# FIRM-SPECIFIC INFORMATION ENVIRONMENT AND ANALYST FORECAST

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Abstract

FIRM-SPECIFIC INFORMATION ENVIRONMENT AND ANALYST FORECAST

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I examine how firm-specific private and public information affect analyst forecast revisions. I find that when managers easily beat (struggle to meet) the consensus forecasts in the previous quarter, financial analysts revise their earnings forecasts upward (downward). The revision magnitudes are higher when there is more private information. Similarly, I find that when managers provide upward (downward) earnings guidance, analysts revise their forecasts upward (downward) more when there is more private information. In contrast, the revision magnitudes are lower when there is more public information. Additionally, I find that the magnitudes of analysts' downward revisions increase with private information prior to the stock option grant dates. I attribute these results to the analysts' dependence on managers in gleaning relevant private information. The effect of private information is smaller for firms covered by star analysts, consistent with star analysts acting as sophisticated skeptics and being more confident in their forecasts than other analysts. Further, for well-governed firms, upward revisions for positive earnings surprises are smaller when there is more private information. This is consistent with stronger governance attenuating analysts' concerns about firms' earnings

quality, which in turn increases their reliance on public earnings numbers and reduces their need to accommodate managers for private information. Finally, I find that private information is negatively associated with target price forecast accuracy, and positively associated with target price forecast optimism. These results suggest that greater information asymmetry adversely affects forecast accuracy and creates incentives for analysts to appease managers to access private information.

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# Chapter 1

## Introduction

Sell-side analysts are vital information intermediaries between corporate insiders and outside investors. They accumulate, analyze, and disseminate information about the firms they follow to retail and institutional investors. Prior research shows that financial analysts face two opposing incentives in making their forecasts and recommendations. On one hand, they strive to provide valuable information to the investors by making accurate and impartial forecasts (e.g. Mikhail et al. 1999; Hong and Kubik, 2003; Jackson, 2005). Providing more precise estimates and accurate information to their clients enhances the reputation of analysts as information providers. I call this the reputation-enhancing incentive. However, to provide good recommendations, the analysts need some information that might be privately held by the managers. When the managers hold significant private information, a contrasting incentive is to gain access to the managers to glean their private information. Prior studies show that managers limit their access to analysts who issue less favorable forecasts (e.g. Chen and Matsumoto, 2006; Mayew, 2008). In order to gain access to managers of the firms they follow, analysts have an incentive to accommodate the desires of the managers. When managers can benefit from an optimistic (pessimistic) forecast, analysts who long for greater access to managers could accommodate the manager and provide an optimistic (pessimistic) forecast. I call this the management accommodation incentive. In order to provide the best recommendation to their clients, analysts trade off between these two incentives.

This study first investigates the extent to which analysts adjust their earnings forecasts to accommodate managers by benchmarking this revision against the revision indicated by the earnings release. When managers beat analysts' forecasts by a wide margin in the previous

period, they feel somewhat more confident they will meet or beat analysts' forecasts in the current period. In addition, prior research (e.g. Burgstahler and Eames, 2006; Soffer et al. 2000) suggests that managers prefer either meeting or slightly beating analysts' forecasts over greatly surpassing them, which is consistent with the managers not only trying hard to ensure that they do not miss the current forecasts, but also attempting to set a future point of reference that is more manageable for them. Another finding from the prior research is that managers tend to disclose some of the good news prior to the earnings announcements, rather than waiting until the earnings announcements to release all of the good news. This is consistent with managers caring about not just the benefits that come with meeting or beating the forecasts in the future, but the benefits associated with positive analysts' forecast revisions in the present as well. Therefore, I argue that when the managers handily beat analysts' forecasts in the previous period, they prefer analysts to revise forecasts upward in the current period, but only up to a certain extent so they will still be able to meet or beat the revised forecasts. Conversely, I posit that managers prefer analysts to revise their forecasts downwards when the previous earnings were well below the forecasts so that they have a better chance of meeting or beating analysts' forecasts in the current period.

I am interested in how private firm-specific information affects the tradeoff between the management accommodation and reputation enhancement incentives. On one hand, since the information provided by managers is a critical component of analysts' forecast models, analysts are more likely to accommodate managers when managers possess more private information. Therefore, analysts' accommodation incentive could be stronger when more of the firm-specific information is private. On the other hand, the accuracy of analysts' forecasts becomes more valuable to the investors when there is greater information asymmetry between managers and

investors. Therefore, when managers hold more private information, the analysts could have a stronger reputation-enhancing incentive to be even more accurate than when the managers hold less private information. The effect of private information on the tradeoff between the management accommodation and reputation-enhancement incentives, is, therefore, an empirical question.

Using a sample of 130,584 firm-quarter observations for analyses conducted at the aggregate firm level and a sample of 502,936 firm-analyst-quarter observations for analyses conducted at the individual analyst level between 1992 and 2016, I find that when the firm has a positive (negative) earnings surprise in the previous quarter, analysts revise their forecasts upward (downward) to a greater extent if more of the firm-specific information is private. In particular, I find that the revisions by analysts following these firms are higher than warranted by the information contained in the earnings announcement and the events that happen between the two forecasts. These findings suggest that analysts are strategically accommodating managers when there is more firm-specific private information.

It is worth noting that the extent of analysts' forecast revisions is affected by two factors: analysts' independent adjustments as new information becomes available, and analysts accommodating managers. For example, while analysts tend to be optimistic, they tone down their optimism and adjust their forecasts downwards when the actual earnings are lower than the previously forecasted earnings. The extent of forecast revision that is not explained by the difference between actual and previously forecasted earnings could be attributable to either the innate tendency of analysts to over- or under-react to the release of earnings, or a strategic choice made by analysts to accommodate managers, or a combination of the two. Both the analysts'

over (under)-reaction and strategic managerial accommodation is likely to depend on the composition of firm-level public and private information.

As managers' preference for the downward or upward analyst forecast revisions is unobservable and difficult to ascertain, I utilize management earnings guidance and stock option grants as the two additional measures on top of earnings surprises to better triangulate managerial intent. When managers issue higher (lower) earnings forecasts relative to the consensus analyst forecast, their likely intent is to guide analysts' forecasts upward (downward). Combining that with the documented managers' success in using management forecasts to influence analyst forecast revisions in the direction they want (e.g. Cotter et al, 2006; Christensen et al, 2011), management forecast is a logical measure of managerial preference for upward or downward analyst forecast revisions. Consistent with these results, using earnings surprises to extrapolate managerial intent, I find that when more of the firm-specific information is private, analysts revise their forecasts upward (downward) to a greater extent when managers issue upward (downward) earnings guidance. And since firms typically award stock options to the senior management at the money (i.e. the exercise price is set equal to the stock price on the grant date) as a part of their executive compensation, I assume that managers prefer downward analyst forecast revisions in advance of the grant dates to reduce stock prices temporarily and thereby maximize the potential payouts from their stock options (e.g. Aboody and Kasznik, 2000). I find that analysts revise their forecasts downward shortly before the stock option grant dates. This relationship indicates that analysts strategically accommodate managers. Further, I find that their downward revision is more when there is more private firm-related information, suggesting asymmetric conservative reaction by the analysts to private information. This effect of private information shows that the management accommodation effect is exacerbated when

there is more private information. In sum, regardless of using earnings surprises, management forecasts, or stock option grants to capture managerial intention, the results from all of the three tests point to greater analyst inclination to accommodate managers when firms are less transparent and have more private information.

Next, I study whether star analyst coverage makes a difference in the impact the firm information environment has on forecast revision. I identify star analysts as those who are recognized in the All-Star analyst ranking released annually by the *Institutional Investor* magazine. Star analysts are generally viewed as better analysts than their non-star peers because of their superior skills and resources (e.g. Stickel, 1992; Leone and Wu, 2008). As a consequence, they are likely to be less dependent on managers for information to generate accurate forecasts. They also have more to lose in terms of reputation if they are perceived to be overly accommodating to the managers instead of being impartial (e.g. Ljungqvist et al. 2006). If star analysts are in fact more independent, I expect the firms with star analyst coverage to have a less dramatic upward forecast revision (compared to the firms without star analyst coverage) when they report good news under greater information asymmetry.

However, it is documented in prior studies that greater access to management is itself one of the factors that determine star status (e.g. Brown et al. 2014). In a recent study, Rees et al. (2017) show that when star analysts have to provide less favorable recommendations, they do so on the weekend rather than weekdays to minimize public attention. The timing of unfavorable recommendations during low-public-attention periods, but favorable recommendations during other periods implies "pandering" to the managers. If star analysts, in fact, pander more, I expect the firms with star analyst coverage to have a more dramatic forecast revision when there is more private information, compared to similar firms without star analyst coverage. I find that firms

with star analyst coverage have less drastic upward forecast revision when firms with more private information report good news. This result is consistent with star analysts striving to be more independent and is not consistent with them pandering to managers. Star analysts appear to mitigate the impact of private information on forecast revision bias.

Furthermore, I examine whether the strength of board governance plays a central role in the relation between the firm's private information and analyst forecast revisions. Board governance is one of the important mechanisms the firm can use to monitor managers and assure outsiders of the integrity of the reported accounting numbers (e.g. Armstrong et al. 2010). Therefore, if the firm has weaker board governance in place, more private information can further lower analysts' confidence in the accuracy of the firm's earnings numbers and consequently change their forecasting behavior. Analysts likely focus more on getting the manager's private information by being more accommodating in their forecasts if they deem the firm's public information (e.g. earnings) to be unreliable. Indeed, I find upward revisions to be smaller for firms with stronger board governance when the firms report good news (i.e. earnings are well above the consensus forecast) and have more private information. This is consistent with analysts having greater confidence in the credibility of earnings reported by well-governed firms, and thus having weaker motivations to adjust their forecasts to comply with managers.

Finally, I examine how the firm's composition of public and private information affects individual analyst target price forecast optimism and accuracy. I find that private (public) information is positively (negatively) related to forecasting optimism and is negatively (positively) related to forecasting accuracy. These findings reinforce the view that greater information asymmetry makes accurate forecasts more elusive and gives analysts stronger incentives to please managers.

This study contributes to the literature in several ways. First, I show that analysts are more likely to give in to managers and change their forecasts when they are heavily reliant on private information held by managers. Second, this study helps foster a better understanding of the differences in forecasting patterns between star and non-star analysts. Star analysts are more capable of acquiring information that is helpful in producing accurate forecasts. They also have more reputational and financial loss at stake and are less apt to accommodate managers and issue forecasts that are more in line with managers' preferences, as opposed to their convictions regarding the future prospects of the firms they follow. Therefore, star analysts are more neutral and less keen than non-star analysts in issuing biased forecasts to accommodate managers. Third, my study provides additional evidence that board governance is a pivotal mechanism that monitors managers and gives outsiders, including analysts, reassurance that financial reports are dependable. Finally, this study expands our understanding of how a firm's information environment affects analyst target price forecasts, while the existing literature is primarily dedicated to earnings forecasts and stock recommendations. Understanding the circumstances under which analysts make their target price forecasts can provide useful insights to investors in the matter of forecast reliability and aid investors in making better investment decisions as they adjust for the biases in analyst target price forecasts.

The remainder of the thesis is organized as follows. I present a review of the related literature in the second chapter. The third chapter gives the development of hypotheses. The fourth chapter describes the data, variable measurement, and research design. I report and discuss the results in the fifth chapter. The sixth chapter provides concluding remarks.

# Chapter 2

## Related Literature

### 2.1. Firm-specific information environment

This study is connected to the extensive literature that explores the firm-specific information environment through stock price variation. French and Roll (1986) furnish evidence that return volatility is mostly explained by private information incorporated into stock prices through the trading of informed investors. Roll (1988) shows no association between a firm's stock price movements and its news events covered in the financial press, and thus attributes higher return variations to either more private information or irrational noise trading instead of public information. Durnev, Morck, Yeung, and Zarowin (2003) find that firms with higher stock price variability contain more information about future earnings in current stock prices, in agreement with Roll's viewpoint that greater firm-specific return variation is fueled by informed trading. Ferreira and Laux (2007) explore the impact of corporate governance and find a negative and significant association between idiosyncratic volatility and the number of firms' antitakeover provisions, indicating that less protection from hostile takeover threats promotes private information collection since the higher probability of takeover presents opportunities for speculative trading. Chen, Sadique, Srinidhi, and Veeraraghavan (2016) examine the audit setting and find that firms with higher audit quality are associated with lower idiosyncratic volatility, which suggests that higher quality firm-specific public information mitigates rather than encourages private information gathering. In effect, a greater reliance on public information diminishes the net benefits of collecting private information. Collectively, prior research establishes that idiosyncratic return volatility (IRV) is a manifestation of trading by investors

with private information and hence an appropriate measure of the relative amount of private information impounded into stock prices.

This study also adds to the growing literature that examines how firm-specific information environment plays a role in shaping analyst activities. Bhushan (1989) argues that the aggregate demand for private information increases with a firm's return variability as the expected trading profits are higher, which in turn drives up demand for analyst services and induces greater analyst coverage. Lang and Lundholm (1996) show that firms with more timely and informative disclosure attract more analysts, forge greater consensus among analysts, and contribute to more accurate analyst forecasts and less volatile forecast revisions. Altschuler, Chen, and Zhou (2015) find that the anticipation of an impending management forecast, on average, reduces the private information contained in analyst forecasts. The effect is more pronounced when earnings are harder to predict, conforming to the point of view that public information serves as a substitute for private information and crowds out analysts' efforts to collect private information, especially when the costs of acquiring it are high. Their findings conform to the view that analysts integrate both firm-supplied public announcements and individually-amassed private information into their forecasts, but place less weight on private information they acquire when public disclosures made by firms increase.

