The Effect of Institutional Investor Distraction on Analyst Forecasts

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Abstract

We find that financial analysts provide more thorough forecasts when firms' institutional investors are distracted (i.e., when firms are neglected). We establish the causality of the effect by identifying exogenous shocks leading to institutional investor distraction following Kempf, Manconi, and Spalt (2017). We find that this effect is stronger for firms with inferior corporate governance or a poor information environment, and for analysts affiliated with smaller brokerage houses. Besides, analysts' earnings forecasts and stock recommendations are shown to be more pessimistic for firms experiencing greater institutional investor distraction. Overall, our findings suggest that financial analysts allocate more effort to monitoring neglected firms than to maximizing their trading commissions.

Keywords: Financial analysts; investor attention; institutional investors; corporate governance

JEL category: G10; G14; G17; G23; G34

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1. Introduction

Analyst coverage of a firm may provide information to facilitate investor trading of the stock, improve the firm's corporate governance, or both. Prior studies suggest that financial analysts allocate more effort to firms that are important to institutional investors to generate trading commissions (e.g., Harford et al. 2019) and their forecasting tone is more positive for firms with whom they have business relations (Irvine et al. 2007; Mola and Guidolin 2009; Firth et al. 2013). Another strand of the literature shows that financial analysts help monitor firms, likely by issuing pessimistic forecasts, and thus mitigate agency problems (Jensen and Meckling 1976; Moyer et al. 1989; Yu 2008).[3] Institutional investors demand information provided by sell-side analysts to supplement their own in-house research and value the monitoring of their investee firms by analysts (Chung and Zhang 2011).

In this paper, we analyze whether the amount of attention paid to a firm by incumbent institutional investors affects the effort financial analysts spend on the firm (e.g., the frequency or thoroughness of the analysts' forecasts) and their forecasting tone, while controlling for the level of institutional ownership. Investor attention tends to exhibit a larger variation than the level of investor ownership because investors can freely re-allocate their attention among different stocks, whereas changes in ownership are limited by transaction costs and investor trading restrictions (i.e., index tracking by index funds). The attention paid by an investor to a firm may be positively affected by announcements of eye-catching news about the firm itself and negatively affected by news about other investees held by the same investor. Investor demand for analyst-provided information about a firm may be stronger when the investors are unable to obtain information related to the firm themselves. Therefore, to identify the effect of investor attention on analyst decisions, we examine analysts' forecasting decisions about firms whose incumbent institutional investors are distracted (i.e., where institutional shareholders are unable to closely monitor the investee firm).

[3] More recent studies identify the causal effect of analyst coverage on governance. For example, Chen et al. (2015) find that an exogenous decrease in firms' analyst coverage leads to an increase in managerial expropriation from 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-based earnings management.

There are two possible strategies financial analysts can follow to allocate their effort across firms based on the level of institutional attention paid to these firms. On the one hand, financial analysts may spend more effort on "neglected" stocks (i.e., stocks whose institutional investors are distracted by other investee stocks) because neglected firms require more external monitoring. When firms' incumbent institutional investors are distracted, the managers of the neglected firms are more likely to take value-destroying action (Kempf et al. 2017; Ni et al. 2020; Flugum et al. 2021; Garel et al. 2021; Li et al. 2021) and provide less voluntary disclosure (Abramova et al. 2020). For example, Kempf et al. (2017) argue, "*If overall attention is limited, supplying more attention to firm 1 decreases the supply of attention to firm 2. From firm 2's point of view, this implies a reduction in monitoring, which, in turn, gives managers in firm 2 more room to maximize private benefits*…" (p.1666). Board governance is also weakened when institutions are distracted. For example, 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 temporarily distracted. Overall, lack of monitoring by institutional investors and ineffective board governance of neglected firms jointly create a strong demand for monitoring of these firms by financial analysts. Anticipating certain favorable rewards from investors (e.g., building a good reputation or receiving a higher rating), analysts may spend more effort monitoring firms whose incumbent institutional investors are distracted.

On the other hand, if the main objective of financial analysts is to maximize trading commissions, they should exert less effort on neglected firms. Institutional investors have a low trading volume in neglected investee stocks when they are distracted by other investee stocks that have extreme return shocks or earnings news (Kempf et al. 2017; Schmidt 2019). The lower likelihood of trading neglected stocks results when investors pay less attention to such stocks due to limited attention and resources. Consequently, analysts who aim to maximize their trading commissions from institutional investors should spend less effort on neglected stocks (i.e., more effort on stocks that are catching institutional investor attention, namely attention-grabbing stocks).

Given the mixed predictions from the monitoring versus the commission-generating views

discussed above, it is an empirical question whether analysts spend more or less effort on neglected stocks.[4] It is important to note that the monitoring effect of financial analysts on neglected stocks is achieved by the threat or actual issuance of unfavorable forecasts for these firms by the analysts. In contrast, the commission-generating view of financial analysts does not clearly predict the tone of their forecasts for neglected stocks because trading commissions can be earned via both purchases and sales of stocks by institutional investors, which normally follow both positive and negative analyst forecasts, respectively.

To establish a causal inference for the empirical effect of institutional distraction on analyst forecasts (i.e., the quantity and tone of forecasts), we follow Kempf et al. (2017) to identify an exogenous increase in institutional investor distraction. The distraction measure quantifies the extent to which the incumbent institutional investors of a firm are distracted by the extreme returns of other investees in their portfolio. Firms experience a negative exogenous shock to institutional investor attention in the identified distracted quarter because the distraction measure is driven by institutional investor holdings in firms in other industries that are performing either extremely well or extremely poorly.[5]

Using the analyst forecast data for U.S. firms from 2001 to 2019, we analyze the effect of institutional investor distraction on the thoroughness of analyst forecasts based on the total number of forecasts made by an analyst for a firm. The analyst forecast thoroughness measure is constructed following

[4] A third possibility is that analysts who have business connections with institutional investors that hold neglected stocks may issue more frequent and more favorable forecasts for the neglected stocks to inflate their price. However, this possibility only works if the analyst–investor pair has business ties; it does not work for all analyst–investor pairs. Therefore, we do not discuss this prediction here because our focus is the universal pattern between institutional investor attention and analyst coverage (without accounting for business ties between analysts and institutional investors).

[5] To validate the institutional investor 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 institutional investors' distraction measure has been used in a number of prior studies. For example, Basu et al. (2019) report that the 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 investor attention can affect managers' disclosures. 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 show that this decrease has little effect on information quality or liquidity. Although the literature finds a strong relation between changes in institutional investors' attention and manager disclosure behavior, it is still unclear whether changes in institutional investor attention affect analyst forecast behavior.

Driskill et al. (2020) as a proxy for the level of analyst effort spent on a firm.[6]

We find that financial analysts react positively to institutional investor distraction by producing more thorough forecasts after controlling for firms' institutional ownership. This effect is economically significant: a one-standard-deviation increase in the distraction measure leads to a 0.518 increase in the average total number of forecasts made by a firm's analysts (for analysts who issue forecasts for the firm in each calendar quarter). As the average number of unique analysts covering a single firm in our sample firm is 8.79, the 0.518 increase in total forecasts per analyst predicts 4.55 (i.e., 8.79 × 0.518) more analyst forecasts issued for our firm in one quarter.

We follow Bushee (1998) to decompose all institutional investors into three groups (quasi-indexers, transients, and dedicated institutional investors) and then analyze which subset of institutional investors drives the above effect. Quasi-indexers care about corporate governance (Appel et al. 2016; Crane et al. 2016; Khan et al. 2017; Schmidt and Fahlenbrach 2017) and may therefore demand firm-specific information from analysts for the purpose of monitoring firms. However, they are unlikely to demand information for the purpose of stock trading because they tend to have a passive trading strategy or simply track certain stock indices. If analyst coverage of neglected stocks is driven by the monitoring view, we expect a positive relation between quasi-indexer distraction and analyst forecast thoroughness. We confirm this prediction in a regression that controls for three distraction measures based on quasi-indexer, transient, and dedicated institutional investors of the firms.

