Information discovery, interpretation, and analysis by institutional investors around earnings announcements

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Abstract: This study is motivated by the fragmented examination of institutional investors' roles in information discovery, response, and analysis around corporate news events. We aim to provide a holistic understanding of these roles and their interplay around quarterly earnings announcements. Building upon prior evidence linking superior performance in concentrated holdings to information advantage, we also explore the influence of industry concentration on these roles. Our results show that institutional investors allocate a substantial proportion of their trading activity towards information analysis, focus on firms likely to report positive news during the discovery phase, and respond more promptly to positive news than negative news. Higher industry concentration enhances their engagement in information discovery, response, and analysis, particularly for positive earnings surprises. In summary, our study's comprehensive approach sheds light on institutional investors' roles in information discovery, interpretation, and analysis. Furthermore, we explore the impact of industry concentration on their proficiency in these roles, ultimately offering a comprehensive understanding of how institutional investors collectively contribute to enhancing overall market efficiency.

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Keywords: Industry Trading Concentration, Institutional Investors, Market Efficiency Around earnings announcements.

1. Introduction

In the dynamic landscape of financial markets, institutional investors play a pivotal role in shaping price efficiency and market dynamics. While previous research has shown a positive link between institutional ownership and stock pricing efficiency (Boehmer and Kelly 2009), the current literature lacks a holistic view of institutional investors' involvement across information discovery before earnings announcements, immediate response to earnings news, and in-depth analysis following earnings disclosures. Unlike previous isolated examinations, our study not only offers a comprehensive understanding of these roles but also investigates how institutional investors' industry concentration influences their engagement in these crucial phases. This comprehensive approach highlights a significant aspect of institutional investors' behavior that prior research has overlooked.

Prior research documents a positive link between institutional investor ownership and stock price efficiency (e.g., Boehmer and Kelly 2009). This is exemplified by a reduced likelihood of stock return anomalies in companies with higher institutional investor presence, including post-earnings announcement drift (PEAD) (Bartov et al., 2000; Ali et al., 2004; Ke and Ramalingegowda, 2005), accrual anomaly (Collins et al., 2003; Green et al., 2011), and momentum anomalies (Hanson and Sauderam, 2013). These investors play a significant role in enhancing price efficiency through the discovery of information before public release, rapid interpretation of public information, and continuous analysis of public information.

The conventional approach in prior research has involved examining the distinct roles of information discovery, response, and analysis in isolation, often overlooking the intricate interplay between these functions. This fragmented approach limits our understanding of how institutional investors navigate the complexities of the market. To address this gap, we undertake a

comprehensive study of these roles in conjunction within the context of quarterly earnings announcements. Unlike other events that lack timing predictability, earnings announcements are pre-scheduled, affording investors the opportunity to prepare and strategize effectively. This predictability offers a unique vantage point to observe the interplay between information discovery, interpretation, and analysis during these pivotal events. Furthermore, findings from the PEAD literature indicate that stock prices continue to drift in the direction of earnings news for about a year (Bartov et al., 2000; Ali et al., 2004; Ke and Ramalingegowda, 2005; Keskek and Rees 2022). This suggests that institutional investors are likely to trade in the direction of earnings news throughout our exploration of the discovery, interpretation, and analysis phases. The study most closely related to ours is Ke and Ramalingegowda (2005), which observes that changes in transient institutional investors' ownership around quarterly earnings announcements are positively associated with earnings surprises. Their conclusion regarding the significance of transient institutional investors exploiting PEAD is noteworthy; however, their setting, based on quarterly changes in institutional ownership, does not enable us to assess the relative importance of institutional investors' abilities in discovering, interpreting, and analyzing earnings announcement information. By comprehensively examining all these roles in our investigation, we aim to illuminate the intricate relationships and dynamics that influence institutional investor decision-making. This effort enhances our understanding of market efficiency and the multitude of factors that contribute to it.

Moreover, empirical evidence contradicts traditional asset pricing theory, showing that both institutional and individual investors with concentrated portfolios tend to achieve better returns (Kacperczyk et al., 2005; Baks et al., 2006; Huij and Dewall, 2011; Choi et al., 2017; Ivkovic et al., 2008; Ekholm and Maury, 2014). A key factor in investment concentration is the

information advantage, suggesting a positive link between industry focus and effective utilization of earnings information (Kacperczyk et al., 2005; Hiraki et al., 2015; Choi et al., 2017; Geiger et al., 2022a). This advantage stems from industry expertise, broader resources, and potential access to diverse information sources (Cici et al., 2018; Kostovetsky and Ratushny, 2016; Henry and Koski, 2017; Hu et al., 2018; Bushee et al., 2019). Other studies, however, suggest that investment concentration may be due to behavioral biases such as overconfidence (Goetzmann and Kumar, 2008) or familiarity (Pool et al., 2012), and hence may result in poor return performance. These findings collectively motivate our exploration of how industry concentration shapes the roles of information discovery, response, and analysis among institutional investors, providing a nuanced understanding of their behavior and impact on market efficiency.

We acquire detailed daily trading data of institutional investors from Ancerno Ltd and calculate net institutional trading activity by subtracting the number of shares sold from the number of shares purchased, divided by the total outstanding shares. Our analysis covers the average daily trading activity of institutional investors across distinct periods: two weeks before earnings announcements (labeled as the 'information discovery period'), three days surrounding earnings announcements (referred to as the 'immediate response period'), and two weeks following earnings announcements (labeled as the 'information analysis period').[1] To gauge earnings surprise, we measure the difference between the actual earnings and the last mean consensus forecasts provided by analysts before the earnings announcements, scaled by the mean consensus forecast itself. Our findings reveal a significant positive relation between net daily trading by institutional investors and earnings surprise in each of these periods, demonstrating their active involvement in information discovery, immediate response, and information analysis. Notably, our results show

[1] In untabulated analyses, we confirm that our results are robust to using both shorter periods (e.g., one week) and longer periods (e.g., one month) for information discovery and analysis phases.

that approximately 65% of average daily trading is concentrated during the information analysis period, followed by 27% during the immediate response period, and only around 8% during the discovery period. This suggests that institutional investors primarily allocate their efforts towards information analysis.

Expanding on prior evidence that PEAD tends to be more pronounced for positive earnings surprises than negative earnings surprises (Ke and Ramalingegowda 2005), we delve into potential variations in institutional investors' engagement across the discovery, response, and analysis periods based on the direction of news. We find substantial evidence supporting each role for positive earnings surprises, with average daily net trading in the information analysis period comprising about 51%, followed by 33% in the immediate response period, and approximately 16% in the discovery period. However, we observe no significant relation between net daily trading and negative earnings surprises in the discovery and immediate response periods. We find however a positive relation between net trading and negative earnings surprises in the information analysis period, indicating that institutional investors tend to be net sellers during this phase for firms missing earnings expectations. This underscores that institutional investors' trading activity predominantly centers around information analysis, particularly when the news is unfavorable. Overall, we find that institutional investors exhibit a distinct pattern of behavior, with a notable focus during the discovery period on companies likely to report positive news. Furthermore, our findings highlight that institutional investors tend to respond more promptly to positive news compared to their response to negative news.

To assess the influence of industry concentration on institutional investor trading behavior, we calculate a fund-specific measure of industry trading concentration. This measure is established by comparing the dollar value of shares traded by a fund in each industry to the total dollar value

of shares traded by the fund over the given period. Our analysis unveils that institutional investors exhibiting higher levels of industry trading concentration display more pronounced participation in discovering, responding to, and analyzing earnings announcement news. Further scrutiny of positive versus negative news indicates that the impact of industry concentration predominantly pertains to positive earnings surprises. This finding provides additional insights into the differential attention that institutional investors allocate to positive versus negative news.