As stock prices reflect both public (e.g. quarterly earnings announcement) and private (e.g. informed trading) firm-specific information, it is important to distinguish between the two to better gauge the overall quality of a firm's information environment as more public information (i.e. less private information) equals greater transparency, resulting in less information asymmetry between managers and investors, and among different investors. This study focuses on whether the greater amount of firm-specific information being private

exacerbates the extent of sell-side analysts accommodating managers in their forecasts to gain access to private information held by management.

## 2.2. Opportunism and objectivity of analysts

This study is closely related to the line of literature that investigates whether analysts' need for access to management influences their forecasts. Some studies in this line of literature assume that managers prefer optimistic forecasts. Francis and Philbrick (1993) argue that analysts' task of striking a balance between producing reasonable forecasts and maintaining a cordial relationship with management often results in positively biased and not necessarily the most accurate forecasts. Therefore, forecast accuracy may not be a proper criterion for evaluating analysts' abilities. Das, Levine, and Sivaramakrishnan (1998) find that analyst earnings forecasts exhibit more upward biases for firms with lower earnings predictability, suggesting that analysts attempt to satisfy management in order to obtain private information. Lim (2001) proposes that analysts trade off optimistic bias for improved access to managers to minimize forecast errors and increase forecast predictability, suggesting that previous studies may jump to the conclusion that analysts' upward biases are irrational. Chen and Matsumoto (2006) find that analysts who upgrade a stock in their recommendations have better forecast accuracy than those who downgrade a stock, suggesting that managers feed more information to analysts who issue more favorable stock recommendations. Mayew (2008) notes that analysts with more optimistic forecasts are allowed to ask more questions to management during conference calls than their peers who hold less favorable views of the firm.

Contrarily, some other studies argue that managers do not always favor optimistic forecasts but instead favor pessimistic forecasts depending on the situation. Richardson, Teoh,

and Wysocki (2004) document a positive and significant association between insider selling after earnings announcements and pessimistic forecasts right before earnings announcements, reinforcing the thinking that managers prefer beatable forecasts, so they can sell their shares at a higher profit after beating analyst forecasts. Similarly, Ke and Yu (2006) find that analysts who walk down their forecasts (i.e. initial optimistic forecasts followed by pessimistic forecasts) experience greater forecast accuracy and better career outcomes, notably when firms have more intensive insider selling. In summary, the literature suggests that analysts cater to management through either upwardly or downwardly biased forecasts depending on the context, perhaps driven by a desire to improve forecast accuracy and advance their careers by gaining better access to private information held by managers.

### 2.3. Earnings announcement surprises

This study is related to the literature on managerial strategies to cope with the approaching earnings announcement surprises. Kasznik and Lev (1995) focus on firms with large earnings surprises, both positive and negative, and examine how their disclosure policies vary preceding a forthcoming earnings announcement. They find that bad news firms provide more voluntary disclosures relative to good news firms, and the greater the disappointment, the more quantitative and earnings-related information the managers disclose. This is consistent with the notion that managers preemptively alert investors to the bad news with more credible disclosures to narrow the expectation gap and avoid big letdowns when earnings are announced. Soffer, Thiagarajan, and Walther (2000) show that preannouncing firms with bad news release almost all of the bad news at the preannouncement, while ones with good news release only about half of the good news at the preannouncement. They suggest that managers of the bad news firms try to steer clear of negative earnings surprises at the formal earnings announcements by accelerating

the release of negative news, or try to preempt litigation, as releasing only part of the bad news potentially puts them in even greater litigation risk if later on they are found to have been aware of the entirety of the bad news at the time they made preannouncements. In contrast, managers of the good news firms only release some of the positive news at preannouncements and save the rest of the good news for the imminent earnings announcements in order to have positive earnings announcement surprises. The study by Matsumoto (2002) is one of the first few that document managers' penchant for avoiding negative earnings surprises, and one mechanism for them to accomplish that is by guiding analysts' forecasts. Brown and Caylor (2005) try to explain the increasing importance of meeting or beating expectations and propose that as firms attract more analysts and analysts' forecasts receive more media coverage over time, meeting or beating analysts' forecasts has overtaken avoiding reporting losses or earnings decreases as the top earnings benchmark that managers prioritize. Burgstahler and Eames (2006) provide evidence that both upward earnings management and downward expectations management are means that the management employs to avoid negative earnings surprises. One of their interesting findings is that managers seem to prefer small positive earnings surprises over substantial positive earnings surprises, and they achieve these by using discretionary accruals, by changing their operating decisions, and by molding analyst forecasts.

# Chapter 3

## Hypotheses Development

### 3.1 Earnings surprise as a measure of managerial intent

Given that management is the paramount source of private information and analysts' dependence on private information increases when public information is scarce, my first hypothesis, the management accommodation hypothesis, predicts that analysts are more likely to accommodate managers when private information forms a more substantial part of the entire information of the firm. For my first measure of managerial intent in terms of desire for optimistic or less optimistic forecasts, I utilize the earnings surprises in the previous period. When the actual earnings outstrip analysts' forecasts by a wide margin in the previous period, managers would want analysts to revise their forecasts upward in the current period so they can reap the benefits associated with contemporary elevated stock prices boosted by the more bullish forecasts. While they would prefer more upbeat forecasts, managers would want analysts to revise their forecasts only up to the level that they can reasonably achieve so they can still meet or beat the revised forecasts. On the contrary, when actual earnings fall well short of analysts' forecasts in the previous period, managers would prefer more downbeat forecasts in the coming period so they could be in a better position to meet or beat the forecasts.

A competing hypothesis makes an opposite empirical prediction. Analysts have strong incentives to provide accurate forecasts to advance their careers and maintain their reputations. Mikhail, Walther, and Willis (1999) find that analysts who issue inaccurate forecasts are more likely to be terminated by their brokerage firms. Jackson (2005) shows that investors pay more attention to analysts of high reputation, which is developed over time through accurate forecasts.

In addition to the benefits that analysts get from greater forecasting performance, investor demand for analyst coverage and accurate analyst forecasts increases when information asymmetry is greater. Barth, Kasznik, and McNichols (2001) find that firms with more intangible assets attract more analysts, lending support to the view that analyst service is much more sought-after under high information asymmetry. Frankel and Li (2004) show that analyst following is negatively associated with insider trading profits, consistent with analysts being effective in reducing information asymmetry rather than colluding with management. On the whole, the reputation enhancement hypothesis, argues that when information asymmetry is high and precise analyst forecasts are more desirable, analysts step up and meet investors' needs by issuing informative rather than misleading forecasts. Given that high information asymmetry creates both stronger incentives for analysts to acquire private information from managers and greater demand from investors for unbiased forecasts at the same time, I state my first hypothesis in the following null form.

Hypothesis 1a: Conditional on managers easily beating (struggling to meet) the analyst consensus forecast in the previous quarter, the degree of upward (downward) analyst forecast revision in the current quarter is the same regardless of the amount of firm-level private information.

In addition to measuring managerial intent by looking at the earnings surprises, I make use of the management earnings guidance as another proxy for managers' partiality towards more optimistic or pessimistic analyst forecasts.

3.2. Management earnings guidance as a measure of managerial intent

This study also complements the expectations-management literature which probes the effect of management earnings guidance on analyst forecasts. Management forecasts have long been considered one of the main channels through which managers can either communicate their private information to or alter the expectations of analysts and investors. Hassell, Jennings, and Lasser (1988) report that analyst forecast errors for firms that release management forecasts are smaller than the ones for similar firms that do not release management forecasts. This is consistent with the view that management forecasts contain useful information that analysts can incorporate and they are also able to adjust for potential biases in management projections to come up with more accurate forecasts. Hutton, Lee, and Shu (2012) compare the relative accuracy of management and analysts and identify that while analysts may have an information advantage in terms of access to proprietary macroeconomic data, management still has a clear information advantage when it comes to firm-specific operational decisions (e.g. how managers respond to unusual operating situations). Therefore, investors should take both management and analyst forecasts into account when making their investment decisions, as both management and analysts bring something valuable to the table. Kim and Park (2012) find that while the proportion of management earnings forecasts (MEFs) intended for expectation management is greater than that for the purpose of conveying tenable information, it is worth noting that a considerably large proportion of MEFs (45%) are aimed to improve the accuracy of earnings numbers anticipated by analysts and investors. Therefore, they caution against simply thinking of management guidance as an instrument for managers to manipulate expectations. However, they do find that management forecasts issued for the expectation management incentive increased after the Regulation Fair Disclosure (Reg FD), which can be explained by managers turning to

public disclosure to influence analyst forecasts as private communication between managers and select analysts was prohibited by Reg FD.

Baik and Jiang (2006) see a sizeable increase in the proportion of firms meeting or beating analyst forecasts after the management guidance date. They also find that firms with greater levels of transient institutional ownership or track records of meeting or beating expectations are more likely to provide pessimistic forecasts before earnings announcements to keep a lid on analysts' estimates as a way to avoid negative earnings surprises. Cotter, Tuna, and Wysocki (2006) also find that analysts revise their forecasts shortly after managers release their earnings forecasts and that analysts are more likely to issue meetable or beatable forecasts for the firms that provide public guidance. It appears that managers have generally been effective in using management guidance as one of the mechanisms to guide analyst forecasts toward the earnings targets they wish for. Christensen, Merkley, Tucker, and Venkataraman (2011) examine the impact of management earnings guidance on analysts' street earnings exclusions. Street earnings, or core earnings, is the non-GAAP earnings number which puts the firms in a more positive light because it usually excludes the non-recurring special items (e.g. restricting charges) and sometimes also excludes certain recurring items (e.g. R&D) that are harder for analysts to justify not being included. They find that the exclusions of both recurring and non-recurring line items by analysts are markedly higher when managers guide versus when they do not guide. The explanation that is congruous with this observation is that managers can sway analysts' street earnings exclusions through earnings guidance. Feng and McVay (2010) show that analysts have a propensity to overweigh management guidance before equity or debt offerings or M&A activities in hopes of increasing the chance of getting the underwriting business or M&A advisory fees. They conclude that analysts take their cues from management in setting their

short-term earnings forecasts when they have motives to please managers. Filzen and Peterson (2015) find that the length of accounting policy disclosure in the notes to financial statements is positively associated with the likelihood of firms beating analyst forecasts, suggesting that managers at firms with more complex financial statements have greater success in managing expectations of analysts, as analysts rely more on management guidance under higher forecasting difficulty. Taking all these studies together, it is safe to say that analysts take management guidance seriously and base their own forecasts off management forecasts to a discernable extent, either due to the usefulness of the management guidance itself or out of their ulterior motives to suit managers. When management guidance is more optimistic (pessimistic) than the consensus analyst forecast, it is indicative that managers are partial to upward (downward) forecast revision by analysts. Analysts know managers' preferences and the likelihood of them making every effort to satisfy managers is probably, at least to some extent, determined by the amount of private information of the firms, which leads to my next hypothesis:

Hypothesis 1b: Conditional on managers issuing upward (downward) earnings guidance previously, the degree of upward (downward) analyst forecast revision in the current quarter is affected by the amount of firm-level private information.

The last measure I use to infer managerial intent is examining the stock options awarded to managers. Stock options have gradually become the foremost part of executive compensation over time, and thus provide a fitting venue to determine managers' incentives.

### 3.3. Stock option grants as a measure of managerial intent

This study extends the stream of research on managerial incentives and opportunistic behavior around stock option grant dates. As stock options account for a significant share of the

performance-based compensation, which in turn is usually the largest component of executive total compensation, managers have strong incentives to minimize the stock prices on stock option grant dates because the exercise price is commonly set to be equal to the closing market price on the days of grants. In order to maximize the value of their stock options, managers either tinker with the timing of option awards or adopt various strategies preceding the option grants dates to depress the stock prices so they can get the lowest exercise price possible. Yermack (1997) finds that most stock options are awarded one day before the earnings announcements and that stocks experience significant price increases following the grant dates, which means that managers tend to receive stock option awards immediately before positive earnings announcements. He interprets the results as evidence that managers who anticipate the forthcoming favorable news wield their power to pressure the compensation committee into awarding them more stock options and timing the grant dates to their advantage. Lie (2005) notices a phenomenon that both negative abnormal returns before the grant dates and positive abnormal returns after the grant dates became more significant in the later years of his sample period from 1992 to 2002. He suggests that unless executives have somehow developed an uncanny ability to foresee the future stock price's trajectory, it is more likely the observed pattern of stock returns around the grant dates is due to the managers becoming more aggressive over time in setting the grant dates retroactively (i.e. backdating options to dates with lower prices). Heron and Lie (2009) show that the practice of backdating options has started to decline since the SEC began requiring firms to report option grants within two days of the grant dates. They also note that the firms that are more likely to delay reporting the grants are smaller, in the technology industry, audited by smaller audit firms, and have higher return volatility. Narayanan and Seyhun (2008) uncover that instead of backdating options, managers may choose to forward-

date options under certain circumstances. For instance, if the stock price has been falling before the board of directors meet together to determine the grant dates, obviously backdating is no longer appealing to managers. Instead, managers may wait and see if the stock price declines further in the period following the board meeting, and choose a day then so they can take advantage of an even lower exercise price. Similar to option grants, Callaghan, Saly, and Subramaniam (2004) record a comparable pattern of negative stock returns prior to and positive stock returns after the option repricing dates, lending credence to the sentiment that managers tamper with the option dates for their personal gains.

