics, measured using FactSet Events and I/B/E/S Detail History. *INTRADAY* is an indicator variable set to 1 for conference calls held during market hours and zero otherwise. *NEG_SURPRISE* is an indicator variable for conference calls held after missing the analyst forecast consensus. Lastly, *EPS_ANNOUNCE* is an indicator variable set to 1 for conference calls held on the same day as earnings announcement dates and zero otherwise.

The last two groups of controls include various firm-level proxies. The third set of controls relates to institutional ownership and are constructed from FactSet 13F data at lagged calendar quarter ends. *II_HOLDINGS* is the total fraction of outstanding shares owned by institutional investors. *TOP_5_II* is the sum of top 5 institutional holdings. The third set of controls related to the information environment are measured from I/B/E/S Detail History and include the natural log of one plus the number of analysts (*ANALYST*) and the natural log of one plus the number of analyst forecasts (*FORECAST*). The last set of controls are the market-based firm characteristics. These controls are gathered from COMPUSTAT and CRSP. *RETURN* is the abnormal daily returns aggregate over the pre-call period, *MTB* is the market-to-book ratio at the end of the earnings quarter, *SIZE* is the natural log

of the market value of equity, and *VOLUME* is the abnormal daily trading volume aggregated over the same period as *RETURN*. Appendix A provides more detail on the construction of these variables.

3.4   Descriptive statistics

Panel A of Table 2 presents descriptive statistics of variables described in Section 3.3. Consistent with prior studies, 6.68 individuals on average appear in conference call transcripts (*#PARTICIPANT*). *PARTICIPANT* is the dependent variable for the regressions in Table 3, calculated as the number of participants normalized by subtracting the past four quarter average. Each firm holding a conference call on a given day has, on average, 21.04 industry peers holding conference calls on the same day (*#CONCURRENT*). The *HEAT SCORE* values of these peer firms are used in constructing the *INATTENTION* measure, as explained in Equation (3.1). The mean value of *INTRADAY* indicates that only 63% of conference calls are held during hours when the market is open. *EPS_ANNOUNCE* shows that most conference calls (72%) are held when firms announce quarterly or annual earnings.

Panel B presents Pearson and Spearman correlation coefficients for all variables included in the regressions of Table 3. Consistent with the two attention variables related to institutional investors—*INATTENTION* and *K_DISTRACT*—capturing different dimensions of institutional investor inattention, the correlation is positive but minimal. The univariate relation between *INATTENTION* and *K_DISTRACT* has a Pearson correlation of 0.02 and a Spearman correlation of 0.04 that are significant

at 1%. Univariate tests show that abnormal participation ($PARTICIPANT$) is positively correlated with $INATTENTION$ but negatively correlated with $K\_DISTRACT$. These seemingly inconsistent patterns suggest that $K\_DISTRACT$ should be controlled for when drawing inference on $INATTENTION$.

CHAPTER 4
MAIN RESULTS

4.1   Results on total participation

Prior to testing the main predictions, Table 3 examines the total number of participants in conference calls, which counts all participants without differentiating those affiliated with institutional investors. This analysis examines the relation between *INATTENTION* and the overall levels of active conference call participation. The two columns report results of the same model but include different fixed effects. As described in Section 3.3, the dependent variable is normalized by subtracting the average number of participants over the past 4 quarters, eliminating the stale component that is unlikely to be associated with inattention. All significance tests are two-sided.

While institutional investors are not yet identified, results in both columns show a positive association between *INATTENTION* and total number of participants. The first column that includes industry-by-date fixed effects shows a significantly positive coefficient of *INATTENTION* (0.019 and t-statistic = 3.50). This result indicates more participants attend conference calls held by firms when institutional investors pay less attention to them during the pre-call period. This result is robust to adding firm fixed effects as shown in the second column (coefficient = 0.035 and t-statistic = 4.50), providing support that the positive association is not likely driven by time-invariant firm-specific factors.

Another notable result in this table is the coefficients of $K\_DISTRACT$, the institutional investor inattention measure introduced by Kempf et al. (2017a). Despite having a significantly negative correlation with $PARTICIPANT$ in the univariate test presented in Table 2 Panel B, $K\_DISTRACT$ shows insignificant coefficients in both columns. It is, therefore, unclear whether the Kempf et al.'s inattention measure explains the variation in conference call participation of this sample.

4.2   Results for participation by category—Test of $P1a$

For testing the first prediction ($P1a$) concerning number of conference call participants affiliated with institutional investors, I classify participants into four categories to identify those that represent institutional investors. I maintain that the activities of these participants will reflect the information-acquisition strategies of institutional investors. The classification process follows from the categories presented in Panel B of Table 1 and resembles prior studies that identify buy-side analysts (Jung et al., 2018; Call et al., 2018). The first category, *Sell-Side*, distinguishes sell-side analysts whenever possible. Sell-side analysts conduct their research activities to disseminate stock recommendations to a broad range of clients (Bradshaw, 2012; Bradshaw et al., 2017; Ramnath et al., 2006; Kothari et al., 2016). Therefore, their activities are less likely to reflect the information-acquisition strategies of institutional investors as closely as those of institution-affiliated participants. The second category, *Buy-Side*, includes participants associated with a 13F filer that does not own either

a brokerage or an investment banking operation and, therefore, their role can be reliably identified as buy-side analysts.

The third category, *Institutional Investor Affiliated (IIA)*, includes participants who have affiliation with institutional investors but cannot be determined as either *Sell-Side* or *Buy-Side*. For instance, the role of a participant cannot easily be determined when she is affiliated with an investment firm that has an in-house brokerage operation. Therefore, all participants affiliated with institutional investors are included in the *IIA* category if the institutional investor that they represent either has an in-house brokerage division or is identified as an I/B/E/S contributor—an indication that the employer releases sell-side analyst reports. Nevertheless, I view the *IIA* participants employed by institutional investors to have closer ties to institutional investors than the brokerage-client relation of *Sell-Side* under the assumption that employment is a stronger link to institutional investors. In addition, some *IIA* participants will be individuals that serve roles of buy-side analysts. Therefore, I view the *Buy-Side* and *IIA* participants to have strong ties to institutional investors. All other participants not included in the three categories are classified as *Others*. Appendix C discusses the classification process in greater detail.

For each category, Panel A of Table 4 presents descriptive statistics of the raw participant count identified with prefix # and the dependent variable of each regression. For the *Sell-Side* and *IIA* categories, the dependent variables are numbers of participants included in the respective categories normalized by subtracting the previous 4-quarter average of each group. As discussed in Section 3.3, the normalization

eliminates stale components that are unlikely to be associated with institutional investor inattention in the short-run. The dependent variables of *Buy-Side* and *Others*, on the other hand, are dichotomized since participants in these two categories appear in only 10% and 22% of all conference calls, respectively. As a result, the coefficients of *INATTENTION* in Panel B for *Buy-Side* and *Others* are estimated from linear probability models.

Panel B of Table 4 presents test results for the first prediction (*P1a*) regarding the relation between institutional investor inattention and number of participants. For brevity, I only provide the coefficients on *INATTENTION*, the main variable of interest. The results in Panel B support my first prediction that institutional investors more likely attend conference calls of firms that suffer from institutional investor inattention in the pre-call period. The coefficients on *INATTENTION* are significantly positive only for the two categories—*Buy-Side* and *IIA*—that represent institutional investors. These results show that findings in Table 3 related to the aggregate participation are not driven by participants without direct ties to institutional investors. The coefficient of *INATTENTION* for *Buy-Side* (0.004 and t-statistic $= 5.18$) implies that one-standard deviation (1.99) increase in *INATTENTION* is associated with a 7.96% ($\frac{0.004 \times 1.99}{0.1}$) increase in the expected probability of a *Buy-Side* participant appearing in a given conference call. This result is economically significant considering that *Buy-Side* participants appear in only 10% of all conference calls included in my sample. The coefficient for *IIA* (coefficient $= 0.010$ and t-statistic $= 2.95$) indicates that one-standard deviation increase in *INATTENTION* is associated with

0.199 (0.010×1.99) increase in the normalized number of *IIA* participants. Panel B also shows that these results are robust to adding firm fixed effects (coefficients 0.011 and 0.018, respectively).