Moreover, in supplementary analyses, we segment institutional investors into mutual funds and pension funds, acknowledging the heterogeneous trading behavior documented in previous studies (Bushee, 2001; Bushee and Goodman, 2007; Geiger et al., 2020a and Geiger et al., 2020b). Mutual funds, characterized as transient and active investors with higher portfolio turnover, exhibit around 4 to 5 times greater average daily trading activity compared to pension funds. While pension funds tend to be less active in trading around earnings announcements, both mutual funds and pension funds demonstrate similar patterns in terms of their trading distribution across the discovery, response, and analysis roles in their net trading activity for both positive and negative surprises. Additionally, the effect of industry concentration remains consistent across both types of funds.

Our study makes significant contributions to understanding institutional investors' behavior and their impact on market efficiency across three main dimensions. First, unlike the fragmented approach prevalent in prior studies that often examines institutional investors' roles in information discovery, response, and analysis in isolation, this study takes a holistic approach, offering a comprehensive understanding of these roles and their interconnectedness around quarterly earnings announcements. The examination of these roles in tandem provides insights into the intricate dynamics shaping institutional investor decision-making.

Second, our study offers insights into the distribution of institutional investors' trading activity across the discovery, response, and analysis periods surrounding earnings announcements. Ke and Ramalingegowda (2005) document a positive relation between changes in transient institutional investors' ownership around quarterly earnings announcements and earnings surprises, suggesting that these investors align their trades with earnings news. However, they do not explore the relative importance of institutional investors' abilities in discovering, interpreting, and analyzing earnings announcement information. Our findings reveal a distinct pattern, where institutional investors allocate a substantial proportion of their trading activity towards information analysis. In addition, we find that institutional investors engage in information discovery solely for firms that announce positive news. Moreover, our findings highlight that institutional investors tend to respond more promptly to positive news compared to their response to negative news, shedding light on their differential attention based on the direction of news.

Lastly, our study delves into the influence of industry concentration on institutional investors' engagement in information discovery, response, and analysis. We extend existing research that connects the enhanced performance of concentrated holdings to the "information advantage" hypothesis, which posits a direct connection between industry focus and the effective utilization of earnings information. In this context, our study contributes by analyzing how industry concentration impacts institutional investors' ability to fulfill these critical roles, thus deepening our insight into the dynamics of market efficiency shaped by the information advantage resulting from concentration. Specifically, our findings reveal that higher industry trading concentration is associated with increased participation in discovering, responding to, and analyzing earnings announcement news, with a more pronounced impact observed for positive earnings surprises. In addition to these contributions, our study distinguishes between mutual funds and pension funds,

providing further insights into their distinct trading patterns and behaviors during these pivotal periods. Overall, the comprehensive approach and findings of our study significantly enhance our understanding of institutional investors' roles and behaviors in the context of earnings announcements, market efficiency, and industry concentration.

2. LITERATURE REVIEW AND RESEARCH QUESTION

2.a. Institutional investors' roles in information discovery, interpretation, and analysis

A significant body of research underscores the positive relationship between institutional investor holdings and the efficiency of stock prices.[2] Boehmer and Kelly (2009) show that equities with higher institutional ownership levels exhibit more efficient pricing, ultimately facilitating well-informed financing and investment decisions. Specifically, heightened institutional investor presence correlates with reduced vulnerability to stock return anomalies, including post-earnings announcement drift (PEAD) (Bartov et al., 2000; Ali et al., 2004; Ke and Ramalingegowda, 2005), accrual anomaly (Collins et al., 2003; Green et al., 2011), and momentum (Hanson and Sauderam, 2013). This heightened efficiency is a result of institutional investors' adeptness in (i) discovering information before its public release, (ii) swiftly interpreting public information, and (iii) continuously analyzing public information.

Firstly, in the context of scheduled corporate events, prior research finds that institutional investors have the ability to discover information and engage in trading before the specific news

[2] Prior research attributes institutional investors' sophistication and contribution to price efficiency to their superior resources (Green et al. 2014; Ng and Troianovski 2015; Solomon and Soltes 2015), sophisticated research methods (Callen et al. 2022; Ben-Rephael et al. 2022), private connections (Bushee et al. 2018), industry expertise (Cici et al. 2018; Kostovetsky and Ratushny 2016), and trading skills (Henry and Koski 2017; Hu et al. 2018; Bushee et al. 2019).

or information regarding these events becomes publicly available (Campbell et al. 2009; Baker et al. 2010). Specifically, Hendershott et al. (2015) show that institutional trading patterns can predict upcoming news releases. Their study reveals that institutional order flow, measured by buy volume minus sell volume, anticipates the sentiment of earnings announcements and the subsequent stock market response on the announcement day. These findings underscore the significant role of institutional investors in price discovery before anticipated news events. Prior studies have also documented informed trading carried out by institutional investors ahead of unscheduled corporate events, including instances like SEC comment letters (Geiger et al. 2022b), SEC 8-K filings (Callen et al. 2022; Ben-Rephael et al. 2022), and recalls (Geiger et al. 2022a). This behavior is often attributed to the institutional investors' capacity to access leaked information through their connections, indicating their advantage in obtaining non-public insights.[3]

Secondly, another aspect of institutional investors' role in enhancing price efficiency is their swift interpretation of public information. Huang et al. (2020) analyze various corporate newswire releases from major media sources and find that institutional investors respond rapidly to the tone of news immediately after its release. This suggests that institutions play a significant role in promptly interpreting public information to contribute to price efficiency. Similarly, Lee and Zhu (2022) demonstrate that actively managed funds (AMFs) exhibit increased trading activity during earnings announcements, leading to quicker price adjustments. Their findings underscore the superior abilities of AMFs to comprehend bundled earnings-related information and emphasize how this proficiency contributes to their swift response to news announcements, ultimately enhancing price efficiency.

[3] Geiger et al. (2022a) suggest that mutual funds can indeed use the publicly available information in customer complaints to predict recalls rather than their access to leaked information through their connections.

Thirdly, the role of institutional investors in enhancing price efficiency extends to their skillful analysis of public information. Brunnermeier and Pedersen (2005) highlights that investors who receive advance signals about future public announcements can capitalize on the information both before and after the news becomes public. Likewise, Li et al. (2022), using Ancerno's daily mutual funds trading dataset, reveal another facet of institutional investors' information analysis capabilities. They find that mutual funds tend to reduce their holdings when their voting decisions diverge from the outcomes of shareholder votes. Despite the absence of significant stock price changes, trading volume remains elevated, persisting strongly for four weeks after shareholder meetings. This persistence indicates that institutional investors continue their analysis of the news emerging from these meetings during the post-meeting period.

While prior research has predominantly centered on investigating the separate roles of institutional investors in market efficiency in isolation, there is a compelling motivation to explore these roles in a more integrated manner to gain a more comprehensive insight into the mechanisms through which institutional investors enhance the efficiency of stock pricing. This prompts us to examine how these interconnected roles of institutional investors, which involve their capacity to discover non-public information, rapidly interpret public information, and continuously analyze information, collectively contribute to shaping stock price efficiency. We collectively study these roles in the context of quarterly earnings announcements because among various corporate events, earnings announcements stand out as crucial occasions that are scheduled and widely anticipated, providing a unique and controlled setting for examining investor behavior. Unlike other events with uncertain timing, earnings announcements are pre-scheduled, allowing investors to prepare and strategize accordingly. This predictability offers a

distinctive opportunity to scrutinize the interplay of information discovery, response, and analysis during these pivotal events.

Moreover, the PEAD literature documents that stock prices tend to persistently move in the direction of earnings news for approximately a year (Bartov et al., 2000; Ali et al., 2004; Ke and Ramalingegowda, 2005; Keskek and Rees 2022). Specifically, Ke and Ramalingegowda (2005) finds that changes in transient institutional investors' ownership around quarterly earnings announcements are positively associated with earnings surprises, suggesting that these investors align their trades in the direction of earnings news. However, their framework, based on quarterly changes in institutional ownership around earnings announcements, does not provide them with the means to evaluate the relative significance of institutional investors' skills in discovering, interpreting, and analyzing earnings announcement information. We expect that the trading decisions of institutional investors in each period will correspond with earnings news, depending on their competence in discovering, interpreting, and analyzing information. Our thorough examination of these dimensions aims to clarify the complex dynamics that influence institutional investor decision-making and contribute to our comprehension of market efficiency and its diverse determinants.