Apart from opportunistically timing the option grants, managers can use either voluntary disclosures or earnings management to drive down the share prices on the grant dates. Chauvin and Shenoy (2001) document a pattern of abnormal negative stock returns during the previous 10 days leading up to the grant dates. They infer that managers time the announcement of the unfavorable corporate news right before the options are granted. Aboody and Kasznik (2000) find that stock prices fall before and rise after the grant dates and that analyst forecasts are less optimistic during the 3-month period prior to the grant dates than the ones issued during other months. They attribute their findings to managers voluntarily disclosing bad news in a timely manner prior to the grant dates to suppress the share prices. They also find that managers who receive options awards prior to earnings announcements are better able to exert voluntary disclosures to influence the stock prices than those who receive options after earnings announcements. This is because managers usually have more intimate knowledge about their firms ahead of earnings announcements than shortly thereafter. Collectively, this stream of research suggests that executives achieve the lower exercise prices by manipulating the timing of releasing their private information to the market. More specifically, managers selectively

accelerate the release of bad news to precede the grant dates and postpone the release of good news until after the grant dates.

Alternatively, another thread of literature concentrates on whether managers manipulate the reported earnings instead of the disclosure or option grant dates. Baker, Collins, and Reitenga (2003) argue that if the stock options are the major constituents of the managers' compensation in a given year, managers are incentivized to report lower earnings prior to the grant dates. They show that discretionary accruals are negatively associated with the proportion of stock option grants to the executives' total compensation, supporting that managers interfere with not only the disclosure but also the financial reporting itself and use income-decreasing accruals to manage earnings downward to reduce the exercise price. Along the same line, Bergstresser and Philippon (2006) find more income-decreasing accruals in the periods when managers are awarded more stock options and more income-increasing accruals in the periods when they exercise more options. Coles, Hertzel, and Kalpathy (2006) note that discretionary accruals are noticeably negative in the periods preceding the option reissue dates after firms canceled the previous options that became out-of-the-money due to the market downturn. Bartov and Mohanram (2004) also find abnormally high discretionary accruals in the pre-option-exercise periods and reversals of the accruals in the post-exercise periods. Extending the research on the relationship between discretionary accruals and stock options, McAnally, Srivastava, and Weaver (2008) pay particular attention to whether managers purposely manage earnings downward to the point of missing earnings targets to bring down the exercise prices. They discover that firms that miss earnings targets have more substantial option grants subsequently. To sum up, managers would prefer lower stock prices on stock option grant dates so they can receive larger payouts when they exercise their options at a later time. As a result, managers would prefer less optimistic

analyst forecasts in the period right before stock option grant dates. I conjecture that since analysts are aware of managers' preferences prior to grant dates, they are more likely to meet the needs of managers when they are more dependent on managers' private information.

Hypothesis 1c: Prior to stock option grant dates, analysts revise their forecasts downward to a greater extent when private information makes up a greater proportion of firm-level information.

### 3.4. Star analysts and the effect of private information

Another strand of literature that is linked to this study identifies the differences between star and non-star analysts in multiple dimensions, such as individual characteristics, relative precision and informativeness of their research reports, market reaction to their outputs, and interactions between them and managers. Stickel (1992) associates star analysts with higher compensation and more accurate and frequent forecasts relative to non-star analysts. In a similar vein, Leone and Wu (2008) find that ranked analysts are associated with better performance measured by forecast accuracy and recommendation returns. They attribute ranked analysts' greater performance to their superior abilities rather than luck, as it persists over time. Ljungqvist, Martson, and Wilhelm (2006) show that star analysts are not as aggressive as non-star analysts in making their stock recommendations for the sake of winning the underwriting mandate to issue debt and equity securities. This is consistent with star analysts having greater incentives to preserve their reputation capital. Gleason and Lee (2003) argue that compared with non-star analysts, star analysts are more reputable and hence their forecasts and recommendations likely elicit stronger and speedier response from the consumers of their research reports. They show that post-forecast-revision price drift is smaller for celebrated

analysts than less known ones who have comparable forecasting abilities, suggesting that analysts' prestige dictates investors' perception of the reliability of their outputs and thus plays a crucial role in the market price discovery process.

Since star analysts are more credible and have a greater influence on capital market investors relative to non-star analysts, they are more likely to receive preferential treatment from managers. Mayew (2008) sifts through earnings conference call transcripts and reports that analysts who have less favorable outstanding stock recommendations get to ask fewer questions during conference calls. However, the penalty of lower participation imposed by managers only applies to non-star analysts and not to star analysts, consistent with the notion that managers are hesitant to punish star analysts as they fear that prestigious analysts are better able to inflict reputational and financial damage on them if those analysts suspect them of discrimination. Using the proprietary records of private interactions between analysts and management at a large-cap NYSE-traded firm, Soltes (2014) documents that star analysts not only get to ask more questions during the public conference calls but also speak privately with management more often over the phone or during office meetings. In light of the knowledge that star analysts have higher compensation and reputation cost at risk and thus are less likely to sacrifice their objectivity, they have better access to management and thus have less need to bend to managers, and they are better insulated from management retaliation when expressing their genuine perspective concerning the outlook of the firms, they are more likely to stay independent and base their forecasts on what they believe, and are less likely to join forces with managers to produce biased forecasts. Non-star analysts, on the other hand, have less need to worry about reputation and are more likely to go along with managers by altering their forecasts. Therefore, my first hypothesis related to the distinction between star and non-star analysts, the

independence hypothesis, predicts that star analyst coverage moderates the effect of private information on analysts altering their forecasts to gratify company management.

My alternative hypothesis, the pandering hypothesis, makes the opposite empirical prediction. Analyst rankings of *Institutional Investor* are often accused of being popularity contests rather than unbiased assessments of analysts' actual abilities. Emery and Li (2009) offer evidence on recognition being the primary determinant of whether non-stars become stars. Analysts from larger brokerage houses are more likely to be voted as star analysts for the first time. However, performance, measured by forecast accuracy or recommendation value, does matter when it comes to reigning star analysts trying to sustain their star status. If star analysts' maintaining their star status is decided by their ability to provide accurate forecasts consistently, they have greater incentives than their non-star peers to appease managers and secure greater access to their private information. Brown, Call, Clement, and Sharp (2014) survey over 300 buy-side analysts from various institutional investment firms. They find that the frequency of communication between sell-side analysts and managers is one of the top factors buy-side analysts consider when deciding whether to incorporate sell-side analysts' reports in their investment decisions. As sell-side analyst rankings are largely determined by the votes of buy-side analysts, star analysts have the motivation to maintain amicable relations with managers to be recognized by buy-side analysts. Rees, Sharp, and Wong (2017) show that one way for star analysts to win favor with managers is to strategically release their downgrade recommendations on weekends instead of weekdays, as a lower level of media and investor attention mitigates the negative impact associated with downbeat recommendations. On top of star analysts' greater motivation to cultivate relations with managers, prior research implies that managers themselves may also prefer to engage in the forecast manipulation process with them because they know that

the star analysts have a greater impact on the market than non-star analysts (e.g. Gleason and Lee, 2003; Mayew, 2008). Together, these studies suggest that star analysts are more inclined to cooperate with managers when private information constitutes a higher proportion of the total amount of information about a firm. Since coverage by star analysts can potentially culminate in either more or less conspiring with managers to issue biased forecasts, my second hypothesis is stated in the null form.

Hypothesis 2: The effect of firm-specific private information on analyst forecast revision is the same for firms with or without star analyst coverage.

3.5. Corporate governance and the effect of private information

Corporate governance is regarded as one of the main mechanisms firms can use to reduce information asymmetry between insiders and outsiders, and board structure is considered to be one of its key elements. Beasley (1996) finds that firms with a higher proportion of outside directors are less likely to have financial reporting-related enforcement actions brought against them by SEC. Ahmed and Duellman (2007) document that firms with a higher proportion of outside directors have a greater level of accounting conservatism, implying that outside directors are conducive to more timely disclosure of bad news by managers. Agrawal and Chadha (2005) and Krishnan (2005) show that financial expertise of the audit committee is negatively associated with the incidence of restatements and internal control problems, respectively. Srinidhi, Gul, and Tsui (2011) find a positive relation between female participation in the board and earnings quality. Altogether, these studies show that firms with a mix of diverse types of directors have higher financial reporting quality.

Given that the strength of board governance affects earnings quality, or at least the perception of the earnings quality of the firm, it likely affects how analysts incorporate the most recent earnings surprises into their latest forecasts. On one hand, outsiders, including financial analysts, have less trust in the reported earnings of firms with weak board governance. As a result, analysts likely have a greater sense of urgency to acquire private information in order to make up for the lack of reliable public information and are more willing to accommodate managers. Therefore, they likely revise their forecasts in the direction managers prefer to a greater extent for poorly-governed firms than for well-governed firms. On the other hand, managers of the firms with weak board governance likely withhold more bad news compared to those at the firms with strong board governance, which in turn increases analysts' concerns about management's trustworthiness. When more of the firm-related information is private (i.e. less transparent corporate information environment), it can amplify analysts' reservations about the reliability of the firm's financial reporting and cause them to discount the upbeat earnings numbers. As a result, analysts may revise their forecasts upward to a lesser degree compared to well-governed firms when there are positive earnings surprises. In short, the strength of board governance can potentially affect the impact of earnings surprises on forecast revisions in opposite ways, which leads to my third null hypothesis.

Hypothesis 3: Upward analyst forecast revision is the same for poorly-governed firms and well-governed firms when firms with more private information report earnings that easily top the consensus forecast.

3.6. Regulatory changes and the effect of private information

There have been new regulations introduced (e.g. Regulation Fair Disclosure, NASD Rule 2711, NYSE 472, among others) and enforcement levied (e.g. Global Analyst Research Settlement) since the early-2000s period that are conducive to more independent analyst research.[1] Regulation Fair Disclosure (Reg FD hereafter) requires that firms disseminate material information to all investors and analysts simultaneously. The Securities and Exchange Commission (SEC) aims to level the playing field for all investors by prohibiting firms from selectively disclosing value-relevant information to preferred analysts or institutional investors. NASD Rule 2711 and NYSE 472 forbid investment banks from determining analysts' compensation based upon the amount of investment banking revenue they bring in to address conflicts of interest faced by analysts. Rule 2711 also mandates investment banks and brokerage firms to disclose the distribution of stock ratings they issue. Under the Global Settlement, the ten large sanctioned investment banks are required to supplement their analysts' own research with reports from three independent research firms and physically separate their research and investment banking departments to prevent the interaction between the two divisions. As a consequence, analysts who only issue strong buy or buy recommendations may be seen as trying to please managers all the time instead of being objective, which in turn reduces (increases) the percentage of buy (sell) recommendations (Barber et al. 2006). Likewise, Kadan, Madureira, Wang, and Zach (2009) document that many investment banks transition from the five-tier rating system to the three-tier system (i.e. strong buy and strong sell ratings excluded) to obtain a more balanced distribution of ratings. They also show that analysts are less likely to furnish favorable

[1] The adoption of these regulations and the Global Settlement occurred during the 2000 - 2003 period. The NASD Rule 2711 and NYSE 472 were retired and replaced by FINRA Rule 2241 in 2015.

recommendations as they are under more scrutiny and better shielded from the pressure to solicit future underwriting business in the post-regulation period.

However, the results on the effectiveness of Reg FD in limiting private communications between managers and analysts in previous studies are mixed. Gintschel and Markov (2006) verify that the gap in the price impact of outputs by optimistic and less optimistic analysts decreases after Reg FD, consistent with optimistic analysts being rewarded with less private information by managers in the post-Reg FD period. Using a sample of multinational firms, Herrmann, Hope, and Thomas (2008) show that the positive association between upward-biased analyst forecasts and firms' international diversification documented in the literature considerably weakens after the introduction of Reg FD, supporting the presumption that the regulation reduces analysts' incentives to please managers to get private information. In contrast, Heflin, Subramanyam, and Zhang (2003) find no reliable evidence of a reduction in analyst performance in terms of forecast errors and dispersion in the post-Reg FD period, implying that the flow of private information to analysts is not disrupted. Mohanram and Sunder (2006) predict a decrease in analyst coverage after Reg FD as analysts need to expend more efforts to collect private information for each firm and thus cannot follow as many firms as they used to. They show that although the number of firms followed by non-star analysts drops significantly, star analysts' coverage remains at the same level. Moreover, star analysts are able to sustain their forecast accuracy while non-star analysts' accuracy deteriorates, implying that star analysts are either more capable of conducting a search for idiosyncratic information or they still enjoy better access to the private information held by managers in the post-Reg FD period.

In sum, if these regulations are effective in curbing private communications between managers and analysts, and encouraging more objective research outputs, analysts are less

motivated to cooperate with managers and adjust their forecasts to managers' likings. Conversely, if managers still grant certain analysts more access either through more private phone conversations and office meetings (Soltes, 2014), or allow them to ask more questions during public conference calls (Mayew, 2008), then analysts still have strong incentives to accommodate managers and their biased forecasts carry on. Therefore, whether management accommodation by analysts continues in the post-regulation period is an empirical question, which leads to my next null hypothesis:

Hypothesis 4: The effect of firm-specific private information on analysts accommodating managers through their earnings forecast revisions are the same in the pre- and post-regulation periods.

### 3.7. Price target

While analysts' earnings forecasts and stock recommendations have garnered much interest in academic research, price target forecasts have received relatively less attention. Bradshaw (2002) examines a small number of analyst reports and finds that analysts include price targets when issuing favorable recommendations. Bradshaw, Richardson, and Sloan (2006) show that optimism in stock price targets is positively associated with equity financing, consistent with analysts satisfying the demands of managers by issuing more optimistic price targets so the companies can raise more funding. Brav and Lehavy (2003) provide evidence that price targets encompass information that is valuable to market participants incremental to earnings forecasts and recommendations. Asquith, Mikhail, and Au (2005) examine the text of a larger sample of analyst reports and conclude that the market reacts to price target revision to a greater degree than earnings forecast revisions. They also find that market only reacts to the

target price and the strength of analysts' justification but not the other sections of research reports when analysts reiterate their recommendations, reinforcing the view that investors do attach importance to price targets and thus it is essential to increase our understanding of properties of target price forecasts.

