THE EFFECT OF INSTITUTIONAL INVESTOR DISTRACTION ON ANALYST FORECASTS

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Abstract

I examine financial analysts' forecasts for firms whose incumbent institutional investors (IIIs) are temporarily distracted. I find that financial analysts react to an increase in institutional investors' distraction by providing more- thorough forecasts. This effect is mainly driven by the distraction of two types of institutions: quasi-indexers and banks. Consistent with stronger investor demand for analyst-provided information when a firm's overall reporting quality is lower and when concern about managerial misbehavior is higher, I find that the effect was stronger before the passage of the Sarbanes–Oxley Act in 2002 and for firms with inferior corporate governance. The effect is also stronger for analysts affiliated with smaller brokerage firms. I also find that analysts issue fewer optimistic forecasts and less-optimistic recommendations for firms with distracted institutional investors. Overall, my findings imply that financial analysts cater to an increase in institutional investors information demand by allocating more efforts to firms when the firms' institutional investors are temporally distracted.

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Chapter 1. Introduction

The strategic interactions between financial analysts and institutional investors (II) (Firth et al. 2013; Irvine et al. 2007; Mola and Guidolin 2009) suggest that financial analysts may allocate their efforts based on a consideration of institutional investors' interests in firms. For example, analysts tend to cover stocks that are more important to institutional investors that supplement their in-house research with analyst-provided information. There are two main reasons why institutional investors consume information from financial analysts: 1) to guide their stock trading or 2) to monitor investees. Prior literature shows that the level of institutional ownership has a positive effect on a firm's analyst coverage, but there is limited evidence regarding the effect of institutional investors' attention on analysts' behavior.[1] Also, there is a dramatic difference between institutional ownership and the attention paid to a firm, especially for passive investors (e.g., ETFs or index funds), when the firm's ownership is relatively sticky. This is because the attention of investors toward a specific firm may vary even though the firm's ownership level stays constant. The growth of passive investing in the past two decades has made it necessary to distinguish the effect of ownership from the effect of attention. In this paper, I analyze, for a given level of institutional ownership, whether the incumbent institutional investors'

[1] For example, financial analysts allocate more effort on stocks with a higher ownership by institutional investors, in order to generate more trading commissions for the associated brokerage firm and to get votes from the institutional investors in the annual evaluation of the all-star analyst rankings (Ljungqvist et al. 2007)

attention paid to a firm affects financial analysts' efforts spent on the firm (e.g., the frequency or the thoroughness of the analysts' forecasts). The attention investors pay to a firm can be affected by any eye-catching news of both the firm itself and other investees. Investors' demand for analyst-provided information may be stronger when the investors are unable to produce detailed firm-specific information themselves. Therefore, I focus on firms whose incumbent institutional investors are distracted, that is, when their full attention is not on a firm and their close oversight is temporarily reduced. There are two possible strategies for financial analysts to allocate their efforts toward these firms.

On the one hand, financial analysts may put more effort on stocks that have lost the attention of incumbent institutional investors because such firms need more monitoring. However, firms are more likely to take value-destroying actions when their incumbent institutional investors are distracted (Li et al. 2021; Ni et al. 2020; Flugum et al. 2021; Kempf et al. 2017; Garel et al. 2021), creating a greater demand for external monitoring in the distracted period. According to prior studies, analyst-provided information is more important for investors in such a period as firms provide less information in such a period.[2] For example, Abramova et al. (2020) find that managers issue fewer management forecasts and 8-K filings when the firms' incumbent institutional investors are distracted.

[2] Consistent with this view, Liu et al. (2020) argue that when institutional investors' attention is temporarily distracted by other firms, they cannot pay enough attention to the focal firms, reducing the focal firm's monitoring intensity. Accordingly, Liu et al. (2020) find that ineffective independent directors are less likely to receive unsupportive votes in proxy voting from institutional investors when these investors are temporally distracted. Also, Yang et al. (2020) find that firms' audit risk increases when firms' institutional investors are distracted.

Besides, analysts play an important governance role in firms (Jensen and Meckling 1976; Yu 2008; Moyer et al. 1989) by providing both direct and indirect monitoring. Chen et al. (2015) find that an exogenous decrease in firms' analyst coverage can lead to an increase in the managerial expropriation of shareholders (e.g., a higher likelihood of value-destroying acquisitions and engagement in earnings management activities). Using the same setting, Irani and Oesch (2016) find that a decrease in analyst coverage is associated with a shift from real earnings management to accrual earnings management. So when incumbent institutional investors are distracted, analysts have an incentive to satisfy the potential increase in the information demand of distracted institutional investors and to perform their monitoring role when they identify potential agency problems due to the distracted institutional investors. That is, to cater to institutional investors' demand for information for monitoring purpose when these investors are distracted, financial analysts may provide more forecasts for the firm.[3]

On the other hand, financial analysts may spend less effort on firms whose incumbent institutional investors are distracted because these investors are unlikely to trade these stocks in such a distracted period. Schmidt (2019) argues that when institutional investors are paying attention to stocks with important financial events (e.g., earnings announcements), these investors need time and

[3] Financial analysts' forecasting decisions may be affected by the associated brokerage firms' desire to generate more trading commissions from institutional investors, especially for analysts affiliated with smaller brokerage firms that tend to provide customized services to attract investors.

resources to digest and respond to the financial events that can affect those stocks. Due to their limited attention and resource constraints, these institutional investors will pay less attention to other stocks that are not due to undergo important financial events, leading to a lower likelihood of trading these "neglected" stocks. Further, analysts' forecasts of stocks with distracted investors are unlikely to increase the trading commission received by the brokerage firms of the institutional investors. Therefore, analysts tend to issue fewer forecasts for firms that do not have the attention of institutional investors.

On the other hand, financial analysts may spend less effort on firms whose incumbent institutional investors are distracted because these investors are unlikely to trade these stocks in such a distracted period. Schmidt (2019) argues that when institutional investors are paying attention to stocks with important financial events (e.g., earnings announcements), these investors need time and resources to digest and respond to the financial events that can affect those stocks. Due to their limited attention and resource constraints, these institutional investors will pay less attention to other stocks that are not due to undergo important financial events, leading to a lower likelihood of trading these "neglected" stocks. Further, analysts' forecasts of stocks with distracted investors are unlikely to increase the trading commission received by the brokerage firms of the institutional investors. Therefore, analysts tend to issue fewer forecasts for firms that do not have the attention of institutional investors.

To test these two conjectures, I examine the effect of institutional investor (II) distraction on analysts' forecast behaviors. To establish a causal inference from the empirical results, I follow Kempf et al. (2017) to identify an exogenous increase in II distraction, which I use to quantify the extent to which the incumbent institutional investors of a firm are distracted by extreme returns of other investees in their portfolio. II distraction is considered an exogenous shock to the firm of interest, and to the analysts covering the firm, because the variations of the distraction measure stem from institutional investors' exposure to firms in other industries that are performing either extremely well or extremely badly.[4]

Using the analyst forecast data for U.S. firms over the period from 2001 to 2019, I analyze the effect of II distraction on the thoroughness of analysts' forecasts, essentially related to the total number of forecasts made by an analyst for a firm. The analyst forecast thoroughness measure is constructed following Driskill et al. (2020) and it proxies for the level of analyst effort spent on a firm.[5]

I find that financial analysts react positively to institutional investors' distraction by producing more-thorough forecasts, after controlling for the firms'

[4] To validate the II distraction measure, Kempf et al. (2017) provide evidence that when the existing institutional shareholders of a firm are distracted, there is less trading in the firm's stock, less conference call participation, and fewer shareholder proposals. This II distraction measure has been used in a number of prior studies. For example, Basu et al. (2019) report that Kempf et al. (2017) distraction measure is negatively correlated with the quantity of management forecasts, non-GAAP disclosures, and conference calls. Abramova et al. (2020) examine how short-term changes in institutional investors' attention can affect managers' disclosure choice. Abramova et al. (2020) find that managers respond to an increase in institutional investor distraction by decreasing the number of management forecasts and 8-K filings, but they show that such a decrease in disclosure has little effect on information quality or liquidity. Although the prior literature finds a strong relation between changes in II attention and manager's disclosure behavior, it is still unclear whether changes in II's attention affect analyst' forecast behaviors.

[5] I include forecasts for any horizon and forecasts for both earnings and non-earnings forecasts to better reflect the quantity of forecasts made by an analyst in a given period.

institutional ownership. This effect is economically significant: a one-standard-deviation increase in the distraction measure leads to a 0.376 increase in the total number of forecasts made by an analyst (for analysts who issue forecasts for the firm in each calendar quarter). Since the average number of unique analysts of my sample firm in this study is 14.7, the 0.376 increase in total forecasts per analyst indicates there will be 5.53 (i.e., 0.376 × 14.7) more analyst forecasts in total issued for my firm in one quarter.

To further explore the potential drivers of financial analysts' catering behavior, I conduct several sets of cross-sectional analyses. First, the information demand for a firm varies with the type of institutional investors. Bushee (1998) argues that dedicated institutional investors are long-term capital providers who take a stake in only a few firms and are usually able to obtain private information by themselves from direct negotiation with management (Boone and White 2015) and from their own in-house research team. The investment strategy of and the private information acquisition ability of dedicated institutional investors largely decrease these investors' reliance on publicly available information. So, I expect that dedicated institutional investors' attention would have a weak impact on the demand for public information. Transient institutional investors, on the other hand, typically have a high portfolio turnover and follow a short investment horizon. They are likely to rely more on public information (e.g., information provided by analysts) for trading purposes. However, transient institutional investors are less likely to trade on a firm's shares when they are not paying

attention to that firm, thus lowering their demand for information on that firm. In contrast, quasi-indexers are institutional investors who exhibit a lower turnover rate and have a higher demand for analyst-provided information because of their diversified investment portfolios, which may restrict their ability to acquire private information about a firm and to vote against its managers. So, quasi-indexers care about a firm's corporate governance and actively monitor the firm (Schmidt and Fahlenbrach 2017; Appel et al. 2016; Crane et al. 2016; Khan et al. 2017). Xue et al. (2020) find that a firm's information environment is less transparent when its quasi-index institutional investors are distracted. Consequently, when a firm's quasi-indexers are distracted, they may demand more public information in order to support their monitoring of a firm.