In addition, we find some evidence supporting the commission-generating view based on distraction by transient institutional investors, who are more likely to demand information from analysts for the purpose of trading stocks. Analysts who aim to earn trading commissions from transient institutional investors should issue more forecasts for stocks that are catching the attention of such investors. That is, there should be a negative relation between transient institutional investor distraction and analyst forecast thoroughness. We confirm this prediction in the data. It is important to note that the level of firm ownership

[6] We 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.

by transient institutional investors (16% of outstanding shares in our sample) is much lower than that of quasi-indexers (39.8% of outstanding shares). Therefore, when we aggregate all types of institutional investors, the effect of quasi-indexers on analyst forecasting dominates the effect of transient institutional investors, leading to a positive relation between institutional investor distraction and analyst thoroughness in our main analysis.[7]

To explore the potential drivers of financial analysts' catering behavior, we conduct several cross-sectional analyses. First, the demand for information for the purpose of monitoring varies with a firm's internal corporate governance. Concerns about manager misbehavior when institutional investors are distracted should be greater when a firm's corporate governance level is lower. Therefore, distracted institutional investors should have a higher demand for information to monitor firms with inferior corporate governance. We find that the positive effect of distraction on forecast thoroughness is stronger when a firm's board is less independent, suggesting that investor demand for analyst-provided information is stronger when the firm's overall corporate governance level is lower.

Second, we consider variations in the influence of the brokerage firm with which the analyst is affiliated. The client network of large brokerage houses in the financial market allows their affiliated analysts to work on more profitable tasks or tasks that bring in short-term profits (e.g., providing forecasts to investors to induce stock trading and generate trading commissions). The literature finds that analysts from larger brokerage firms provide more accurate earnings forecasts (Clement 1999; Herrmann and Thomas 2005). However, small brokerage houses have to differentiate from larger brokerage houses and focus on less profitable business or tasks that may only result in long-run benefits (e.g., by monitoring investees to build their analysts' reputation and hence attract future investors). We find that the effect of

[7] 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 themselves via direct negotiation with management (Boone and White 2015) and their own in-house research team. The investment strategy and private information acquisition ability of dedicated institutional investors tend to decrease their reliance on publicly available information. In addition, dedicated investors only hold 8.1% of outstanding shares in our sample firms, the least among the three subsets of institutional investors. Therefore, we expect and confirm that dedicated institutional investor distraction has an insignificant effect on analyst thoroughness.

institutional investor distraction on analyst effort is stronger for analysts affiliated with smaller brokerage firms, consistent with the view based on the segmentation of analyst businesses.

Third, we find that the positive effect of institutional investor distraction on analyst forecast thoroughness is stronger for smaller and less liquid firms relative to other stocks covered by the same analysts. This finding confirms the monitoring view of analyst coverage of neglected firms because smaller and less liquid firms tend to have poorer corporate governance than larger and more liquid firms. In addition, this cross-sectional result is inconsistent with the commission-generating view, which predicts the opposite of what we find. If the commission-generating view holds, the positive effect of institutional investor distraction on analyst forecast thoroughness should be weaker for smaller (less liquid) firms than for larger (more liquid) firms because the latter group can generate larger earnings from trading commissions.

To provide further support for the monitoring view of analyst coverage of neglected stocks, we investigate the tone of financial analyst earnings forecasts and stock recommendations. Whereas analysts tend to issue optimistic forecasts for stocks to boost the value of investors' stock holdings (Gu et al. 2013), they should issue (or threaten to issue) negative or pessimistic forecasts if they intend to discipline the misbehavior of firm managers. As institutional investor distraction increases the likelihood of managerial misbehavior (Kempf et al. 2017), we should expect the tone of analyst forecasts to be more negative when the distraction is larger (i.e., neglect is greater). Consistent with the monitoring view of analysts, we find that financial analysts issue fewer (and a smaller fraction of) optimistic forecasts (e.g., forecasts with positive forecast errors) for neglected firms when the firms' institutional investors are distracted. We also find that the tone of analyst stock recommendations for firms is more pessimistic when the firm's institutional investors are more distracted.

We conduct several robustness tests. First, we decompose the institutional investor distraction of a focal firm into two components based on whether this distraction is due to positive or negative extreme returns from their other investees. We find that both the positive-return and negative-return components of institutional investor distraction are positively correlated with the number of forecasts for the firm. Second, we repeat our analysis with data at the analyst-firm-quarter level and find that the positive relation between

institutional investor distraction and analyst forecast thoroughness still holds. Third, to rule out the possibility that the effect of institutional investor distraction on the thoroughness of analysts' forecasts is driven by changes in institutional ownership, in an untabulated analysis, we restrict the sample to firms with little change in institutional ownership (i.e., less than 5%). Our results remain unchanged.

We make two main contributions. First, we contribute to the literature on institutional investors and financial analysts by providing direct evidence of a causal and negative effect of institutional investor attention on the forecast behavior of financial analysts. Our paper supplements the literature focused on how institutional ownership (e.g., Harford et al. 2019) or the relation between institutional investors and brokerage firms affects analyst forecast behavior (e.g., Mola and Guidolin 2009). Although Kadan et al. (2008) find that the passage of the Global Analyst Research Settlement, intended to curb conflicts of interest between investment banking and the brokerage houses of financial analysts, leads to less optimistic recommendations by analysts, our findings suggest that financial analysts cater to the information demands of institutional investors (for monitoring purposes) by providing more thorough and also more pessimistic forecasts for stocks temporarily neglected by institutional investors. Overall, we provide supportive evidence for the role of financial analysts in monitoring firms (Jensen and Meckling 1976; Moyer et al. 1989; Yu 2008), as a substitute for monitoring by institutional investors or other internal governance mechanisms. We also confirm prior evidence that institutional investors value analyst monitoring of their investee firms (Chung and Zhang 2011).

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

Similar to our analysis, Chiu et al. (2021) use a firm's abnormal search volume performed from Bloomberg terminals on the firm's earnings announcement day as a proxy for institutional investor attention. In contrast to our findings, however, they find that analysts cater to the information needs of institutional investors by producing more timely forecasts when institutional investor attention is higher (i.e., a negative effect of institutional investor distraction on analyst coverage).

Our paper differs from that of Chiu et al. (2021) in the following ways. First, we focus on the attention of incumbent institutional investors who have already purchased the stocks of the firm. In contrast, the Bloomberg search volume used by Chiu et al. (2021) is a proxy for the attention of all institutional investors, regardless of their equity holding in the firm (e.g., bond investors or equity investors that hold no shares in the firm may also contribute to the firm's Bloomberg search volume).[8] Second, Chiu et al. (2021) focus on investor demand for analyst-provided information for stock trading purposes when firms have informative events (i.e., earnings announcements), leading to greater analyst coverage when investors are paying attention to the earnings. Chiu et al. (2021) write, "*Providing research to institutional investors when they need the information for trading decisions is an essential way for analysts to add value for their clients…Many institutions rely on these platforms (professional platforms, such as Bloomberg terminals) to search for financial information, analyze securities, and execute trades. Thus, search activity on these platforms reveals their efforts to obtain information.*" (pp.1-2). However, we focus on institutional investor demand for analyst-provided information when firms are likely to take value-destroying action (i.e., when existing institutional investors are distracted).

We argue that the monitoring view and the commission-generating view of analyst coverage are not mutually exclusive, and that their relative importance in different samples can help reconcile the difference in findings between Chiu et al. (2021) and our paper. If one focuses on a sample featuring

[8] The difference between all institutional investors in the market and incumbent equity institutional investors is important for understanding our focus in this paper. When managers take value-destroying action to pursue personal benefits, the wealth of the distracted incumbent institutional investors is negatively affected, leading them to demand analyst-provided information to monitor such managers. In contrast, institutions who do not own a firm's stock do not have the incentive to monitor the firm.

announcements of economically meaningful news, the commission-generating view dominates the monitoring view as timely trading is important for investors, leading to a negative effect of institutional investor distraction on analyst coverage, as documented by Chiu et al. (2021). However, if one focuses on firms when investors are likely to suffer from agency costs, the monitoring view dominates the commission-generating view, leading to a positive effect of institutional investor distraction on analyst coverage, as shown in our paper.

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 Section 5 concludes the paper.