Prior studies provide two potential explanations on why *Sell-Side* participants do not show significant association with *INATTENTION*. First, prior studies suggest that sell-side analysts are less likely to experience limits to attention as much as institutional investors. Brown et al. (2016) compare two surveys conducted on sell-side (2015) and buy-side analysts and contrast the job descriptions of the two groups. Only 50% of sell-side analysts cover two or more industries while this portion is 80% for buy-side analysts. Sell-side analysts also cover significantly less firms with median number of firm ranging from 16 to 25, compared to the buy-side analysts' median coverage of 26 to 50. Their evidence suggests that the *Buy-Side* and *IIA* groups are more likely to experience inattention. Second, while the information demand of institutional investors will effect sell-side analysts through the brokerage-client relation, sell-side analyst are likely to have other factors that determine their conference call participation. The most recent survey of Brown et al. (forthcoming) find that their recommendation and the number of coverage periods are the two main factors that affect conference call participation of sell-side analysts. These factors are unlikely to be related to the transient nature of inattention.

In summary, the results included in Panel B of Table 4 support the prediction (*P1a*) that conference call participation of institutional investors is larger for firms that experience institutional investor inattention during the pre-call period. I ob-

serve significantly positive association between the institutional investor inattention measure and conference call participation for *Buy-Side* and *IIA* representatives, two categories that represent institutional investors but do not observe similar association among the *Sell-Side* and *Others*.

4.3 Results for number of questions asked during conference calls—Test of *P1b*

In this section, I examine the second prediction (*P1b*) regarding the number of questions that are asked by the various groups of participants.[1] Because *Buy-Side* (10%) and *Others* (22%) appear only in relatively few conference calls, I conduct the analyses in this section and the following by combining *Sell-Side* and *Others* into one group and *Buy-Side* and *IIA* into another. The *Buy-Side & IIA* group effectively combines the number of questions asked by participants associated with institutional investors. I normalize the number of combined questions by subtracting the previous 4-quarter average for each of the two groups. I also divide these numbers by the respective numbers of participants to address a concern that the total number of questions may simply reflect changes in participation. Panel A of Table 5 provides descriptive statistics related to the number of questions and the dependent variables.

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[1] As discussed in Section 3.1, the number of dialogues overstates the number of questions since a dialogue may start with a "Hello" and end with a "Thank you." Assuming that occurrences of these colloquial conversations do not change over time, the normalization of subtracting the previous 4-quarter average will reduce the risk of dependent variables being driven by colloquial conversations. Following this argument, I refer to the normalized number of dialogues as "number of questions" in this section.

There are 68 conference calls in which neither *Buy-Side* nor *IIA* participants appear, reducing the sample size of the *Buy-Side & IIA* group to 41,515.

A notable result in Panel A is the comparison of the mean values between the two groups. The average number of questions (19.98 *vs.* 10.08) and the average questions per participant (5.20 *vs.* 4.76) are both larger for the *Sell-Side & Others* group. Paired *t*-tests indicate that these differences are statistically significant ($p <$ 0.001) with *t*-statistics of 132.68 and 10.09, respectively. These results are consistent with the conventional belief that institutional investors, on average, have the incentive to avoid revealing private information (Call et al., 2018). When institutional investors increase their involvement in conference calls, this is an indication that their incentive to gather information outweighs their incentive to be discrete about the amount of information they may possess about the firm.

Panel B of Table 5 provides the test results for *P1b* regarding the relation between institutional investor inattention and number of questions per participant asked during conference calls. The coefficients of *INATTENTION* are estimated from equation (3.2) separately for each participant group. The coefficient of *INAT-TENTION* (0.181 and *t*-statistic = 2.46) is significantly positive for the *Buy-Side & IIA* group, which indicates that participants affiliated with institutional investors ask more questions in conference calls held by firms that suffer from institutional investor inattention during the pre-call period. A one-standard deviation (1.99) change in *INATTENTION* is associated with a 0.36 (0.181×1.99) increase in abnormal number of questions per participant, an increase equivalent to 7.6% of the average number

of questions per institution-affiliated participant (4.76). Panel B also shows that the result is robust to adding firm fixed effects (coefficient = 0.232 and t-statistic = 2.38). Collectively, the results in Tables 4 and 5 reveal that more participants from institutional investors attend the calls and these participants each asks more questions on average for firms that suffer institutional investor inattention during the pre-call periods. These results are consistent with the notion that institutional investors' reliance on conference calls increases for firms to which they have paid less attention during the pre-call period.

4.4   Results for requests for guidance—Test of *P1c*

In this section, I examine more directly the nature of the information acquired by institutional investors through conference call participation. To proxy for investment-relevant information, I examine the dialogues linked to individual participants to identify requests for future guidance. I parse each dialogue into sentences and categorize the dialogue as a request for future guidance if any sentence contains at least one "forward-looking" word.[2] For this process, I adopt the list of forward-looking words introduced by Chuk et al. (2013) and augmented by Chapman and Green (2018). Panel A of Table 6 provides descriptive statistics for requests for future guidance. Among the questions examined in Table 5, approximately one third of the dialogues include at least one forward-looking word and are therefore identified

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[2] "Forward-looking" word refers to any of the following words: *anticipate, anticipated, expect, expectation, expected, forecast, guidance, outlook, anticipating, anticipation, forecasted, going to be, projected, projection, revised, should be, trajectory,* and *will be.*

as requests for guidance. Similar to the previous section, I subtract the previous 4-quarter average and scale by the number of participants to construct the dependent variable.

Panel B of Table 6 provides the test results for *P1c* regarding the relation between institutional investor inattention and number of request for future guidance posed during conference calls. It provides the coefficients of *INATTENTION* estimated from equation (3.2) using requests for guidance as the dependent variable. Coefficients of *INATTENTION* are estimated for the *Sell-Side & Others* and the *Buy-Side & IIA* groups separately. The coefficient on *INATTENTION* (0.351 and *t*-statistic = 9.61) is significantly positive for the institutional investor—*Buy-Side & IIA*—group of participants and remains significant when firm fixed effects are included (coefficient = 0.149 and *t*-statistic = 3.22). The *Sell-Side & Others* group of of participants also shows a significantly positive coefficient in the first column (coefficient = 0.098 and *t*-statistic = 2.66). This coefficient, however, becomes insignificant when firm fixed effects are added (coefficient = 0.041 and *t*-statistic = 0.91). Therefore, the positive association between *INATTENTION* and number of request for future guidance can be consistently documented only for the *Buy-Side & IIA* group.

While these results reinforce the previous results in Tables 4 and 5, the results Panel B of Table 6 provide more direct evidence on the nature of information that institutional investors acquire through conference call participation when they exhibit inattention. Results in this section suggest that institutional investors rely more on conference call participation to gather investment-relevant, forward-looking informa-

tion when they have likely been inattentive to acquiring firm-specific information during the pre-call period.