I predict that investors' demand for a firm's information is stronger when the firm's quasi-indexers are distracted. Consistent with this prediction, I expect that the effect of distraction on the thoroughness of analysts' forecasts is mainly driven by the distraction of quasi-indexers. To further explore which type of institutions demand more analyst-provided information when they are distracted, I calculate the distraction for different types of institutions based on the 13F institution classification in Thomson Reuters' database. I find that analysts issue more-thorough forecasts for a firm when the firm's bank investors are distracted. This finding is consistent with the prior literature finding that bank investors exhibit a higher degree of prudentiality (Bennett et al. 2003; Parrino et al. 2003) and care more about a firm's corporate governance. Compared with bank lenders, bank

shareholders are less likely to obtain private information about an investee, thus increasing their reliance on public information. When bank shareholders are distracted, they may demand both more information and firm monitoring data to be provided by financial analysts.

Second, I compare the impact of II distraction on the thoroughness of analyst forecasts before and after the implementation of the Sarbanes–Oxley Act (SOX) in 2002. This act constrains a firm's management's ability to manipulate financial reports, which may lower institutional investors' desire for information even when they are distracted due to the improved financial reporting quality after the SOX. Thus, such a decrease in the demand for information may lower an analyst's incentive to provide more-thorough forecasts. Consistent with this conjecture, I find that the impact of II distraction on the thoroughness of analysts' forecasts was stronger in the pre- vs. post-Sox period.

Third, the demand for information also varies with the level of a firm's corporate governance. Concerns about managers' misbehavior during a period when institutional investors are distracted will be greater when a firm's corporate governance level is lower. So, distracted institutional investors' demand for information to monitor a firm will be higher for a firm with inferior corporate governance. I find that the effect of distraction on forecast thoroughness is stronger when a firm's board is less independent, consistent with the stronger investor demand for analyst-provided information when the firm's overall corporate governance level is lower.

Four, I consider a variation due to the pressure from the brokerage firm that the analyst is affiliated with. Smaller brokerage firms have a greater incentive to produce customized services to attract and retain institutional investors. Selling analysts' reports to an investor who does not have time to collect such information itself (i.e., when the institutions need it the most) can lead to a higher price demanded for the information, or it may be provided in exchange for a larger trading commission. I find that this effect is stronger when an analyst is affiliated with a smaller brokerage firm, consistent with the incentive to generate commission for brokerage firms.

I also investigate other financial analysts' outputs provided to firms when the firms' institutional investors are distracted. While institutional investors prefer analysts to issue more optimistic comments on stocks they hold (Gu et al. 2013), they also demand less-biased research outputs from financial analysts. This is especially the case when institutional investors are temporarily distracted, as such distraction can increase the likelihood of managerial misbehavior. I find that financial analysts issue a smaller number (and a smaller fraction) of optimistic forecasts (e.g., forecasts with positive forecasts error) for a firm when the firm's institutional investors are distracted. I also find that the degree of analyst stock recommendation for a firm is lower when the firm's institutional investors are distracted.

I also conducted several robustness tests to check my findings. These show that the positive effect of II distraction on analyst thoroughness is robust to the

inclusion of an alternative institutional investor attention proxy. Further, the identified relation is robust after excluding utility and financial firms. By decomposing the II distraction of a focal firm into two components based on whether this distraction is due to a positive or negative extreme return in firms from other industries, I find that both the positive and negative components of II distraction are positively correlated with the number of total forecasts for the firms. I also aggregated the analyst level forecast thoroughness measure to the firm level and find that the positive relation between II distraction and analyst forecast thoroughness still holds true when using the firm quarterly data. To rule out the possibility that the effect of institutional investors distraction on the thoroughness of analysts' forecasts is driven by changes in institutional ownership, I restricted the sample to overall having a less than 5% change in institutional ownership and find that the results remain unchanged.

The contribution of this paper is two-fold. First, this paper contributes to the literature by providing direct evidence of the effect of incumbent institutional investors' attention on financial analysts' forecast behavior. Much of the prior literature focuses on how institutional ownership (e.g., Harford et al. 2019) or the relation between institutional investors and the brokerage firm affect analysts' forecasting behavior (e.g., Mola and Guidolin 2009), while the findings of this paper suggest that financial analysts cater to institutional investors' information demands by providing more-thorough forecasts.

Second, this paper also contributes to the literature by highlighting the role of

financial analysts in complementing the firm-specific information. Piotroski and Roulstone (2004) specify the roles of financial analysts, insiders, and institutional investors in influencing a firm's information based on how they incorporate different types of information into the firm's stock price. However, Piotroski and Roulstone (2004) do not specify the complementary role of these three information providers in how they affect a firm's information environment. In this paper, I provide evidence that analysts allocate more effort toward producing information in response to a decrease in the information produced by institutional investors and firms' managers when the firms' institutional investors are distracted.

A paper close to my analysis is that of Chiu et al. (2021). They argue that institutional investors' demand for a firm's information is higher when they are paying more attention to that firm. In contrast to my findings, they find that analysts cater to the information needs of institutional investors by producing more timely forecasts when institutional investors' attention is elsewhere and the institutional investors are distracted. Chiu et al. (2021) use a proxy for institutional investors' attention, namely an abnormal searching volume performed from Bloomberg terminals on the firm's earnings announcement day.

My paper is different from Chiu et al. (2021) in the following ways. First, this paper focuses on the attention of incumbent institutional investors who have already purchased the stocks of the firm. Although the searching activity

performed from Bloomberg terminals can to some extent proxy for the attention of institutional investors, it is still different from the attention of incumbent institutional investors. Second, Chiu et al. (2021) argue that the demand for information on a firm is high when institutional investors' attention on that firm is high, because these investors need this information to make trading decisions. However, this paper argues that institutional investors still demand more information about a firm even when they are not paying attention to the firm because they may need such information for monitoring the firm. The difference in arguments in this paper and in Chiu et al. (2021) arises from the difference between institutional investors and incumbent institutional investors, as the latter need information for both trading and monitoring purposes. When institutional investors are distracted, managers may take the opportunity to explore such lapses of monitoring intensity to maximize their private benefits. In this situation, the wealth of the distracted incumbent institutional investors may be affected by the managers' misbehavior. Thus, they may have a demand for information to monitor the managers. In contrast, unlike incumbent institutional investors, institutions who do not own a firm's stock are less likely to demand a firm's information when they are not paying attention to that firm.

The remainder of this paper is structured as follows. Section 2 presents the related literature and hypothesis development. Section 3 outlines the key data, research design, and summary statistics. Section 4 presents the main empirical analysis and results. Section 5 covers the cross-sectional tests. Section 6 conducts

some additional analyses. Section 7 concludes the report.

Chapter 2. Related Literature and Hypothesis Development

2.1. Institutional investors' attention

Attention is a scarce cognitive resource (Falkinger 2008). Prior literature in accounting and finance provides evidence that investors have limited attention (DeHaan et al. 2015; Hirshleifer et al. 2009). Institutional investors (IIs), one of the most important players in the U.S. capital market, holding more than half of all the stocks in the market (Kempf et al. 2017), are also subject to limited attention, regardless of their large investment in forming research teams and in their IT capacity.

Due to such attention constraints, institutional investors can be distracted by important financial events. Schmidt (2019) finds that the attention of fund managers can be attracted by the earnings announcements of their watchlist stocks, consequently leading to lower trading activities in other stock in their portfolio. Kempf et al. (2017) argue that extreme stock returns of an industry will also attract the attention of institutional investors. These findings indicate that the attention of institutional investors is not evenly distributed among the firms in their portfolio.

Prior literature has highlighted the importance of institutional investors in monitoring firms' corporate governance (Coates 2015; Hartzell and Starks 2003; McCahery et al. 2016; Parrino et al. 2003; Boone and White 2015). Faced with limited attention constraints, the intensity of institutions' monitoring of firms is likely to be affected by the level of attention they pay to the firms (Fich et al.

2015). Consequently, firms with the same level of institutional ownership may receive different levels of monitoring intensity from their institutional investors. When institutional investors are paying attention to a firm, they are likely to allocate more time and effort to collecting information on the firm, which in turn may increase the monitoring intensity on that firm and therefore deter the firm's managers' from the incentive to maximize their private benefits. To investigate how the attention of institutional investors affect their monitoring intensity, Kempf et al. (2017) examine firms' reaction to the distraction of their institutional investors. To measure institutional investors' distraction, Kempf et al. (2017) use industry shocks unrelated to the institutional investors' portfolio as an exogenous factor that can cause a variation in their attention. They find that when a firm's institutional investors are distracted, their participation in conference calls and submissions of shareholder proposals decrease. They further find that firms with distracted institutional investors are more likely to undertake value-destroying acquisitions, grant inefficient stock options to managers, and be reluctant to fire poor-performing CEOs.

The findings of Kempf et al. (2017) provide direct evidence for the relation between institutional investors' attention and monitoring intensity toward their portfolio firms. Consistent with these findings, Liu et al. (2020) find that distracted institutional investors are less likely to discipline ineffective directors in terms of voting these directors out. Ni et al. (2020) find a positive relation between institutional investors distraction and a firm's stock price crash risk,

implying that the distraction of institutional investors loosens their monitoring intensity toward firms, ultimately leading to an increase in managers' bad-news-hoarding behavior. Similarly, Garel et al. (2021) find that firms engage in more earnings management when their institutional investors are temporarily distracted. Consistent with the decrease in corporate governance by distracted institutional investors, Yang et al. (2020) find that auditors allocate more effort, proxied in their study by audit fee and audit report lags, to firms with distracted institutional investors due to the increased audit risk.