2.b. Industry concentration

Contrary to traditional asset pricing theory and conventional financial investment advice, prior findings highlight that institutional investors (Kacperczyk et al. 2005; Baks et al. 2006; Huij and Dewall 2011: Choi et al. 2017) as well as individual investors (Ivkovic et al. 2008; Ekholm and Maury 2014) with concentrated holdings tend to achieve superior returns compared to those with more diversified portfolios. Various explanations exist for investors maintaining concentrated holdings, including possessing an informational edge (Kacperczyk et al. 2005;

Hiraki et al. 2015; Choi et al. 2017; Geiger et al. 2022a), managing investment information overload (Simon 1972; Tversky and Kahneman 1986; Agnew and Szykman 2004; Mbanga et al. 2019), and behavioral biases like overconfidence (Goetzmann and Kumar 2008) or familiarity (Pool et al. 2012).

Among these reasons, the information advantage perspective directly associates industry concentration with the utilization of earnings information. According to this viewpoint, investors focus on specific companies or industries due to their informational advantage, enabling them to discover, swiftly interpret, and analyze firm- or industry-specific information more effectively than other investors. This advantage, possessed by sophisticated investors, could arise from their broader resources to examine pertinent information and their private connections to various sources like company management, media, and regulators. Building upon the aforementioned literature, we investigate whether the level of industry trading concentration among institutional investors is linked to their capacity for discovering, promptly responding to, and analyzing earnings announcement information.

3. SAMPLE SELECTION AND DATA

3.1 Institutional Investors

In investigating the institutional investors' trading behavior during the discovery, immediate response, and analysis periods, we employ Ancerno Ltd.'s daily institutional investors trading data.[4] We begin our sample period in 2002 and end in 2010, the last full year after which Ancerno Ltd. stopped providing fund identifiers ("*clientcode*") to protect their clients' privacy.[5] Our sample period (2002-2010) covers a substantial amount of institutional trading activity. For

[4] Ancerno Ltd. specializes in providing transaction cost analysis services to institutional investor clients.
[5] We employ *clientcode* to compute the industry specialization of each institutional investor.

example, Hu et. al (2018) suggest that Ancerno Ltd. trading data covers nearly 12 percent of overall CRSP trading volume.

The Ancerno database does not overtly disclose the identities of institutional investors. Instead, it employs unique codes ("*clientcode*") to trace each investor throughout the sample period, enabling us to aggregate trades on a per-investor basis. Ancerno also identifies the type of the institutional investor ("*clienttype*") as mutual or pension fund. Moreover, the database discloses firm level identifiers (*CUSIP* and *TICKER* symbols), as well as details such as the execution date ("*tradedate*"), the volume of shares executed ("*volume*"), and the execution price ("*price*"). Notably, Ancerno also reports the direction of trade (*side*=1 for buys and *side*=-1 for sells).[6]

The main sample for our study consists of firms announcing quarterly earnings for the period 2002 to 2010. We only examine firms having substantial trading data from Ancerno Ltd. That is, following the prior literature (Cready et al. 2014; Bhattacharya, Cho, and Kim 2018; Geiger et al. 2022b), we exclude thinly traded firms. Specifically, to be included in our final sample firms must be traded more than five days and more than ten Ancerno funds during the one-month period surrounding earnings announcement (i.e., two-week pre- and post-earnings announcement and 3-day around the announcement).

3.2 Financial Data

We obtain quarterly financial statement data from Compustat and require that firms have data available to compute market-to-book ratio (*MTB*) at the end of the quarter, price, and their assets (*AT*). We use I/B/E/S to calculate earnings surprise, *ESURP*. Finally, we require that firms have stock return data available on the CRSP in order to calculate their stock price momentum

[6] Consequently, we do not need to use the algorithm developed by Lee and Ready (1991) to infer the side of the trade as Holden and Jacobsen 2014 show that algorithmic trading has substantially decreased the accuracy of the Lee and Ready algorithm based on Trade and Quote (TAQ) database.

(*MOMENTUM*) and eliminate firms with price less than $1. By imposing these criteria, our dataset is ultimately refined to encompass 108,385 quarterly earnings announcements during 2002-2010.

4. VARIABLE MEASUREMENT AND DESCRIPTIVE STATISTICS

4.1 Net-Buy Trading Metric

We compute institutional net-buying activity during each window (i.e., two-week pre- and post-announcement periods, and 3-day announcement period) for ach quarterly earnings announcement. We begin by calculating the total number of shares purchased by institutional investors minus the number of shares sold, divided by total number of shares outstanding. This is our measure of net institutional investor buying over the period, calculated separately for the pre- and post-earnings announcement periods. Our pre-earnings trading period (*NET_BUY [-15, -2*]) is the two-weeks beginning 15 days before the earnings announcement date. Our post-earnings trading period (*NET_BUY [+2, +15]*) is the two-weeks beginning 2 days after the earnings announcement date, and finally our event period (*NET_BUY [-1, +1]*)) is the three days around earnings announcement date. In untabulated analyses, we confirm that our findings remain robust when using both shorter periods (e.g., one week) and longer periods (e.g., one month) for information discovery and analysis phases. Following the prior literature (e.g., Cready et al. 2014), we calculate net institutional trading for the three event periods (i.e., pre- and post-earnings and during earnings) as follows:

$$\sum_{p \in \substack{Event \\ Period}} NET\_BUY = \sum_{p \in \substack{Event \\ Period}} \left(\frac{BUY_{ip} - SELL_{ip}}{SHO_i}\right)/T \qquad (1)$$

where BUY_{ip} *(*$SELL_{ip}$*)* represents total number of shares purchased (sold) by the Ancerno investors in firm *i* during period *p*, SHO_i (in Millions) is the total number of shares outstanding (*CSHOQ*)

for firm *i* at the end of the quarter, and *T* is the number of days in respective event periods. We then divide $(\frac{BUY_{ip}-SELL_{ip}}{SHO_i})$by *T* to find the average daily net buying in each of our three periods. Therefore, $\sum NET\_BUY$ represents institutional investors' daily average percentage net buying activity in firm *i* during our event periods.

4.2 Industry Trading Concentration

Following Geiger et al. 2022a, we calculate our industry trading concentration metric for each investment fund in each year based on the fund's percentage total trading activity in each of the 2-digit industry SIC (e.g., 20 is the 2-digit code for Food & Kindred Products). First, our trading concentration metric, $CONCMET_{f,i}$, is computed as the ratio of each fund's dollar trading activity (i.e., buy plus sell) in the industry *i* scaled by the fund's total dollar trading activity in that year.[7] In particular,

$$CONCMET_{f,i} = \frac{\sum_{f,i}(BUY_{f,i}+SELL_{f,i})}{\sum_{f}(BUY_{f}+SELL_{f})} \quad (2)$$

where $BUY_{f,i}$ $(SELL_{f,i})$ represents total dollar value of shares purchased (sold) by the Ancerno fund *f* in industry *i* during the year and BUY_f $(SELL_f)$ represents total dollar value of shares purchased (sold) by the Ancerno fund *f* during the year.[8] For example, $\sum_{f,i}(BUY_{f,i} + SELL_{f,i})$ represents fund *f*'s total dollar trading activity in industry *i* during the year.[9]

[7] Our industry concentration metric resembles Ekholm and Maury's (2014) Average Weight Index, with the key distinction being that our measure pertains to an entire industry rather than an individual firm. Additionally, in contrast to alternative metrics, we calculate our concentration measure using dollar trading volume rather than holdings at the end of the period. This choice is made because differences in holdings may not provide an accurate reflection of the actual level of trading activity within the industry throughout the period under consideration.

[8] In this study, industry *i* represent the industry. The trading concentration metric for each Ancerno fund is recalculated every year.

[9] Because we scale fund-industry level trading activity (the numerator) by the total fund activity (the denominator), our concentration metric, expressed as a percentage, remains unbiased by fund size.