4.5 Results for daily institutional investor trading volume—Test of *P2*

This section examines whether trading patterns provide evidence consistent with institutional investors relying more on conference calls immediately after periods of inattention. Consistent with conference call participation compensating for institutional investor inattention, I predict that inattention during the pre-call period will be positively associated with institutional investor trading on conference call days. To focus on larger off-exchange trades, I estimate the daily institutional trading volume using the trades recorded through the FINRA Trade Reporting Facility (TRF). Boehmer et al. (2017) introduce a method that can reliably determine whether TRF trades are initiated by a retail or an institutional investor. This method exploits the fact that TRF retail orders receive price improvements (i.e., prices more favorable than the National Best Bid and Offer), while off-exchange institutional orders are prohibited by Regulation NMS from having subpenny limit prices. The price improvement that retail orders can receive are fractions of cents—most commonly 0.01, 0.1, and 0.2 cents—higher (lower) than the National Best Bid (Offer). Institutional orders, by contrast, can only be executed at prices with exact pennies when bid-ask spreads are even numbers and half pennies (0.5 cents) when bid-ask spreads are odd numbers. Following the method introduced by Boehmer et al. that relies on this institutional detail, I identify trades executed at prices with exact pennies or

nearly half pennies (0.4–0.6 cents) as trades initiated by institutional investors. Daily abnormal institutional trading volume is defined as the difference between daily trading volume on the days of conference calls and the average during the past 30 days. I run the following OLS regression to test *P2*.

$$Abnormal\ Institutional\ Trading\ Volume_{i,t} =$$

$$\beta_1 \cdot INATTENTION_{i,t} + \sum_{k \in K} \beta_k \cdot Z_{i,t,k} + Fixed\ Effects + \varepsilon_{i,t} \tag{4.1}$$

where i represents each conference call holder, t represents conference call date, and Z_k indicates a set of k control variables in equation (3.2). Tabel 7 provides the estimates from equation (4.1) that includes both industy-by-date and firm fixed effects. The result with respect to abnormal institutional trading volume supports *P2*. The coefficient on *INATTENTION* (0.018 and t-statistic $= 5.00$) shows that abnormal institutional trading volume on conference call days is greater for firms to which institutional investors paid less attention during the pre-call period. Relative to the sample mean of abnormal institutional trading volume (0.12, untabulated), a one-standard deviation (1.99) increase in *INATTENTION* is associated with a 29.9% ($\frac{0.018 \times 1.99}{0.12}$) increase in abnormal institutional investor trading volume. These findings on the trading patterns of institutional investors corroborate the findings presented in previous sections on their information acquisition through conference call participation. The result in Table 7 suggests that the information gathered through conference calls compensate for institutional investor inattention during the pre-call period.

CHAPTER 5
ADDITIONAL ANALYSES

5.1   Cross-Sectional test for conference call participation of institutional investor

This section provides corroborating evidence to the main results presented in Section 4. The cross-sectional test presented in this section is derived from anecdotal evidence suggesting that some buy-side analysts are more reluctant to gather information in public settings such as earnings conference calls. Institutional investors likely bear additional costs such as increased risks of front running when they reveal their private information in public settings (Brunnermeier and Pedersen, 2005). Moreover, disclosing not the information itself but simply the firms on which they gather information can become signals exploitable by other investors. I argue that transient investors possess traits that render them more susceptible to such costs. Transient investors have high portfolio turnover and short-term trading strategies, which suggest that they implement investment strategies that rely more heavily on information advantages in the short-run than those of quasi-indexers (Bushee, 1998; Boone and White, 2015). Under this argument, I predict that the positive association between institutional investor inattention and conference call participation is less pronounced for firms that have relatively greater portion of shares owned by transient investors.

Table 8 provides results that test this prediction using the number of participants affiliated with institutional investors—the dependent variables examined in

Table 4. I calculate the median value of transient investor ownership for each quarter to divide the sample into firms with high or low transient investor ownership. I estimate the coefficients on *INATTENTION* separately for the two sub-samples to test the difference in coefficients across sub-samples. Consistent with the prediction, the positive coefficient on *INATTENTION* is more pronounced for the sub-sample with lower-than-median transient investor ownership for both the *Buy-Side* and the *Institutional Investor Affiliated (IIA)* groups of participants (one-tailed *p-value* of 0.053 and 0.002, respectively). The results in Table 8 suggest that potential costs of publicly revealing information-acquisition strategies restrict institutional investors' tendency to compensate for the lack of firm-specific information during the pre-call period with conference call participation.

5.2 Alternative explanation

One competing explanation for results in Section 4 is that the decision to participate in a given conference call can take place prior to the pre-call period—the period after the end of an earnings quarter until the day before a conference call–over which institutional investor inattention is measured. Some firms announce the next scheduled conference at the end of the current conference call. Others have schedules of multiple future conference calls included in the current earnings press release. Consequently, investors know when certain firms' conference calls will be held as early as several months in advance. This raises a concern that the decision to participate in a call of a given firm causes institutional investors to allocate time and effort to

other firms, knowing that they will be participating in a future conference call to gather information about the firm in question. I examine this alternative explanation by applying the inattention measure to periods after the calls. If conference call participation is the cause of inattention, I expect institutional investors to regather attention with respect to a subject firm after the call. Conversely, the post-period inattention measure will have a negative association with the number of conference call participants if anticipation for future call participation is the cause of inattention during the pre-call period. Table 9 examines this alternative explanation. Contrary to this alternative explanation, the number of institutional participants—*Buy-Side & Others*—is uncorrelated with inattention measured after the calls. The result in Table 9 is more consistent with investors increasing conference call participation following periods of inattention rather than planned conference call participation causing firms to devote less attention to certain firms in their investment portfolio.

CHAPTER 6
CONCLUSION

In this paper, I examine how inattentive institutional investors rely on information gathering through conference call participation to compensate for their inattention during the pre-call period. I use earnings conference calls as a setting where institutional investors' information gathering is partially observable, and I use the Bloomberg heat score to construct a measure of institutional investor inattention. I show that institutional investor inattention during the period after the end of the earnings quarter until the day before the conference call is positively correlated with conference call participation of institutional investors. Collectively, my results suggest that institutional investors rely more on conference call participation to compensate for the paucity of firm-specific information gathering during the pre-call period. By examining the information-acquisition strategies observed during conference calls, this paper provides preliminary evidence to the literature that examines the roles served by institutional investors in capital markets, specifically regarding their role wiithin the procedure of how firms-specific information is incorporated into asset prices via trading.

I provide several caveats to the findings of this paper. First, conference call participation is not a random or first-come, first-serve occurrence but a joint outcome of participant inquiry and management selection (Jung et al., 2018). Just as an inquiry is a reflection of revealed preference for firm-specific information, management selection is a reflection of various manager incentives (Mayew, 2008). For this study,

I rely on the finding in Call et al. (2018) that management tend to give priority to institutional investors' questions during conference calls to draw my conclusions. Second, earnings conference calls are public settings where information is shared not only between management and a given participant but with everyone involved in the call. Therefore, each participant's questions are not independent from others'. This study does not consider early questions either preempting others or leading to subsequent additional questions. Third, this study views institutional investors separately from other participants. However, a recent survey of Brown et al. (forthcoming) finds that some buy-side analysts may use sell-side analysts to ask questions without revealing their identity. Lastly, conference call transcripts only capture participants that asked at least one question during earnings conference calls. To the extent that institutional investors rely on transcripts after the calls, the proxies of information acquisition constructed from transcript will underestimate the actual information demand of institutional investors.

Subject to these caveats, this paper provides novel evidence that supports the notion that institutional investors substitute prior acquisition of firm-specific information with conference call participation. I find that institutional investors participate more often, ask more questions, and request more guidance in conference calls held by firms that they have paid less attention to prior to the calls. I also find evidence consistent in the abnormal daily trading volumes of institutional investors. My results support the proposition that participating in earnings conference calls can in-

crementally benefit institutional investors when their attention to call-holding firms

is constrained.