When institutional investors are distracted, the information environment of a firm may also change. The distracted institutional investors of a firm are, by nature of them being distracted, less likely to acquire the firm's information by themselves, thus hindering the incorporation of information into the firm's price. Ben-Rephael et al. (2017) find that price drifts after earnings announcements and changes in analyst recommendations are consequences of the inattention of institutional investors. Faced with distracted institutional investors, a firm's incentive to provide additional information also decreases, leading to a decrease in both the quantity and frequency of the firm's disclosures (Abramova et al. 2020; Basu et al. 2019). Flugum et al. (2021) find a causal relationship between institutional distraction and firms' information asymmetry.

2.2. Financial Analysts

The primary job of financial analysts in the capital market is to channel firms' information to investors by issuing forecasts of earnings and earnings-related

components, issuing buy and sell recommendations, and generating research reports. Prior literature has examined the determinants and consequences of the analysts' research output (Bradshaw 2011; Bradshaw et al. 2017), and found that although financial analysts are sophisticated information intermediaries, and the nature of their job is to deal with information on multiple firms, they are also subject to limited attention (Driskill et al. 2020). Faced with limited resource constraints, analysts have a strong incentive to strategically allocate their effort to maximize their own benefits (Harford et al. 2019).

One of the most important determinants on the outputs of financial analysts is institutional investors (Bradshaw 2011; Bradshaw et al. 2017). Institutional investors are important to financial analysts because they can affect not only the trading commission of the brokerage firms the analysts for, but also the annual selection of all-star analysts. Given the importance of institutional investors to analysts, analysts may adjust their attention and effort to cater to the interests of institutional investors.

Analysts may, thus, allocate more effort to stocks that institutional investors hold. Gu et al. (2013) find that institutional investors may reward a brokerage firm whose affiliated analysts issue supportive opinions on stocks that they hold, i.e., that increase the value of the institutions' equity holdings, by directing more trading commission fees to the brokerage firm. Harford et al. (2019) find that analysts make more accurate, frequent, and informative earnings forecasts and recommendations for firms with higher institutional ownership. Irvine et al. (2007)

find evidence that institutional investors receive tips from analysts prior to the release of analyst recommendations. These institutional investors' trade and earn abnormal returns based on the tips they get from analysts, consistent with the view that some investors rely on analysts' recommendations for investment decisions. Drake et al. (2020) find that analyst bundling, a phenomenon in which analysts issue earnings forecasts for multiple firms on the same day, is negatively associated with forecast accuracy, boldness, and informativeness. They argue that forecast bundling is a by-product of analysts' priority toward providing services to institutional investors.

Firms' reactions to institutional distraction have been extensively examined in the recent literature; however, the relation between institutional distraction and financial analysts remains largely unexplored. Given the importance of institutional investors to analysts and the important role analysts play as information intermediaries and in corporate governance, I aimed to examine whether and how institutional investors' distraction affect the forecast behavior of financial analysts.

2.3. Hypothesis development

The information demand of institutional investors can be affected by their attention. Schmidt (2019) finds that when fund managers are distracted toward stocks that have earnings announcements due or out, they are less likely to trade other stocks in their portfolio. So, fund managers may demand less information for stocks they are not actively paying attention to. Analysts have a strong

incentive to provide research information to institutional investors when they need information for trading decisions. Using the searching activities performed in Bloomberg terminals as a proxy for institutional investors' attention, Chiu et al. (2021) find that analysts cater to the information needs of and add value to their institutional clients by issuing a more timely forecast for a firm when the attention of institutional investors on that firm is high. Because financial analysts' time, energy, and resources are limited, they may choose to spend less effort (e.g., provide less-thorough forecasts) on firms that have temporarily lost the attention of institutional investors.

Alternatively, the information demand from distracted institutional investors on firms may increase because they cannot collect such information by themselves. The information demand of distracted institutional investors may even be higher for firms that they own.

When institutions are not distracted, they are usually able to acquire private information from private engagement with management and directors, at broker-hosted investor conferences, and through their own in-house research (Green et al. 2014; McCahery et al. 2016). However, when institutions are distracted, the cost to acquire information by themselves may exceed the benefit, and therefore they are less likely to get the aforementioned private information. Besides, firms have less incentive to provide additional information when their institutional investors are distracted (Abramova et al. 2020; Basu et al. 2019), further decreasing the volume of information available to distracted institutions. So,

institutional investors may demand more easily accessible information or may even outsource the information gathering to other information intermediaries to remain informed when they are temporarily distracted. Liu et al. (2020) find evidence that distracted institutional investors increase their reliance on information from proxy advisors in their voting in annual director elections. Because institutional institutions are less likely to trade stocks that they are not paying attention to, and managers may take advantage of the weakened monitoring intensity to maximize their private benefits, distracted institutions may demand more accessible information and a larger volume of information to monitor managers and dissuade them from taking part in value-destroying activities.

Financial analysts, who play an important role in providing and analyzing a firm's information, have an incentive to cater to the increased information demands of distracted institutional investors. Additionally, financial analysts can act as external monitoring agents to mitigate the managerial expropriation of outside shareholders (Bradley et al. 2017; Chen et al. 2015), thereby alleviating distracted institutional investors' concern about possible managerial misconduct. Thus, analysts may spend more effort on firms that have temporary distracted institutional investors by providing more easily assessable and more thorough information to their institutional clients. Given these competing hypotheses, I present my main hypothesis in the null form:

Hypothesis (null): *Analysts' forecast thoroughness will not be affected when*

incumbent institutional investors are distracted.

Chapter 3. Data and Research Design

3.1. Sample and data

The sample was taken from a combination of several databases. I first calculated the forecast thoroughness for each analyst-ticker pair at each calendar year quarter based on I/B/E/S data. Then I merged in the firm year-quarter fundamental data from Compustat, stock return, turnover, and volatility data from The Center for Research in Security Prices |(CRSP). Since the incumbent institutional investors distraction data in Kempf et al. (2017) are based on the firm's calendar quarter, I matched the firm's fiscal quarter Compustat data to Kempf et al. (2017)'s measure and to the analyst forecast thoroughness measure following Abramova et al. (2020)'s matching method. Here, the fiscal quarter of Compustat data is matched to the calendar quarter that ends on or after the fiscal quarter (for example, for a firm with an April fiscal year-end, where I match the July fiscal quarter to the September calendar quarter, the November fiscal quarter to the December calendar quarter, etc.).

The sample period starts in 2001 because this is the first year after Regulation Fair Disclosure (Reg FD) and ends in the last quarter of 2019. I dropped a firm–quarter if the stock price at the fiscal beginning of the quarter is below $1, in order to avoid extremely illiquid stocks (Cen et al. 2013; Malmendier and Shanthikumar 2014). I further excluded observations with missing values for the dependent variables or control variables. I winsorized all the continuous variables by quarters at the 1st and 99th percentiles to minimize the effects of outliers. My

final sample consists of 2,023,381 observations at the firm-analyst-year-quarter level, including 13,707 analysts and 8,085 firms.

3.2. Variable measurements

3.2.1. Institutional investors' distraction

I follow Kempf et al. (2017) to measure incumbent institutional investors' distraction. The key independent variable, DSTRQ, for firm *i* in calendar quarter *q* is defined as follows:

$$\boldsymbol{DSTRQ_{i,t}} = \sum_{f \in F_{t-1}} \sum_{IND \neq IND_i} \boldsymbol{\omega_{f,i,t-1}} \times \boldsymbol{\omega_{f,t-1}^{IND}} \times \boldsymbol{IS_t^{IND}}, \quad (\mathbf{1})$$

where F_{t-1} denotes the set of firm *i*'s institutional shareholders at the end of quarter *q*-1; *IND* denotes the 12 industries classified by Fama–French and IND_i denotes the industry of firm *i*; $\boldsymbol{IS_t^{IND}}$ is an indicator variable that equals one if the industry return is the highest or the lowest of all12 Fama–French industries in quarter t; $\boldsymbol{\omega_{f,t-1}^{IND}}$ is the weight of industry IND in the institutional investors f's portfolio in quarter t-1; and the weight $\boldsymbol{\omega_{f,i,t-1}}$ denotes the importance of institutional shareholder *f* in firm *i* in quarter *t*-1 calculated based on Equation 2 from Kempf et al. (2017).

I now explain the construction of these terms in greater detail. First, w_{ft-1}^{IND} is defined as the weight of industry IND in the portfolio of investor f. Second, IS_t^{IND} is an industry-level measure of whether something distracting is going on in industry IND in quarter t. I refer to IS as an industry shock. In most of my tests, I define IS_t^{IND} as an indicator variable equal to one if an industry has the highest

return across all 12 Fama–French industries in a given quarter.

In the final step, I aggregate the investors to obtain a firm-level distraction measure. Given the large differences between institutional investors, their holdings, and their motivation to perform monitoring, equally weighting all the investors is inappropriate. Therefore, I take a weighted average, with the weight w_{ft-1}^{IND}. In this weighting, I give more weight to investor i if firm f has more weight in i's portfolio, and if i owns a larger fraction of firm *i* 's shares. The former captures the belief that investors will, on average, spend more time and effort analyzing the biggest positions in their portfolio (Fich et al. 2015). The latter captures the belief that managers will care more about their largest shareholders, who also have the largest incentive to perform monitoring, as suggested, for example, by the Goldstein (2011) IRRC survey. I therefore define:

$$w_{ifq-1} = \frac{QPFweight_{ift-1} + QPercOwn_{ift-1}}{\sum_{i \in F_{q-1}} \left(QPFweight_{ift-1} + QPercOwn_{ift-1}\right)}$$

where $PercOwn_{ifq-1}$ is the fraction of firm i's shares held by investor f, and $PFweight_{ifq-1}$ is the market value weight of firm i in investor f's portfolio. To minimize the impact of outliers and measurement error, I sort all stocks held by investor f in quarter t − 1 by $PFweight_{ift-1}$ into quintiles, denoted as $QPFweight_{ift-1}$. Similarly, I sort firm i's shareholders by $PercOwn_{ift-1}$ into quintiles $QPercOwn_{ift-1}$. Finally, I scale by the term in the denominator so that the weights w_{ift-1} add up to one.