Second, we rank institutional investors based on the trading concentration metric, $CONCMET_{f,i}$, in every year and sort them into three groups of industry concentration. Finally, our scaled trading concentration metric, *CONS*, takes a value of 0 for the lowest tercile, 0.5 for the middle tercile, and 1 for the most concentrated trading funds.

4.3 Earnings Surprise

We measure earnings surprise, *ESURP*, as the actual earnings minus the last mean analyst consensus forecasts before the earnings announcements as provided by the I/B/E/S summary file, scaled by the absolute value of the actual. We replace the absolute value of the actual with 0.05 if it is less than 0.05 to prevent division by zero or to mitigate the impact of a small denominator effect.[10]

4.4 Descriptive Statistics

We report the descriptive statistics for our sample of quarterly earnings announcements (N=108,385) in Panel A of Table 1. We find that average net buying during discovery period, *NET_BUY [-15,-2*], interpretation period, *NET_BUY [-1,+1]*, and analysis period, *NET_BUY [+2, +15]*, are -3.95, -43.37, and 32.99, respectively, suggesting that institutional investors are net sellers in discovery and interpretation periods and net buyers in the analysis period during our sample period. Specifically, the average percentage daily net selling during the interpretation period is 0.0043 percent.[11] In terms of economic magnitude, the net selling activity by Ancerno investors during the three days surrounding announcement date, [-1, +1], is approximately

[10] Our results are robust to not replacing the actual earnings with 0.05 or replacing it with 0.1. In addition, our results and inferences are robust to scaling by price rather than the absolute actual earnings.

[11] We use SHO in millions of shares to reduce the number of zero decimals reported in our regression results tables. Hence, to determine the actual average daily percentage of net trading, *NET_BUY* should be divided by a Million and then multiplied by 100.

$72,240,000 ($5.6 billion mean MVE x 0.0043 x 3 days). That is, the funds in our study, on average, net sold $72,240,000 equity securities per firm during the 3 days around earnings announcements.

The mean (median) *ESURP* is 3.61% (3.99%) consistent with prior research suggesting that firms on average tend to report positive surprise at earnings announcements. *MVE (in $Billions)* is market value of equity and computed as price times number of shares outstanding at the end of the quarter, with a mean value of $5.6 Billion. *MTB* is market-to-book calculated as *MVE* divided by the book value of common stock (CEQQ) as of the most recent fiscal quarter. A*T* (in $Millions) is total assets at the end of quarter, and *PRICE* is the end of the quarter stock price. *MOMENTUM* is the cumulative value-weighted excess returns computed from the days -253 to -31 relative to earnings announcement day (i.e., *CAR [-253, -31])*. Finally, all the continuous variables are winsorized at the 5% level to mitigate outliers' effect.

In Panel B of Table 1, we report the correlation coefficients and find that net buy in each of the discovery, interpretation, and analysis periods are positively correlated with *ESURP*, providing preliminary support for the institutions' ability in discovering, interpreting, and analyzing earnings announcement information. A notable distinction that emerges when examining the correlations between net buying activity and *ESURP* is that the correlation coefficient is four times greater during the analysis period compared to either the discovery or interpretation periods.

5. EMPIRICAL MODELS AND RESULTS

5.1 Earnings Surprises and Institutional Trading

We first examine the institutional investors' ability to discover, interpret, and analyze the earnings information as reflected in their trades by estimating the following model:

$$NET\_BUY\ [t_1, t_2] = \beta_0 + \beta_1 ESURP + \beta_2 MTB + \beta_3 SIZE + \beta_4 MOMENTUM + \varepsilon \quad (3)$$

where $NET\_BUY\ [t_1, t_2]$ is average daily net buying activity between the days t_1 and t_2 relative to the earnings announcement day. The other variables are defined as in the previous section.

In Table 2, we report the results from estimation of model (3). We find the coefficients on *ESURP* in the discovery, interpretation, and analysis periods are 0.092, 0.300, and 0.713, respectively, and are statistically significant within each respective period. Our findings suggest that institutional investors as a group trade in the direction of earnings surprise in each period, providing evidence for their ability to discover, interpret, and analyze earnings information. We then compare the coefficients on *ESURP* in each period to assess relative importance of each role for institutional investors' trading activity. Specifically, we find that average net daily buying associated with *ESURP* in the information analysis period is about 2.4 times (0.713 versus 0.300) larger than that in the interpretation period, and about 7.8 times (0.713 versus 0.092) larger than that in the discovery period. Thus, our results reveal that approximately 65% of average daily net trading associated with earnings surprise is concentrated during the information analysis period, followed by 27% during the interpretation period, and only around 8% during the discovery period.[12] Our findings suggest that institutional investors primarily trade on earnings information based on their efforts towards information analysis.

It's important to mention that our results rely on average daily net buying rather than cumulative total net buying within each period. We adopted this approach to facilitate meaningful comparisons, considering that the interpretation period spans only 3 days, whereas the discovery

[12] We calculate trading concentration percentages for each period by dividing the coefficient for the specific period by the sum of the coefficients for discovery, interpretation, and analysis periods.

and analysis periods extend over 14 days each. Thus, we also calculate the cumulative total net buying associated with *ESURP* within each period by multiplying the *ESURP* coefficient with the number of days in each period. Using the cumulative total net buying, the coefficient on *ESURP* becomes 1.288, 0.900, and 9.982 in the discovery, interpretation, and analysis periods, respectively. Interestingly, despite the relatively small average daily net buying in the discovery period, the cumulative total net buying over the entire discovery period surpasses that occurring within the shorter 3-day interpretation period. Additionally, our findings based on cumulative total net buying reveal that over 80% of trading related to *ESURP* is concentrated in the information analysis period. This highlights the significance of the analysis phase in terms of trading activity related to earnings surprises.

5.2 Positive and Negative Earnings Surprises

Next, we investigate whether institutional investors' engagement across the discovery, response, and analysis periods varies based on the direction of news. We estimate the following model:

$$NET\_BUY\ [t_1,\ t_2] = \beta_0 + \beta_1 POS\_ESURP + \beta_2 NEG\_ESURP + \beta_3 MTB + \beta_4 SIZE + \beta_5 MOMENTUM + \varepsilon \quad (4)$$

where *POS_ESURP* (*NEG_ESURP*) is the positive (negative) earnings surprise equal to *ESURP* if the surprise is greater than (less than) zero, and equal to zero otherwise. The other variables are defined as in the previous section.

In Table 3, we present the results from estimation of model (4). Our results reveal a noticeable difference in the magnitudes of coefficients for *POS_ESURP* across the different periods. Specifically, the coefficients for *POS_ESURP* are 0.343 during the discovery period,

0.732 during the interpretation period, and 1.128 during the analysis period. Importantly, all of these coefficients are statistically significant, providing support for institutional investors' ability to discover, interpret, and analyze earnings information for firms reporting positive earnings surprise. Moreover, our results indicate that the impact of *POS_ESURP* becomes increasingly pronounced as we progress from the discovery period to the analysis period. When comparing the average daily trading activity in each period, our findings reveal that institutional investors' trading related to *POS_ESURP* during the information analysis period is approximately 1.5 times greater than that during the interpretation period and approximately 3.3 times greater than that during the discovery period. This underscores the significantly heightened trading activity during the information analysis phase in relation to positive earnings surprises. When we use the cumulative total net buying rather than average daily during each period, the coefficient on *POS_ESURP* becomes 4.802, 2.196, and 15.792 in the discovery, interpretation, and analysis periods, respectively. Our findings based on cumulative net buying suggest that, over the course of approximately a month centered around earnings announcements, around 69% of *POS_ESURP* related trading takes place in the information analysis period. In contrast, about 21% and 10% of this trading activity occur in the discovery and interpretation periods, respectively. This distribution highlights the information analysis phase as the dominant period for trading related to positive earnings surprises.