I investigate whether the composition of public and private firm-specific information influences analysts' target price forecast accuracy and bias in a similar way to how it influences earnings forecasts. On the one hand, when public firm-specific information is lacking and they cannot simply rely on the limited amount of public information to generate accurate forecasts, analysts are more likely to be discouraged from issuing price target forecasts relative to earnings forecasts and stock recommendations because price targets deal with longer time horizons and require a tighter range of estimates.[2] When analysts do provide price targets, they may err on the side of caution and are more conservative since there is greater uncertainty involved. On the other hand, higher demand for private firm-level information when public information is in short supply prompts analysts to expend more efforts and resources to gather private information. In order to obtain an information advantage over their peers, analysts may be tempted to issue more upbeat price targets in hopes of acquiring private information held by managers to improve their forecast accuracy. One can also argue that when uncertainty is high, analysts may issue bolder price targets since it is harder to determine the firms' intrinsic values and the market may be more forgiving to analysts for inflated and inaccurate price targets. Therefore, whether more private firm-level information promotes more pessimistic or optimistic price targets is ambiguous. Thus, I state my fifth hypothesis in the null form as well.

[2] The majority of target price forecasts are 12-month-ahead forecasts (i.e. longer horizon) whereas most earnings forecasts are 1-quarter-ahead forecasts. Target price forecasts require point estimates (i.e. a specific price) whereas stock recommendations only come in five discrete levels (e.g. buy, hold, sell).

Hypothesis 5a: The mix of public and private firm-level information has no effect on target price forecast bias.

In addition, when private information constitutes a greater proportion of total information regarding the firms relative to public information, it is more difficult for analysts to provide accurate price targets and forecast accuracy is likely to decline. Hence, I state my next hypothesis in the following alternative form.

Hypothesis 5b: Target price forecasts are more (less) accurate when there is more public (private) firm-specific information.

# Chapter 4

# Data and Research Design

## 4.1. Data

I obtain analyst forecast data for my sample of U.S. firms from I/B/E/S. I use the detail file for analyses at the individual forecast level and use the summary file for analyses of the aggregate forecast at the firm level. My sample includes quarterly earnings forecasts for the period of 1992 - 2016 for firms with all fiscal year-ends and 12-month-ahead target price forecasts for the period of 2000 - 2016. I also obtain management earnings guidance data from I/B/E/S. I get the CEO stock option grant date data from ExecuComp.[3] I get financial statement data from COMPUSTAT and stock returns data from CRSP. I get corporate governance data for the period of 2003 - 2015 from MSCI GMI Ratings. Star analyst data are from the annual All-America Research Team ranking published in each October issue of the *Institutional Investor* magazine between 2000 and 2013.[4] Since each I/B/E/S detail recommendation file only provides the last name and the initial of an analyst's first name, I also hand collect analysts' biographical information and match them with I/B/E/S data on their employment history, the brokerage firms where they work, and the industries and firms they cover. I manually reconcile inconsistencies in analyst names over time due to errors in the database or name changes as well.

[3] For my sample of stock option grants to CEOs, I cross-check the exercise price data in ExecuComp against the share price data in CRSP and make sure they match. Drawing from the literature (e.g. Lie 2005; McAnally et al. 2008), I infer the grant dates from the expiration dates and make assumption that option maturities are denominated in whole years. Then I obtain the closing prices in CRSP from 5 weekdays before to 5 weekdays after the inferred grant date. The date that is closest to the inferred date and has the same share prices in both databases is identified as the grant date.

[4] *Institutional Investor* polls around 3,000 equity research directors, portfolio heads, money managers, and other investment professionals across a vast array of industries over a broad range of sectors every year to determine the best sell-side analysts. It has four rankings: first place, second place, third place, and runner-up, with the first three spots usually awarded to one analyst while the runner-up spot is often shared by multiple analysts. Analysts are rated based on various dimensions, such as industry knowledge, management access, professionalism, quality of their written reports, and forecast accuracy.

4.2. Measure of analyst earnings forecast revision

I compute the analyst forecast revision as the difference between the first one-quarter-ahead consensus earnings forecast for the current quarter t made after the release of the firm's earnings announcement of the previous quarter t-1 and the last two-quarter-ahead consensus earnings forecast made before the earnings announcement, divided by the lagged stock price to get the forecast revision. Consensus earnings forecast is defined as the mean of all analysts' forecasts for the firm-quarter and I require each firm-quarter to have a following of at least three analysts.[5] Next, I regress the forecast revision on the buy-and-hold return during the period between the earlier forecast and the day before the later forecast. Eq. (1) is estimated for each industry-year based on the Fama and French 48-industry classifications for all industries except utilities and financials with at least 20 observations in a given industry-year.[6]

$$Forecast\ Revision = \alpha + \beta_1\ Buy\ and\ Hold\ Return\ Between\ Forecasts\ + \varepsilon \qquad (1)$$

I then employ the residual (*Revision_Residual*) of the regression to gauge the level of forecast revision optimism or pessimism. A positive residual (i.e. actual revision is more positive than predicted) suggests analyst optimism while a negative residual (i.e. actual revision is more negative than predicted) indicates analyst pessimism.

4.3. Measure of managerial intent: earnings benchmark

To determine whether managers easily beat or struggle to meet analyst forecasts, I construct three firm-specific measures to confirm robustness. The first measure looks at the absolute magnitude of the difference between the actual earnings and the consensus forecast.

[5] I obtain similar results using the median of all analysts' forecasts as an alternative measure of the consensus forecast.
[6] I obtain similar results including the utility and financial industries.

The firm is categorized as easily beating the benchmark (*EB_absolute*) if the actual earnings are greater than the consensus forecast by at least 5 cents in the previous quarter t-1 and are categorized as struggling to meet the benchmark (*SM_absolute*) if the consensus forecast is greater than the actual earnings by at least 5 cents. The second measure considers the relative magnitude of the difference between the actual earnings and the consensus forecast among all the firms. I sort firms yearly based on the difference between actual earnings and consensus forecast scaled by the stock price into quintiles. Observations with the magnitude of the differences in the top quintile are classified as the easily beat group (*EB_relative*), and observations in the bottom quintile are classified as the struggle to meet group (*SM_relative*). As either the 5-cent cutoff point or the quintile designation might be viewed by some as arbitrary, I integrate the standard deviation of the consensus forecast into my third measure. The firms are designated as members of the easily beating (struggling to meet) group if their actual earnings are at least two standard deviations above (below) the consensus analyst forecast (*EB_2SD, SM_2SD).*[7]

4.4. Measure of managerial intent: management earnings guidance

To determine whether the management earnings guidance is upward or downward, I classify the majority of the management forecasts in this study using the groups to which I/B/E/S assigns the guidance. In other words, the shortfall group in the database would translate into the downward guidance (*MF_DownwardGuidance*) group, the match consensus group would belong to the neutral guidance group (*MF_NeutralGuidance*), and the beat consensus group would be included in the upward guidance group (*MF_UpwardGuidance*) in my sample. For the few management guidance observations that are assigned to none of the groups above in the database, I compare those management forecasts to the consensus analyst forecast at the time and

[7] I obtain similar results using 3 standard deviations above or below the consensus forecast.

assign them accordingly based on the differences between the two values.[8] For the firms that do not release management earnings guidance during the quarter, I use those observations as the base group (Non-Forecaster) in my multivariate analyses and see how analyst forecasts for the firms in one group differ from the ones in the other three groups depending on the information mix of the firms.

4.5. Measure of managerial intent: stock option grant

It is well accepted that the manager prefers a lower stock price on the stock option grant date, as the exercise price is set to the closing price on the grant date in most cases. Therefore, analysts who want to ingratiate themselves with managers might change their forecasting behavior around the option grant dates, and the amount of private information the manager holds presumably has some effect on that as well. I look at the forecast revisions where the later forecasts the analysts make are within 45, 30, and 15 days prior to the option grant dates, respectively. I exclude the observations with the earnings announcement during these 45-, 30-, and 15-day periods (i.e. no earnings announcement between the later forecast and the option grant date) to be more certain that the forecast revision is mostly driven by the stock option grant instead of the earnings announcement. The forecast revisions that are linked to a stock option grant date (*SO_Grant*) are then compared to the ones that are not followed by any stock option grants within those three timeframes.

[8] If the management forecast is at least 1 cent above the mean of the analyst forecasts at the time, then it is considered an upward guidance; if it is at least 1 cent below, then it is considered a downward guidance; if the difference is within ± 1 cent, then it is considered a neutral guidance.

4.6. Measures of firm-specific private and public information

Drawing on prior literature (e.g. Ferreira and Laux, 2007; Chen, Sadique, Srinidhi, and Veeraraghavan 2016), I use idiosyncratic return volatility (IRV) during the non-earnings-announcement period as a proxy for firm-specific private information.[9] I measure IRV for each firm, each year, by first estimating the regressions of daily excess stock returns on the three Fama-French factors:

$$ExcRet_{i,d} = \alpha + \beta_1(RM - RF)_{i,d} + \beta_2\, SMB_{i,d} + \beta_3\, HML_{i,d} + \varepsilon_i \quad (2)$$

where *ExcRet* is the daily stock return for firm *i* in excess of the risk-free rate on day *d,* and *RM - RF*, *SMB*, and *HML* are the three stock-market factors included in the Fama-French three-factor model to capture common variation in stock returns.[10] I then calculate the variance of residuals from the regression of all daily observations, excluding days during the 4 quarterly earnings announcement periods (i.e. daily observations that are not in the [-3, 1] window around earnings announcement dates), for each firm-year as my measure of *IRV*. I require each firm to have at least 120 days of stock return data to be included in the sample and multiply the original IRV by 100 for ease of interpretation. A higher IRV implies that a greater proportion of total amount of firm-specific information is private.

[9] Prior literature generally uses IRV over the entire year as a measure of private information based on the following logic: a year can be viewed as containing a shorter period around the earnings announcements and a longer inter-earnings-release period. Since IRV is affected more by the long non-earnings-release period than the short earnings-release period, IRV is mainly determined by the private information collection over the long inter-release period. In contrast, I use IRV over the non-earnings-release period to minimize the amount of public information contained in IRV (i.e. a more precise measure of private information). I obtain similar results using IRV over the entire year.

[10] Fama and French (1993) identify the market, size, and value/growth as the key factors to explain stock returns. I obtain the data for RM-RF, SMB, HML from Kenneth French's website http://mba.tuck.dartmouth.edu/pages /faculty /ken.french /data_library.html. I get similar results using the Fama-French 5-factor model in robustness tests.

To measure firm-specific public information, I follow Chen, Sadique, Srinidhi, Veeraraghavan (2016) and compute the earnings announcement volatility (*EAV*), which is the ratio of IRV during the earnings-announcement period to the IRV during the non-earnings-announcement period. Most public firm-specific information comes out at the same time during the earnings announcement period, due to both the regulation for mandatory disclosure and the growing trend of managers bundling voluntary disclosure with earnings announcements while private firm-specific information seeps into stock prices through informed trading all over the year.[11] *EAV* is therefore a measure (though noisy) of the relative amount of public firm-specific information with a greater value translating into a greater proportion of firm-specific information being public.

4.7. Regression models for earnings forecast revision

To test my hypothesis (H1a) regarding how the public and private firm-specific information respectively affects analyst forecast revision conditional on whether managers easily beat or struggled to meet analyst forecasts in the previous period, I examine both the forecast at the individual analyst level and the aggregate forecast at the firm level, and estimate various forms of the regressions using the following ordinary least squares (OLS) model.

[11] Securities and Exchange Commission mandates companies to disclose major corporate events on Form 8-K so that investors can be aware of the material information in a more timely manner. In addition to certain corporate events which need to be made public, the other main part of Form 8-K disclosures is related to financial statements and exhibits (section 9). This part is typically released at the same time as earnings announcements. See Anilowski, Feng, and Skinner (2007) and Rogers and Van Buskirk (2013) for the increase in managers' practices of issuing management forecasts contemporaneously with earnings announcements.