In summary, my investor distraction measure (1) depends on whether shocks occur in other industries, whether investors care about those other industries, and whether investors that are most affected by the unrelated shock are potentially important monitors of the firms. The following example can explain how this distraction measure works: Suppose an institutional investor has large stockholdings in firm A (from the pharmaceutical industry) and firm B (from the automotive industry). When an unexpected shock happens in the pharmaceutical industry, such as the approval of a COVID-19 vaccine, this institutional investor may allocate more effort and pay more attention toward understanding the impact of this shock to firm A. Due to limited attention constraints, the institutional investor is distracted by firm A, which results in a lower level of attention being paid to firm B.

3.2.2. The thoroughness of analysts' forecasts

To measure the efforts of analysts, I follow the analyst thoroughness construction outlined in Driskill et al. (2020). Driskill et al. (2020) argue that the more time and energy analysts allocate to the development of forecasts, the more thorough the forecasts will be. Both Chiu et al. (2021) and Driskill et al. (2020) argue that timely forecasts are more valuable to investors when they are paying attention to firms to acquire information to help them make trading decisions. Driskill et al. (2020) further find that the thoroughness of the forecast is negatively correlated with the forecast timeliness. However, when institutional investors are distracted, the value of such timely forecasts decreases, and the importance of thorough

forecasts may increase. By incorporating more earnings components and forecasts for different horizons into their forecasts, analysts are able to provide more detailed information to institutional investors.

The main variable for forecast thoroughness, *#TOT_FORE*, is the total number of all kinds of forecasts issued by an analyst for a sample firm over a given quarter. Here, I include all types of forecasts, regardless of the forecast horizon and forecast targets (both earnings and non-earnings targets). Prior literature tended to use the total number of forecast as the amount of effort that an analyst allocates to a company he or she covers (Clement and Tse 2003; Jacob et al. 1999). The larger number of forecasts an analyst makes for a firm, the more thorough the forecast will be (measured at the firm/analyst–quarter level).

I also provide two alternative forecast thoroughness measures in the robustness tests. The first alternative variable is the number of earnings forecasts issued for any horizons. A broader spectrum of forecast horizons of an analyst's forecasts for a firm means the analyst must have allocated a greater amount of effort toward the firm. For example, *#EPS_HORI*=1 if an analyst issues only an earnings forecast for quarter t+1; *#EPS_HORI*=4 if the analyst issues earnings forecasts for quarter t+1, quarter t+2, year t+1, and year t+2.

The second alternative variable is the number of distinct types of forecast targets that an analyst makes in each quarter. Forecast items include revenue, cash flow, gross margin, and various types of earnings. The more unique types of non-earning items included in the forecast an analyst issues, the more effort the analyst

must have allocated to the firm. For example, if an analyst issues only earnings forecast for a firm, then *#EPS_COM*=1; if the analyst issues revenue and cash flow forecasts of a firm in addition to the earnings forecasts, then *#EPS_COM*=3.

I calculated these three thoroughness variables for an analyst's forecast for a firm within a given calendar quarter. So, the thoroughness variables used in this paper represent the effort an analyst has made in each forecast for a firm in one calendar year quarter.

3.3. Research design

I use the following regression specification to estimate the effect of II distraction:

$$\boldsymbol{Thoroughness_{j,i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 Controls_{i,t-1} + \epsilon_{i,t},} \quad (1)$$

where $Thoroughness_{j,i,t}$ is the thoroughness variable in analyst *j*'s forecast issued for firm i in calendar quarter t (*#TOT_FORE*), and $DSTRQ_{i,t-1}$ is firm *i*'s institutional investors distraction for quarter *t-1*. Firm, analyst, and calendar-year-quarter fixed effects are included too to alleviate concerns about potential cross-sectional and time-series omitted variables. To adjust for possible cross-sectional correlations, I cluster all the standard errors by the analyst and firm.

I follow the literature to control for a wide range of variables, including two proxies for the information environment: firm size (*LOGATQ*) and analyst coverage (*LOG_COVERAGE*). I control for firm's leverage (*LEVQ)* to measure the firms' financial constraint. I include institutional ownership (IO) because analysts tend to allocate more effort to firms with higher institutional holdings

(Harford et al. 2019). I control for the market-to-book ratio (*MTB*), which is a proxy for a firm's growth opportunities because analysts may allocate more effort to growth firms due to their demand for information. I also control for stock turnover (*TURNOVER*) to capture firms' stock liquidity, because more-liquid stocks could induce more trading and generate larger trading commissions for the analyst's brokerage firm, thus affecting the allocation of the analysts' effort (Harford et al. 2019).

I include two earnings news variables to capture accounting performance, measured at the firm–quarter level: the absolute value of the earnings surprise (*AUE*) and an indicator of negative earnings surprises *(BADNEWES*). I include ROA, past abnormal returns (*ABRET*), and return volatility (*STD_RET*) to control for past performance and risk. I also control for research and development expense (*XRDQ*), which represents the firm's opaqueness in its financial reporting due to operational reasons. I include the industry returns where the industry is defined based on Fama–French's 12 industry classifications.

I also control for analysts' characteristics that may affect the analysts' willingness and ability to provide thorough forecasts, including analyst experience of the firm (*EXP_FIRM*), brokerage size (*B_SIZE*), number of firms covered by the analyst (*ANALYS_FIRM*), and number of quarters that the analyst has appeared in I/B/E/S (*EXP_GEN*).

3.4. Summary Statistics

Table 1 presents the summary statistics. Panel A shows a summary of the

institutional investors' distraction measures. The mean (median) value of *DSTRQ* is 0.132 (0.113), indicating that incumbent institutional investors are generally distracted. According to the descriptive statistics of the forecast thoroughness variables, on average, an analyst makes in total 47.11 forecasts for a firm that he or she covers in one calendar quarter. For each quarter when an analyst makes a forecast decision for a firm, the number of earnings components forecasts and earnings forecasts for different horizons are 5.79 and 6.23, respectively.

In each quarter, the average institutional ownership of a firm is 65.7%, the average past 12 months abnormal stock return is 3.5%, and the average analyst coverage of the firm is 14.7. The average turnover rate in each quarter for a firm during the past one year is 1.11%. In terms of the analyst characteristics, each analyst in my sample covers 16.44 firms, covers each firm for 17.44 quarters, and shows up in the I/B/E/S record for 51.9 quarters.

< Insert Table 1 here >

Chapter 4. Empirical Results

Table 2 presents the regression results for the analyst forecast thoroughness regarding the distraction and control variables. The first column shows that II distraction has a significant and positive effect on the total number of forecasts provided by analysts. This result is significant after controlling for the firm, analyst, and calendar-year-quarter fixed effects. The effect of II distraction on the thoroughness of analysts' forecasts is economically significant. A one-standard-deviation increase in II distraction increases the total number of forecasts by 0.376. II distraction's effect on the thoroughness of analysts' forecasts is of great economic significance, because the analyst forecast thoroughness measure represents the effort an analyst spends within a quarter when he or she issues a forecast for the firm. The results are consistent with my prediction that analysts provide more information to complement the in-house research of institutional investors when these investors are temporarily distracted.

Regarding the control variables, I find that the number of total forecasts is negatively correlated with the past 12-months return volatility, an analyst's experience of the firm, and the bad news indicator. I also find that the number of forecasts is positively correlated with the firm size, stock turnover, past 12-months market adjusted return, firm leverage, analyst coverage, market-to-book ration, and the number of firms an analyst covers.

< Insert Table 2 here >

Chapter 5. Cross-sectional Variations and Other Analyst Forecast Outcomes

To further explore the potential drivers of financial analysts' catering behavior, I conduct several sets of cross-sectional analyses.

5.1. Investor Type and The Impact of II Distraction on Analyst Forecast Thoroughness.

Thus far, I have examined the relation between the thoroughness of analysts' forecasts and II distraction but have not distinguished among the different types of institutional investor. However, the information demand for firms may vary with the type of institutional investors. Bushee (1998) argues that dedicated institutional investors are long-term capital providers who may care more about monitoring firms via private information acquired by themselves (e.g., via interaction with a firm's management team or through their own research teams) and thus may rely less on public information. Transient institutional investors, on the other hand, typically have a high portfolio turnover and a short investment horizon and are less likely to monitor a firm and demand less information when they are temporarily distracted. Another type is quasi-indexers, who are institutional investors that exhibit a lower turnover rate and have a diversified investment in many firms. They are less able to collect private information by themselves; however, they typically care about and will influence firms' corporate governance (Appel et al. 2016). So compared with the other two types of institutional investors, quasi-indexers will rely more on publicly available information, which is considered an important low-cost information source for

them to monitor firms. If more-thorough analyst forecasts can help institutional investors to monitor a firm when they are distracted, I predict that investors' demand for the firm's information will be stronger for distracted quasi-indexers and the effect of II distraction on the thoroughness of an analyst's forecast should be mainly driven by the distraction of quasi-indexers.

Table 3 presents the results for the empirical tests for the above prediction. In column (1) to column (3), I replaced the distraction measure by the distraction of dedicated institutional investors, transient institutional investors, and quasi-indexers separately. The type of institutional investors is based on Bushee (1998)'s definition. *IO_DII, IO_QII,* and *IO_TII* represent the ownership of a firm's dedicated institutional investors, quasi-indexers, and transient institutional investors, respectively. Consistent with the quasi-indexers' reliance on analyst-provided information, in column (2) of panel A, I find that the quasi-indexers' ownership is positively correlated with the thoroughness of the analyst's forecast. I also find a negative (positive) coefficient on *IO_DII* (*IO_TII),* indicating that dedicated institutions (transient institutions), on average, rely less (more) on public information provided by analysts.