Figure 1. Construction of the Bloomberg Heat Score
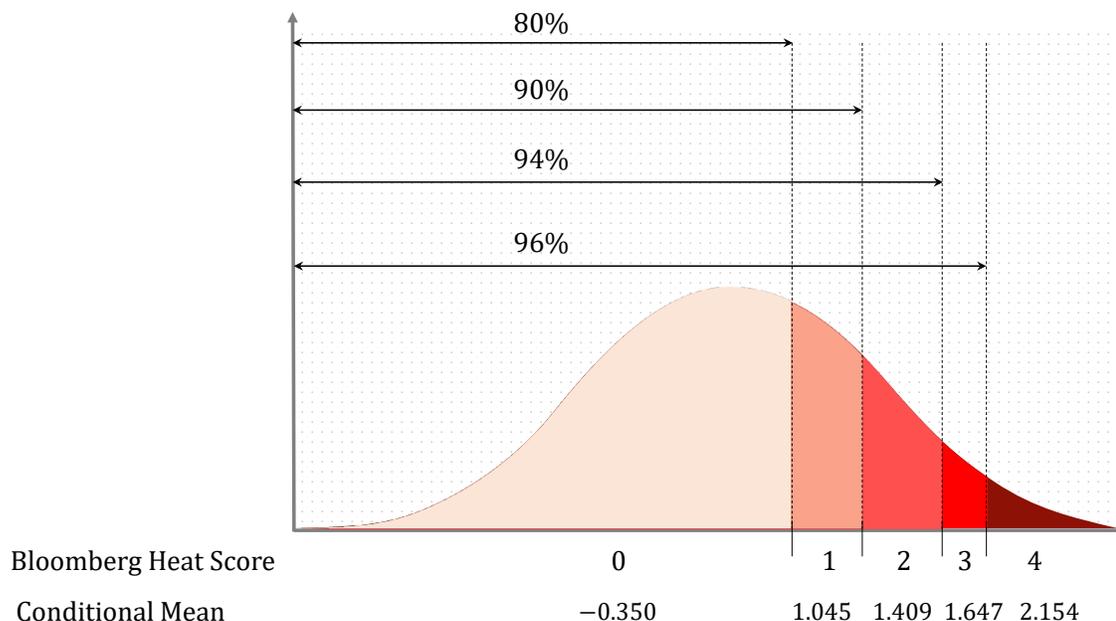
This figure depicts how Bloomberg constructs the daily Heat Scores. The Heat Score is determined by search activities on individual stocks. The average hourly search activities over the previous 8 hours is compared to a firm-level distribution of hourly searches. The underlying distribution comprises all hourly search activities of the same stock during the previous 30 days. A Heat Score of 0 corresponds to the lowest 80% of the distribution. A score of 1, 2, 3, or 4 each corresponds to average hourly search activities between 80% and 90%, 90% and 94%, 94% and 96%, or greater than 96% of the underlying distribution, respectively. The Bloomberg historical daily data provides the daily maximum score (Item: RQ369, $NEWS\_HEAT\_READ\_DMAX$) for each stock. Ben-Rephael et al. assume the daily stock-level scores follow a truncated

normal distribution and transform each score into corresponding conditional means

of -0.350, 1.045, 1.409, 1.647, and 2.154.

Figure 2. Construction of Firm-Level Inattention Measure
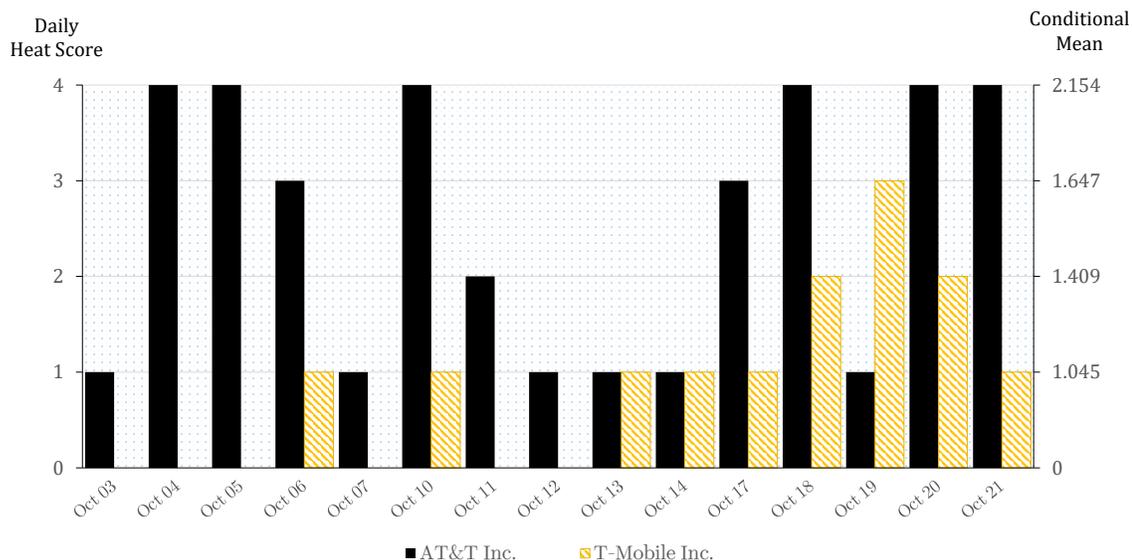
This figure provides an example of AT&T Inc. and T-Mobile Inc., the two industry peers within the telecommunication industry that held their conference calls on October 22, 2016. The figure shows the daily Bloomberg Heat Scores and the corresponding conditional means for market days during the period after the end of the earnings quarter until the day before the conference call. To construct the firm-level *INATTENTION*, the conditional means corresponding to the daily Heat Scores are aggregated for the given period. This first step results in aggregate scores (*HEAT SCORE*) of 23.897 and 8.635 for AT&T Inc. and T-Mobile Inc., respectively. Following Equation (3.1), *INATTENTION* is calculated based on the difference in

the *HEAT SCORE.*

$$INATTENTION \text{ of AT\&T Inc.} =$$

$$HEAT\ SCORE \text{ of T-Mobile Inc.} - HEAT\ SCORE \text{ of AT\&T Inc.}$$

$$= 8.635 - 23.897 = -15.262$$

$$INATTENTION \text{ of T-Mobile Inc.}$$

$$= HEAT\ SCORE \text{ of AT\&T Inc.} - HEAT\ SCORE \text{ of T-Mobile Inc.}$$

$$= 23.897 - 8.635 = 15.262$$

Alternatively, when more than one peer exist within the peer group (i.e., a group of industry peers that hold conference calls on the same day), *INATTENTION* is calculated as the sum of all differences in the *HEAT SCORE* between a given firm and its peers.

Table 1: Sample Selection and Summary Statistics

This table presents the sample selection procedure (Panel A) and the number of appearances partitioned by institution type (Panel B). Panel B also provides the number of unique entities. In Panel B, Form 13F filers consist of firms that filed at least one institutional ownership filing pursuant to Section 13(f) of the Securities Exchange Act of 1934 between the first quarter of 1990 and the last quarter of 2017. Institutional types are determined according to the type ($ENTITY\_TYPE$) and sub-type ($ENTITY\_SUB\_TYPE$) fields in the FactSet entity file.