Regarding *NEG_ESURP*, we find that coefficients are -0.104, -0.037, and 0.389 in the discovery, interpretation, and analysis periods, respectively. Interestingly, *NEG_ESURP* coefficient is negative, though marginally significant, in the discovery period, indicating that institutional investors not only fail to discover negative earnings surprise but also trade in the opposite direction. Similarly, we find no evidence of information interpretation as the

NEG_ESURP coefficient is insignificant in this period. We find however significant evidence for information analysis following the announcement of negative earnings surprises. Thus, our results suggest that institutional investors' contribution to improving price efficiency in relation to negative earnings surprises is mainly attributable to their ability to analyze information. Furthermore, when comparing the coefficients for *NEG_ESURP* to those for *POS_ESURP* in each respective period, our findings underscore that institutional investors show a tendency to concentrate on companies expected to report positive news during the discovery phase. Additionally, they tend to interpret and analyze positive news more promptly compared to negative news.

5.4 Earnings Surprises and Industry Trading Concentration

In this section, we explore whether institutional investors who concentrate their trades within specific industries differ in their utilization of earnings information. We expect that funds heavily focused on particular industries possess superior capabilities and insights for processing industry-related data, potentially leading to more aligned trading behavior with earnings information. To investigate this argument, we categorize investors into groups based on their industry trading concentration levels and calculate net trading activities around earnings announcements for each group. We then estimate the following regression model:

$$NET\_BUY\ [t_1, t_2] = \beta_0 + \beta_1 CONS + \beta_2 ESURP + \beta_3 CONS*ESURP + \beta_4 MTB + \beta_5 SIZE + \beta_6 MOMENTUM + \varepsilon \quad (5)$$

where *CONS* is our measure of industry trading concentration taking value of 0 for low industry trading concentration funds and 1 for funds with moderate and high industry trading concentration.[13] The other variables are as defined previously.

[13] We combined the moderate and high industry trading concentrating funds because ,in untabulated analyses, we find that these two groups perform similar in information discovery, interpretation, and analysis roles, suggesting

Table 4 report the results from estimation of model (5). We find that the coefficient on *ESURP* in the discovery, interpretation, and analysis periods are -0.001, 0.001, and 0.045, respectively, and is statistically significant only in the analysis period. In contrast, the coefficients on the interaction term, *CONS*ESURP*, are 0.024, 0.073, and 0.090 in the discovery, interpretation, and analysis periods, respectively, and are statistically significant in each period. Our results suggest that institutional investors' ability to discover, interpret, and analyze earnings information significantly increases with their industry concentration. Specifically, we find that concentrated institutional investors demonstrate the ability to discover and interpret earnings information whereas there is no evidence of discovery or interpretation among low industry concentration institutions. Our results also reveal that institutional investors with higher levels of industry trading concentration analyze earnings news more promptly.

Next, we examine whether the effect of industry concentration is different for positive versus negative earnings surprises by estimating the following model:

$$NET\_BUY\ [t_1, t_2] = \beta_0 + \beta_1 CONS + \beta_2 POS\_ESURP + \beta_3 NEG\_ESURP + \beta_4 CONS * POS\_ESURP + \beta_5 CONS * NEG\_ESURP + \beta_6 MTB + \beta_7 SIZE + \beta_8 MOMENTUM + \varepsilon \quad (6)$$

We present the results in Table 5. We find that the coefficient on *POS_ESURP* in the discovery, interpretation, and analysis periods are 0.028, 0.019, and 0.080, respectively, and is statistically significant in the discovery and analysis periods, but insignificant in the interpretation period. In contrast, the coefficients on the interaction term, *CONS* POS_ESURP*, are 0.045, 0.148, and 0.141 in the discovery, interpretation, and analysis periods, respectively, and are statistically significant in each period. Thus, we find evidence that institutional investors' ability to discover,

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that the effect of concentration on funds' trading performance is non-linear. However, our results are robust to defining industry concentration variable taking value of 0 for the low, 0.5 for the middle, and 1 for the high concentration funds.

interpret, and analyze positive earnings news is positively related to their industry concentration. Specifically, we find that low industry concentration institutions show no evidence of interpretation following positive earnings news.

Interestingly, our analysis reveals that during the discovery period, low industry concentration institutions struggle to detect negative news, as indicated by the highly significant coefficient of -0.022 for *NEG_ESURP*. Surprisingly, these institutions tend to be net buyers rather than net sellers during this phase, potentially hindering price efficiency leading up to the announcement of negative earnings surprises. Crucially, the combined coefficients for *NEG_ESURP* and *CONS* NEG_ESURP*, which represent high industry concentration institutions in the discovery period, amount to -0.014 and are statistically insignificant (*p-value*=0.205). This suggests that industry concentration doesn't significantly influence these institutions' ability during discovery.

Moving to the interpretation period, our results show that the coefficient for *NEG_ESURP* is insignificant for low concentration institutions, implying that they don't notably contribute to price efficiency through the interpretation of negative earnings news. Likewise, the combined coefficient for *NEG_ESURP* and *CONS* NEG_ESURP* in this period total 0.002 and is statistically insignificant, indicating that industry concentration doesn't significantly impact the interpretation ability of these institutions. However, our findings provide support for the idea that industry concentration positively affects institutions' capacity to analyze negative earnings information in the right direction, as indicated by the significant positive coefficient of 0.050 on the interaction term, *CONS* NEG_ESURP*, in the analysis period.

5.4 Additional results

a. Mutual versus Pension Funds

In our supplementary analyses, we extended our investigation by categorizing institutional investors into two distinct groups: mutual funds and pension funds, as identified by the client type (*clienttype*) identifier provided by Ancerno Ltd. Building upon prior research indicating that mutual funds and pension funds exhibit contrasting characteristics, including investment horizon and portfolio turnover, we aim to explore potential variations in how these two groups discover, interpret, and analyze earnings information to inform their trading decisions. To explore this possibility, we conducted all analyses separately for mutual funds and pension funds to gain deeper insights into their respective behaviors in relation to earnings information.

In Table 6, we present the results obtained from estimating Model (4) separately for each institution type. We observe significantly positive coefficients for *POS_ESURP* across all periods, both for mutual funds (see columns 1-3) and pension funds (see columns 4-6), indicating that both mutual funds and pension funds are actively engaged in information discovery, interpretation, and analysis of positive earnings information. Furthermore, similar to the trends observed in our full sample results, we note that the magnitude of the coefficient on *POS_ESURP* tends to increase as we transition from the discovery period to the analysis period for both mutual funds and pension funds. This result highlights the information analysis phase as the dominant period for trading related to positive earnings surprises by both types of funds. However, a notable distinction emerges in the trading patterns of these two fund types. Mutual funds exhibit trading activity related to positive earnings information that is approximately 3 to 4 times greater than that of pension funds across all periods. For example, in the discovery period, *POS_ESURP* coefficient is 0.255 in column 1 compared to 0.069 in column 4 of Table 6. It's important to highlight that this discrepancy cannot be attributed to differences in fund sizes, as total assets under management by

pension funds exceed that by mutual funds (e.g., Del Guercio and Tkac 2002; Zhong et al. 2017).

Regarding negative earnings surprises, our analysis reveals that during the discovery period, both mutual funds and pension funds face challenges in detecting negative news, as indicated by the lack of significance in the coefficients for *NEG_ESURP*. However, following the announcement of negative earnings surprises, both types of funds exhibit significant evidence of engaging in information analysis, as evidenced by the significant positive coefficients on *NEG_ESURP* during the analysis period. Intriguingly, our results suggest that mutual funds do not significantly interpret earnings news negatively during the interpretation period, as indicated by the insignificant coefficient on *NEG_ESURP*. In contrast, there is some indication that pension funds respond to negative news during the interpretation period, as demonstrated by the marginally significant positive coefficient on *NEG_ESURP*. Consequently, our findings imply that both types of funds contribute to enhancing price efficiency concerning negative earnings surprises primarily through their ability to analyze information.