*OLS Model (Individual Forecast)*:

$$Revision\_Residual = \alpha + \beta_1\ IRV + \beta_2\ EB + \beta_3\ SM + \beta_4\ IRV\ x\ EB + \beta_5\ IRV\ x\ SM + \beta_6 Horizon + \beta_7\ Frequency + \beta_8\ NFIRM + \beta_9\ NIND + \beta_{10}\ Experience + \beta_{10}\ BrokerSize + \beta_{11}\ TopBroker + \beta_{12}\ SIZE + \beta_{13}\ BM + \beta_{14}\ TACC + \beta_{15}\ Following + \beta_{16}\ MacroUncertainty + \sum FIRM + \sum YEAR + \mathcal{E}$$

$$Revision\_Residual = \alpha + \beta_1\ EAV + \beta_2\ EB + \beta_3\ SM + \beta_4\ EAV\ x\ EB + \beta_5\ EAV\ x\ SM + \beta_6 Horizon + \beta_7\ Frequency + \beta_8\ NFIRM + \beta_9\ NIND + \beta_{10}\ Experience + \beta_{10}\ BrokerSize + \beta_{11}\ TopBroker + \beta_{12}\ SIZE + \beta_{13}\ BM + \beta_{14}\ TACC + \beta_{15}\ Following + \beta_{16}\ MacroUncertainty + \sum FIRM + \sum YEAR + \mathcal{E}$$

The variables *Revision_Residual*, *EB*, *SM*, *IRV*, *EAV* are described in the previous sections 4.2, 4.3, and 4.6. There are three main categories of controls that are relevant to the context of this study (e.g. Mikhail et al. 1997; Clement 1999; Jacob et al. 1999). First, I control for a set of analyst-specific characteristics that are believed to be associated with forecast accuracy and bias, including forecast horizon (*Horizon*), forecast frequency (*Frequency*), the number of firms and industries covered (*NFIRM* and *NIND*), and the number of years following the firm (*Experience*). I expect forecast horizon to be positively associated with forecast revision as it is more difficult for the analyst to make accurate forecasts when he or she has to predict earnings outcomes that are further away in the future. Therefore, the analyst has greater incentives to issue optimistic forecasts to gratify the manager in order to extract private information. The effect of *Frequency*, *NFIRM*, and *NIND* (proxies for the amount of effort the analyst devotes to keeping track of the firm) on forecast revision is less clear as one can argue that if an analyst spares no effort following the firm, it means he or she is really committed to

making accurate forecasts and thus more willing to accommodate the manager. At the same time, more effort could mean that he or she is more knowledgeable about the firm and thus less reliant on managers for private information. The effect of *Experience* is also ambiguous because if the analyst has followed the firm for a long time, he or she is more informed about what is going on with the firm and hence less dependent on the manager. However, longer tenure could also facilitate a cozy relationship between the analyst and the manager, which could potentially impair the analyst's independence. Second, I consider investment firm environment variables, like the size of the brokerage house (*BrokerSize* and *TopBroker*) since it likely dictates the amount of resources made available to their analysts and plays a part in the relationships between the analysts and the companies they follow; and third, I check the firm-specific factors that may influence forecast characteristics among analysts, like firm size (*SIZE*) measured by the natural logarithm of market value of the firm, book-to-market ratio (*BM*), and total accruals (*TACC*). Lastly, I control for the number of analysts following the firm (*Following*), which serves as a proxy for the amount of information available related to the firm. And I control for macroeconomic uncertainty using the measure of CBOE's Volatility Index (*VIX*).[12] Since macroeconomic uncertainty has a direct impact on a firm's operational strategy and process, it likely alters its disclosure policy and overall information environment as well. In addition, it is relatively costless for analysts to incorporate the factor of macroeconomic uncertainty into their analyses compared to the resources they have to use in order to get firm-level information (Kim et al., 2016). Therefore, analysts likely take macroeconomic uncertainty into consideration when forming expectations of the firm's future performance, and update their forecasts accordingly. For the analyses using individual analyst forecasts, I include the firm- and year-fixed effects to

[12] I obtain similar results using the dispersion in GDP growth forecasts from the Federal Reserve Bank of Philadelphia as an alternative measure of macroeconomic uncertainty.

attenuate the concern that variation in forecast revision may be partly driven by the firm and some trends over time. I cluster standard errors at the analyst level.[13]

*OLS Model (Aggregate Forecast)*:

$$Revision\_Residual = \alpha + \beta_1\ IRV + \beta_2\ EB + \beta_3\ SM + \beta_4\ IRV\ x\ EB + \beta_5\ IRV\ x\ SM + \beta_6\ SIZE + \beta_7\ BM + \beta_8\ LOSS + \beta_9\ NAF + \beta_{10}\ MacroUncertainty + \sum IND + \sum YEAR + \mathcal{E}$$

$$Revision\ Residual = \alpha + \beta_1\ EAV + \beta_2\ EB + \beta_3\ SM + \beta_4\ EAV\ x\ EB + \beta_5\ EAV\ x\ SM + \beta_6\ SIZE + \beta_7\ BM + \beta_8\ LOSS + \beta_9\ NAF + \beta_{10}\ MacroUncertainty + \sum IND + \sum YEAR + \mathcal{E}$$

For the analyses using the aggregate forecasts at the firm level, I control for *SIZE*, *BM*, operating performance (*LOSS*), the number of analyst earnings forecasts (*NAF*), and macroeconomic uncertainty measured by *VIX*. I include the industry- and year-fixed effects and cluster standard errors at the firm level.

To evaluate whether managers beating the forecast without difficulty or scrambling to meet the forecast in the previous period makes a difference to analyst forecasts of the current period in different firm information settings, I include two interaction terms for the firms with more private information: (1) the *IRV x EB* variable corresponds to *IRV* multiplied by an indicator variable that equals 1 if actual earnings of the firm were well above the consensus forecast in the preceding period, 0 otherwise; and (2) the *IRV x SM* variable corresponds to *IRV* multiplied by an indicator variable that equals 1 if actual earnings came in well below the consensus forecast in the preceding period, 0 otherwise. I include two interaction terms for the firms with more public information as well: (1) *EAV x EB* and (2) *EAV x SM*.

[13] Continuous variables are winsorized at the 1 % and 99 %.

These interaction terms are the variables of interest. A positive (negative) coefficient on *IRV x EB* (*IRV x SM*) is consistent with the theory that a greater amount of available firm-specific information being private exacerbates the problem of analysts pumping up (paring down) their forecasts to accommodate managers when managers easily beat (struggled to meet) the consensus forecast the last time. A negative (positive) coefficient on *EAV x EB* (*EAV x SM*) is consistent with the theory that a greater amount of firm-specific information being public alleviates the problem of analysts revising their forecasts by a greater magnitude to maintain favor with managers.

To test my hypothesis (H1b) regarding how the public and private firm-specific information respectively affects analyst forecast revision conditional on whether the management earnings forecast eclipses or comes in below the consensus analyst forecast,[14] I replace the main variables of interest (*EB, SM*, and their interaction terms with *IRV* or *EAV)* used in the OLS regressions for testing hypothesis H1a with a new set of variables (*MF_NeutralGuidance*, *MF_UpwardGuidance*, *MF_DownwardGuidance* and their interaction terms with *IRV* or *EAV*).

$$Revision\_Residual = \alpha + \beta_1\ IRV + \beta_2\ MF\_NeutralGuidance + \beta_3\ IRV\ x\ MF\_NeutralGuidance + \beta_4\ MF\_UpwardGuidance + \beta_5\ IRV\ x\ MF\_UpwardGuidance + \beta_6\ MF\_DownwardGuidance + \beta_7\ IRV\ x\ MF\_UpwardGuidance + \beta_8\ Horizon + \beta_9\ Frequency + \beta_{10}\ NFIRM + \beta_{11}\ NIND + \beta_{12}\ Experience + \beta_{13}\ BrokerSize + \beta_{14}\ TopBroker + \beta_{15}\ SIZE + \beta_{16}\ BM + \beta_{17}\ TACC + \beta_{18}\ Following + \beta_{19}\ MacroUncertainty + \sum FIRM + \sum YEAR + \mathcal{E}$$

[14] In addition to comparing it to the consensus analyst forecast, I also compare the management earnings forecast to the earlier individual analyst forecast that is used to calculate the forecast revision as an alternative test. I obtain similar results using either the consensus or earlier forecast.

$$Revision\_Residual = \alpha + \beta_1\ EAV + \beta_2\ MF\_NeutralGuidance + \beta_3 MF\_UpwardGuidance + \beta_4\ MF\_DownwardGuidance + \beta_5\ EAVxMF\_NeutralGuidance + \beta_6\ EAVx\ MF\_UpwardGuidance + \beta_7\ EAV\ x\ MF\_UpwardGuidance + \beta_8\ Horizon + \beta_9\ Frequency + \beta_{10}\ NFIRM + \beta_{11}\ NIND + \beta_{12}\ Experience + \beta_{13}\ BrokerSize + \beta_{14}\ TopBroker + \beta_{15}\ SIZE + \beta_{16}\ BM + \beta_{17}\ TACC + \beta_{18}\ Following + \beta_{19}\ MacroUncertainty + \sum FIRM + \sum YEAR + \mathcal{E}$$

To test my hypothesis (H1c) regarding how the public and private firm-specific information influences analyst forecast revision in the periods immediately before the stock option grant dates, I introduce the indicator variable, *StockOption_Grant*, and the interaction term of itself with either *IRV* or *EAV* to the regressions.

$$Revision\_Residual = \alpha + \beta_1\ IRV + \beta_2\ StockOption\_Grant + \beta_3\ IRV\ x\ StockOption\_Grant + \beta_4 Horizon + \beta_5\ Frequency + \beta_6\ NFIRM + \beta_7\ NIND + \beta_8\ Experience + \beta_9\ BrokerSize + \beta_{10}\ TopBroker + \beta_{11}\ SIZE + \beta_{12}\ BM + \beta_{13}\ TACC + \beta_{14}\ Following + \beta_{15}\ MacroUncertainty + \sum FIRM + \sum YEAR + \mathcal{E}$$

$$Revision\_Residual = \alpha + \beta_1\ EAV + \beta_2\ StockOption\_Grant + \beta_3\ EAV\ x\ StockOption\_Grant + \beta_4 Horizon + \beta_5\ Frequency + \beta_6\ NFIRM + \beta_7\ NIND + \beta_8\ Experience + \beta_9\ BrokerSize + \beta_{10}\ TopBroker + \beta_{11}\ SIZE + \beta_{12}\ BM + \beta_{13}\ TACC + \beta_{14}\ Following + \beta_{15}\ MacroUncertainty + \sum FIRM + \sum YEAR + \mathcal{E}$$

4.8. Measures of corporate/board governance

To measure the strength of board governance, I follow Larcker, Richardson, and Tuna (2007) and Srinidhi, He, and Firth (2014) and develop two measures, *BG IndexI* and *BG IndexII*. The first measure (*BG IndexI*) aggregates the following factors that determine board

effectiveness: board independence (measured as the percentage of outside directors), board diligence (measured as the number of board meetings), board expertise (measured as percentage of financial experts on the audit committee plus the number of directorships held by outside directors), and CEO power (CEO duality or founder CEO). I add the board independence, board diligence, and board expertise variables and subtract CEO power indicator variable to form the index.[15]

The second measure (*BG IndexII*) incorporates board independence (measured as the percentage of outside directors plus percentage of female directors minus percentage of affiliated directors), board diligence (measured as number of board meetings plus fraction of directors who attend more than 75 percent of meetings), board and audit committee sizes (sum of the number of directors on the board and audit committee), CEO power, and board busyness (measured as the percentage of outside directors who serve on four or more boards plus the percentage of inside directors who serve on three or more boards). I classify the firms with index scores greater than the median for the industry-year as "Strong CG" firms and the rest of the firms as "Weak CG" firms. The advantages of using the aggregate index are that it offers a more comprehensive assessment of the board governance and reduces the measurement error associated with each individual variable (see Larcker et al., 2007; Srinidhi et al. 2014).

4.9. Measures and regression models of target price forecast

Following prior research (e.g. Asquith, Mikhail, and Au, 2005; Bradshaw, Brown, and Huang, 2013), I construct three measures of target price forecast accuracy and bias. The first measure, *TP_ERROR*, is computed as the actual stock price at the end of the 12-month forecast

[15] I standardize the non-dichotomous variables that may have values outside the [0,1] range before aggregating all the variables.

horizon minus the price target scaled by the beginning stock price. I use the unsigned forecast error (|*TP_ERROR*|) to gauge accuracy and signed forecast error (*TP_ERROR*) to see whether the price target is overly optimistic or pessimistic. The second measure, *TP_METEND*, is an indicator variable and is set to 1 if the actual 12-month-ahead closing stock price is equal to or greater than the target price. The third measure, *TP_METANY*, is an indicator variable and is set to 1 if the price target is met anytime during the 12-month period. Higher frequency of meeting the price target either at the end of or during the forecast horizon hints that analysts are more pessimistic, whereas lower frequency suggests that analysts are more optimistic.

To test my hypothesis (H4) on whether the make-up of public and private firm-specific information affects analyst target price forecasts, I estimate the different regression models depending on the measure of target price forecasts. I use the OLS model for *TP_ERROR* and |*TP_ERROR*| and the Probit model for *TP_METEND* and *TP_METANY.*

*OLS Model:*

$$TP\_ERROR \text{ or } |TP\_ERROR| = \alpha + \beta_1\ IRV \text{ or } EAV + \beta_2\ Lag\ TP\_ERROR \text{ or } Lag\ |TP\_ERROR| + \beta_3\ PRCMOM + \beta_4\ STDPRC + \beta_5\ MKTRET + \beta_6\ LOGMV + \sum IND + \sum TIME + \mathcal{E}$$

*Probit Model:*

$$Prob\ (TP\_METEND \text{ or } TP\_METANY = 1) = \alpha + \beta_1\ IRV \text{ or } EAV + \beta_2\ Lag\ TP\_METEND \text{ or } Lag\ TP\_METANY + \beta_3\ PRCMOM + \beta_4\ STDPRC + \beta_5\ MKTRET + \beta_6\ LOGMV + \sum IND + \sum TIME + \mathcal{E}$$

When the dependent variable is *TP*_ERROR, TP*_METEND*, or *TP_METANY* and the variable of interest is *IRV*, a negative coefficient on $\beta_1$ is consistent with the argument that more

private firm-specific information prods analysts into issuing overly optimistic forecasts to win managers over, whereas a positive coefficient on $\beta_1$ suggests that analysts issue more pessimistic price targets when uncertainty is high. When the variable of interest is *EAV*, a positive coefficient on $\beta_1$ is consistent with the argument that more public firm-specific information prompts less optimistic forecasts as it is less necessary for analysts to curry favor with managers. When the dependent variable is |*TP_ERROR*| and the main variable of interest is *IRV (EAV)*, I expect the coefficient $\beta_1$ to be positive (negative) as more private (public) information hinders (improves) analysts' capability to provide accurate forecasts.