Panel A: Sample selection

Selection criteria	Observations	Companies
Call transcripts from FactSet Events database 2011–2017	75,220	4,617
Less: Links to COMPUSTAT, CRSP, and I/B/E/S	(1,068)	(163)
Less: Non-missing conference calls in 4 previous quarters	(20,762)	(715)
Less: Minimum 1 call of industry peer on the same day	(9,624)	(79)
Less: Additional data requirements for controls	(2,183)	(344)
Total observations	41,583	3,316

Panel B: Appearance by type

Categories	13F filers		Non-filers		Total	
	Appear.	Entities	Appear.	Entities	Appear.	Entities
Broker	96,696	42	118,275	355	214,971	397
Research firm	-	-	12,071	122	12,071	122
Hedge fund	3,672	295	1,117	223	4,789	518
Investment adviser	3,595	234	1,191	192	4,786	426
Private banking/Wealth mgmt	563	62	105	23	668	85
Mutual fund	460	27	88	15	548	42
Venture capital/Pvt equity	54	5	1,345	48	1,399	53
Pension fund	25	8	-	-	25	8
Foundation/endowment	7	1	2	2	9	3
Family office	3	2	16	3	19	5
Insurance company	2	2	8	4	10	6
Bank	1	1	48	4	49	5
Investment banking	-	-	72	6	72	6
Others	494	42	37,518	525	38,012	644
Total	105,572	721	171,856	1,599	277,428	2,320

Table 2: Descriptive Statistics and Correlation Matrix

This table presents the descriptive statistics (Panel A) and correlation coefficients (Panel B) of variables included in the regression of Table 3. *PARTICIPANT* is the dependent variable, which is calculated as the number of participants (*#PARTICIPANT*) normalized by subtracting its average value over the previous 4 quarters. Panel B presents Pearson (Spearman) correlations in the lower (upper) diagonal. * indicates correlation coefficients significant at the 1% level. All continuous variables are winsorized at the 1st and the 99th percentile. Appendix A provides detailed definitions of the variables.

Panel A: Descriptive statistics

	n	Mean	Std.Dev.	Median	25%	75%
#PARTICIPANT	41,583	6.68	3.71	6.00	4.00	9.00
PARTICIPANT	41,583	−0.05	1.68	0.00	−1.00	1.00
#CONCURRENT	41,583	21.04	17.93	16.00	6.00	32.00
INATTENTION	41,583	−0.01	1.99	−0.19	−1.00	0.47
K_DISTRACT	41,583	0.13	0.09	0.10	0.06	0.17
RETAIL_DIST	41,583	−18.19	36.40	−6.65	−22.61	−0.50
INTRADAY	41,583	0.63	0.48	1.00	0.00	1.00
NEG_SURPRISE	41,583	0.39	0.49	0.00	0.00	1.00
EPS_ANNOUNCE	41,583	0.72	0.45	1.00	0.00	1.00
II_HOLDINGS	41,583	0.74	0.25	0.82	0.63	0.93
TOP_5_II	41,583	0.31	0.12	0.31	0.25	0.37
ANALYST	41,583	2.39	0.74	2.40	1.95	2.94
FORECAST	41,583	3.34	1.01	3.37	2.77	4.06
RETURN	41,583	−0.01	0.11	0.00	−0.06	0.05
MTB	41,583	3.60	4.96	2.10	1.29	3.73
SIZE	41,583	7.42	1.63	7.37	6.26	8.44
VOLUME	41,583	−5.28	6.39	−3.92	−7.89	−1.05

Panel B: Correlation coefficients

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) *PARTICIPANT*	1.00	0.04*	−0.01*	0.03*	0.00	−0.02*	0.00	0.02*
(2) *INATTENTION*	0.03*	1.00	0.04*	−0.05*	0.02*	−0.01*	0.06*	0.17*
(3) *K_DISTRACT*	−0.01*	0.02*	1.00	0.05*	0.04*	0.00	0.00	0.11*
(4) *RETAIL_DIST*	0.03*	−0.13*	0.02*	1.00	0.18*	0.04*	−0.12*	−0.05*
(5) *INTRADAY*	0.00	−0.01	0.02*	0.31*	1.00	0.06*	−0.39*	0.02*
(6) *NEG_SURPRISE*	−0.02*	−0.01*	0.01	0.05*	0.06*	1.00	−0.02*	−0.06*
(7) *EPS_ANNOUNCE*	0.00	0.05*	0.03*	−0.16*	−0.39*	−0.02*	1.00	0.03*
(8) *II_HOLDINGS*	0.01*	0.13*	0.15*	−0.03*	0.03*	−0.07*	0.05*	1.00
(9) *TOP_5_II*	0.00	−0.05*	0.13*	−0.02*	−0.03*	0.00	0.03*	0.71*
(10) *ANALYST*	0.00	0.43*	0.03*	−0.08*	−0.02*	−0.02*	0.19*	0.26*
(11) *FORECAST*	−0.01	0.40*	0.03*	−0.06*	0.00	0.00	0.18*	0.26*
(12) *RETURN*	−0.01*	0.00	−0.06*	0.01*	0.03*	0.11*	−0.02*	−0.02*
(13) *MTB*	0.04*	0.09*	0.01*	−0.10*	−0.15*	−0.04*	0.13*	0.04*
(14) *SIZE*	0.03*	0.47*	0.05*	−0.03*	0.12*	−0.10*	0.05*	0.32*
(15) *VOLUME*	−0.01	0.09*	−0.04*	0.02*	0.16*	−0.04*	−0.07*	0.15*

Table 2: Descriptive Statistics and Correlation Matrix–*continued*

Panel B: Correlation coefficients–*continued*

	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) *PARTICIPANT*	0.00	0.01	0.00	−0.01	0.06*	0.04*	−0.01
(2) *INATTENTION*	−0.07*	0.52*	0.50*	0.01*	0.13*	0.52*	0.09*
(3) *K_DISTRACT*	0.11*	0.02*	0.03*	−0.05*	0.02*	0.06*	−0.03*
(4) *RETAIL_DIST*	−0.01*	−0.12*	−0.10*	0.00	−0.08*	−0.10*	−0.01
(5) *INTRADAY*	−0.04*	−0.01*	0.00	0.03*	−0.22*	0.13*	0.16*
(6) *NEG_SURPRISE*	0.00	−0.04*	−0.03*	0.12*	−0.10*	−0.10*	−0.04*
(7) *EPS_ANNOUNCE*	0.02*	0.16*	0.15*	−0.02*	0.20*	0.03*	−0.07*
(8) *II_HOLDINGS*	0.63*	0.26*	0.26*	−0.02*	0.14*	0.32*	0.08*
(9) *TOP_5_II*	1.00	−0.11*	−0.11*	−0.01*	0.02*	−0.10*	−0.05*
(10) *ANALYST*	−0.06*	1.00	0.93*	0.00	0.17*	0.69*	0.17*
(11) *FORECAST*	−0.05*	0.92*	1.00	−0.02*	0.12*	0.64*	0.16*
(12) *RETURN*	−0.02*	0.00	−0.01*	1.00	−0.01*	0.03*	0.01
(13) *MTB*	0.02*	0.11*	0.06*	−0.01*	1.00	0.25*	−0.03*
(14) *SIZE*	−0.07*	0.66*	0.60*	0.04*	0.12*	1.00	0.27*
(15) *VOLUME*	−0.02*	0.20*	0.18*	0.02*	−0.02*	0.31*	1.00

Table 3: Inattention and Number of Participants

This table presents the OLS results of equation (3.2) examining the association between institutional investor inattention and the total number of conference call participants. The dependent variable is normalized by subtracting its average over the previous 4 quarters. *INATTENTION* is the institutional inattention measure calculated based on equation (3.1) as described in Section 3.2. All continuous variables are winsorized at the 1st and the 99th percentile. *, **, and *** indicate two-tailed statistical significance at the 10%, 5%, and 1%, respectively. *t*-statistics are based on two-way clustered robust standard errors using firm and date clusters. Appendix A provides detailed definitions of the variables.