We also investigate whether the influence of industry concentration on information discovery, interpretation, and analysis differs based on the type of institution. To explore this, we separately estimate Model (5) for each institution type and present the findings in Table 7. For mutual funds, our analysis reveals that industry concentration enhances their capacity to discover, interpret, and analyze positive earnings news information. However, it primarily improves their ability to analyze negative earnings news and has no discernible impact on the discovery and interpretation of negative earnings news. Interestingly, our results for pension funds align closely with those for mutual funds, displaying a similar pattern for the effects of industry concentration on information discovery, interpretation, and analysis roles concerning both positive and negative earnings surprises. However, a notable trading pattern becomes evident when contrasting high

industry-concentrated mutual funds with their pension fund counterparts. High industry-concentrated mutual funds consistently exhibit significantly more vigorous trading activity linked to positive earnings information, consistently surpassing that observed among high-concentration pension funds across all periods, amounting to approximately three to four times greater activity. We also observe similar differences in trading activities of these two groups, particularly in the analysis phase, when dealing with negative earnings news information, but not during the discovery or interpretation phases. This pronounced distinction underscores the divergent approaches employed by these two institutional categories when responding to positive earnings news, with mutual funds consistently adopting a notably more assertive trading stance in this context. This finding is consistent with mutual funds being more active traders than pension funds (e.g., Del Guercio and Tkac 2002; Zhong et al. 2017).

b. Using different windows for information discovery and analysis

In our untabulated analyses, we extended our investigation of information discovery and analysis by institutions by considering both shorter and longer time windows. Specifically, we examined shorter time windows ranging from 2 to 5 days and longer ones spanning from 2 to 30 days. Intriguingly, our findings and conclusions remained consistent and unchanged when we employed these alternative windows. This robustness in results across different time frames suggests that the patterns we have identified regarding information discovery and analysis are robust and not dependent on the specific time periods chosen for analysis. This lends further credibility to the reliability of our research findings in this context.

6. CONCLUSION

In this study, we address the fragmented perspective on institutional investors' roles in information discovery, response, and analysis around quarterly earnings announcements. Our study offers a comprehensive perspective on these roles, also investigating the influence of institutional investors' industry concentration on their involvement during these critical phases. Our findings underscore the significance of each role in institutional investors' trading activities. Notably, our results reveal that institutional investors predominantly trade on earnings announcement in the information analysis period. In the context of information discovery, our findings highlight a distinct focus on firms expected to report positive news. Moreover, institutional investors respond more promptly to positive news than negative news, underscoring their differential attention based on news direction.

Furthermore, our study explores the impact of industry concentration on institutional investors' behavior. We discover that higher industry trading concentration corresponds to heightened participation in discovering, responding to, and analyzing earnings announcement news, with a stronger effect noted for positive earnings surprises. This underscores the crucial role industry focus plays in shaping institutional investors' actions during these events. In addition to these contributions, our study differentiates between mutual funds and pension funds, uncovering similar patterns in their trading behavior across roles during both positive and negative surprises. This is significant given the documented heterogeneity in their trading behavior.

In conclusion, our study offers a holistic understanding of institutional investors' engagement across different phases of information processing. We bridge the gap between isolated examinations of their roles and illuminate the intricate dynamics shaping their decision-

making process. Moreover, our investigation into the impact of industry concentration extends the literature on the "information advantage" hypothesis, revealing its effect on institutional investors' behavior and market efficiency. Overall, our study significantly advances the understanding of institutional investors' roles, industry concentration, and their combined effects on market efficiency within the context of earnings announcements. Moving forward, future research could explore the interplay between institutional investors' behavior, industry concentration, and other external factors that may influence their roles and impact on the market.

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Appendix A – Variable Definitions

Variable Name	Variable Definition
NET_BUY[t_1, t_2]	Average daily net trading activity during the period (days t_1 through t_2) relative to the earnings announcement day, calculated as the daily average number of shares bought less the daily average number of shares sold from days t_1 to t_2 (i.e., the pre or post two-week and 3-day windows) by our sample of institutional investors scaled by the number of shares outstanding.
ESURP	Earnings surprise computed as difference between actual earnings and the last mean consensus forecasts provided by analysts before the earnings announcements, scaled by the absolute value of actual earnings.
POS_ESURP	Positive earnings surprise equal to *ESURP* if the surprise is greater than zero, and equal to zero otherwise.
NEG_ESURP	Negative earnings surprise equal to *ESURP* if the surprise is less than zero, and equal to zero otherwise.
AT ($Millions)	Total assets of the firm at the end of the fiscal quarter.
MOMENTUM	Cumulative abnormal returns (raw return minus the CRSP value-weighted index returns) over the period (days -253 to -31) relative to earnings announcement day.
MVE ($Billions)	Market value of equity of the firm, computed as price times number of shares outstanding at the end of the quarter.
MTB	Market-to-book ratio measured as the market value of equity scaled by the book value of equity (CEQQ) at the end of the fiscal quarter.
PRICE	Stock price of the firm at the end of the fiscal quarter.
SHO (Millions)	Number of shares outstanding at the end of the fiscal quarter.
CONS	Fund-level industry trading concentration measure taking value of 0 (0.5) [1] for funds with low(middle)[high] industry trading concentration, calculated for each investment fund in each year based on the fund's percentage total trading volume in the 2-digit industry SIC. The percentage trading volume is computed as the ratio of each fund's dollar trading activity, buy plus sell, in the industry to the fund's total dollar trading activity in that year.

Table 1

Panel A: Descriptive Statistics

Variable	*Mean*	*Median*	*Min*	*P25*	*P75*	*Max*
ESURP	3.61	3.99	-200	-5	17.34	146.83
POS_ESURP	14.63	3.99	0	0	17.34	146.83
NEG_ESURP	-11.01	0	-200	-5	0	0
MOMENTUM	0.10	0.07	-2.64	-0.12	0.29	8.34
MVE ($Billions)	5.59	1.00	0.01	0.37	3.17	505.71
AT ($Millions)	11,831.03	1,249.71	2.79	369.98	4,381.55	3,293,755.00
MTB	2.70	2.06	0.28	1.33	3.36	9.28
PRICE	50.15	21.67	1.01	11.56	35.76	141,600.00
SHO (Millions)	178.43	50.65	1.23	26.09	118.62	29,206.44
NET_BUY [-15,-2]	-3.95	4.07	-1437.45	-244.53	240.15	1,638.99
NET_BUY [-1,+1)	-43.37	0.41	-3395.04	-436.85	415.14	3,377.32
NET_BUY [+2,+15]	32.99	16.10	-1665.20	-245.68	312.91	1,758.17

Panel A of Table 1 reports descriptive statistics relating to our population of 108,385 quarterly earnings announcements between January 1, 2002 and December 31, 2010. *ESURP* is the earnings surprise computed as difference between actual earnings and the last mean consensus forecasts provided by analysts before the earnings announcements, scaled by the mean consensus forecast., *MOMENTUM* is cumulative abnormal returns (raw return minus the CRSP value-weighted index returns) over the period (days -253 to -31) relative to earnings announcement day., *MVE* ($Billions) is market value of equity of the firm, computed as price times number of shares outstanding at the end of the quarter, *AT($Millions)* is the total assets of the firm at the end of the fiscal quarter, *MTB* is market-to-book ratio measured as the market value of equity scaled by the book value of equity (CEQQ) at the end of the fiscal quarter, *AT* (in Millions) is total assets at the end of quarter, *PRICE* is the end of the quarter stock price, *SHO* (Millions) is number of shares outstanding at the end of the quarter, and *NET_BUY [t1, t2]* is average daily net trading activity during the period (days t1 through t2) relative to the earnings announcement day, calculated as the daily average number of shares bought less the daily average number of shares sold from days t1 to t2 (i.e., the pre or post two-week and 3-day windows) by our sample of institutional investors scaled by the number of shares outstanding.