I include a set of analyst and firm characteristics that are identified as principal determinants of analyst target price forecast accuracy and bias. The variable *Lag TP_ERROR, Lag |TP_ERROR|, Lag TP_METEND, or Lag TP_METANY* is one of the measures of analysts' target price forecast performance in the previous period (*Lag TP_PERFORM*) and is expected to be positively associated with their target price forecast performance in the current period, assuming analysts' forecast abilities are persistent. To ensure independence in prices and to circumvent the automatically positive relation between previous and current target price forecast performance, the forecast made in the current period cannot overlap with the forecast horizon of the previous forecast. For instance, if the analyst's current price target is released during the second half of the year 2002, the 12-month-ahead target price forecast that is used as the measure of his prior performance has to fall in the first half of 2001. The variable *PRCMOM* is price momentum and is expected to be negatively associated with |*TP_ERROR*| and positively associated with *TP_ERROR*, *TP_METEND*, and *TP_METANY,* consistent with the results of excess returns associated with adopting trading strategies of buying past winners and selling past losers as there seem to be delayed price reactions to firm-specific information, at least in the

short run (see Jegadeesh and Titman, 1993). The variable *STDPRC* is the standard deviation of stock price, and is expected to be positively associated with |*TP_ERROR*| and negatively associated with *TP_ERROR, TP_METEND,* and *TP_METANY,* compatible with the philosophy that target price forecasts become more difficult, less accurate, and more optimistic when the stock price is less predictable. The variable *MKTRET* is the value-weighted market return over the forecast horizon period, and is expected to be negatively associated with |*TP_ERROR*| and positively associated with *TP_ERROR*, *TP_METEND,* and *TP_METANY* since the individual firm's stock price is likely to move in the same direction as the overall market. The variable *LOGMV* is measured by the natural logarithm of the firm's market value. It is expected to be negatively associated with *TP_ERROR*, |*TP_ERROR*|, *TP_METEND*, and *TP_METANY*, congruent with the belief that price targets for larger firms are less likely to be attained but the absolute forecast errors are also smaller. Finally, I include industry-fixed effects using the Fama-French 48-industry classification and time-fixed effects using the semi-annual period, and I cluster standard errors at the analyst level.

# Chapter 5

# Empirical Results

## 5.1. Sample composition and descriptive statistics

Table 1, Panel A shows the distribution of firm-quarter observations across industries between 1992 and 2016 from the I/B/E/S summary file for the analyses performed at the aggregate firm level. Panel B shows the distribution of analyst-firm-quarter observations across industries between 1992 and 2016 from the I/B/E/S detail file for the analyses performed at the individual analyst level. My sample period starts in 1992 as the data for stock option grants, one of the measures I use to proxy for managerial intent, became available then.

Table 2, Panel A provides the descriptive statistics for the variables in the main regression analyses of the effect of firm-specific information on earnings forecast revisions at the aggregate firm level. It also provides the descriptive statistics for the variables in the analyses of the effect of board governance on the relationship between the firm information environment and forecast revision. Panel B exhibits the descriptive statistics for the variables in the three separate subsamples that form the full sample. As expected, I find that the easily beat sample has the highest analyst forecast revision, while the struggle to meet sample has the lowest analyst forecast revision. I also find that the firms in the easily beat group have more public information and less private information than the struggle to meet group, which is unsurprising as firms that perform well are likely more eager to share information with outsiders, whereas firms that do not do well are less willing to do so to avoid scrutiny. The easily beat sample firms also seem to be larger firms and have more analyst coverage. Panel C and D divide the full sample into two groups based on the strength of board governance measure (*BG IndexI* or *BG IndexII*). It appears

that firms with strong board governance have more private information and less public information than the firms with weak board governance, which may seem counter-intuitive at the first glance, but may be explained by weak governance firms compensating for weakness in board governance by being more forthcoming with their information, or firms with greater information asymmetry seeking to rectify that by strengthening their board governance. Panel E displays the descriptive statistics for the variables in the main regression analyses at the individual analyst level. Each analyst on average provides at least one forecast in a given quarter, follow more than ten firms in three industries for around five years. Not surprisingly, I find that all three subsamples at the individual analyst level have similar firm-specific information environments and other firm characteristics to their counterparts at the aggregate firm level shown in Panel B. Panel F reports the descriptive statistics for the variables in the analyses of target price forecasts. On average, target prices are met 41 % of the time at the end of the 12-month forecast horizon and 66% of the time on at least one day during the 12-month period. The distributions of forecast-related variables, firm-specific information measures, board governance measures and their components, and control variables are for the most part in line with prior research in all panels.

5.2. Impact of firm-specific private and public information

Table 3, Panel A presents the results of the OLS regressions of the aggregate firm earnings forecast revision bias (*Revision_Residual*) on firm-specific private information (*IRV*). The negative and significant coefficients on *IRV* lend credence to the view that when more of the firm-specific information is private (i.e. less transparent), analysts are more cautious and revise their forecasts downward more. *EB* is a dummy variable that is set equal to 1 if the manager easily beat the consensus forecast in the previous quarter, and 0 otherwise. *SM* is a dummy

variable that is set equal to 1 if the manager struggled to meet the consensus forecast in the previous quarter, and 0 otherwise. As expected, the positive and significant coefficients on *EB* suggest that analysts revise their forecasts upward when earnings came in much higher than expected in the last quarter. The negative and significant coefficients on *SM* suggest that analysts revise their forecasts downward when earnings came in much lower than expected in the last quarter. These results are consistent with analysts incorporating the latest firm-related information contained in the most recent earnings announcement into their updated forecasts, but revisions are greater than expected, reflecting a certain degree of bias and overreaction. The positive and significant coefficients on the interaction term *IRV* * *EB* (with t-statistics of 8.51, 5.68, and 10.05), along with the negative and significant coefficients on the interaction term *IRV* * *SM* (with t-statistics of -22.40, -18.03, and -19.89), indicate that greater private information exacerbates the bias in analyst forecast revisions as analysts attempt to augment access to privately-informed managers by accommodating managers to a greater extent in their forecast revisions. The positive and significant coefficient on *SIZE* is consistent with the thought that larger firms tend to be more profitable, thus leading to more upward revisions by analysts. The negative and significant coefficients on *BM* and *LOSS* suggest that analysts seem to favor the glamour stock and take the cue from a firm's recent operating performance and revise their forecast downward when the firm reported negative earnings in the previous period. The negative and significant coefficient on *MacroUncertainty* implies that the less predictable the level of macroeconomic activities are, the more cautious and conservative financial analysts are in making their forecasts. In all, the results support the management-accommodation instead of the reputation-enhancement argument, and are consistent across all the earnings surprise

measures used to represent a managerial preference for upward or downward analyst forecast revisions.

Panel B presents the analysis of the effect of firm-specific public information on forecast revision bias. The insignificant positive or negative coefficient on *EAV* (versus the significant negative coefficient on *IRV*) hints that analysts are more satisfied with the quality of the firm's overall information environment and thus revise their forecasts downward to a lesser extent. The negative and significant coefficients on the interaction term *EAV* * *EB* (with t-statistics of -3.27, -3.88, and -2.65) as well as the positive and significant coefficients on the interaction term *EAV* * *SM* (with t-statistics of 5.00, 1.75, and 3.89) indicate that when more of the firm-level information is public, analysts look to comply with managers less as their dependence on private information held by managers decreases and they can just utilize publicly available information to prepare their forecasts. Taken together, Panels A and B of Table 3 provide evidence that the firm-level information environment is a crucial factor that explains the direction of and cross-sectional variations in the association between earnings surprises and analyst forecast revisions.

Panel C reports the results of using management earnings guidance as the measure of managers' preference for upward or downward analyst forecast revisions. The positive and significant coefficients on the interaction term *IRV* * *MF_UpwardGuidance* (with t-statistics of 9.56 and 10.29), and the negative and significant coefficients on the interaction term *IRV* * *MF_UpwardGuidance* (with t-statistics of -13.54 and -13.85) suggest that analysts revise their forecasts to a greater extent in the direction the managers prefer when the firms have more

private information.[16] The insignificant coefficients on the interaction term *EAV * MF_UpwardGuidance* suggest that when the firms have more public information, analysts do not come across as accommodating managers by altering their forecasts in the directions that the managers favor.

Table 4 gives the results for the differential impact of the firm information environment on analyst forecast revision between firms with and without star analyst coverage. The first two columns show the analysis with the effect of private information, and the last two columns show the analysis with the effect of public information. The less significant coefficient on *IRV * EB* for the subsample with star analyst coverage compared to the one without star analyst coverage indicates that when there is more private information, forecasts for firms with star analyst coverage are revised upward to a lesser degree relative to those of firms without star analyst coverage when firms report good news. This is consistent with star analysts being more independent and thus more skeptical about the credibility of reported earnings when firms are less transparent.

Table 5 examines whether board governance makes a difference in the effect of firm-specific information on analyst forecast revision. The strong and weak board governance subsamples are constructed by a median split, where the firms with above-median (below-median) governance scores are designated as strongly (weakly) governed firms. Columns (1) to (4) show the results using *BG IndexI* and Columns (5) to (8) show the results using *BG IndexII* as the measure of the strength of board governance. The insignificant coefficients on *IRV x EB* (with t-statistics of 1.34, -0.02, 1.62, and 0.39) for the strong board governance subsample and

[16] While the coefficients on the interaction term *IRV * MF_NeutralGuidance* is also statistically significant, the coefficients on the interaction term *IRV * MF_UpwardGuidance* are significantly greater (Not tabulated, with F-statistics of 55.91 and 82.50).

the significant coefficients on *IRV x EB* (with t-statistics of 4.80, 2.66, 4.30, and 2.15) for the weak board governance subsample support the idea that when the firms have stronger (weaker) board governance in place, analysts are more (less) confident in the firm's reported earnings, which is public information. Therefore, they are less (more) likely to accommodate managers as there is lesser (greater) need for analysts to acquire private information.

Table 6, Panel A presents the results of the OLS regressions of the individual analyst earnings forecast revision (*Revision_Residual*) on firm-specific private information (*IRV*). Consistent with the results of the analyses using earnings forecasts aggregated at the firm level, I find that analysts revise their forecasts upward (downward) more when managers handily beat (wildly miss) the consensus forecast in the previous quarter when there is more private information. Panel B reveals that analysts revise their forecasts to smaller degrees when there is more public information. Panel C shows that analysts revise their forecasts upward (downward) more when managers issue upward (downward) earnings guidance when private information is plentiful, and revise less when public information is abundant. Panel D examines the effect of stock option grants on analyst forecast revision. Managers have incentives to rein in share prices on the stock option grant dates, so they prefer lower analyst forecasts prior to the grant dates. I find that analysts revise their forecasts downward more in the periods leading up to the grant dates when private information is bountiful. To summarize, analysts show signs of accommodating management to a greater extent when public information about the firms is limited, as they try to obtain the private information possessed by management.

Table 7 examines the impact of various regulations and enforcement that took effect in the early-2000s period on analyst forecast revision. The negative and significant coefficient on

*IRV x PostRegulation* suggests that analysts are more cautious in the post-regulation period than they are in the pre-regulation period when the amount of private information is high.

Table 8, Panel A presents the results of the OLS and Probit regressions that analyze the effect of firm-specific private information on analyst target price forecast optimism and accuracy. The negative and significant coefficient on *IRV* when the dependent variable is *TP_ERROR, TP_METEND,* or *TP_METANY* supports the view that when more of the firm-specific information is private, analysts issue more optimistic target price forecasts to gain favor with managers in order to obtain private information. Consistent with my hypothesis, the positive and significant coefficient on *IRV* is positive when the dependent variable is |*TP_ERROR*|. This result shows that when private information constitutes a greater proportion of available firm-specific information, it makes analysts' job of making accurate forecasts more difficult and thus their forecast accuracy declines.

Panel B provides the results for the analysis of the effect of firm-specific public information on target price forecast. The positive and significant coefficient on *EAV* when the dependent variable is *TP_ERROR, TP_METEND,* or *TP_METANY* demonstrates that target price forecasts are less upward-biased when analysts are less dependent on private information from managers and can rely more on publicly available information. The negative and significant coefficient on *EAV* when the dependent variable is |*TP_ERROR*| shows that target price forecast accuracy improves when more firm-specific information is public, which makes accurate forecasts less difficult and more attainable.

5.3. Additional Analyses

Table 9 presents the first set of robustness tests using the alternative measures of firm-specific private information to alleviate the concern for construct validity. In columns (1) to (3) are the results of the first alternative measure, *IRV* derived from the Fama and French 5-factor model (2016), in lieu of *IRV* from the 3-factor model used in the primary analyses. In columns (4) to (6) are the results of the second alternative measure, *Bid-Ask Spread*, a proxy for information asymmetry with a higher value corresponding to a less transparent firm information environment. One thing worth pointing out is that the coefficients on *Bid-Ask Spread* are positive, as opposed to the negative coefficients on *IRV*. One probable explanation could be that *IRV* measures the information asymmetry between insiders and outsiders of the firm, whereas *Bid-Ask Spread* measures the information asymmetry among the outside parties of the firm (disagreement on the firm's share price between sellers and buyers of the firm's stock). That being said, the interaction terms provide further support that analysts accommodate managers more when information asymmetry is high. In essence, both measures produce similar results to the ones in the primary tests and thus do not change my inferences about the effect of firm-specific private information on analyst forecast revision.

# Chapter 6

# Conclusion

In this study, I examine the effect of firm-specific private and public information on the relation between earnings surprises and analyst forecast revisions. I find that analysts revise their forecasts upward (downward) more in the current period when managers easily beat (struggled to

meet) the expectations of analysts in the previous period when there is more private firm-level information, and revise less when there is more public firm-level information. I then show that the firm-specific information has a similar effect on the connection between management forecasts and analyst forecast revisions. Analysts follow managers' cues and revise their forecasts upward (downward) when managers issue upward (downward) earnings guidance. The magnitudes of forecast revisions increase with private information. I also show that analysts revise their forecasts downward to a greater degree in the periods leading up to the dates CEOs receive their stock options when there is more private information. These findings corroborate the view that analysts strategically align their forecasts with managers' preferences to have better access to managers' private information when information asymmetry is high. Moreover, I examine how the presence of star analysts and the strength of board governance influence the impact of firm-level information on forecast revision. I find upward revisions are smaller for firms with star analyst coverage when there is more private information, consistent with star analysts being more cautious than their non-star peers. And I find upward revisions are smaller for firms with strong board governance, consistent with analysts having more trust in reported earnings and thus feeling less compelled to accommodate managers for private information. Finally, I examine how firm-level information affects analyst target price optimism and accuracy. I document a positive (negative) association between private (public) information and forecast optimism, and a negative (positive) association between private (public) information and forecast accuracy. These findings amplify the beliefs that greater information asymmetry results in more optimistic forecasts by analysts as they hope to build a better relationship with privately-informed managers, and lower information asymmetry makes analysts' assignment of issuing accurate forecasts more achievable.