	Number of Participants			
	OLS (β / t)		OLS (β / t)	
INATTENTION	0.019***	(3.50)	0.035***	(4.50)
K_DISTRACT	−0.221	(−0.87)	−0.065	(−0.21)
RETAIL_DIST	0.002***	(5.41)	0.002***	(5.28)
INTRADAY	−0.017	(−0.73)	0.027	(0.47)
NEG_SURPRISE	−0.009	(−0.47)	−0.001	(−0.03)
EPS_ANNOUNCE	0.003	(0.15)	0.080	(1.41)
II_HOLDINGS	0.239***	(3.80)	0.329**	(2.13)
TOP_5_II	−0.382***	(−3.08)	−0.282	(−1.09)
ANALYST	−0.007	(−0.22)	0.052	(0.92)
FORECAST	−0.091***	(−3.84)	−0.244***	(−6.95)
RETURN	−0.040	(−0.44)	−0.049	(−0.51)
MTB	0.013***	(6.57)	0.005	(1.30)
SIZE	0.052***	(5.53)	0.372***	(11.32)
VOLUME	−0.005***	(−3.45)	−0.004**	(−2.56)
R-Square	0.027		0.029	
Industry×Date FE	Y		Y	
Firm FE	N		Y	
Observations	41,583		41,583	

Table 4: Inattention and Number of Participants by Category

This table presents, for each participant category, the descriptive statistics of the dependent variables (Panel A) and the results of equation (3.2) examining the association between institutional investor inattention and the number of conference call participants (Panel B). The prefix # indicates the raw counts. The dependent variables for the *Sell-Side* and *Institutional Investor Affiliated (IIA)* categories are normalized by subtracting the previous 4-quarter average. The dependent variables for the *Buy-Side* and *Others* categories are indicator variables equal to 1 when respective groups appear in a conference call. *INATTENTION* is the institutional inattention measure calculated based on equation (3.1) as described in Section 3.2. All continuous variables are winsorized at the 1st and the 99th percentile. *, **, and *** indicate two-tailed statistical significance at the 10%, 5%, and 1%, respectively. *t*-statistics are based on two-way clustered robust standard errors using firm and date clusters.

Panel A: Descriptive statistics

	n	Mean	Std.Dev.	Median	25%	75%
#Sell-Side	41,583	3.88	2.15	4.00	2.00	5.00
Sell-Side	41,583	0.02	1.28	0.00	−0.75	0.75
#Buy-Side	41,583	0.12	0.37	0.00	0.00	0.00
I(Buy-Side)	41,583	0.10	0.30	0.00	0.00	0.00
#IIA	41,583	2.42	2.31	2.00	1.00	4.00
IIA	41,583	−0.01	1.00	0.00	−0.50	0.50
#Others	41,583	0.25	0.53	0.00	0.00	0.00
I(Others)	41,583	0.22	0.41	0.00	0.00	0.00

Panel B: Coefficients and *t*-statistics

	Number of Participants			
	Sell-Side	*I(Buy-Side)*	*IIA*	*I(Others)*
	OLS (β / t)	Linear (β / t)	OLS (β / t)	Linear (β / t)
INATTENTION	0.006	0.004***	0.010***	0.002*
	(1.48)	(5.18)	(2.95)	(1.93)
R-Square	0.127	0.169	0.144	0.175
Controls	Y	Y	Y	Y
Industry×Date FE	Y	Y	Y	Y
Firm FE	N	N	N	N
Observations	41,583	41,583	41,583	41,583
INATTENTION	0.011*	0.011***	0.018***	0.002
	(1.84)	(4.14)	(3.80)	(1.49)
R-Square	0.201	0.422	0.211	0.470
Controls	Y	Y	Y	Y
Industry×Date FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Observations	41,583	41,583	41,583	41,583

Table 5: Inattention and Number of Questions per Participant

This table presents the descriptive statistics related to the dependent variables (Panel A) and the results of equation (3.2) examining the association between institutional investor inattention and the number of questions per participant (Panel B). The dependent variables are normalized by subtracting the previous 4-quarter average and denominated by the number of participants. *INATTENTION* is the institutional inattention measure calculated based on equation (3.1) as described in Section 3.2. All continuous variables are winsorized at the 1$^{\text{st}}$ and the 99$^{\text{th}}$ percentile. *, **, and *** indicate two-tailed statistical significance at the 10%, 5%, and 1%, respectively. t-statistics are based on two-way clustered robust standard errors using firm and date clusters.

Panel A: Descriptive statistics

	n	Mean	Std.Dev.	Median	25%	75%
Sell-Side & Others						
Number of questions	41,583	19.98	11.30	19.00	12.00	27.00
Per participant	41,583	5.20	2.32	4.88	3.75	6.17
Per part. (abnormal)	41,583	−0.48	7.99	−0.50	−5.25	4.25
Buy-Side & IIA						
Number of questions	41,515	10.80	9.54	9.00	3.00	16.00
Per participant	41,515	4.76	2.30	4.33	3.33	5.67
Per part. (abnormal)	41,515	−0.38	6.07	−0.25	−3.50	2.75

Panel B: Coefficients and t-statistics

	Number of Questions per Participant	
	Sell-Side & Others	*Buy-Side & IIA*
	OLS (β / t)	OLS (β / t)
INATTENTION	−0.059	0.181***
	(−0.59)	(2.46)
R-Square	0.130	0.130
Controls	Y	Y
Industry×Date FE	Y	Y
Firm FE	N	N
Observations	41,583	41,515
INATTENTION	0.059	0.232***
	(0.45)	(2.38)
R-Square	0.196	0.196
Controls	Y	Y
Industry×Date FE	Y	Y
Firm FE	Y	Y
Observations	41,583	41,515

Table 6: Inattention and Request for Guidance per Participant

This table presents the descriptive statistics related to the dependent variables (Panel A) and the results of equation (3.2) examining the association between institutional investor inattention and the number of requests for guidance per participant (Panel B). The dependent variables are normalized by subtracting the previous 4-quarter average and denominated by the number of participants. *INATTENTION* is the institutional inattention measure calculated based on equation (3.1) as described in Section 3.2. All continuous variables are winsorized at the 1$^\text{st}$ and the 99$^\text{th}$ percentile. *, **, and *** indicate two-tailed statistical significance at the 10%, 5%, and 1%, respectively. *t*-statistics are based on two-way clustered robust standard errors using firm and date clusters.

Panel A: Descriptive statistics

	n	Mean	Std.Dev.	Median	25%	75%
Sell-Side & Others						
Requests for guidance	41,583	6.68	4.06	6.00	4.00	9.00
Per participant	41,583	1.75	0.95	1.60	1.00	2.17
Per part. (abnormal)	41,583	−4.06	3.11	−3.31	−5.17	−2.04
Buy-Side & IIA						
Requests for guidance	41,515	3.77	3.53	3.00	1.00	6.00
Per participant	41,515	1.63	0.98	1.50	1.00	2.00
Per part. (abnormal)	41,515	−3.38	3.16	−2.75	−4.50	−1.50

Panel B: Coefficients and *t*-statistics

	Request for Guidance per Participant	
	Sell-Side & Others	*Buy-Side & IIA*
	OLS (β / t)	OLS (β / t)
INATTENTION	0.098***	0.351***
	(2.66)	(9.61)
R-Square	0.220	0.176
Controls	Y	Y
Industry×Date FE	Y	Y
Firm FE	N	N
Observations	41,583	41,515
INATTENTION	0.041	0.149***
	(0.91)	(3.22)
R-Square	0.392	0.400
Controls	Y	Y
Industry×Date FE	Y	Y
Firm FE	Y	Y
Observations	41,583	41,515

Table 7: Inattention and Daily Institutional Investor Trading Volume

This table presents the results of equation (4.1) examining the association between institutional investor inattention and the abnormal institutional trading volume. The abnormal institutional trading volume is the difference between the daily institutional trading volume on the day of the conference call and the average daily institutional trading volume over the past 30 days. *INATTENTION* is the institutional inattention measure calculated based on equation (3.1) as described in Section 3.2. All continuous variables are winsorized at the 1st and the 99th percentile. *, **, and *** indicate two-tailed statistical significance at the 10%, 5%, and 1%, respectively. *t*-statistics are based on two-way clustered robust standard errors using firm and date clusters.