Table 1
Panel B: Correlations

	[1]	*[2]*	*[3]*	*[4]*	*[5]*	*[6]*	*[7]*	*[8]*	*[9]*
ESUPR	*1*	0.0938	0.00729	-0.00616	0.03899	0.00093	0.01307	0.01374	0.05524
[1]		<.0001	0.0168	0.0423	<.0001	0.7603	<.0001	<.0001	<.0001
MOMENTUM		1	-0.01858	-0.02944	0.2467	-0.00029	0.04744	0.01641	0.06119
[2]			<.0001	<.0001	<.0001	0.9237	<.0001	<.0001	<.0001
MVE				0.47702	0.09823	0.12139	-0.01367	-0.00306	-0.01975
[3]				<.0001	<.0001	<.0001	<.0001	0.3148	<.0001
SIZE				1	-0.05362	0.04619	-0.00345	0.00023	-0.00725
[4]					<.0001	<.0001	0.2555	0.94	0.017
MTB						-0.00506	0.02883	0.01852	0.04776
[5]						0.0952	<.0001	<.0001	<.0001
PRICE						1	-0.00115	0.00325	0.00018
[6]							0.705	0.2846	0.9535
NET_BUY [-15,-2]							1	0.29093	0.20539
[7]								<.0001	<.0001
NET_BUY [-1,+1)								1	0.30784
[8]									<.0001
NET_BUY [+2,+15]									1
[9]									

Panel B of Table 1 presents Pearson correlations relating to our population of 108,385 quarterly earnings announcements between January 1, 2002 and December 31, 2010. *ESURP* is the earnings surprise computed as difference between actual earnings and the last mean consensus forecasts provided by analysts before the earnings announcements, scaled by the mean consensus forecast., *MOMENTUM* is cumulative abnormal returns (raw return minus the CRSP value-weighted index returns) over the period (days -253 to -31) relative to earnings announcement day., *MVE* ($Billions) is market value of equity of the firm, computed as price times number of shares outstanding at the end of the quarter, *AT($Millions)* is the total assets of the firm at the end of the fiscal quarter, *MTB* is market-to-book ratio measured as the market value of equity scaled by the book value of equity (CEQQ) at the end of the fiscal quarter, *AT* (in Millions) is total assets at the end of quarter, *PRICE* is the end of the quarter stock price, *SHO* (Millions) is number of shares outstanding at the end of the quarter, and *NET_BUY [t1, t2]* is average daily net trading activity during the period (days t1 through t2) relative to the earnings announcement day, calculated as the daily average number of shares bought less the daily average number of shares sold from days t1 to t2 (i.e., the pre or post two-week and 3-day windows) by our sample of institutional investors scaled by the number of shares outstanding.

Table 2 Institutional Investor Trading and Overall Earnings Surprise

	Dependent Variable*: Net Trading Activity*		
	Discovery	*Interpretation*	*Analysis*
	NET_BUY [-15,-2]	*NET_BUY [-1,+1]*	*NET_BUY [+2,+15]*
ESURP	0.0921**	0.300***	0.713***
	(0.021)	(0.001)	(0.000)
MTB	4.564***	13.12***	12.04***
	(0.000)	(0.000)	(0.000)
AT	-0.0291	-0.0276	-0.0480**
	(0.129)	(0.406)	(0.012)
MOMENTUM	51.84***	9.676	63.95***
	(0.000)	(0.364)	(0.000)
Constant	-44.16	-40.54	-2.942
	(0.450)	(0.580)	(0.914)
N	108385	108385	108385
Adj-R2	0.006	0.003	0.009

Table 2 presents coefficient estimates from model (3)

$$NET\_BUY\ [t_1, t_2] = \beta_0 + \beta_1 ESURP + \beta_2 MTB + \beta_3 AT + \beta_4 MOMENTUM + \varepsilon$$

where *NET_BUY [t1, t2]* is average daily net trading activity during the period (days t1 through t2) relative to the earnings announcement day, calculated as the daily average number of shares bought less the daily average number of shares sold from days t1 to t2 (i.e., the pre or post two-week and 3-day windows) by our sample of institutional investors scaled by the number of shares outstanding, *ESURP* is the earnings surprise computed as difference between actual earnings and the last mean consensus forecasts provided by analysts before the earnings announcements, scaled by the mean consensus forecast., *MOMENTUM* is cumulative abnormal returns (raw return minus the CRSP value-weighted index returns) over the period (days -253 to -31) relative to earnings announcement day, *AT($Millions)* is the total assets of the firm at the end of the fiscal quarter, and *MTB* is market-to-book ratio measured as the market value of equity scaled by the book value of equity (CEQQ) at the end of the fiscal quarter. Numbers in parentheses are p-values calculated using standard errors per White (1980) and standard errors are clustered at the firm and industry level. ***, **, and * denote statistical significance at the 1%,5%, and 10% levels, respectively.

Table 3 Institutional Investor Trading and Positive and Negative Earnings Surprise

	Dependent Variable*: Net Trading Activity*		
	Discovery	*Interpretation*	*Analysis*
	NET_BUY [-15,-2]	*NET_BUY [-1,+1]*	*NET_BUY [+2,+15]*
POS_ESURP	0.343***	0.732***	1.128***
	(0.000)	(0.000)	(0.000)
NEG_ESURP	-0.104*	-0.0374	0.389***
	(0.089)	(0.776)	(0.000)
MTB	5.015***	13.90***	12.79***
	(0.000)	(0.000)	(0.000)
AT	-0.0279	-0.0256	-0.0461**
	(0.140)	(0.444)	(0.013)
MOMENTUM	51.85***	9.694	63.97***
	(0.000)	(0.362)	(0.000)
Constant	-51.43	-53.05	-14.97
	(0.370)	(0.473)	(0.585)
N	108385	108385	108385
Adj-R2	0.006	0.003	0.009

Table 3 presents coefficient estimates from model (4)

$$NET\_BUY\ [t_1, t_2] = \beta_0 + \beta_1 POS\_ESURP + \beta_2 NEG\_ESURP + \beta_3 MTB + \beta_4 AT + \beta_5 MOMENTUM + \varepsilon$$

where *NET_BUY [t1, t2]* is average daily net trading activity during the period (days t1 through t2) relative to the earnings announcement day, calculated as the daily average number of shares bought less the daily average number of shares sold from days t1 to t2 (i.e., the pre or post two-week and 3-day windows) by our sample of institutional investors scaled by the number of shares outstanding, *POS_ESURP* is the positive earnings surprise equal to ESURP if the surprise is greater than zero, and equal to zero otherwise. *NEG_ESURP* represents the negative earnings surprise equal to ESURP if the surprise is less than zero, and equal to zero otherwise, *MOMENTUM* is cumulative abnormal returns (raw return minus the CRSP value-weighted index returns) over the period (days -253 to -31) relative to earnings announcement day, *AT($Millions)* is the total assets of the firm at the end of the fiscal quarter, and *MTB* is market-to-book ratio measured as the market value of equity scaled by the book value of equity (CEQQ) at the end of the fiscal quarter. Numbers in parentheses are p-values calculated using standard errors per White (1980) and standard errors are clustered at the firm and industry level. ***, **, and * denote statistical significance at the 1%,5%, and 10% levels, respectively.

Table 4 Institutional Investor Trading and Industry Concentration

	Dependent Variable*: Net Trading Activity*		
	Discovery	*Interpretation*	*Analysis*
	NET_BUY [-15,-2]	*NET_BUY [-1,+1]*	*NET_BUY [+2,+15]*
ESURP	-0.000181	0.00122	0.0452***
	(0.963)	(0.862)	(0.000)
CONS	0.721**	-5.035***	4.824***
	(0.046)	(0.000)	(0.000)
ESURPxCONS	0.0240***	0.0729***	0.0900***
	(0.003)	(0.000)	(0.000)
MTB	1.107***	2.803***	2.116***
	(0.000)	(0.000)	(0.000)
AT	-0.00576*	-0.00907	-0.00770**
	(0.089)	(0.121)	(0.039)
MOMENTUM	4.915***	-4.055***	6.677***
	(0.000)	(0.003)	(0.000)
Constant	-11.29	-0.394	-1.075
	(0.108)	(0.969)	(0.750)
N	650208	650208	650208
Adj-R2	0.001	0.001	0.002