In column (1) of panel A, I regressed the forecast thoroughness based on the distraction of the aforementioned three types of institutional investors and find that the coefficient on the distraction of the quasi-indexers (*D_QII)* is significantly positive, while the coefficients on *D_DII* and *D_TII* are statistically insignificant. In column (3) of panel A, I separately added the ownership by

dedicated institutions, quasi-indexers, and transient institutions into the column (1) regression of Table 3, and the results remain unchanged. The findings in panel A of Table 3 show that the effect of II distraction on analyst thoroughness is mainly due to the distraction of the quasi-indexers, suggesting that analysts will allocate more effort to firms with distracted quasi-indexers who demand more information to monitor firms. Abramova et al. (2020) find that firms decrease their disclosure practices when their institutional investors are distracted, and that the decrease in firm disclosures is mainly driven by the distraction of quasi-indexers. To complement the reduction in quantity of firm information, financial analysts will provide more-thorough forecasts to cater to the information demands of distracted quasi-indexers.

To further explore which type of institutions demand more-thorough analyst forecasts when they are distracted, I calculated the distraction measure based on the classification of 13F filing institutions. In the Thomson Reuters database, there are five types of institutions: banks, insurance companies, investment companies, independent investment advisors, and others. Among all these types of institutions, banks are the most powerful firm monitors as banks by nature are delegated to act as monitors and have some informational advantages over others (Diamond 1984; Fama 1985). Ahn and Choi (2009) provide empirical evidence that banks' monitoring power is negatively related to firms' earnings management. So, compared with the other types of institutions, banks have a higher demand for information to monitor firms. Thus, I predict that analysts will provide more-

thorough forecasts for firms with distracted banks. Following the 13F classification in the Thomson Reuters database, I calculated the distraction of these five types of institutions separately, and then replaced *DSTRQ* in Table 2 with the distraction measures of the different types of institutions. In panel b of Table 3, I find that the coefficient on *D_BANK* is positive and significant at the 1% level and that the coefficients for the other types of institutions' distraction are statistically insignificant. This result indicates that analysts issue more-thorough forecasts to firms when the firms' bank investors are distracted, consistent with my prediction.

< Insert Table 3 here >

5.2. SOX and the impact of II distraction on the thoroughness of analysts' forecasts

Next, I examine whether and how SOX affects the relationship between II distraction and the thoroughness of analysts' forecasts. The purpose of SOX is to protect investors by improving the quality of corporate disclosure. Prior literature has found that the passage of SOX increased firms financial reporting quality (e.g., Cohen et al. 2008; Lobo and Zhou 2006). Such an increased financial reporting quality reduces the information acquisition cost for institutional investors.

Table 4 shows the results of the regression for the total number of forecasts on II distraction and SOX, which is a dummy variable that takes the value of 1 if the observation is after fiscal year 2002, and 0 otherwise, and the interaction between II distraction and SOX. I further restricted the sample to include only observations

from year 2001 to 2003 because my sample starts only at 2001. I find that the interaction term is negative and statistically significant. This result shows that the passage of the SOX act weakened the impact of II distraction on the thoroughness of analysts' forecasts, suggesting that the increase in analyst' effort to cater to the distracted institutional investors has decreased in the post-SOX period. The increase in firms financial reporting quality after the passage of SOX makes it easier for institutional investors to monitor the firm, thereby lowering their demand for additional firm information, even when they are temporarily distracted.

< Insert Table 4 here >

5.3. Corporate governance and the impact of II distraction on the thoroughness of analysts' forecasts

In previous sections, I found that analysts provide more-thorough forecasts to a firm when its incumbent institutional investors are distracted and that this effect is mainly driven by investors who may demand more information to monitor managers from misbehavior. In this section, I examine possible situations where institutional investors' demand for thorough analyst forecasts is higher. Prior research suggests that managers will explore a loosening of their monitoring intensity due to temporarily distracted institutions to maximize their own benefit (Li et al. 2021; Ni et al. 2020; Flugum et al. 2021; Kempf et al. 2017; Garel et al. 2021) and this situation would be worse for firms with inferior corporate governance. I hypothesize that the effect of II distraction on the thoroughness of

analysts' forecasts is more pronounced for firms with weak corporate governance. To measure a firm's corporate governance level, I used board independence based on the percentage of independent directors on a firm's board. A higher value of board independence proxies for a higher level of firm corporate governance.

In panel a of Table 5, I interacted II distraction with *LOW_GOV*, which is a dummy variable equal to 1 if the board independence of the firm is lower than the median value of board independence for all the firms in the sample and equal to 0 otherwise. I find that the interaction term between II distraction and *LOW_GOV* is positive and significant at a 5% statistical level. This result indicates that the effect of distraction on forecast thoroughness is stronger when a firm's board is less independent, consistent with a stronger investor demand for analyst-provided information when a firm's overall corporate governance level is lower.

< Insert Table 5 here >

5.4. Influence from Brokerage Firm.

I also considered variations due to the influence from the brokerage firm with which the analyst is affiliated. Smaller brokerage firms have a greater incentive to produce customized services to attract and retain institutional investors. Selling analysts' reports to an investor who does not have time to collect information by itself (i.e., when the institutions need it the most) may lead to a higher price demanded for the information, or it may be provided in exchange for a larger trading commission. In panel b of Table 5, I find that the effect is stronger when an analyst is affiliated with a smaller brokerage firm, consistent with analysts

having an incentive to generate commission for brokerage firms.

5.5. Institutional investor distraction, analyst forecast optimism, and forecast accuracy

In this section, I examine whether institutional investor distraction affects other outputs of analysts. Institutional investors may reward a brokerage firm whose affiliated analysts issue optimistic views or who withhold negative opinions on stocks that they hold, i.e., increase the value of institutions' equity holdings, by directing more trading commission fees to the brokerage firm (Gu et al. 2013). However, when a firm's institutional investors are distracted, the monitoring intensity imposed on the firm decreases. Managers may be induced to misbehave, and this behavior will eventually affect the value of the firm. In addition to providing more-thorough forecasts for institutional investors for monitoring purposes, analysts may use the tone of the forecast or investment recommendations to reveal the potential impact of managerial misbehavior on a firm due to the distracted institutional investors. Because analysts have the incentive to provide unbiased or less-biased research to institutional investors (Ljungqvist et al. 2007), they may issue a less-optimistic forecast or recommendation when a firm's institutional investors are distracted.

In panel A of Table 6, I empirically tested the above predictions by regressing the analyst forecast tone (*FTONE*), which equals the number of earnings forecast with a positive forecast error, based on II distraction. In column (1), I find that *DSTRQ* is negatively correlated with *FTONE*, and the coefficient on *DSTRQ* is

statistically significant at the 1% level. In column (2), I replaced the total number of positive forecast error forecasts with the percentage of positive forecast error forecasts to the total number of earnings forecasts and find similar results as in column (1). The findings in these two columns indicate that analysts issue less-optimistic forecasts to firms when their institutional investors are distracted. In column (3), I tested whether analysts react to II distraction using stock recommendations. I find that II distraction is negatively associated with the level of the analysts' stock recommendation.

Additionally, in panel B of Table 6, I regressed the analyst forecast accuracy, which is the mean absolute value of the analyst forecast error, based on II distraction to examine how institutional investor distraction affects the analyst forecast accuracy. I find a negative correlation between the absolute forecast error and II distraction. Although both the quality and quantity of firms' disclosure decrease when a firm's institutional investors are distracted, which may hinder the forecast accuracy of analysts, the positive relation between the analyst forecast accuracy and institutional investors distraction suggests that the increase in analyst forecast accuracy is a consequence of the analysts' allocation of effort to provide more-thorough forecast for firms with distracted institutional investors.

Overall, these results suggest that analysts react to the distraction of institution investors by issuing less-optimistic forecasts and recommendations, and more-accurate forecasts.

Chapter 6. Robustness Tests

Here, I conducted a series of robustness tests to strengthen my findings. Since I argue that the effect of a firm's incumbent institutional investor distraction on analysts should be different from the effect on institutions that may not own the firm's stock, I empirically tested this argument by including an alternative institutional investors' attention measure into my main regression. The additional attention measure I used was the searching activity of firm's ticker on Bloomberg terminals. Since most of the users of Bloomberg terminals are institutional investors, the searching activities in Bloomberg can be a proxy for institutional investor attention. However, it is impossible to differentiate whether an institution is a firm's incumbent institutional investor or not when an institution searches the firm's ticker in Bloomberg, so the Bloomberg searching activity can only be an attention proxy for institutional investors who may demand information to make a trading decision. [6]

Following Chiu et al. (2021), I constructed the Bloomberg attention measure, *BB_READER*, using the mean value of the Bloomberg abnormal attention score over the previous calendar quarter. In panel A, Table 7, I regressed analyst forecast thoroughness on *DSTRQ* and *BB_READER* simultaneously and find that the coefficient on *DSTRQ* is positive and statistically significant. Besides, I also find that *BB_READER* is also positively correlated with analyst forecast

[6] Ben-Rephael et al. (2017) find that the Bloomberg searching activities can be positively correlated with the abnormal trading volume of institutional investors.

thoroughness, suggesting that analysts will also provide more-thorough forecast of a firm when institutional investors are actively searching for the firm's information. The positive coefficient on *BB_READER* is also consistent with the finding in the prior literature that analysts will allocate more effort to cater to institutional investors' information demands for trading. The positive coefficient on *DSTRQ* and *BB_READER* indicates that analysts will cater to institutional investors' information demands for both monitoring and trading.

The information demand of institutional investors who are distracted by a positive extreme return of other stocks in their portfolio may be different from those institutional investors who are distracted by a negative extreme return of other stocks in their portfolio. To test this conjecture, I regressed the analyst thoroughness measure on positive and negative II distraction, and the results are presented in Table 7. In panel B of Table 7, I find that both positive and negative II distraction are positively correlated with the number of forecasts. This result indicates that the increase in analyst forecast thoroughness is affected by II distraction, regardless of the underlying reasons of such as distraction (either losing money or making profit in other investees).