2. Related literature and hypothesis development

2.1 Institutional investor attention and corporate policy

The accounting and finance literature provides evidence that investors have limited attention (Hirshleifer et al. 2009; DeHaan et al. 2015). Institutional investors are also subject to limited attention. They may be distracted by important financial events despite having large research teams because of the large number of stocks in their portfolios. For example, Kempf et al. (2017) find that institutional investors are attracted by extreme industry returns if they hold stocks in these extreme-return industries, causing a distraction (i.e., a low level of attention) from other investee stocks that do not operate in these industries. Schmidt (2019) finds that fund managers are attracted by the earnings announcements of stocks on their watch list, causing distraction and low trading volumes of other stocks in their portfolios.

Although the literature shows that institutional investors are effective in monitoring firms' corporate governance (Hartzell and Starks 2003; Parrino et al. 2003; Boone and White 2015; Coates 2015; McCahery et al. 2016), the efficacy of their monitoring of investee firms is constrained by the attention they pay to these firms. Fich et al. (2015) show that the intensity of institutional investor monitoring of a firm varies with the level of attention they pay to the firm, indicating that firms may receive different levels of

monitoring despite the same level of institutional ownership. Kempf et al. (2017) find that when a firm's institutional investors are distracted, their participation in the firm's conference calls and submissions of shareholder proposals decrease. Consequently, firms with distracted institutional investors are more likely to undertake value-destroying acquisitions and grant inefficient stock options to managers, and less likely to fire poorly performing CEOs (Kempf et al. 2017).

The work to identify exogenously determined distraction by Kempf et al. (2017) led to several follow-up empirical papers analyzing alternative consequences of institutional investor distraction. For example, Liu et al. (2020) find that distracted institutional investors are less likely to discipline ineffective directors by voting them out. Ni et al. (2020) find a positive relation between institutional investor distraction and firm stock price crash risk, implying that the distraction of institutional investors loosens their monitoring intensity toward firms, ultimately leading to increased bad-news-hoarding behavior by managers. Yang et al. (2020) find that a firm's audit risk increases when its institutional investors are distracted. 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, Chan et al. (2021) find that external auditors allocate less effort to examine firm management when the firm's institutional investors are distracted, leading to a deterioration in the firm's audit quality. 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 (Basu et al. 2019; Abramova et al. 2020).

2.2 Financial analysts' effort allocation across covered firms

The literature includes studies on the determinants and consequences of financial analysts' research output (Bradshaw 2011; Bradshaw et al. 2017). Analysts are also subject to limited attention (Driskill et al. 2020) and have a strong incentive to allocate their effort strategically to maximize their own benefits (i.e., by putting more effort into stocks that are more important to institutional investors; Harford et al. 2019). Financial analysts allocate more effort to stocks with higher ownership by institutional investors because

these investors generate trading commissions for analysts' brokerage houses and vote for analysts in the annual all-star analyst rankings (Ljungqvist et al. 2007).

Harford et al. (2019) find that analysts make more accurate, frequent, and informative earnings forecasts and stock recommendations for firms with higher institutional ownership. Gu et al. (2013) find that institutional investors direct more trading commission fees to brokerage firms whose affiliated analysts issue optimistic forecasts for stocks they hold (i.e., to reward analyst forecasts that inflate the value of the institutions' equity holdings). Irvine et al. (2007) find evidence that institutional investors receive tips from analysts before the release of analyst recommendations, and earn abnormal returns based on these tips. Drake et al. (2020) find that analyst bundling (i.e., the issuing of 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 prioritizing the needs of institutional investors.

2.3 Hypothesis development

Institutions can monitor firms because they are able to obtain firm-specific information via multiple channels, including publicly available firm news, private information obtained from engagement with management, information from broker-hosted investor conferences, and other sources that supplement their own in-house research (Green et al. 2014; McCahery et al. 2016). When a firm's incumbent institutional investors are distracted, the firm's management is more likely to take value-destroying action (Kempf et al. 2017; Ni et al. 2020; Flugum et al. 2021; Garel et al. 2021; Li et al. 2021) and provide less voluntary disclosure (Basu et al. 2019; Abramova et al. 2020). In addition, board governance is weakened when institutions are distracted (Liu et al. 2020).

Institutional investors may outsource information collection and monitoring of firms in their portfolios to other information intermediaries (e.g., sell-side financial analysts or proxy advisors) when they are temporarily distracted. Liu et al. (2020) find evidence that distracted institutional investors increase their reliance on information from proxy advisors when voting in annual director elections. As important information intermediaries and monitors (Jensen and Meckling 1976; Moyer et al. 1989; Yu 2008), financial

analysts have an incentive to spend more effort on firms when their institutional investors are distracted and when the firms are likely to suffer from agency problems. Research shows that institutional investors care about analysts' monitoring of firms. For example, Chung and Zhang (2011) find that the external monitoring provided by financial analysts alleviates the concerns of institutional investors related to firm corporate governance quality when making portfolio construction decisions.

Alternatively, if the main objective of financial analysts is to maximize trading commissions, they should spend less effort on firms whose institutional investors are distracted. Institutional investors have a low trading volume in their no-news investee stocks when they are distracted by news of other investee stocks that have extreme return shocks or earnings news (Kempf et al. 2017; Schmidt 2019). For example, Chiu et al. (2021) find that analysts cater to the information needs of their institutional clients by issuing more timely forecasts for firms with high Bloomberg search volumes. Our first (main) hypothesis is thus as follows:

Hypothesis 1a: (The monitoring view) *Analyst forecast thoroughness is higher when incumbent institutional investors are distracted.*

Hypothesis 1b: (The commission-generating view) *Analyst forecast thoroughness is lower when incumbent institutional investors are distracted.*

Research suggests that managers take advantage of the loosening of their monitoring intensity by temporarily distracted institutions to maximize their own benefit (Kempf et al. 2017; Ni et al. 2020; Flugum et al. 2021; Garel et al. 2021; Li et al. 2021). This effect should be even stronger for firms whose corporate governance is worse (e.g., firms with a low fraction of independent directors). Consequently, we expect analysts to provide more thorough forecasts for neglected firms with weaker corporate governance.

Analysts affiliated with large brokerage houses have an advantage over analysts working for small brokerage houses. For example, the survey results of Emery and Li (2009) show that analysts from large brokerage houses are more likely to be remembered by institutional investors than analysts from small brokerage houses. Emery and Li (2009) also find that the size of the brokerage house analysts work for is positively correlated with the probability of them becoming all-star analysts. Covering the firms that are

attracting institutional investor attention (i.e., attention-grabbing stocks) may be the best choice for most analysts because this coverage may lead to high trading commissions to the associated brokerage houses in the short run. However, for the analysis of attention-grabbing stocks, institutional investors may only resort to analysts who have won their trust, such as the few top-notch analysts affiliated with large brokerage houses. Therefore, most analysts who do not enjoy such privileges (i.e., rich research resources and close connections with institutional investors) may be better off by avoiding direct competition for these attention-grabbing stocks. Consequently, we posit that compared with analysts affiliated with larger brokerage houses, analysts from smaller brokerage houses are more likely to cover neglected stocks to avoid direct competition and build a reputation in the long run. Our second hypothesis is thus as follows:

Hypothesis 2: *The positive effect of incumbent institutional investor distraction on analyst forecast thoroughness is stronger for firms with weak corporate governance and for analysts affiliated with smaller brokerage houses.*

To provide further support for the monitoring view of analyst coverage of neglected firms, we conduct a cross-sectional analysis based on firm characteristics that have opposite moderating effects according to the monitoring view and the commission-generating view.

Firm size and trading volume are positively related to corporate governance. That is, smaller and less liquid firms tend to have weaker corporate governance than larger and more liquid firms. For example, smaller and less liquid firms have greater information asymmetry, making it difficult for investors to monitor these firms. Therefore, according to the monitoring view, analysts should allocate more effort to neglected firms that are smaller (less liquid) rather than larger (more liquid). This prediction is also consistent with the view that institutional investors have a greater demand for analyst-provided information for firms with greater information asymmetry. For example, Loh and Stulz (2018) find that analyst research output is more valuable and investor reliance on analyst output is higher when firms have greater information asymmetry.

Alternatively, covering smaller or less liquid firms is less likely to generate large commissions for analysts because trading commissions are linked to the dollar value of the shares traded, which tend to be

low for small firms and firms with low trading volumes. Therefore, according to the commission-generating view, analysts should allocate less effort to small neglected firms (neglected firms with low trading volumes) than to larger neglected firms (neglected firms with high trading volumes).