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**APPENDIX A**

Variable Definitions

| Variable | Definition |
|---|---|
| Forecast-related variables | |
| *Revision_residual* | The residual from the regression of forecast revision on the buy-and-hold return during the period between the earlier forecast to the day before the latter forecast. The forecast revision is measured by taking the first one-quarter-ahead consensus earnings forecast made after the firm's earnings announcement of the previous quarter t-1 minus the last two-quarter-ahead consensus earnings forecast before the earnings announcement of the quarter t-1, scaled by the stock price on the day of the earlier forecast. |
| *EB_absolute* | An indicator variable; set to one if the firm's earnings is greater than the consensus forecast by at least 5 cents in the quarter t-1, and zero otherwise. |
| *EB_relative* | An indicator variable; set to one if the difference between the firm's earnings and the consensus forecast in the quarter t-1 scaled by the stock price is in the top quintile, and zero otherwise. |
| *EB_2SD* | An indicator variable; set to one if the firm's earnings is more than two standard deviations above the consensus forecast in the quarter t-1, and zero otherwise. |
| *SM_absolute* | An indicator variable; set to one if the firm's earnings is lower than the consensus forecast by at least 5 cents in the quarter t-1, and zero otherwise. |
| *SM_relative* | An indicator variable; set to one if the difference between the firm's earnings and the consensus forecast in the quarter t-1 scaled by the stock price is in the bottom quintile, and zero otherwise. |
| *SM_2SD* | An indicator variable; set to one if the firm's earnings is more than two standard deviations below the consensus forecast in the quarter t-1, and zero otherwise. |
| *MF_NeutralGuidance* | An indicator variable; set to one if the firm's management earnings guidance is in line with either the consensus analyst forecast at the time of earnings guidance or the earlier analyst forecast used in the calculation of forecast revision, and zero otherwise. |
| *MF_UpwardGuidance* | An indicator variable; set to one if the lower bound of the firm's management earnings guidance is at least 1 cent above the consensus analyst forecast at the time of earnings guidance or the earlier analyst forecast used in the calculation of forecast revision, and zero |
| *MF_DownwardGuidance* | An indicator variable; set to one if the upper bound of the firm's management earnings guidance is at least 1 cent below the consensus analyst forecast at the time of earnings guidance or the earlier analyst forecast used in the calculation of forecast revision, and zero |
| *TP_ERROR* | Target price forecast error, calculated as the stock price 12 months following the price target release date minus the target price then scaled by the stock price three trading days before the price target release day (P12-TP)/P. |
| *\|TP_ERROR\|* | The absolute value of the target price forecast error \|(P12-TP)/P\|. |
| *TP_METEND* | An indicator variable; set to one if the closing stock price at the end of the 12-month forecast horizon is greater than or equal to the target price, and zero otherwise. |
| *TP_METANY* | An indicator variable; set to one if the closing stock price at anytime during the 12-month forecast horizon is greater than or equal to the target price, and zero otherwise. |
| Firm-specific Information Variables | |
| *IRV* | Idiosyncratic return volatility during the non-earnings-announcement period in the year t-1 relative to the revised earnings forecast, computed as the variance of the regression residuals from either the Fama and French 3-factor or 5-factor model multiplied by 100. Each firm needs to have at least 120 days of stock return data in a given year to be included in the sample. |
| *EAV* | Earnings announcement volatility, computed as idiosyncratic return volatility over the fiscal year-end earnings announcement periods (i.e., event days [-3,+1] around each fiscal year-end earnings announcement) divided by idiosyncratic return volatility over all the other days during the year t-1 relative to the revised earnings forecast except for the three quarterly earnings announcement periods (i.e., event days [-3,+1] around each quarterly earnings announcement). |
| *Bid-Ask Spread* | The average of bid-ask spreads of a firm from the third Wednesday of each month in the year t-1 relative to the revised earnings forecast. Bid-ask spread is computed by subtracting the bid price from the ask price, divided by the average of the two prices. |

(continued)

| Variable | Definition |
|---|---|
| Board Governance Variables | |
| *BG IndexI* | % Outside Directors + # Board Meetings + % Financial Experts + # Directorships - CEO power. |
| *BG IndexII* | Independence Index + Meetings Index + Size Index - CEO power - Busy Index. |
| *% Outside Directors* | The percentage of outside directors on the board. |
| *% Female Directors* | # female outside directors / # total outside directors. |
| *% Affiliated Directors* | The percentage of affiliated directors on the board. |
| *% Financial Experts* | The percentage of accounting or financial experts who serve on the audit committee. |
| *# Board Meetings* | The number of board meetings held in a given year. |
| *# Directorships* | The average number of other boards on which outside directors serve. |
| *CEO Power* | An indicator variable; set to one if the CEO is the chairman or founder, and zero otherwise. |
| *Independence Index* | % Outsider Directors + % Female Directors - % Affiliated Directors. |
| *Meetings Index* | # Board Meetings + % Attended. |
| *Size Index* | Board Size + Audit Committee Size. |
| *Busy Index* | % Busy Affiliated or Outside Directors + % Busy Inside Directors. |
| *Board Size* | The number of directors serving on the board. |
| *Audit Committee Size* | The number of directors serving on the audit committee. |
| *% Attended* | The percentage of directors who attend at least 75% of all the board meetings. |
| *% Busy Affiliated or Outside Directors* | The percentage of affiliated or outside directors who serve on four or more other boards. |
| *% Busy Inside Directors* | The percentage of inside directors who serve on two or more other boards. |
| Control Variables | |
| *Horizon* | The number of days between the analyst's earnings forecast date and the firm's earnings announcement date. |
| *Frequency* | The number of earnings forecasts issued by the analyst for the firm during the quarter. |
| *NFIRM* | The number of firms followed by the analyst during the quarter. |
| *NIND* | The number of industries followed by the analyst during the quarter. |
| *Experience* | The number of years that the analyst issues at least one forecast for the firm during the year. |
| *BrokerSize* | The number of anlaysts employed by the brokerage firm that the analyst works for during the quarter. |
| *TopBroker* | An indicator variable; set to one if the analyst's brokeraage firm size is within the top decile in a given year, and zero otherwise. |
| *SIZE* | The natural logarithm of the market value of the firm at the beginning of the quarter. |
| *BM* | The book-to-market ratio of the firm at the beginning of the quarter. |
| *TACC* | The firm's income before extraordinary items minus total operating cash flow from the last quarter, scaled by the average of total assets of the last quarter. |
| *MacroUncertainty* | Proxied by VIX, which is the average daily value of Chicago Board Options Exchange Volatility Index during the month t-1 relative to the earnings forecast release month. |
| *LOSS* | An indicator variable; set to one if the firm's income before extraordinary items is negative in the quarter t-1, and zero otherwise. |
| *NAF* | The number of analyst earnings forecasts that make up the consensus forecast in the quarter t-1. |
| *Lag_TP_PERFORM* | The analyst *i*'s price target forecast performance measured during the semiannual period t-3 relative to the current price target release period. |
| *PRCMOM* | The six month buy-and-hold raw return ending three trading days before the price target release date. |
| *STDPRC* | The standard deviation of stock price over the 12 month before the price target release date. |
| *MKTRET* | The buy-and-hold value-weighted daily market return over the 12-month forecast horizon following the price target release date. |
| *LOGMV* | The natural logarithm of market value of the firm three trading days before the price target release date. |

**Table 1**
**Sample Composition**

Panel A: Aggregate Analyst Forecast at the Firm Level

| Industry | # of Firms | # of Observations | | # of Firms | # of Observations |
|---|---|---|---|---|---|
| Agriculture | 15 | 88 | Aircraft | 32 | 924 |
| Food Products | 104 | 2,352 | Shipbuilding and Railroad | 16 | 286 |
| Candy and Soda | 8 | 48 | Defense | 7 | 40 |
| Liquor and Tobacco | 18 | 451 | Precious Metals | 30 | 680 |
| Recreational Products | 42 | 763 | Nonmetallic Mining | 16 | 376 |
| Entertainment | 106 | 2,210 | Coal | 17 | 309 |
| Printing and Publishing | 49 | 726 | Petroleum and Natural Gas | 328 | 7,556 |
| Consumer Goods | 93 | 2,251 | Telecommunication | 279 | 3,991 |
| Apparel | 74 | 1,921 | Personal Services | 83 | 1,890 |
| Healthcare | 165 | 2,823 | Business Services | 1,246 | 19,366 |
| Medical Equipment | 284 | 5,238 | Computers | 354 | 6,402 |
| Pharmaceutical Products | 564 | 8,669 | Electronic Equipment | 477 | 10,851 |
| Chemicals | 140 | 3,772 | Measuring and Control Equipmen | 137 | 3,159 |
| Rubber and Plastic Products | 46 | 596 | Business Supplies | 74 | 1,905 |
| Textiles | 28 | 309 | Shipping Containers | 19 | 520 |
| Construction Materials | 104 | 2,150 | Transportation | 237 | 5,465 |
| Construction | 86 | 1,977 | Wholesale | 249 | 4,729 |
| Steel | 97 | 2,213 | Retail | 400 | 10,323 |
| Fabricated Products | 10 | 46 | Restaurant and Hotel | 148 | 3,122 |
| Machinery | 219 | 5,324 | Real Estate | 32 | 298 |
| Electrical Equipment | 58 | 1,109 | Miscellaneous | 52 | 929 |
| Automobiles | 102 | 2,427 | Overall | 6,645 | 130,584 |

This table presents the distribution of all firm-quarter observations across industries from the I/B/E/S summary file with data to calculate control variables during the 1992 -2016 period. Industries are based on the Fama and French 48 industry classification (excluding Utilities and Financials).

| Panel B: Individual Analyst Forecast | | | | | |
|---|---|---|---|---|---|
| Industry | # of Firms | # of Observations | | # of Firms | # of Observations |
| Agriculture | 10 | 613 | Aircraft | 25 | 4,831 |
| Food Products | 67 | 6,040 | Shipbuilding and Railroad | 10 | 1,421 |
| Candy and Soda | 7 | 683 | Defense | 3 | 607 |
| Liquor and Tobacco | 16 | 1,815 | Precious Metals | 21 | 3,545 |
| Recreational Products | 24 | 2,019 | Nonmetallic Mining | 14 | 2,533 |
| Entertainment | 72 | 8,848 | Coal | 11 | 1,792 |
| Printing and Publishing | 29 | 1,230 | Petroleum and Natural Gas | 254 | 59,622 |
| Consumer Goods | 50 | 6,689 | Telecommunication | 157 | 15,310 |
| Apparel | 50 | 6,398 | Personal Services | 46 | 3,809 |
| Healthcare | 81 | 7,268 | Business Services | 716 | 62,768 |
| Medical Equipment | 149 | 13,506 | Computers | 232 | 27,498 |
| Pharmaceutical Products | 290 | 24,282 | Electronic Equipment | 327 | 55,293 |
| Chemicals | 102 | 13,321 | Measuring and Control Equipmen | 79 | 10,093 |
| Rubber and Plastic Products | 22 | 1,492 | Business Supplies | 52 | 6,002 |
| Textiles | 18 | 1,049 | Shipping Containers | 13 | 1,991 |
| Construction Materials | 70 | 7,389 | Transportation | 162 | 21,228 |
| Construction | 55 | 9,140 | Wholesale | 139 | 11,967 |
| Steel | 72 | 7,167 | Retail | 260 | 45,249 |
| Fabricated Products | 6 | 419 | Restaurant and Hotel | 91 | 11,764 |
| Machinery | 153 | 21,921 | Real Estate | 13 | 557 |
| Electrical Equipment | 36 | 3,002 | Miscellaneous | 29 | 2,420 |
| Automobiles | 70 | 8,345 | Overall | 4,103 | 502,936 |

This table presents the distribution of all analyst-firm-quarter observations across industries from the I/B/E/S detail file with data to calculate control variables during the 1992 -2016 period. Industries are based on the Fama and French 48 industry classification (excluding Utilities and Financials).