Because the analyst forecast thoroughness measure in this paper is the total effort an analyst spends on a firm. I used two alternative forecast thoroughness measures to further explore the details of the effort allocation of financial analysts when facing distracted institutional investors. The first one is *#EPS_COMP*, which is the total number of unique earnings components an analyst has issued in

the quarter. In column (1) of panel C, I find a positive association between *DSTRQ* and *#EPS_COMP*. This result indicates that analysts will provide a more unique number of earnings components to distracted institutional investors. The second measure is *#EPS_HORI*, which is the total number of unique forecast horizons of the EPS forecast. In column (2) of panel C, I find a negative coefficient on *DSTRQ*, suggesting that analysts provide a smaller number of unique forecast horizons of earnings when institutional investors are distracted. In columns (3) and (4), I regressed the mean and max horizon of the analyst earnings forecast based on the distraction of institutional investors and find that both the mean and max horizon of an analyst's earnings forecasts for firms are reduced when firms' institutional investors are distracted. These results show that analysts will allocate more effort to producing a number of unique earnings component forecasts and will allocate less effort to producing forecasts for a longer horizon, consistent with the limited resource and attention of analysts and the temporality of the II distraction.

In panel D, I removed firms from the utility and financial industries, and the results remain unchanged. To exclude the probability that the effect of II distraction on an analyst's forecast thoroughness is from changes in the institutional ownership, I further restricted the sample observations to have less than 5% changes in institutional ownership (IO) from quarter t-1 to t. In panel E, I find that the results remain unchanged even when I restricted the sample to less than 5% IO change.

< Insert Table 7 here >

To show robustness regarding the fixed effects used, I replaced the firm, analyst, and calendar-year-quarter fixed effects in Table 2 with firm-analysts and calendar-year-quarter fixed effects. In Table 8, the result shows that the coefficient on *DSTRQ* is positive and significant when I included the firm-analysts and calendar-year-quarter fixed effects.

< *Insert Table 8 here* >

Lastly, the main effect remained robust after I aggregated the data at firm–quarter level. In particular, I aggregated the forecasts of all the analysts for each firm by taking the mean value analyst forecast thoroughness measure of all the analysts who cover the firm. The results in Table 9 show that II distraction has a positive effect on the total number of forecasts, suggesting that on average, a firm's analysts allocate more effort to the firm when the incumbent institutional investors are distracted.

< *Insert Table 9 here* >

Chapter 7. Conclusion

In this paper, I explore the effect of institutional investors distraction on analyst forecast thoroughness. Using analyst-firm-quarter level sample from year 2001 to 2019, I find that analysts provide more thorough forecasts to a firm when the firm's incumbent institutional investors are temporally distracted by exogenous attention-grabbing events. This effect is of economic significance: a one-standard-deviation increase in institutional investors distraction leads to 0.376 (5.53) more total forecasts issued by an analyst (by all analysts covering the firm). I also find that this effect is driven by the distraction of quasi-indexers and banks. This effect is stronger in the period before the Sarbanes-Oxley period, when firm's corporate governance is inferior, and when the analysts are affiliated with a smaller brokerage firm. These findings are robust to a battery of robustness tests.

My study contributes to the literature by providing fresh evidence of how analysts cater to the information demand of institutional investors. I show that the analyst-provided information supplements the institutions' in-house research. As a consequence, analysts make more thorough forecasts in response to the temporarily distraction of the incumbent institutional investors.

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List of Tables

Table 1: Descriptive Statistics

This table presents the sample summary statistics for the main variables. The sample spans from year 2001 to 2019. Variable definitions are presented in Appendix.

Variable	N	Mean	Std. Dev.	P25	Median	P75
#TOT_FORE	2023381	47.110	42.630	15.000	37.000	64.000
DSTRQ	2023381	0.132	0.076	0.075	0.113	0.184
LOGATQ	2023381	8.054	1.940	6.694	8.002	9.350
LEVQ	2023381	0.198	0.181	0.027	0.166	0.314
IO	2023381	0.657	0.273	0.529	0.734	0.865
MTB	2023381	3.759	4.823	1.494	2.399	4.070
ROA	2023381	0.006	0.038	0.002	0.010	0.021
ABRET	2023381	0.035	0.396	-0.185	-0.007	0.193
STD_RET	2023381	0.026	0.014	0.016	0.022	0.031
FFI12_RET	2023381	0.029	0.123	-0.029	0.030	0.087
XRDQ	2023381	0.124	0.631	0.000	0.000	0.065
TURNOVER	2023381	1.109	0.896	0.537	0.854	1.379
AUE	2023381	0.011	0.070	0.000	0.001	0.004
BADNEWS	2023381	0.596	0.491	0.000	1.000	1.000
COVERAGE	2023381	2.575	0.631	2.197	2.639	3.045
EXP_GEN	2023381	51.900	37.060	19.000	45.000	80.000
EXP_FIRM	2023381	17.440	18.460	5.000	11.000	23.000
ANALYS_FIRM	2023381	16.440	16.470	11.000	15.000	20.000
B_SIZE	2023381	56.670	53.340	17.000	39.000	86.000
DSTRQPNW	2023381	0.064	0.053	0.027	0.058	0.086
DSTRQBNW	2023381	0.068	0.059	0.030	0.049	0.089
IO_DII	2023381	0.059	0.072	0.000	0.034	0.095
IO_QII	2023381	0.448	0.206	0.302	0.471	0.597
IO_TII	2023381	0.160	0.112	0.077	0.139	0.219
D_DII	2023381	0.092	0.112	0.000	0.061	0.139
D_QII	2023381	0.133	0.077	0.074	0.116	0.186
D_TII	2023381	0.128	0.078	0.067	0.108	0.185
D_BANK	2023381	0.129	0.081	0.071	0.114	0.176
D_INS	2023381	0.127	0.086	0.067	0.108	0.178
D_INV	2023381	0.133	0.079	0.071	0.118	0.190
D_IIA	2023381	0.130	0.077	0.070	0.110	0.184
D_OTHERS	2023381	0.131	0.080	0.070	0.114	0.188
#EPS_COM	2023000	5.794	3.039	3.000	6.000	8.000
#EPS_HORI	1946000	6.230	3.042	4.000	6.000	8.000
BB_READER	678203	0.966	0.763	0.370	0.754	1.400
SUM POSITIVE	1927000	3.508	3.533	1.000	3.000	5.000
POSITIVE	1927000	0.518	0.368	0.167	0.500	0.857
IRECCD	373455	3.554	0.921	3.000	3.000	4.000

Table 2: Analyst Forecast Thoroughness and II Distraction

This table presents the results of institutional investors' distraction on concurrent analyst forecast thoroughness . The definition of variables can be found in the Appendix.

$$\boldsymbol{Thoroughness_{j,i,t} = \beta_0 + \beta_1 STD\_DSTRQ_{i,t-1} + \beta_2 Controls_{i,t-1}}.$$

Analyst level controls and analyst coverage are measured in quarter t and other controls are measured in quarter t-1. The reported OLS analysis is implemented at analyst-firm-quarter level. Firm, analyst, and calendar year quarter fixed effects are included. The t-statistics in parentheses in panel regressions are calculated from robust standard errors clustered by analyst and firm. *, ** or *** denote a significance level at 10%, 5% and 1% respectively. The coefficients of interest are shown in bold.

	(1) *#TOT_FORE*
DSTRQ	**4.953*** **
	(4.65)
LOGATQ	0.626**
	(2.24)
LEVQ	-3.032***
	(-3.44)
MTB	0.038**
	(2.06)
IO	0.233
	(0.68)
ROA	3.724*
	(1.85)
ABRET	0.444***
	(3.19)
STD_RET	-47.785***
	(-3.76)
FFI12_RET	-3.941***
	(-3.37)
XRDQ	-0.118
	(-0.94)
TURNOVER	2.093***
	(12.50)
AUE	-1.860*
	(-1.92)
BADNEWS	-1.103***
	(-12.96)
LOGCOVERAGE	3.145***
	(9.32)
EXP_GEN	0.461
	(0.27)
EXP_FIRM	-0.024***
	(-4.36)
ANALYS_FIRM	0.038***
	(3.73)

B_SIZE	0.003
	(0.26)
Constant	8.980
	(0.10)
FE: Calendar year-quarter	YES
FE: Firm	YES
FE: Analyst	YES
N	2023381
Adjusted R^2	0.502

Table 3: The Effect of Distraction Across Different Types of Institutional Investors

This table presents OLS regression results of equation (1) using distraction from different types of institutional investors.

$$\boldsymbol{Thoroughness_{j,i,t}} = \boldsymbol{\beta_0 + \beta_1 D\_DII_{i,t-1} + \beta_2 D\_QII_{i,t-1} + \beta_3 D\_TII_{i,t-1} + \beta_4 Controls_{i,t-1}}$$

IO_DII is the aggregate ownership of the firm by all dedicated institutional investors. *IO_QII* is the aggregate ownership of the firm by all quasi-indexers. *IO_TII* is the aggregate ownership of the firm by all transient institutional investors. *D_DII* is distraction from dedicated institutional investors. *D_QII* is distraction from quasi-indexers institutions. *D_TII* is distraction from transient institutional investors. *D_BANK* is distraction from Banks. *D_INS* is distraction from insurance companies. *D_INV* is distraction from investment companies. *D_IIA* is distraction from independent investment advisors. *D_OTHERS* is distraction from other investors. The definition of the above five types of institution are from the 13F classification in Thomson Reuters database. The reported OLS results are at analyst-firm-quarter level. Analyst level controls and analyst coverage are from quarter t and other controls are from quarter t-1. Firm, analyst, and calendar year quarter fixed effects are included. The t-statistics in parentheses in panel regressions are calculated from robust standard errors clustered by analyst and firm. *, ** or *** denote a significance level at 10%, 5% and 1% respectively.

Panel A: Distraction by dedicated, quasi-indexers, and transient institutional investors.