	Abnormal Institutional Investor Trading Volume	
	OLS (β / t)	
INATTENTION	0.018***	(5.00)
K DISTRACT	−0.752**	(−2.40)
RETAIL DIST	−0.001***	(−4.33)
INTRADAY	−0.376***	(−11.22)
NEG SURPRISE	0.041***	(3.85)
EPS ANNOUNCE	0.093***	(2.96)
II HOLDINGS	0.340**	(2.51)
TOP 5 II	−0.542***	(−3.23)
#ANALYST	0.078**	(2.29)
#FORECAST	0.014	(0.67)
RETURN	0.231***	(4.18)
MTB	0.000	(0.00)
SIZE	0.162***	(7.96)
VOLUME	−0.061***	(−54.83)
R-Square	0.369	
Industry×Date FE	Y	
Firm FE	Y	
Observations	40,373	

Table 8: Cross-Sectional Tests on Conference Call Participation

This table presents cross-sectional tests of Table 4 regarding the number of participants for the *Buy-Side* and *Institutional Investor Affiliated (IIA)* participant categories. The cross-sectional tests are based on subgroups that divide the sample based on quarterly median ownership of transient investors. The dependent variable for the *Buy-Side* category is an indicator variables equal to 1 when *Buy-Side* participants appear in a conference call. The dependent variable for the *IIA* category is the number of participants normalized by subtracting the previous 4-quarter average. *INATTENTION* is the institutional inattention measure calculated based on equation (3.1) as described in Section 3.2. All continuous variables are winsorized at the 1st and the 99th percentile. *, **, and *** indicate two-tailed statistical significance at the 10%, 5%, and 1%, respectively. *t*-statistics are based on two-way clustered robust standard errors using firm and date clusters.

	Number of Participants—I(Buy-Side)		
	Transient Investor Ownership		*P-value* from one-tailed
	High	Low	*t*-test of *Low > High*
INATTENTION	0.004***	0.005***	0.053*
	(3.77)	(3.51)	
	Number of Participants—IIA		
	Transient Investor Ownership		*P-value* from one-tailed
	High	Low	*t*-test of *Low > High*
INATTENTION	0.008**	0.013***	0.002***
	(2.07)	(2.88)	

Table 9: Conference Call Participation and Post-Period Inattention

This table presents the results of the following equation examining the association between institutional investor participation (*Buy-Side & IIA*) and the institutional investors inattention during periods after the conference calls.

$$\textit{Post-Period Inattention}_{i,t} =$$

$$\beta_1 \cdot \textit{Buy-Side \& IIA}_{i,t} + \sum_{k \in K} \beta_k \cdot Z_{i,t,k} + \textit{Fixed Effects} + \varepsilon_{i,t}$$

where i represents each conference call holder, t represents conference call date, and Z_k indicates a set of k control variables in equation (3.2). All continuous variables are winsorized at the 1st and the 99th percentile. *, **, and *** indicate two-tailed statistical significance at the 10%, 5%, and 1%, respectively. t-statistics are based on two-way clustered robust standard errors using firm and date clusters.

	Post-Period Inattention	
	OLS (β / t)	
Buy-Side & IIA	-1.209	(-1.18)
K_DISTRACT	23.991	(0.55)
R-Square	0.602	
Controls	Y	
Industry×Date FE	Y	
Firm FE	Y	
Observations	41,583	

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APPENDIX A
VARIABLE DEFINITION

Variable	Definition
Attention-related variables	
$HEAT\ SCORE_{i,t}$	A measure of abnormal institutional attention for the period after the end of the earnings quarter until the day before the conference call. The measure is based on daily abnormal institutional attention introduced by Ben-Rephael et al. (2017) and constructed from the daily Heat Scores collected from the Bloomberg historical daily data (Item: RQ369, $NEWS\_HEAT\_READ\_DMAX$). A detailed description of how Bloomberg constructs the variable is included in Section 3.2 and Figure 1.
$INATTENTION_{i,t}$	A firm-level measure of institutional investor inattention measure that identifies firms that hold conference calls when institutional investors have been less active in gathering firm-specific information on them during the pre-call period. The variable is calculated based on the $HEAT\ SCORE$ of peer firms. Peers are defined as firms that 1) are in the same Fama-French 12 industry and 2) hold a concurrent conference on the same day. The measure is calculated as the summation of all differences between firm i's textitHEAT SCORE and that of all peer firms. Figure 2 demonstrates the construction of this measure by using an example of AT&T Inc. and T-Mobile Inc., the two industry peers within Telecommunication that held their conference calls on October 22, 2016. . C represents the set of firm i's peers. $$\sum_{c \in C}(HEAT\ SCORE_{c,t} - HEAT\ SCORE_{i,t})$$
$K\_DISTRACT_{i,q}$	A quarterly, firm-level distraction measure proposed by Kempf et al. (2017a). For each calendar quarter, attention-grabbing industries are identified as the two Fama-French 12 industries with either the highest or lowest industry returns. To construct a firm-level measure, investors' portfolio weights in attention-grabbing industries excluding firm i's industry are averaged across all institutional investors of i. An average is calculated using a weight determined by each institutional investor's portfolio weight invested in firm i in and the fraction of firm i's outstanding shares held by each institutional investor. Institutional investors of i are determined using Form 13F filed at the previous calendar quarter end.

Variable	Definition
$RETAIL\_DIST_{i,t}$	A proxy for retail investor inattention. Using identical definitions of peer firms and aggregation periods as *INATTENION*, *RETAIL_DIST* substitutes *HEAT SCORE* with daily media coverage aggregated over the pre-call period. The daily media converge is calculated as the natural log of one plus the number of news articles obtained from Ravenpack Dow Jones Equities where the relevance score is higher than 90.
Conference call characteristics	
$INTRADAY_{i,t}$	An indicator for conference calls held between 8:30 and 15:00 CST
$NEG\_SURPRISE_{i,t}$	An indicator for conference calls that follow quarters in which the I/B/E/S actual EPS is below the I/B/E/S analyst forecast consensus
$EPS\_ANNOUNCE_{i,t}$	An indicator for conference calls held on the same day as the I/B/E/S actual EPS announcement dates
Institutional investor variables	
$II\_HOLDINGS_{i,q-1}$	The fraction of outstanding shares held by institutional investors at the end of the previous calendar quarter as reported in the FactSet 13F Institutional Ownership database
$TOP\_5\_II_{i,q-1}$	The fraction of outstanding shares owned by 5 institutional investors with the largest holdings in firrm i at the end of the previous calendar quarter as reported in the FactSet 13F Institutional Ownership database
Information environment variables	
$ANALYST_{i,t}$	The natural log of one plus the number of analysts that released any EPS forecast on I/B/E/S during the year preceding the conference call
$FORECAST_{i,t}$	The natural log of one plus the number of quarterly EPS forecasts on I/B/E/S during the year preceding the conference calls
Market-based firm characteristics	
$RETURN_{i,t}$	The abnormal daily returns aggregated over after the end of the earnings quarter until the day before the conference call. Abnormal daily return is calculated as the difference between CRSP daily return and its average over the previous month
$MTB_{i,t}$	The market-to-book ratio calculated at the end of the previous fiscal quarter
$SIZE_{i,t}$	The natural log of total market value at the end of the previous fiscal quarter
$VOLUME_{i,t}$	The abnormal daily volume aggregated over after the end of the earnings quarter until the day before the conference call. Abnormal daily volume is calculated as the natural log of the ratio of one plus the CRSP daily volume to its average over the previous month.