Table 4 presents coefficient estimates from model (5)

$$NET\_BUY\ [t_1, t_2] = \beta_0 + \beta_1 CONS + \beta_2 ESURP + \beta_3 CONS*ESURP + \beta_4 MTB + \beta_5 SIZE + \beta_6 MOMENTUM + \varepsilon$$

where *NET_BUY [t1, t2]* is average daily net trading activity during the period (days t1 through t2) relative to the earnings announcement day, calculated as the daily average number of shares bought less the daily average number of shares sold from days t1 to t2 (i.e., the pre or post two-week and 3-day windows) by our sample of institutional investors scaled by the number of shares outstanding, *ESURP* is the earnings surprise computed as difference between actual earnings and the last mean consensus forecasts provided by analysts before the earnings announcements, scaled by the mean consensus forecast., *MOMENTUM* is cumulative abnormal returns (raw return minus the CRSP value-weighted index returns) over the period (days -253 to -31) relative to earnings announcement day, *AT($Millions)* is the total assets of the firm at the end of the fiscal quarter, *CONS* is fund-level industry trading concentration measure taking value of 0(0.5)[1] for funds with low(middle)[high] industry trading concentration, calculated for each investment fund in each year based on the fund's percentage total trading volume in the 2-digit industry SIC. and *MTB* is market-to-book ratio measured as the market value of equity scaled by the book value of equity (CEQQ) at the end of the fiscal quarter. Numbers in parentheses are p-values calculated using standard errors per White (1980) and standard errors are clustered at the firm and industry level. ***, **, and * denote statistical significance at the 1%,5%, and 10% levels, respectively.

Table 6 Mutual and Pension Fund Trading

	Dependent Variable*: Net Trading Activity* (NET_BUY [t1,t2])					
	Mutual Funds			**Pension Funds**		
	Discovery [-15,-2]	*Interpretation [-1,+1]*	*Analysis [+2,+15]*	*Discovery [-15,-2]*	*Interpretation [-1,+1]*	*Analysis [+2,+15]*
POS_ESURP	0.255***	0.576***	0.872***	0.0690***	0.138***	0.241***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
NEG_ESURP	-0.0766	-0.0333	0.284***	-0.00491	0.0428*	0.0713***
	(0.173)	(0.778)	(0.000)	(0.669)	(0.071)	(0.000)
MTB	4.298***	11.83***	10.40***	1.254***	2.943***	2.387***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
AT	-0.0200	-0.0179	-0.0327*	-0.00759*	-0.0108*	-0.0124***
	(0.189)	(0.558)	(0.056)	(0.061)	(0.092)	(0.005)
MOMENTUM	35.21***	-1.714	44.33***	11.65***	1.648	13.04***
	(0.000)	(0.851)	(0.000)	(0.000)	(0.514)	(0.000)
Constant	-54.07	-8.548	4.918	-5.739	-42.98***	-24.27**
	(0.195)	(0.897)	(0.808)	(0.640)	(0.000)	(0.038)
N	108385	108385	108385	108385	108385	108385
Adj-R2	0.005	0.003	0.007	0.007	0.002	0.009

Table 6 presents coefficient estimates for mutual and pension funds from model (4)

$$NET\_BUY\ [t_1, t_2] = \beta_0 + \beta_1 POS\_ESURP + \beta_2 NEG\_ESURP + \beta_3 MTB + \beta_4 AT + \beta_5 MOMENTUM + \varepsilon$$

where *NET_BUY [t1, t2]* is average daily net trading activity during the period (days t1 through t2) relative to the earnings announcement day, calculated as the daily average number of shares bought less the daily average number of shares sold from days t1 to t2 (i.e., the pre or post two-week and 3-day windows) by our sample of institutional investors scaled by the number of shares outstanding, *POS_ESURP* is the positive earnings surprise equal to ESURP if the surprise is greater than zero, and equal to zero otherwise. *NEG_ESURP* represents the negative earnings surprise equal to ESURP if the surprise is less than zero, and equal to zero otherwise, *MOMENTUM* is cumulative abnormal returns (raw return minus the CRSP value-weighted index returns) over the period (days -253 to -31) relative to earnings announcement day, *AT($Millions)* is the total assets of the firm at the end of the fiscal quarter, and *MTB* is market-to-book ratio measured as the market value of equity scaled by the book value of equity (CEQQ) at the end of the fiscal quarter. Numbers in parentheses are p-values calculated using standard errors per White (1980) and standard errors are clustered at the firm and industry level. ***, **, and * denote statistical significance at the 1%,5%, and 10% levels, respectively.

Table 7 Mutual and Pension Fund Trading and Industry Concentration

	Dependent Variable: *Net Trading Activity* (NET_BUY [t1,t2])					
	Mutual Funds			**Pension Funds**		
	[-15,-2]	*[-1,+1]*	*[+2,+15]*	*[-15,-2]*	*[-1,+1]*	*[+2,+15]*
POS_SURP	0.0762***	0.0244	0.157***	0.00429	-0.00983	0.0275***
	(0.009)	(0.676)	(0.000)	(0.448)	(0.303)	(0.000)
NEG_SURP	-0.0615**	-0.0731	0.0533*	0.00584	0.0173**	0.0127***
	(0.017)	(0.167)	(0.073)	(0.190)	(0.015)	(0.008)
POS_SURPxCONS	0.00918	0.0839**	0.0599***	0.00824***	0.0267***	0.0225***
	(0.585)	(0.017)	(0.003)	(0.002)	(0.000)	(0.000)
NEG_SURPxCONS	0.0158	0.0286	0.0140	-0.00479**	-0.00401	0.00401
	(0.286)	(0.367)	(0.425)	(0.033)	(0.266)	(0.107)
CONS	1.345**	-4.852***	3.575***	-0.247***	-1.628***	0.131
	(0.010)	(0.000)	(0.000)	(0.006)	(0.000)	(0.204)
MTB	1.880***	4.794***	3.665***	0.483***	1.057***	0.816***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
AT	-0.00852	-0.0128	-0.0109*	-0.00262*	-0.00466**	-0.00386***
	(0.123)	(0.212)	(0.085)	(0.052)	(0.027)	(0.007)
MOMENTUM	7.192***	-6.982***	10.52***	2.639***	-1.126*	2.839***
	(0.000)	(0.004)	(0.000)	(0.000)	(0.097)	(0.000)
Constant	-26.04**	6.884	-2.189	-0.195	-5.371	-4.960*
	(0.022)	(0.730)	(0.677)	(0.949)	(0.161)	(0.061)
N	325104	325104	325104	325104	325104	325104
Adj-R2	0.002	0.002	0.003	0.003	0.001	0.004

Table 7 presents coefficient estimates from model (6)

$$NET\_BUY\ [t_1, t_2] = \beta_0 + \beta_1 CONS + \beta_2 POS\_ESURP + \beta_3 NEG\_ESURP + \beta_4 CONS * POS\_ESURP + \beta_5 CONS * NEG\_ESURP + \beta_6 MTB + \beta_7 SIZE + \beta_8 MOMENTUM + \varepsilon$$

where *NET_BUY [t1, t2]* is average daily net trading activity during the period (days t1 through t2) relative to the earnings announcement day, calculated as the daily average number of shares bought less the daily average number of shares sold from days t1 to t2 (i.e., the pre or post two-week and 3-day windows) by our sample of institutional

investors scaled by the number of shares outstanding, *POS_ESURP* is the positive earnings surprise equal to ESURP if the surprise is greater than zero, and equal to zero otherwise. *NEG_ESURP* represents the negative earnings surprise equal to ESURP if the surprise is less than zero, and equal to zero otherwise, *MOMENTUM* is cumulative abnormal returns (raw return minus the CRSP value-weighted index returns) over the period (days -253 to -31) relative to earnings announcement day, *AT($Millions)* is the total assets of the firm at the end of the fiscal quarter, *CONS* is fund-level industry trading concentration measure taking value of 0(0.5)[1] for funds with low(middle)[high] industry trading concentration, calculated for each investment fund in each year based on the fund's percentage total trading volume in the 2-digit industry SIC. and *MTB* is market-to-book ratio measured as the market value of equity scaled by the book value of equity (CEQQ) at the end of the fiscal quarter. Numbers in parentheses are p-values calculated using standard errors per White (1980) and standard errors are clustered at the firm and industry level. ***, **, and * denote statistical significance at the 1%,5%, and 10% levels, respectively.