	(1)	(2)	(3)
	#TOT_FORE	*#TOT_FORE*	*#TOT_FORE*
D_DII	-0.754		-0.734
	(-1.33)		(-1.30)
D_QII	6.816***		7.887***
	(3.18)		(3.69)
D_TII	-0.655		-1.787
	(-0.35)		(-0.95)
IO_DII		-3.120**	-2.995**
		(-2.15)	(-2.07)
IO_QII		1.697**	1.769**
		(2.46)	(2.57)
IO_TII		2.004**	2.066**
		(2.30)	(2.37)
Controls	YES	YES	YES
Constant	8.822	9.794	8.573
	(0.10)	(0.11)	(0.10)
FE: Calendar year-quarter	YES	YES	YES
FE: Firm	YES	YES	YES
FE: Analyst	YES	YES	YES
N	2023381	2023381	2023381
Adjusted R^2	0.502	0.502	0.502

Panel B: Distraction by 13F institution types.

	(1) *#TOT_FORE*
D_BANK	11.029***
	(4.30)
D_INS	-1.340
	(-0.88)
D_INV	0.045
	(0.03)
D_IIA	-1.955
	(-0.96)
D_OTHERS	-2.306
	(-1.52)
Controls	YES
Constant	8.803
	(0.10)
FE: Calendar year-quarter	YES
FE: Firm	YES
FE: Analyst	YES
N	2023381
Adjusted R^2	0.502

Table 4: Impact of II Distraction on Analyst Forecast Thoroughness: Pre- versus Post- SOX

This table presents estimates of OLS regression of analyst forecast thoroughness on institutional investors by partitioning observations into pre- and post-SOX periods using sample from 2001 to 2003.

$$\boldsymbol{Thoroughness_{j,i,t}} = \boldsymbol{\beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 SOX + \beta_3 DSTRQ * SOX_{i,t} + \beta_4 Controls_{i,t-1}}$$

SOX is a dummy variable that takes the value 1 if the observation occurs after year 2002, and 0 otherwise. The reported OLS results are at analyst-firm-quarter level. Analyst level controls and analyst coverage are from quarter t and other controls are from quarter t-1. Firm, analyst, and calendar year quarter fixed effects are included. The t-statistics in parentheses in panel regressions are calculated from robust standard errors clustered by analyst and firm. *, ** or *** denote a significance level at 10%, 5% and 1% respectively. The coefficients of interest are shown in bold.

	(1) *#TOT_FORE*
DSTRQ	2.698**
	(1.96)
DSTRQ*SOX	-3.186*
	(-1.68)
Controls	YES
Constant	74.901
	(0.40)
FE: Calendar year-quarter	YES
FE: Firm	YES
FE: Analyst	YES
N	256134
Adjusted R^2	0.426

Table 5: Cross-sectional Variations

This table presents the cross-sectional variation in the effect of institution investor distraction on analyst forecast thoroughness. Variable definitions can be found in the Appendix.

$$\boldsymbol{Thoroughness_{i,t}} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 DSTRQ_{i,t-1}} + \boldsymbol{\beta_2 LOW\_GOV_{i,t}} + \boldsymbol{\beta_3 DSTRQ_{i,t-1} * LOW\_GOV_{i,t}} + \boldsymbol{\beta_4 Controls_{i,t-1}}$$

$$\boldsymbol{Thoroughness_{j,i,t}} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 DSTRQ_{i,t}} + \boldsymbol{\beta_2 B\_SIZE_{i,t}} + \boldsymbol{\beta_3 DSTRQ_{i,t} * B\_SIZE_{i,t}} + \boldsymbol{\beta_4 Controls_{i,t-1}}$$

LOW_GOV is a dummy variable which equals to 1 if the percentage of independent directors to total number of directors of the firm is larger than the median value of independent directors' percentage of all firms and 0 otherwise. The reported OLS result for *LOW_GOV* is at firm-quarter level. The reported OLS result for *B_SIZ* is at analyst-firm-quarter level. Analyst level controls and analyst coverage are from quarter t and other controls are from quarter t-1. The t-statistics in parentheses in panel regressions are calculated from robust standard errors clustered by analyst and firm. *, ** or *** denote a significance level at 10%, 5% and 1% respectively. The coefficients of interest are shown in bold.

Panel A: Corporate Governance:

	(1) *#TOT_FORE*
DSTRQ	4.909***
	(5.67)
LOW_GOV	-0.688***
	(-2.87)
DSTRQ*LOW_GOV	**2.002****
	(2.07)
Controls	YES
Constant	27.607***
	(17.81)
FE: Calendar year-quarter	YES
FE: Firm	YES
N	238430
Adjusted R^2	0.598

Panel B: Brokage house size:

	(1) *#TOT_FORE*
DSTRQ	7.563***
	(5.99)
B_SIZE	0.001
	(0.75)
DSTRQ*B_SIZE	**-0.045*****

	(-3.46)
Controls	YES
Constant	7.521
	(0.08)
FE: Calendar year-quarter	YES
FE: Firm	YES
FE: Analyst	YES
N	2023376
Adjusted R^2	0.502

Table 6: II Distraction, Analyst Recommendation, Analyst Forecast Tone and Analyst Forecast Error.

This table presents the regression of analyst stock recommendation, analyst forecast tone, analyst forecast error on II distraction. The definition of variables can be found in the Appendix.

$$\boldsymbol{FTone_{j,i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 Controls_{i,t-1}}$$

$$\boldsymbol{IRECCD_{j,i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 Controls_{i,t-1}}$$

$$\boldsymbol{ABS\_AFE_{j,i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 Controls_{i,t-1}}$$

FTone (or *FTone%*) is the total number (percentage) of earnings forecast with positive forecast error an analyst made for firm i in calendar quarter t. IRECCD is the mean value of analyst investment recommendation in quarter t (IRECCD ranges from 1 to 5. Strong buy=5, buy=4, hold=3, underperform=2, or sell=1). *ABS_AFE* is the mean value of the absolute value of analyst earnings forecast error for firm i in calendar quarter t. The reported OLS results are at analyst-firm-quarter level. Analyst level controls and analyst coverage are from quarter t and other controls are from quarter t-1. Firm, analyst, and calendar year quarter fixed effects are included. The t-statistics in parentheses in panel regressions are calculated from robust standard errors clustered by analyst and firm. *, ** or *** denote a significance level at 10%, 5% and 1% respectively.

Panel A: Analyst recommendation, analyst forecast tone

	(1) *FTONE*	(1) *FTONE%*	(1) *IRECCD*
DSTRQ	-0.613***	-0.064***	-0.149***
	(-4.30)	(-4.34)	(-3.63)
Controls	YES	YES	YES
Constant	7.400	0.142	-0.344
	(1.53)	(0.50)	(-0.32)
FE: Calendar year-quarter	YES	YES	YES
FE: Firm	YES	YES	YES
FE: Analyst	YES	YES	YES
N	1926672	1926672	371682
Adjusted R^2	0.287	0.246	0.155

Panel B: Analyst forecast accuracy

	(1) *ABS_FE*
DSTRQ	-0.004*
	(-1.83)
Controls	YES
Constant	-0.004
	(-0.08)
FE: Calendar year-quarter	YES
FE: Firm	YES
FE: Analyst	YES
N	1887871
Adjusted R^2	0.614

Table 7: Robustness Tests

This table shows results of additional tests. The definition of variables can be found in the Appendix.

$$\boldsymbol{Thoroughness_{j,i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_1 BB\_READER_{i,t-1} + \beta_3 Controls_{i,t-1}}$$

Analyst level controls and analyst coverage are from quarter t and other controls are from quarter t-1. The reported OLS result is at analyst-firm-quarter level. Panel A presents estimates of OLS regression of analyst forecast thoroughness on alternative II Distractions.

$$\boldsymbol{Thoroughness_{j,i,t} = \beta_0 + \beta_1 DSTRQPNW_{i,t-1} + \beta_2 DSTRQBNW_{i,t-1} + \beta_3 Controls_{i,t-1}}.$$

Panel B presents estimates of OLS regression of analyst forecast thoroughness on two type of institutional investors' attention distraction. *DSTRQPNW (DSTRQBNW)* is II distraction measure based on existing shareholders' exposures to concurrent *positive (negative)* extreme returns of other stocks. Panel C reports results using alternative dependent variables. Analyst level controls and analyst coverage are from quarter t and other controls are from quarter t-1. The reported OLS results are at analyst-firm-quarter level. Firm, analyst, and calendar year quarter fixed effects are included. The t-statistics in parentheses in panel regressions are calculated from robust standard errors clustered by analyst and firm. *, ** or *** denote a significance level at 10%, 5% and 1% respectively. The coefficients of interest are shown in bold.

Panel A: Controlling for alternative institutional investor attention measure.

	(1) *#TOT_FORE*	(1) *#TOT_FORE*
DSTRQ		**4.671****
		(2.11)
BB_READER	**0.743*****	**0.747*****
	(2.85)	**(2.88)**
Controls	YES	YES
Constant	80.105	79.532
	(1.01)	(1.00)
FE: Calendar year-quarter	YES	YES
FE: Firm	YES	YES
FE: Analyst	YES	YES
N	677899	677899
Adjusted R^2	0.519	0.519

Panel B: Positive distraction vs negative distraction

	(1) *#TOT_FORE*	(2) *#TOT_FORE*	(3) *#TOT_FORE*
DSTRQPNW	**6.967*****		**7.253*****
	(4.55)		**(4.74)**
DSTRQBNW		**2.472***	**3.026****
		(1.72)	**(2.11)**
Controls	YES	YES	YES
Constant	9.261	9.782	8.930
	(0.10)	(0.11)	(0.10)
FE: Calendar year-quarter	YES	YES	YES
FE: Firm	YES	YES	YES
FE: Analyst	YES	YES	YES

N	2023381	2023381	2023381
Adjusted R^2	0.502	0.502	0.502

Panel C: Alternative forecast thoroughness measures

	(1) *#EPS_COMP*	(2) *#EPS_HORI*	(3) *EPS_HORI_MEAN*	(4) *EPS_HORI_MAX*
DSTRQ	**0.296*** **	**-0.142***	**-0.460*** **	**-0.150*** **
	(5.09)	**(-1.83)**	**(-5.27)**	**(-3.89)**
Controls	YES	YES	YES	YES
Constant	-0.820	0.249	1.155	2.110
	(-0.11)	(0.03)	(0.19)	(0.97)
FE: Calendar year-quarter	YES	YES	YES	YES
FE: Firm	YES	YES	YES	YES
FE: Analyst	YES	YES	YES	YES
N	2023381	1945816	1945666	1945666
Adjusted R^2	0.665	0.486	0.475	0.437

Panel D: Excluding firms from the financial and utility industries.