APPENDIX B
EXAMPLE OF TRANSCRIPT WITH XML STRUCTURE

The figures below show the participant list portion of the earnings conference call transcript of Huntington Bancshares, Inc.(CUSIP: 446150104) that held an earnings conference call on January 25, 2017. For each participant, the XML in Figure A.1 includes a participant ID, type, affiliation name, affiliation entity ID, job title, and the name of the participant. The information embedded in XML accurately transfers to texts in Figure A.2. The participant IDs reappear in the Q&A section to facilitate accurate transcription, ensuring consistent occurrence of participants' names throughout the transcript. Section 3.1 discusses the advantages of transcripts generated with XML.

Figure B.1. Example of XML structure

CORPORATE PARTICIPANTS

Mark Muth
Director-Investor Relations, Huntington Bancshares, Inc.

Howell D. McCullough
Chief Financial Officer & Senior Executive Vice President, Huntington Bancshares, Inc.

Stephen D. Steinour
Chairman, President & Chief Executive Officer, Huntington Bancshares, Inc.

Daniel J. Neumeyer
Senior Executive Vice President & Chief Credit Officer, Huntington Bancshares, Inc.

OTHER PARTICIPANTS

Jon Arfstrom
Analyst, RBC Capital Markets LLC

Kenneth M. Usdin
Analyst, Jefferies LLC

Matt O'Connor
Analyst, Deutsche Bank

John Pancari
Analyst, Evercore Group LLC

Kyle Peterson
Analyst, FBR Capital Markets & Co.

R. Scott Siefers
Analyst, Sandler O'Neill & Partners LP

Erika P. Najarian
Analyst, Bank of America Merrill Lynch

David J. Long
Analyst, Raymond James & Associates, Inc.

Terry J. McEvoy
Analyst, Stephens, Inc.

Kevin J. Barker
Analyst, Piper Jaffray & Co.

Peter J. Winter
Analyst, Wedbush Securities, Inc.

Brian Klock
Analyst, Keefe, Bruyette & Woods, Inc.

Figure B.2. XML transferred to text

APPENDIX C
PARTICIPANT CLASSIFICATION

This appendix describes the classification process to categorize participants into *Sell-Side*, *Buy-Side*, *Institutional Investor Affiliated (IIA)*, and *Others*. The classification process follows from the categories presented in Panel B of Table 1 and requires two additional steps for both 13F filers (105,572) and non-filers (171,856). The table below shows how the 277,428 total appearances are classified after each step. Appearances associated with 13F filers are classified as either *Buy-Side* or *IIA*. Appearances associated with non-filers are classified as either *Sell-Side* or *Others*. C.1 and C.2 describes the two additional steps in detail.

13F filers						105,572
C.1. Business descriptions	Buy		Sell		Other	
		8,380		96,696		496
C.2. I/B/E/S contributors	Y	N	Y	N	Y	N
	3,722	4,658	70,346	26,350	259	237
Classification	***IIA***	***Buy-Side***	***IIA***	***IIA***	***IIA***	***IIA***
Non-filers						171,856
C.1. Business descriptions	Buy		Sell		Other	
		2,512		155,096		14,248
C.2. I/B/E/S contributors	Y	N	Y	N	Y	N
	139	2,373	115,773	39,323	6,053	8,195
Classificaton	***Sell-Side***	***Others***	***Sell-Side***	***Sell-Side***	***Sell-Side***	***Others***

C.1   Business descriptions

The first step requires examining the business descriptions of 2,320 unique entities appearing in conference call transcripts as an affiliation. For this step, I rely on the *ENTITY_SUB_TYPE* and the *BUY_SELL_INDICATOR* fields in FactSet. The *ENTITY_SUB_TYPE* field includes business descriptions of financial institutions that FactSet collects from various sources. The *BUY_SELL_INDICATOR* field classifies each sub-type into either buy-side, sell-side, or other. A 13F filer may not always be identified as a buy-side if the institution has both buy-side and sell-side operations (96,696). The 496 appearances of 13F filers identified as "other" include those with missing *ENTITY_SUB_TYPE*. The 14,248 appearances of non-filers identified as "other" consist of business descriptions not categorized as either "sell" or "buy", those with missing *ENTITY_SUB_TYPE*, and those not linked to a FactSet entity. I keep entities not linked to a FactSet entity in case they might appear in the I/B/E/S contributors list examined in the second step.

C.2 I/B/E/S contributors

The second step involves comparing the names of the 2,320 entities to a list of 3,276 Thompson I/B/E/S contributors to determine whether they issue sell-side analyst reports on I/B/E/S. For each entity, I match 3 contributors with the closest names based on a character distance matching method (normalized Levenshtein distance, Yujian and Bo, 2007). After manually reviewing the 6,960 (2,320×3) entries, I find 532 correct links. A total of 196,292 appearances are associated with I/B/E/S contributors. Before the matching process, I clear up clutters in the names that may cause erroneous matches using regular expressions provided below. These regular expressions clear the clutters in the names and convert all letters into uppercase to provide better matches.

– Unique entity names collected from transcripts

```
NAMES['ENTITY_PROPER_NAME']=NAMES['ENTITY_PROPER_NAME'].str.replace(re.
compile(r'Inc\.|LLC|L\.?P\.?(\sII)?'),'').str.upper()
```

```
NAMES['ENTITY_PROPER_NAME']=NAMES['ENTITY_PROPER_NAME'].str.replace(re.
compile(r'\s\s+'),'\s')
```

– Unique names of Thompson I/B/E/S contributors

```
pat1=re.compile(r'\s[\-|\>|\<]\s(?:.*?(?:REPORTS?|REVIEWS?|HANDBOOK|
SNAPSHOTS?|FORECASTS?|ANALYSIS|NOTES?)|\$[0-9\,]+|[0-9]?[0-9][\+|\-|]?
(?:\sTO\s)?(?:[0-9]?[0-9])?\s(?:PAGES?|DAYS)|ONE-ON-ONE|AUERBACH
\sGRAYSON|INITIAL\sOPINION)'
```

```
pat2=re.compile(r'\s(?:[0-9]?[0-9]?[0-9](?:\+?|\-?|\sTO\s)?(?:[0-9]?[0-9]
?[0
-9]+?)?\s?(?:PAGES?|DAYS?|PGS)(?:\,)?|AGED\s[0-9]?[0-9]\+?\sDAYS?)')
```

```
pat3=re.compile(r'\s\-\s\>[0-9]?[0-9]?[0-9]\sDAYS')
```

```
NAMES['ThompsonContributors']=NAMES['ThompsonContributors'].str.replace
(pat1,'').str.strip()
```

```
NAMES['ThompsonContributors']=NAMES['ThompsonContributors'].str.replace
(re.compile(r'\(.*?\)'),'')
```

```
NAMES['ThompsonContributors']=NAMES['ThompsonContributors'].str.replace
(pat2,'')
```

```
NAMES['ThompsonContributors']=NAMES['ThompsonContributors'].str.replace
(pat3,'')
```

```
NAMES['ThompsonContributors']=NAMES['ThompsonContributors'].str.replace
(re.compile(r'\s\s+'),'\s')
```