We posit that relative to other firms covered by the same analyst, a firm with greater information asymmetry (i.e., lower market value or lower trading volume) will receive more thorough forecasts from analysts when the firm's institutional investors are distracted.

Hypothesis 3a: (The monitoring view) *The positive effect of incumbent institutional investor distraction on analyst forecast thoroughness is stronger for smaller and less liquid firms.*

Hypothesis 3b: (The commission-generating view) *The positive effect of incumbent institutional investor distraction on analyst forecast thoroughness is weaker for smaller and less liquid firms.*

As an important corporate governance mechanism (Yu 2008; Dyck et al. 2010; Kim et al. 2019), financial analysts can curb manager opportunism when institutional investors are distracted. If analyst coverage of neglected stocks is mainly explained by the monitoring view, we would expect the tone of analyst earnings forecasts and stock recommendations to differ for neglected versus attention-grabbing stocks. Whereas analysts tend to issue optimistic forecasts for stocks to inflate the value of investor stock holdings (Gu et al. 2013), they should issue (or at least threaten to issue) pessimistic forecasts if they intend to discipline misbehaving firm managers.

Analysts may use a pessimistic tone in a forecast or investment recommendation to reveal the potential effect of managerial misbehavior and express their concern about potential value-destroying action by neglected firms. Moreover, as analysts have an incentive to provide unbiased research to institutional investors (Frankel et al. 2006; Ljungqvist et al. 2007), they may issue pessimistic forecasts or stock recommendations for neglected firms, because these firms may have already implemented certain value-destroying actions. As institutional investor distraction increases the likelihood of managerial misbehavior, we expect the tone of analyst forecasts to be more negative when the distraction is larger (i.e., there is more neglect).

Hypothesis 4: *Analysts provide less optimistic forecasts or stock recommendations when a firm's incumbent*

institutional investors are distracted.

3. Data and research design

3.1 Sample and data

The sample is extracted from several databases. We first calculate the forecast thoroughness for each analyst–ticker pair in each calendar quarter based on I/B/E/S data. Then we merge the fundamental firm year-quarter data from Compustat and the stock return, turnover, and volatility data from the Center for Research in Security Prices (CRSP). As the incumbent institutional investor distraction data in Kempf et al. (2017) are based on the firm's calendar quarter, we match the firm's fiscal quarter data from Compustat to the measure of Kempf et al. (2017) and to the analyst forecast thoroughness measure following the matching method of Abramova et al. (2020). The fiscal quarter of the Compustat data is matched to the calendar quarter that ends on or after the fiscal quarter (e.g., for a firm with an April fiscal year-end, we match the July fiscal quarter to the September calendar quarter, the November fiscal quarter to the December calendar quarter).

The sample period starts in 2001, because this is the first year after the Regulation Fair Disclosure (Reg FD), and ends in the last quarter of 2019. To avoid extremely illiquid stocks (Cen et al. 2013; Malmendier and Shanthikumar 2014), we omit firm-quarter observations if the stock price at the fiscal beginning of the quarter is below $1. We also exclude observations with missing values for the dependent or control variables. We winsorize all continuous variables by quarter at the 1st and the 99th percentiles to minimize the effect of outliers. Our final sample consists of 239,097 observations at the firm-year-quarter level and includes 13,707 analysts and 7,929 firms.

3.2 Variable measurement

3.2.1 Institutional investor distraction

We follow Kempf et al. (2017) to measure incumbent institutional investor distraction. The main

independent variable, *DSTRQ*, for firm *i* in calendar quarter *q* is defined as follows:

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

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*; IS_t^{IND} is an indicator variable that equals 1 if the industry return is the highest or the lowest of all 12 Fama–French industries in quarter *t*; $\omega_{f,t-1}^{IND}$ is the weight of industry *IND* in institutional investor *f*'s portfolio in quarter *t*-1; and the weight $\omega_{f,i,t-1}$ denotes the importance of institutional shareholder *f* in firm *i* in quarter *t*-1 calculated based on Equation 2 from Kempf et al. (2017).

We 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*. IS refers to an industry shock. In most of our tests, we define IS_t^{IND} as an indicator variable that equals 1 if an industry has the highest return across all 12 Fama–French industries in a given quarter.

In the final step, we 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, weighting all of the investors equally is inappropriate. Therefore, we take a weighted average with the weight w_{ft-1}^{IND}, which gives 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, on average, tend to spend more time and effort analyzing the biggest positions in their portfolio (Fich et al. 2015); the latter captures the belief that managers 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. We therefore define the following:

$$w_{ifq-1} = \frac{QPFweight_{ift-1} + QPercOwn_{ift-1}}{\sum_{i \in F_{q-1}} \left(QPFweight_{ift-1} + QPercOwn_{ift-1}\right)}, \quad (2)$$

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 effect of outliers and measurement errors, we sort all stocks held by investor f in quarter *t*-1 by $PFweight_{ift-1}$ into quintiles, denoted as $QPFweight_{ift-1}$. Similarly, we sort firm *i*'s shareholders by $PercOwn_{ift-1}$ into quintiles $QPercOwn_{ift-1}$. Finally, we scale by the term in the denominator so that the weights w_{ift-1} add up to 1.

In summary, our investor distraction measure (1) depends on whether shocks occur in other industries, whether investors care about these other industries, and whether the investors 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 (in the pharmaceutical industry) and firm B (in the automotive industry). When an unexpected shock occurs in the pharmaceutical industry, such as the approval of a COVID‐19 vaccine, this institutional investor may allocate more effort and pay more attention to understanding the effect of this shock on 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 Analyst forecast thoroughness

To measure the efforts of analysts, we 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 are. Both Chiu et al. (2021) and Driskill et al. (2020) argue that timely forecasts are more valuable to investors when they pay attention to firms to acquire information to help them make trading decisions. Driskill et al. (2020) further find that the thoroughness of a forecast is negatively correlated with forecast timeliness. However, when institutional investors are distracted, the value of forecast timeliness decreases and the importance of forecast thoroughness may increase. By incorporating more earnings components and forecasts for different horizons into their forecasts, analysts can provide more detailed information to institutional investors.

The main variable for forecast thoroughness, *#TOT_FORE*, is the total number of all types of forecasts issued by an analyst for a sample firm over a given quarter. Here, we include all types of forecasts

regardless of the forecast horizon and forecast target (both earnings and non-earnings targets). The literature tends to use the total number of forecasts to proxy for the amount of effort an analyst allocates to a company being covered (Jacob et al. 1999; Clement and Tse 2003). The larger the number of forecasts an analyst makes for a firm, the more thorough the forecasting (measured at the analyst-firm-quarter level).

We also provide an alternative forecast thoroughness measure in the robustness tests. The alternative variable is the number of distinct types of forecast targets 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-earnings items included in an analyst's forecast, the more effort the analyst would have allocated to the firm. For example, if an analyst issues only an earnings forecast for a firm, then *#EPS_COM* = 1; if the analyst issues revenue and cash flow forecasts for the firm in addition to the earnings forecast, then *#EPS_COM* = 3.

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

3.3 Research design

We use the following regression specification to estimate the effect of institutional investor distraction:

$$\#TOT\_FORE_{i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 Controls_{i,t-1} + \epsilon_{i,t}, \quad (3)$$

where $\#TOT\_FORE_{i,t}$ is the analyst forecast thoroughness variable for firm *i* in calendar quarter *t*, and $DSTRQ_{i,t-1}$ is firm *i*'s institutional investor distraction for quarter *t*-1. Firm and calendar-year quarter fixed effects are included to alleviate concerns about potential cross-sectional and time-series omitted variables. To adjust for possible cross-sectional correlations, we cluster all of the standard errors by firm.

We 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*). We control for

firm leverage (*LEVQ)* to measure the firms' financial constraints. We include institutional ownership (*IO*) because analysts tend to allocate more effort to firms with higher institutional holdings (Harford et al. 2019). We 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. We also control for stock turnover (*TURNOVER*) to capture firm stock liquidity, because greater stock liquidity could induce more trading and generate larger trading commissions for the analyst's brokerage firm, thus affecting the allocation of analyst effort (Harford et al. 2019).