	(1) *#TOT_FORE*
DSTRQ	**3.163*** **
	(2.60)
Controls	YES
Constant	-38.051
	(-0.67)
FE: Calendar year-quarter	YES
FE: Firm	YES
FE: Analyst	YES
N	1577175
Adjusted R^2	0.498

Panel E: IO change less than 5%

	(1) *#TOT_FORE*
DSTRQ	**5.452*** **
	(4.69)
Controls	YES
Constant	10.271
	(0.11)
FE: Calendar year-quarter	YES
FE: Firm	YES
FE: Analyst	YES
N	1622648
Adjusted R^2	0.507

Table 8: Robustness test: Within-Firm-Analyst Variation

This table presents estimates of OLS regression of analyst forecast thoroughness and institutional investors' attention distraction. The definition of variables can be found in the Appendix.

$$\boldsymbol{Thoroughness_{j,i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 Controls_{i,t-1}}.$$

Analyst level controls and analyst coverage are from quarter t and other controls are from quarter t-1. The reported OLS results are at analyst-firm-quarter level. Firm-analyst, calendar year quarter fixed effects are included. The t-statistics in parentheses in panel regressions are calculated from robust standard errors clustered by firm and analyst. *, ** or *** denote a significance level at 10%, 5% and 1% respectively. The coefficients of interest are shown in bold.

	(1) *#TOT_FORE*
DSTRQ	**4.029***** **-3.98**
LOGATQ	0.866** -2.31
LEVQ	-3.746*** (-3.74)
IO	-0.111 (-0.33)
MTB	0.048** -2.47
ROA	4.203** -2.13
ABRET	0.183 -1.33
STD_RET	-59.851*** (-4.39)
FFI12_RET	-2.343** (-2.17)
XRDQ	0.108 -0.84
TURNOVER	1.988*** -10.22
AUE	-1.234 (-1.26)
BADNEWS	-1.143*** (-13.87)
LOGCOVERAGE	3.231*** -8.08
EXP_GEN	0.073 -0.05
EXP_FIRM	-0.027 (-0.21)
ANALYS_FIRM	0.037** -2.16
B_SIZE	0.000

	(-0.01)
Constant	28.279
	-0.38
FE: Calendar year-quarter	YES
FE: Firm	NO
FE: Analyst	NO
FE: Firm*Analyst	YES
N	1998557
Adjusted R^2	0.558

Table 9: Robustness Test: Firm Quarter Level Regressions

This table presents estimates of OLS regression of analyst forecast thoroughness on institutional investors distraction. The definition of variables can be found in the Appendix.

$$\boldsymbol{Thoroughness_{i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 Controls_{i,t-1}}.$$

The reported OLS result is at firm-quarter level. Firm, calendar year quarter fixed effects are included. The t-statistics in parentheses in panel regressions are calculated from robust standard errors clustered by firm. *, ** or *** denote a significance level at 10%, 5% and 1% respectively. The coefficients of interest are shown in bold.

	(1)	(2)	(3)	(4)
	#TOT_FORE	*#EPS_COMP*	*#EPS_HORI*	*IRECCD*
DSTRQ	5.985***	0.479***	-0.207***	-0.085**
	(8.70)	(10.10)	(-3.03)	(-2.13)
LOGATQ	1.168***	0.022	0.102***	-0.030***
	(5.24)	(1.28)	(5.67)	(-4.07)
LEVQ	-0.940	-0.187***	0.077	-0.064**
	(-1.17)	(-3.18)	(1.26)	(-2.45)
IO	0.935***	0.100***	0.096***	0.060***
	(2.77)	(4.05)	(4.04)	(5.36)
MTB	-0.000**	-0.000	0.000***	-0.000
	(-2.10)	(-1.29)	(2.85)	(-1.06)
ROA	-0.399	0.096	-0.451***	0.563***
	(-0.27)	(0.93)	(-3.48)	(8.05)
ABRET	1.008***	0.038***	0.069***	0.201***
	(9.59)	(4.59)	(7.35)	(39.92)
STD_RET	-52.222***	-5.537***	5.852***	-4.290***
	(-6.44)	(-8.45)	(8.39)	(-13.23)
FFI12_RET	-5.235***	-0.047	-0.125**	-0.157***
	(-8.13)	(-1.21)	(-2.30)	(-4.98)
XRDQ	-0.194***	-0.008***	-0.010**	0.004*
	(-5.21)	(-3.12)	(-2.57)	(1.66)
TURNOVER	2.611***	0.041***	0.124***	-0.022***
	(16.71)	(3.89)	(10.54)	(-4.47)
AUE	-0.277	0.002	-0.023	-0.060***
	(-0.80)	(0.06)	(-0.86)	(-3.70)
BADNEWS	-0.933***	0.016***	-0.097***	0.052***
	(-11.93)	(2.90)	(-14.23)	(12.60)
LOG_COVERAGE	3.467***	0.226***	0.071***	-0.068***
	(13.29)	(10.09)	(3.31)	(-7.56)
EXP_GEN	0.019***	0.005***	-0.002***	0.000**
	(3.00)	(8.24)	(-4.50)	(2.14)
EXP_FIRM	-0.111***	-0.003**	-0.014***	-0.008***
	(-7.05)	(-2.00)	(-11.11)	(-14.72)
ANALYS_FIRM	-0.032***	-0.003***	-0.001	-0.001**
	(-5.25)	(-4.38)	(-0.75)	(-2.24)
B_SIZE	-0.011**	0.001***	-0.000	-0.002***
	(-2.51)	(3.01)	(-0.68)	(-14.49)
Constant	27.256***	4.612***	5.337***	4.298***
	(17.59)	(37.17)	(42.02)	(81.90)

FE: Firm	YES	YES	YES	YES
FE: Calendar year-quarter	YES	YES	YES	YES
N	238430	238430	237442	158928
Adjusted R^2	0.598	0.758	0.413	0.143

Appendix : Variable Definitions

Variable	Description
#TOT_FORE	The total number of forecasts, counting each combination of forecast horizon and forecast item separately, for the sample firm issued by the analyst in calendar quarter t.
#EPS_COMP	The number unique types of earnings or earnings component forecasts for the sample firm issued by the analyst in calendar quarter t
#EPS_HORI	The number of earnings forecasts for different horizons (variable "fpi" in I/B/E/S database) of the sample firm issued by the analyst in calendar quarter t
DSTRQ	Distraction measure of Kempf et al. (2017) based on existing shareholders' exposures to all concurrent extreme returns of other stocks in calendar quarter t-1 (higher value means a greater distraction in the quarter)
DSTRQBNW	Distraction measure based on existing shareholders' exposures to concurrent negative extreme returns of other stocks (higher value means a greater distraction in the quarter)
DSTRQPNW	Distraction measure based on existing shareholders' exposures to concurrent positive extreme returns of other stocks (higher value means a greater distraction in the quarter)
IO	Institutional ownership for quarter t-1
FFI12_RET	Fama-French 12 industry quarterly return.
XRDQ	Research and development expenses for quarter t-1 divided by net sales in the fiscal quarter t.
AUE	The absolute value of UE (unexpected earnings)
BADNEWS	An indicator variable equals 1 if the firm's realized earnings for quarter t as recorded in I/B/E/S are less than the most recent analyst forecast before fiscal quarter t's earnings announcement, and 0 otherwise.
LOG_COVERAGE	Ln (1+number of analyst coverage). the number of analysts issuing any forecast for the stock.
LOGATQ	Ln (1+ total assets).
TURNOVER(%)	Stock turnover*100. Stock turnover is the ratio of total trading volume divided by the total number of shares outstanding over the past year.
STD_RET	Standard deviation of daily (or monthly) stock return over the t-3 to t.

MTB	Market to book ratio
ABRET	Cumulative abnormal stock return over the past 12 months. Abnormal stock return is calculated as stock return minus value weighted market return
EXP_GEN	The number of quarters the analyst has issued a forecast for any firm in calendar quarter t.
EXP_FIRM	The number of quarters the analyst has issued a forecast for the focal firm in calendar quarter t.
ANALYS_FIRM	The number of firms the analyst covered in calendar quarter t.
IO_DII	Dedicated institutional ownership, which equals the sum of all percentage holdings by the firm's dedicated institutional investors.
IO_QII	Quasi-indexer institutional ownership, which equals the sum of all percentage holdings by the firm's Quasi-indexers .
IO_TII	Transient institutional ownership, which equals the sum of all percentage holdings by the firm's transient institutional investors.
D_DII	A measure of Distraction calculated for dedicated investors only
D_TII	A measure of Distraction calculated for transient investors only
D_QII	A measure of Distraction calculated for quasi-indexers only
D_BANK	A measure of Distraction calculated for Banks only
D_INS	A measure of Distraction calculated for insurance companies only
D_INV	A measure of Distraction calculated for investment companies only
D_IIA	A measure of Distraction calculated for independent investment advisors only
D_OTHERS	A measure of Distraction calculated for other investors only.
LOW_GOV	Dummy variable that equals 1 if the firm's board independence is above the sample median and 0 otherwise.
FTONE	The total number of earnings forecast with positive forecast error an analyst made for firm i in calendar quarter t.

FTONE%	The total percentage of earnings forecast with positive forecast error an analyst made for firm i in calendar quarter t.
IRECCD	Mean value of analyst investment recommendation in quarter t (IRECCD ranges from 1 to 5. Strong buy=5, buy=4, hold=3, underperform=2, or sell=1).
ABS_AFE	Mean value of the absolute value of analyst earnings forecast error for firm i in calendar quarter t.
SOX	Dummy variable that equals 1 if current year is after year 2002, and 0 otherwise.