We 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 *(BADNEWS*). We include return on assets (*ROA*), past abnormal returns (*ABRET*), and return volatility (*STD_RET*) to control for past performance and risk. We also control for research and development expense (*XRDQ*), which represents the firm's opaqueness in its financial reporting due to operational reasons. We include the industry returns where the industry is defined based on the Fama–French 12 industries classification.

We also control for analyst characteristics that may affect analyst 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 investor distraction measures. The mean (median) value of *DSTRQ* is 0.134 (0.114), indicating that incumbent institutional investors are generally distracted. According to the descriptive statistics of the forecast thoroughness variables, on average, an analyst makes 42.15 forecasts for a firm that he or she covers in one calendar quarter.

In each quarter, the average institutional ownership of a firm is 59%, the average abnormal stock return in the previous 12 months is 4.7%, and the average analyst coverage of the firm is 8.79. The average

turnover rate in each quarter for a firm during the past year is 0.9%. In terms of analyst characteristics, each analyst in our sample covers 16.44 firms, covers each firm for 15.39 quarters, and shows up in the I/B/E/S record for 50.29 quarters.

< *Insert Table 1 here* >

4. Empirical analysis

4.1 Baseline results

Table 2 presents the regression results for analyst forecast thoroughness regarding the distraction and control variables. Column (1) of Table 2 shows that institutional investor distraction has a significant and positive effect on the total number of forecasts provided by analysts, consistent with Hypothesis 1a (the monitoring view) and inconsistent with Hypothesis 1b (the commission-generating view). The result is significant after controlling for firm, analyst, and calendar-year quarter fixed effects. Column (2) of Table 2 shows the results when we further control for analyst-level characteristics. We find that the effect of institutional investor distraction on the thoroughness of analyst forecasts is economically significant. A one-standard-deviation increase in institutional investor distraction increases the total number of forecasts by 0.376. The institutional investor distraction effect on the thoroughness of analyst forecasts is of great economic significance because the analyst forecast thoroughness measure represents the effort an analyst spends over a quarter issuing forecasts for the firm. The results are consistent with our 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, we find that the number of total forecasts is negatively correlated with the past 12-month return volatility, analyst experience with the firm, and the bad news indicator. We also find that the number of forecasts is positively correlated with firm size, stock turnover, the past 12-month market adjusted return, firm leverage, analyst coverage, the market-to-book ratio, and the number of firms covered by the analyst.

< Insert Table 2 here >

4.2 Cross-sectional analysis

4.2.1 Variation in the type of institutional investors

Thus far, we have examined the relation between the thoroughness of analysts' forecasts and institutional investor distraction but have not distinguished between different types of institutional investor. However, the information demand for firms may vary with the type of institutional investor. In the second hypothesis, we argue that analyst forecasts are more (less) thorough when a firm's quasi-indexers (transient institutional investors) are distracted.

Table 3 presents the results for the empirical tests of the second hypothesis. Columns (1) and (2) show the results when we replace the distraction measure by the distraction of dedicated institutional investors, quasi-indexers, and transient institutional investors separately. The types of institutional investor are based on the definitions by Bushee (1998). *IO_DED-II*, *IO_QUASI-II*, and *IO_TRANS-II* represent ownership by a firm's dedicated institutional investors, quasi-indexers, and transient institutional investors, respectively.

Column (1) of Table 3 shows the result when we regress forecast thoroughness based on the distraction of the three aforementioned types of institutional investors. We find that the coefficient on the distraction of the quasi-indexers (*D_QUASI-II)* is significant and positive, whereas the coefficient on *D_DED-II* is statistically insignificant. The coefficient on *D_TRANS.-II* is negative and significant at the 5% level. Column (2) of Table 3 shows the results when we separately add ownership by dedicated institutions, quasi-indexers, and transient institutions into the regression used in Column (1) of Table 3, and the results remain unchanged. The findings shown in Table 3 indicate that the effect of institutional investor distraction on analyst thoroughness is mainly due to the distraction of quasi-indexers, suggesting that analysts 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 disclosure is mainly driven by the distraction of quasi-indexers. To compensate for the reduction in quantity of firm information, financial analysts provide forecasts that are more thorough to cater to the information demands of distracted quasi-indexers.

In Table 3, we see that the coefficient on *D_TRANS.-II* is negative and significant at the 5% level. This result shows that analyst forecasts are less thorough when the firm's transient institutional investors are distracted, consistent with our prediction that transient institutional investors are less likely to engage in monitoring firms and demand less information when they are distracted. This result also indicates that analysts allocate more effort to produce forecasts that are more thorough when transient institutional investors are not distracted, consistent with analyst catering to institutional investor demand for information for trading (Driskill et al. 2020; Chiu et al. 2021).

< Insert Table 3 here >

4.2.2 Variation in corporate governance

In Hypothesis 2, we argue that managers take advantage of institutional investor distraction to maximize their own benefit when firms have inferior corporate governance, and thus predict that the positive effect of institutional investor distraction on analyst forecasts is more pronounced for firms with weak corporate governance. To measure firm corporate governance level, we use board independence (i.e., the percentage of independent directors on a firm's board). A higher value of board independence proxies for a higher level of corporate governance.

Panel A of Table 4 shows the results when we interact institutional investor distraction with *LOW_GOV*, which is a dummy variable that equals 1 if the firm's board independence is lower than the median of board independence for all firms in the sample, and 0 otherwise. We find that the interaction term between institutional investor distraction and *LOW_GOV* is positive and significant at the 5% 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 4 here* >

4.2.3 Variation in size of the brokerage house

In Hypothesis 2, we also discuss variations in the influence of the brokerage firm with which the analyst is affiliated. Smaller brokerage houses have a greater incentive to produce customized services to attract and retain institutional investors. Selling analysts' reports to investors that do not have time to collect information themselves (i.e., when institutions need it most) may lead to a higher price demanded for the information, or it may be provided in exchange for a larger trading commission. $D\_B\_SIZE_{i,j,t}$ is a dummy variable that equals 1 if the brokerage firm of analyst *j* (covering firm *i* in quarter *t*) is larger than the sample median, and 0 otherwise. The size of the brokerage firm refers to the number of unique financial analysts affiliated with it in quarter *t*.

Table 5 presents the results. We conduct the analysis as an analyst-firm-quarter sample because the variation is specific to each individual analyst. We find that the positive effect of distraction on analyst forecast thoroughness is stronger when an analyst is affiliated with a smaller brokerage firm (i.e., there is a negative interaction term between *D_B_Size* and *DSTRQ*), suggesting that analysts from small brokerage houses avoid direct competition with analysts affiliated with large brokerage houses in covering attention-grabbing firms (see Hypothesis 2).

< *Insert Table 5 here* >

4.2.4 Variation in firm size and trading volume relative to other stocks covered by the same analyst

In this section, we explore variations in firm size and trading volume. To better capture the comparisons among all firms covered by the same analyst and rule out the fixed effects associated with analysts, we conduct the analysis as an analyst-firm-quarter sample following Harford et al. (2019).

To measure firm size and volume relative to other firms covered by the same analyst, we separately

sort firm trading volume (or market value) in the previous quarter into quartiles for firms covered by each analyst. The larger the market capitalization or trading volume of a firm, the lower the information asymmetry of the firm and the worse the corporate governance. $LOW\_MV_{j,i,t\text{-}1}$ ($HIGH\_MV_{j,i,t\text{-}1}$) is a dummy variable that equals 1 if firm *i*'s market capitalization as of quarter *t*-1 is in the bottom (top) quartile of all firms analyst *j* covers in quarter *t*, and 0 otherwise. We then interact $DSTRQ_{i,t\text{-}1}$ with these dummy variables to investigate the cross-sectional variation in our main results.

In Panel A of Table 6, we report the interaction results based on the ranking of market capitalization within an analyst's portfolio using data at the analyst-firm-quarter level. The coefficient on the interaction term *DSTRQ*LOW_MV* is positive and significant at the 1% level (*t* = 3.02), consistent with Hypothesis 3a. Furthermore, the coefficient on the interaction term *DSTRQ*HIGH_MV* is negative and significant at the 1% level (*t* = -2.78).

In Panel B of Table 6, we conduct the interaction test based on the ranking of firm trading volume within all firms covered by the same analyst. $LOW\_VOL_{j,i,t\text{-}1}$ ($HIGH\_VOL_{j,i,t\text{-}1}$) is a dummy variable that equals 1 if firm *i*'s dollar trading volume as of quarter *t*-1 falls in the bottom (top) quartile of all firms covered by analyst *j* in quarter *t*, and 0 otherwise. The coefficient on the interaction term *DSTRQ*HIGH_ VOL* (*DSTRQ*LOW_ VOL*) is negative (positive) and statistically significant. This result is consistent with our prediction in Hypothesis 3a that analyst forecasts are more thorough for neglected firms with worse corporate governance. Whereas Driskill et al. (2020) find that analysts allocate their attention to provide timely forecasts for large firms that are more likely to benefit the analysts and their brokerage firms, we find that the forecasts they provide are more thorough for small firms with distracted institutional investors. This result suggests that when institutions are not paying attention to a firm, they demand more monitoring information, and analysts cater to this demand by providing more thorough forecasts, consistent with Hypothesis 3a but inconsistent with Hypothesis 3b.

Overall, our results in Table 6 provide further support for the monitoring view as an explanation of analyst coverage of neglected firms, and these cross-sectional results are inconsistent with the alternative view based on analysts' commission-generating incentives.

< Insert Table 6 here >

4.2.5 Effect of institutional investor distraction on optimism and deviation in analyst forecasts

In this section, we examine whether institutional investor distraction affects the tone of analyst forecasts. As stated in Hypothesis 4, we predict that analysts provide less optimistic forecasts or stock recommendations for a firm when its incumbent institutional investors are temporarily distracted.

Table 7 shows the results when we test the above hypothesis empirically. In Column (1), the dependent variable is the analyst forecast tone (*FTONE*), which equals the number of earnings forecasts with a positive forecast error, based on institutional investor distraction. *DSTRQ* is negatively correlated with *FTONE*, and the coefficient on *DSTRQ* is statistically significant at the 1% level. These findings indicate that analysts issue less optimistic forecasts for firms when their institutional investors are distracted, consistent with Hypothesis 4.

In Column (2) of Table 7, we provide the results of a supplementary analysis using analyst stock recommendations as the dependent variable. Following the literature (e.g., Cremers et al. 2021), we measure analyst stock recommendations, *IRECCD*, as the mean value of the analyst's investment recommendation in quarter *t* (*IRECCD* ranges from 1 to 5: strong buy = 5, buy = 4, hold = 3, underperform = 2, and sell = 1). We find that institutional investor distraction is negatively associated with the level of analyst stock recommendations. That is, analysts are more likely to recommend that investors sell the stock when the firm's institutional investors are more distracted.

Studies also suggest that if analysts allocate more effort to a firm, their forecasts tend to be more accurate. However, this prediction does not hold if the analyst's main objective is to monitor firms with incentives to take value-destroying actions, because the reported earnings of these firms may be the outcome of earnings management. Therefore, a larger absolute difference between analyst earnings forecasts and reported earnings (i.e., a larger forecasting deviation) may indicate greater earnings management.

Column (3) of Table 7 shows the results when we regress the forecast deviation (i.e., the absolute

value of the difference between forecasted and reported earnings scaled by stock price) on firm distraction (*DSTRQ*). We find a positive and significant coefficient for *DSTRQ*, indicating that the reported earnings of neglected firms (i.e., firms whose institutional investors are distracted) tend be managed relative to the assessment of financial analysts.

Overall, these results suggest that analysts react to the distraction of institutional investors by issuing pessimistic earnings forecasts (which also deviate more from the firms' reported earnings) and stock recommendations, consistent with the monitoring view of analyst coverage of neglected firms.

< *Insert Table 7 here* >

4.3 Robustness tests

We conduct a series of robustness tests to strengthen our main findings. As we argue that the distraction of a firm's incumbent institutional investors should have a different effect on analysts from the distraction of institutions that may not own the firm's stock, we test this argument by including an alternative institutional investor attention measure in our main regression. The additional attention measure we use is search activity for a firm's ticker on the Bloomberg terminals. As most users of Bloomberg terminals are institutional investors, search activity in Bloomberg can be a proxy for institutional investor attention. However, it is impossible to identify whether an institution searching the firm's ticker in Bloomberg is an incumbent institutional investor of the firm, thus Bloomberg search activity can only be an attention proxy for institutional investors who may demand information to make a trading decision.[9]

Following Chiu et al. (2021), we construct the Bloomberg attention measure *BB_READER* using the mean value of the Bloomberg abnormal attention score over the previous calendar quarter. Column (1) of Panel A in Table 8 shows the result when we regress analyst forecast thoroughness on *DSTRQ* and *BB_READER* simultaneously. The coefficient on *DSTRQ* is positive and statistically significant.

[9] Ben-Rephael et al. (2017) find that Bloomberg search activity is positively correlated with an abnormal trading volume of institutional investors.

Furthermore, *BB_READER* is positively correlated with analyst forecast thoroughness, suggesting that analysts' forecasts for firms are more thorough when institutional investors are actively searching the firm's information via Bloomberg. The positive coefficient on *BB_READER* is consistent with the finding in the literature that analysts allocate more effort to cater to the information demands of institutional investors for trading purposes. The positive coefficients on both *DSTRQ* and *BB_READER* indicate that analysts cater to the information demands of institutional investors for both monitoring and trading.

The information demand of distracted institutional investors may differ if they are distracted by the positive extreme returns of some stocks in their portfolio versus the negative extreme returns of other stocks in their portfolio. To test this conjecture, we regress the analyst thoroughness measure on positive and negative institutional investor distraction and present the results in Table 8. As shown in Column (2) of Panel A, both positive and negative institutional investor distractions are positively correlated with the number of forecasts. This result indicates that the increase in analyst forecast thoroughness is affected by institutional investor distraction, regardless of the underlying reason for the distraction (either losing money or profiting from other investees).

The analyst forecast thoroughness measure in this paper is the total effort an analyst spends on a firm. We use an alternative forecast thoroughness measure to further explore the details of the effort allocation of financial analysts when institutional investors are distracted. The alternative measure is *#EPS_COM*, which is the total number of unique earnings components an analyst issues in a quarter. In Column (3) of Panel A, we find a positive association between *DSTRQ* and *#EPS_COM*. This result indicates that analysts provide a greater number of unique earnings components to distracted institutional investors.

Lastly, the main effect remains robust using data at the analyst-firm-quarter level. The results in Panel B of Table 8 show that institutional investor distraction has a positive effect on the total number of forecasts, suggesting that analysts allocate more effort to a firm when its incumbent institutional investors are distracted.

< *Insert Table 8 here* >

5. Conclusion

In this paper, we explore the effect of institutional investor distraction on analyst forecast thoroughness. Using an analyst-firm-quarter sample from 2001 to 2019, we find that analysts provide more thorough and more pessimistic forecasts for firms when the firms' incumbent institutional investors are temporarily distracted by exogenous attention-grabbing events. This effect is of economic significance: a one-standard-deviation increase in institutional investor distraction leads to 0.518 (4.55) more total forecasts issued by all analysts covering the firm. We find that this effect is driven by the distraction of quasi-indexers. This effect is stronger when firms have inferior corporate governance or a poor information environment, and when the analysts are affiliated with a smaller brokerage firm. These findings are robust to a battery of robustness tests.

We contribute to the literature by providing fresh evidence of how the attention of institutional investors affects analyst forecast behavior. We show that information provided by analysts supplements the in-house research of institutions. Consequently, analysts make more thorough forecasts in response to the temporary distraction of incumbent institutional investors.

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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	239,097	42.150	24.640	23.500	40.440	57.110
DSTRQ	239,097	0.134	0.076	0.077	0.114	0.188
LOGATQ	239,097	7.155	1.924	5.788	7.079	8.385
LEVQ	239,097	0.184	0.188	0.009	0.135	0.303
IO	239,097	0.590	0.287	0.380	0.652	0.830
MTB	239,097	3.240	3.905	1.317	2.066	3.507
ROA	239,097	0.001	0.045	0.000	0.007	0.018
ABRET	239,097	0.047	0.460	-0.205	-0.011	0.212
STD_RET	239,097	0.028	0.015	0.017	0.024	0.035
FFI12_RET	239,097	0.027	0.125	-0.033	0.028	0.085
XRDQ	239,097	0.272	1.870	0.000	0.000	0.056
TURNOVER	239,097	0.900	0.800	0.400	0.700	1.100
AUE	239,097	0.030	0.234	0.001	0.002	0.006
BADNEWS	239,097	0.556	0.497	0.000	1.000	1.000
LOG_COVERAGE	239,097	2.027	0.727	1.386	2.079	2.565
EXP_GEN	239,097	50.290	19.600	38.000	50.250	62.210
EXP_FIRM	239,097	15.390	10.160	7.500	13.230	21.120
ANALYS_FIRM	239,097	16.290	7.445	12.770	15.590	18.770
B_SIZE	239,097	50.500	27.640	29.250	48.500	67.670
FISCAL_Q4	239,097	0.250	0.433	0.000	0.000	1.000
DSTRQPNW	239,097	0.064	0.052	0.027	0.059	0.086
DSTRQBNW	239,097	0.070	0.060	0.030	0.050	0.091
D_DED-II	155,121	0.123	0.110	0.049	0.097	0.176
D_QUASI-II	155,121	0.137	0.078	0.076	0.119	0.191
D_TRANS.-II	155,121	0.134	0.081	0.071	0.112	0.192
IO_DED-II	155,121	0.081	0.078	0.021	0.062	0.119
IO_QUASI-II	155,121	0.398	0.200	0.237	0.405	0.548
IO_TRANS.-II	155,121	0.160	0.116	0.074	0.134	0.219
#EPS_COM	239,097	5.437	2.144	4.000	5.800	7.111
SUM POSITIVE	236,843	3.345	2.530	1.333	3.000	4.857
IRECCD	159,763	3.587	0.767	3.000	3.500	4.000
BB_READER	57,152	0.796	0.823	0.231	0.492	1.095

Table 2: Analyst forecast thoroughness and institutional investor distraction

This table presents the effect of institutional investor distraction on analyst forecast thoroughness.

$$\#TOT\_FORE_{i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 Controls_{i,t-1}.$$

Analyst-related controls and firms' analyst coverage are measured in quarter *t* and other controls are measured in quarter *t*-1. The analysis is implemented at firm-quarter level. Firm, and 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.

	(1) *#TOT_FORE*	(2) *#TOT_FORE*
DSTRQ	6.751***	6.810***
	(9.81)	(9.90)
LOGATQ	1.120***	1.321***
	(4.92)	(5.77)
LEVQ	-1.668**	-1.574*
	(-2.01)	(-1.89)
MTB	0.794**	0.835**
	(2.37)	(2.50)
IO	0.108***	0.103***
	(4.45)	(4.29)
ROA	0.720	0.178
	(0.48)	(0.12)
ABRET	0.969***	0.923***
	(9.18)	(8.75)
STD_RET	-51.195***	-51.442***
	(-6.32)	(-6.36)
FFI12_RET	-5.642***	-5.630***
	(-9.90)	(-9.93)
XRDQ	-0.191***	-0.192***
	(-4.99)	(-4.99)
TURNOVER	2.645***	2.578***
	(17.00)	(16.53)
AUE	-0.355	-0.331
	(-1.04)	(-0.98)
BADNEWS	-0.914***	-0.918***
	(-11.74)	(-11.78)
LOGCOVERAGE	3.796***	3.417***
	(14.79)	(13.09)
FIS_Q4	3.386***	3.379***
	(20.90)	(20.86)
EXP_GEN		0.019***
		(3.01)
EXP_FIRM		-0.110***
		(-6.97)
ANALYS_FIRM		-0.031***
		(-5.04)
B_SIZE		-0.012**
		(-2.56)
Constant	23.932***	25.139***
	(15.47)	(15.82)
FEs: Calendar-year quarter	YES	YES
FEs: Firm	YES	YES
N	239,097	239,097
Adjusted R^2	0.600	0.600

Table 3: The effect of distraction induced by different types of institutional investor

This table presents OLS regression results of equation (2) using distraction from different types of institutional investors.

$$\#TOT\_FORE_{i,t} = \beta_0 + \beta_1 D\_QUASI - II_{i,t-1} + \beta_2 D\_DED - II_{i,t-1} + \beta_3 D\_TRANS. - II_{i,t-1} + \beta_4 Controls_{i,t-1}$$

IO_DED-II is the aggregate ownership of the firm by all dedicated institutional investors. *IO_QUASI-II* is the aggregate ownership of the firm by all quasi-indexers. *IO_TRANS.-II* is the aggregate ownership of the firm by all transient institutional investors. *D_DED-II* is distraction from dedicated institutional investors. *D_QUASI-II* is distraction from quasi-indexers institutions. *D_TRANS.-II* is distraction from transient institutional investors. The analysis is implemented at firm-quarter level. Firm, and 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.

	(1) *#TOT_FORE*	(2) *#TOT_FORE*
D_QUASI-II	12.102***	12.146***
	(5.54)	(5.55)
D_DED-II	-0.590	-0.612
	(-1.08)	(-1.13)
D_TRANS.-II	-4.715**	-4.756**
	(-2.27)	(-2.29)
IO_QUASI-II		1.471
		(1.59)
IO_DED-II		-1.100
		(-0.71)
IO_TRANS.-II		1.521
		(1.53)
Controls	YES	YES
Constant	24.593***	24.620***
	(13.85)	(13.72)
FEs: Calendar-year quarter	YES	YES
FEs: Firm	YES	YES
N	155,121	155,121
Adjusted R^2	0.665	0.665

Table 4: Cross-sectional variation in firm internal corporate governance

This table presents the cross-sectional variation in the effect of institution investor distraction on analyst forecast thoroughness. We obtain coefficients from the following regression specification:

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

LOW_GOV is a dummy variable which equals to one if the percentage of independent directors to total number of directors of the firm is larger than the sample median (i.e., median value of independent directors' percentage of all firms) and zero otherwise. The reported OLS result is estimated at firm-quarter level. Analyst related controls and firms' analyst coverage are measured in quarter *t* and other controls are measured in quarter *t*-1. Variable definitions can be found in the Appendix. 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.

	(1) *#TOT_FORE*
DSTRQ	5.579***
	(6.48)
LOW_GOV	-0.688***
	(-2.89)
DSTRQ*LOW_GOV	**2.133****
	(2.22)
Controls	YES
Constant	26.728***
	(17.32)
FEs: Firm, calendar-year quarter	YES
N	239,097
Adjusted R^2	0.600

Table 5: Cross-sectional variation in size of analysts' brokerage houses

This table presents the cross-sectional variation in the effect of institution investor distraction on analyst forecast thoroughness. We obtain coefficients from the following regression specification:

$$\#TOT\_FORE_{i,j,t} = \beta_0 + \beta_1 DSTRQ_{i,t} + \beta_2 D\_B\_SIZE_{i,j,t} + \beta_3 DSTRQ_{i,t} * D\_B\_SIZE_{i,j,t} + \beta_4 Controls_{i,t-1}.$$

$D\_B\_SIZE_{i,j,t}$ is a dummy variable which equals to one if the size of brokerage firm of analyst *j* (who is covering the firm *i* in quarter *t*) is larger than the sample median, and zero otherwise. The size of a breakage firm refers to the number of unique financial analysts affiliated with the breakage firm in the quarter *t*. The reported OLS result is estimated at firm-analyst-quarter level. Analyst related controls and firms' analyst coverage are measured in quarter *t* and other controls are measured in quarter *t*-1. Variable definitions can be found in the Appendix. 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.

	(1) *#TOT_FORE*
DSTRQ	7.116***
	(5.90)
D_B_SIZE	3.566***
	(4.28)
DSTRQ*D_B_SIZE	**-3.509****
	(-2.57)
Controls	YES
Constant	26.754
	(0.28)
FEs: Analyst, firm, calendar-year quarter	YES
N	2,023,381
Adjusted R^2	0.502

Table 6: Cross-sectional variation in relative firm size and trading volume

This table presents the cross-sectional variations in the effect of institution investor distraction on analyst forecast thoroughness at analyst-firm-quarter level.
Regression specification for panel A:

$$\#TOT\_FORE_{j,i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 LOW\_MV_{j,i,t-1} + \beta_3 HIGH\_MV_{j,i,t-1} + \beta_4 DSTRQ_{i,t-1} * LOW\_MV_{j,i,t-1} + \beta_4 DSTRQ_{i,t-1} * HIGH\_MV_{j,i,t-1} + \beta_4 Controls_{i,t-1}$$

Regression specification for panel B:

$$\#TOT\_FORE_{j,i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 LOW\_VOL_{j,i,t-1} + \beta_3 HIGH\_VOL_{j,i,t-1} + \beta_4 DSTRQ_{i,t-1} * LOW\_VOL_{i,t-1} + \beta_4 DSTRQ_{i,t-1} * HIGH\_VOL_{j,i,t-1} + \beta_4 Controls_{i,t-1}$$

$LOW\_MV_{j,i,t-1}$ *(*$HIGH\_MV_{j,i,t-1}$*)* is a dummy variable, which equals one if the firm *i*'s market capitalization as of quarter *t*-1 is in the bottom (top) quartile of all firms the analyst *j* covers in quarter *t* and zero otherwise. $LOW\_VOL_{j,i,t-1}$ *(*$HIGH\_VOL_{j,i,t-1}$*)* is a dummy variable, which equals one if the firm *i*'s dollar trading volume as of quarter *t*-1 falls in the bottom (top) quartile of all firms the analyst *j* covers in quarter *t* and zero otherwise. Analyst related controls and firms' analyst coverage are measured in quarter *t* and other controls are measured in quarter *t*-1. Variable definitions can be found in the Appendix. 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: Interaction with market value ranking of firms covered by an analyst

	(1) $\#TOT\_FORE_{j,i,t}$
DSTRQ	5.408***
	(4.87)
$HIGH\_MV_{j,i,t-1}$	0.398
	(1.52)
$LOW\_MV_{j,i,t-1}$	-1.373***
	(-6.56)
$DSTRQ*HIGH\_MV_{j,i,t-1}$	-2.479***
	(-2.78)
$DSTRQ*LOW\_MV_{j,i,t-1}$	2.276***
	(3.02)
Constant	26.189
	(0.28)
Controls	YES
FEs: Firm, calendar-year quarter	YES
N	2,023,381
Adjusted R^2	0.502

Panel B: Interaction with trading volume ranking of firms covered by an analyst

	(1) $\#TOT\_FORE_{j,i,t}$
DSTRQ	5.153***
	(4.69)
$HIGH\_VOL_{j,i,t-1}$	1.483***
	(6.48)
$LOW\_VOL_{j,i,t-1}$	-2.005***
	(-10.08)

$DSTRQ*HIGH\_VOL_{j,i,t-1}$	-1.987**
	(-2.11)
$DSTRQ*LOW\_VOL_{j,i,t-1}$	2.373***
	(3.13)
Constant	26.189
	(0.28)
Controls	YES
FEs: Firm, calendar-year quarter	YES
N	2,023,381
Adjusted R^2	0.502

Table 7: Effect of institutional investor distraction on tone and accuracy of analyst earnings forecasts

This table presents the regression of analyst forecast tone, analyst stock recommendations, and analyst forecast error on institutional investor distraction. The definition of variables can be found in the Appendix.

$$FTONE_{i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 Controls_{i,t-1},$$
$$IRECCD_{i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 Controls_{i,t-1},$$
$$ABS\_AFE_{i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 Controls_{i,t-1}.$$

FTONE is the mean number of earnings forecast with positive forecast error for all analysts 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).The reported OLS results are at firm-quarter level. *ABS_AFE* is the mean value of the absolute value of analyst quarterly earnings forecast error scaled by the stock price (as of the end of previous quarter) for firm *i* in calendar quarter *t*. Analyst-level controls and firms' analyst coverage are measured in quarter *t* and other controls are measured in quarter *t*-1. Firm, 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.

	(1) *FTONE*	(2) *IRECCD*	(3) *ABS_AFE*
DSTRQ	-0.554***	-0.098**	0.006***
	(-5.55)	(-2.46)	(2.75)
Controls	YES	YES	YES
Constant	-1.462***	4.216***	-0.020***
	(-7.45)	(78.27)	(-4.30)
FEs: Calendar-year quarter	YES	YES	YES
FEs: Firm	YES	YES	YES
N	236,795	159,319	217,709
Adjusted R^2	0.300	0.144	0.685

Table 8: Robustness tests

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

$$\#TOT\_FORE_{j,i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_1 BB\_READER_{i,t-1} + \beta_3 Controls_{i,t-1}$$

$$\#TOT\_FORE_{j,i,t} = \beta_0 + \beta_1 DSTRQPNW_{i,t-1} + \beta_2 DSTRQBNW_{i,t-1} + \beta_3 Controls_{i,t-1}$$

$$\#EPS\_COM_{i,t} = \beta_0 + \beta_1 DSTRQ_{i,t-1} + \beta_2 Controls_{i,t-1}.$$

Analyst-level controls and firms' analyst coverage are measured in quarter *t* and other controls are measured in quarter *t*-1. The reported OLS result is at analyst-firm-quarter level. Panel A provides robustness analyses for the main results. Panel A, Column (1) use alternative institutional investor distraction measure. Column (2) decomposes our main institutional investor distraction measure into two alternative institutional investor distraction measures. Column (3) transforms the *#TOT_FOR* by taking the natural logarithm of one plus the measure. *DSTRQPNW (DSTRQBNW)* is institutional investor distraction measure based on existing shareholders' exposures to concurrent *positive (negative)* extreme returns of other stocks. Panel B presents estimates of OLS regression of analyst forecast thoroughness on institutional investors distraction at firm-quarter level. The definition of variables can be found in the Appendix. Analyst level controls and analyst coverage are from quarter t and other controls are from quarter t-1. The reported OLS results are at firm-quarter level. Firm and calendar year quarter fixed effects are included (Firm, analyst and calendar year quarter fixed effects are included for regressions in Panel B).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: Robustness tests with alternative dependent variables and independent variables

	(1)	(2)	(3)	(4)
	#TOT_FORE	*#TOT_FORE*	*#EPS_COM*	*LOG(#TOT_FORE)*
DSTRQ	3.715**		0.488***	0.085***
	(2.24)		(3.29)	(4.45)
BB_READER	0.659***			
	(2.68)			
DSTRQPNW		8.596***		
		(8.51)		
DSTRQBNW		5.273***		
		(5.58)		
Controls	YES	YES	YES	YES
Constant	48.218***	26.360***	4.597***	3.068***
	(11.21)	(17.09)	(31.17)	(77.94)
FEs: Calendar-year quarter	YES	YES	YES	YES
FEs: Firm	YES	YES	YES	YES
N	57,152	239,097	239,097	239,097
Adjusted R^2	0.475	0.600	0.758	0.702

Panel B: Analyst-firm-quarter level regressions

	(1) *#TOT_FORE*	(2) *#TOT_FORE*
DSTRQ	4.980***	4.966***
	(4.69)	(4.67)
LOGATQ	0.616**	0.626**
	(2.21)	(2.25)
LEVQ	-3.018***	-3.018***
	(-3.43)	(-3.43)
MTB	0.038**	0.037**
	(2.05)	(2.00)
IO	0.237	0.237
	(0.69)	(0.69)
ROA	3.965*	3.917*
	(1.92)	(1.90)
ABRET	0.450***	0.449***
	(3.27)	(3.26)
STD_RET	-47.709***	-47.476***
	(-3.77)	(-3.76)
FFI12_RET	-4.045***	-4.030***
	(-3.46)	(-3.45)
XRDQ	-0.143	-0.140
	(-1.30)	(-1.27)
TURNOVER	2.093***	2.089***
	(12.53)	(12.51)
AUE	-1.913**	-1.866**
	(-2.04)	(-1.99)
BADNEWS	-1.102***	-1.106***
	(-12.92)	(-12.99)
LOG_COVERAGE	3.197***	3.150***
	(9.49)	(9.35)
FIS_Q4	-0.842***	-0.840***
	(-3.42)	(-3.41)
EXP_GEN		0.174
		(0.10)
EXP_FIRM		-0.024***
		(-4.36)
ANALYS_FIRM		0.039***
		(3.77)
B_SIZE		0.003
		(0.26)
Constant	33.445***	24.059
	(16.01)	(0.26)
FEs: Calendar-year quarter	YES	YES
FEs: Firm	YES	YES
FEs: Analyst	YES	YES
N	2,023,381	2,023,381
Adjusted R^2	0.502	0.502