**Table 2**

**Descriptive Statistics**

Panel A: Key Variables of Aggregate Analyst Earnings Forecast

| Variable | N | 25% | Mean | Median | 75% |
|---|---|---|---|---|---|
| *Revision_Residual* | 130,584 | -0.044 | 0.002 | 0.070 | 0.182 |
| *IRV* | 130,584 | 0.022 | 0.079 | 0.045 | 0.095 |
| *EAV* | 130,584 | 0.666 | 3.294 | 1.571 | 3.616 |
| *SIZE* | 130,584 | 6.01 | 7.16 | 7.00 | 8.15 |
| *BM* | 130,584 | 0.22 | 0.45 | 0.38 | 0.59 |
| *LOSS* | 130,584 | 0 | 0.23 | 0 | 0 |
| *NAF* | 130,584 | 4 | 8.37 | 6 | 11 |
| *MacroUncertainty* | 130,584 | 14.35 | 20.04 | 17.82 | 23.48 |
| **Board Governance Variables** | | | | | |
| *BG IndexI* | 59,690 | 0.121 | 0.644 | 0.694 | 1.085 |
| *BG IndexII* | 59,690 | 0.041 | 0.521 | 0.339 | 1.062 |
| *% Outside Directors* | 59,690 | 0.546 | 0.633 | 0.667 | 0.75 |
| *% Female Directors* | 59,690 | 0 | 0.128 | 0.125 | 0.2 |
| *% Affiliated Directors* | 59,690 | 0 | 0.111 | 0.091 | 0.167 |
| *% Financial Experts* | 59,690 | 0.000 | 0.150 | 0.000 | 0.250 |
| *# Board Meetings* | 59,690 | 5 | 7.88 | 7 | 9 |
| *# Directorships* | 59,690 | 1.40 | 1.94 | 1.80 | 2.3 |
| *CEO Power* | 59,690 | 0 | 0.531 | 1 | 1 |
| *Independence Index* | 59,690 | 0.588 | 0.646 | 0.666 | 0.739 |
| *Meetings Index* | 59,690 | 0.154 | 0.228 | 0.205 | 0.256 |
| *Size Index* | 59,690 | 0.250 | 0.306 | 0.296 | 0.341 |
| *Busy Index* | 59,690 | 0 | 0.128 | 0.1 | 0.2 |
| *Board Size* | 59,690 | 8 | 9.880 | 10 | 11 |
| *Audit Committee Size* | 59,690 | 3 | 3.598 | 4 | 5 |
| *% Attended* | 59,690 | 1 | 0.991 | 1 | 1 |
| *% Busy Affiliated or Outside Directors* | 59,690 | 0 | 0.080 | 0 | 0.125 |
| *% Busy Inside Directors* | 59,690 | 0 | 0.048 | 0 | 0.1 |

This Table presents descriptive statistics on firm-specific private and public information, earnings forecast revision, board governance, and control variables for the analyses conducted at the aggregate firm level. The primary sample consists of the firms listed in the I/B/E/S database from 1992 to 2016 with non-missing values for the measures of forecast revision, firm-specific private and public information, and control variables. The subsample used for the analyses of board governance spans from 2003 to 2015 as the variables required to construct the board governance index are only available during that time period. All variables are defined in the Appendix A.

Panel B: Difference among Easily Beat, Struggle to Meet, and Base Group

| | Easily Beat | | | Struggle to Meet | | | Base Group | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **N** | **Mean** | **Median** | **N** | **Mean** | **Median** | **N** | **Mean** | **Median** |
| *Revision_Residual* | 27,033 | 0.118 | 0.120 | 23,502 | -0.291 | -0.054 | 80,049 | 0.049 | 0.075 |
| *IRV* | 27,033 | 0.071 | 0.038 | 23,502 | 0.103 | 0.058 | 80,049 | 0.075 | 0.044 |
| *EAV* | 27,033 | 3.748 | 1.775 | 23,502 | 2.802 | 1.316 | 80,049 | 3.286 | 1.591 |
| *SIZE* | 27,033 | 7.43 | 7.31 | 23,502 | 6.88 | 6.75 | 80,049 | 7.15 | 6.97 |
| *BM* | 27,033 | 0.47 | 0.40 | 23,502 | 0.58 | 0.49 | 80,049 | 0.41 | 0.34 |
| *LOSS* | 27,033 | 0.19 | 0 | 23,502 | 0.44 | 0 | 80,049 | 0.18 | 0 |
| *NAF* | 27,033 | 9.01 | 7 | 23,502 | 7.60 | 6 | 80,049 | 8.39 | 6 |
| *MacroUncertainty* | 27,033 | 19.82 | 17.57 | 23,502 | 20.75 | 18.02 | 80,049 | 19.91 | 17.98 |

This Table presents descriptive statistics on firm-specific private and public information, earnings forecast revision, and control variables for the analyses conducted at the aggregate firm level. The primary sample is separated into three subsamples: Easily Beat, Struggle to Meet, and the base group (neither easily beat nor struggle to meet) based on the earnings surprise measure whether the actual earnings is at least 5 cents above (below) the consensus forecast (EB_absolute, SM_absolute). Other earnings measures to determine which group the observation belongs to are not tabulated for the sake of brevity.

Panel C: Strength of Board Governance (*BG IndexI*)

| | *BG IndexI* | | | | | |
|---|---|---|---|---|---|---|
| | N = 30,242 Weak CG | | N = 29,448 Strong CG | | t-test | Wilcoxon Rank Sum |
| **Variable** | **Mean** | **Median** | **Mean** | **Median** | t-stat | z-stat |
| *Revision_Residual* | 0.017 | 0.081 | -0.004 | 0.076 | *** | *** |
| *IRV* | 0.049 | 0.028 | 0.052 | 0.029 | *** | *** |
| *EAV* | 4.447 | 2.206 | 4.291 | 2.109 | *** | *** |
| *SIZE* | 7.597 | 7.449 | 7.509 | 7.379 | *** | *** |
| *BM* | 0.457 | 0.388 | 0.468 | 0.393 | *** | ** |
| *LOSS* | 0.19 | 0 | 0.23 | 0 | *** | *** |
| *NAF* | 10.29 | 8 | 9.96 | 8 | *** | *** |
| *MacroUncertainty* | 19.56 | 16.92 | 19.50 | 16.79 | Not Sig. | Not Sig. |
| **Board Governance Variables** | | | | | | |
| *BG IndexI* | 0.166 | 0.125 | 1.136 | 1.088 | *** | *** |
| *% Outside Directors* | 0.623 | 0.636 | 0.643 | 0.667 | *** | *** |
| *% Female Directors* | 0.124 | 0.125 | 0.131 | 0.143 | *** | *** |
| *% Affiliated Directors* | 0.117 | 0.091 | 0.106 | 0.091 | *** | Not Sig. |
| *% Financial Experts* | 0.116 | 0.000 | 0.186 | 0.000 | *** | *** |
| *# Board Meetings* | 7.28 | 7 | 8.50 | 8 | *** | *** |
| *# Directorships* | 1.88 | 1.75 | 2.01 | 1.86 | *** | *** |
| *CEO Power* | 0.944 | 1 | 0.108 | 0 | *** | *** |
| *Independence Index* | 0.639 | 0.661 | 0.653 | 0.672 | *** | *** |
| *Meetings Index* | 0.212 | 0.205 | 0.243 | 0.231 | *** | *** |
| *Size Index* | 0.303 | 0.296 | | 0.296 | *** | *** |
| *Busy Index* | 0.122 | 0.091 | 0.134 | 0.1 | *** | *** |
| *Board Size* | 9.725 | 9 | 10.038 | 10 | *** | *** |
| *Audit Committee Size* | 3.598 | 4 | 3.599 | 4 | Not Sig. | *** |
| *% Attended* | 0.989 | 1 | 0.992 | 1 | *** | *** |
| *% Busy Affiliated or Outside Directors* | 0.074 | 0 | 0.087 | 0 | *** | *** |
| *% Busy Inside Directors* | 0.048 | 0 | 0.047 | 0 | ** | ** |

Panel D: Strength of Board Governance (*BG IndexII*)

| | *BG IndexII* | | | | | |
|---|---|---|---|---|---|---|
| | N = 30,736 Weak CG | | N = 28,954 Strong CG | | t-test | Wilcoxon Rank Sum |
| **Variable** | **Mean** | **Median** | **Mean** | **Median** | t-stat | z-stat |
| *Revision_Residual* | 0.015 | 0.081 | -0.002 | 0.076 | *** | ** |
| *IRV* | 0.048 | 0.028 | 0.053 | 0.029 | *** | *** |
| *EAV* | 4.386 | 2.159 | 4.353 | 2.145 | Not Sig. | ** |
| *SIZE* | 7.659 | 7.521 | 7.442 | 7.308 | *** | *** |
| *BM* | 0.453 | 0.384 | 0.473 | 0.399 | *** | *** |
| *LOSS* | 0.19 | 0 | 0.24 | 0 | *** | *** |
| *NAF* | 10.41 | 9 | 9.82 | 8 | *** | *** |
| *MacroUncertainty* | 19.59 | 16.92 | 19.47 | 16.79 | Not Sig. | Not Sig. |
| **Board Governance Variables** | | | | | | |
| *BG IndexII* | 0.058 | 0.051 | 1.011 | 1.069 | *** | *** |
| *% Outside Directors* | 0.631 | 0.667 | 0.635 | 0.643 | *** | *** |
| *% Female Directors* | 0.121 | 0.125 | 0.135 | 0.143 | *** | *** |
| *% Affiliated Directors* | 0.113 | 0.083 | 0.110 | 0.091 | ** | *** |
| *% Financial Experts* | 0.150 | 0.000 | 0.151 | 0.000 | Not Sig. | Not Sig. |
| *# Board Meetings* | 7.24 | 7 | 8.557 | 8 | *** | *** |
| *# Directorships* | 1.99 | 1.83 | 1.890 | 1.778 | *** | *** |
| *CEO Power* | 0.951 | 1 | 0.085 | 0 | *** | *** |
| *Independence Index* | 0.642 | 0.666 | 0.650 | 0.666 | *** | ** |
| *Meetings Index* | 0.211 | 0.205 | 0.245 | 0.231 | *** | *** |
| *Size Index* | 0.302 | 0.296 | 0.311 | 0.296 | *** | *** |
| *Busy Index* | 0.146 | 0.111 | 0.109 | 0.091 | *** | *** |
| *Board Size* | 9.720 | 9 | 10.049 | 10 | *** | *** |
| *Audit Committee Size* | 3.580 | 4 | 3.618 | 4 | *** | *** |
| *% Attended* | 0.989 | 1 | 0.992 | 1 | *** | *** |
| *% Busy Affiliated or Outside Directors* | 0.093 | 0 | 0.067 | 0 | *** | *** |
| *% Busy Inside Directors* | 0.053 | 0 | 0.042 | 0 | ** | ** |

Panel E: Key Variables of Individual Analyst Earnings Forecast

| | Easily Beat | | | Struggle to Meet | | | Base Group | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **N** | **Mean** | **Median** | **N** | **Mean** | **Median** | **N** | **Mean** | **Median** |
| *Revision_Residual* | 134,742 | 0.114 | 0.115 | 84,434 | -0.246 | -0.053 | 283,760 | 0.026 | 0.073 |
| *IRV* | 134,742 | 0.048 | 0.028 | 84,434 | 0.073 | 0.042 | 283,760 | 0.055 | 0.032 |
| *EAV* | 134,742 | 4.004 | 1.971 | 84,434 | 3.100 | 1.515 | 283,760 | 3.855 | 1.908 |
| *Horizon* | 134,742 | 78.940 | 89 | 84,434 | 78.494 | 88 | 283,760 | 78.140 | 89 |
| *Frequency* | 134,742 | 1.601 | 1 | 84,434 | 1.679 | 1 | 283,760 | 1.475 | 1 |
| *NFIRM* | 134,742 | 11.749 | 11 | 84,434 | 11.731 | 11 | 283,760 | 10.488 | 10 |
| *NIND* | 134,742 | 2.827 | 2 | 84,434 | 2.85 | 2 | 283,760 | 2.660 | 2 |
| *Experience* | 134,742 | 4.917 | 4 | 84,434 | 4.681 | 4 | 283,760 | 4.581 | 4 |
| *BrokerSize* | 134,742 | 39.594 | 32 | 84,434 | 38.611 | 30 | 283,760 | 37.024 | 27 |
| *Top_Broker* | 134,742 | 0.083 | 0 | 84,434 | 0.076 | 0 | 283,760 | 0.07 | 0 |
| *SIZE* | 134,742 | 8.412 | 8.359 | 84,434 | 7.856 | 7.764 | 283,760 | 8.23 | 8.13 |
| *BM* | 134,742 | 0.444 | 0.383 | 84,434 | 0.551 | 0.479 | 283,760 | 0.40 | 0.33 |
| *TACC* | 134,742 | -0.046 | -0.038 | 84,434 | -0.048 | -0.039 | 283,760 | -0.05 | -0.04 |
| *Following* | 134,742 | 11.72 | 10 | 84,434 | 10.88 | 9 | 283,760 | 10.50 | 9 |
| *MacroUncertainty* | 134,742 | 19.77 | 17.57 | 84,434 | 20.86 | 17.69 | 283,760 | 20.10 | 17.76 |

This Table presents the descriptive statistics for the individual analyst earnings forecast observations. The earnings surprise measure used here is whether the actual earnings is at least 5 cents above (below) the consensus forecast (*EB_absolute, SM_absolute*). Other earnings measures to determine which group the observation belongs to are not tabulated for the sake of brevity.

| Panel F: Key Variables of Individual Analyst Target Price Forecast | | | | | |
|---|---|---|---|---|---|
| Variable | N | Q1 | Mean | Median | Q3 |
| **Firm-specific Information Variables** | | | | | |
| *IRV* | 790,035 | 0.01 | 0.04 | 0.02 | 0.05 |
| *EAV* | 790,035 | 0.77 | 3.54 | 1.77 | 4.06 |
| **Target Price Forecast variables** | | | | | |
| *TP_ERROR* | 790,035 | -0.33 | -0.09 | -0.07 | 0.16 |
| *\|TP_ERROR\|* | 790,035 | 0.11 | 0.34 | 0.24 | 0.46 |
| *TP_METEND* | 790,035 | 0 | 0.42 | 0 | 1 |
| *TP_METANY* | 790,035 | 0 | 0.67 | 1 | 1 |
| **Control Variables** | | | | | |
| *Lag TP_PERFORM* | 790,035 | 0.25 | 0.50 | 0.50 | 0.75 |
| *PRCMOM* | 790,035 | -0.10 | 0.08 | 0.07 | 0.23 |
| *STDPRC* | 790,035 | 1.89 | 4.40 | 3.22 | 5.44 |
| *MKTRET* | 790,035 | 0.05 | 0.49 | 0.18 | 0.43 |
| *LOGMV* | 790,035 | 13.94 | 15.11 | 15.08 | 16.29 |

This Table presents descriptive statistics on firm-specific private and public information, target price forecast, and control variables. The sample consists of the firms listed in the I/B/E/S database from 2000 to 2016 with non-missing values for the measures of target price forecast, firm-specific private and public information, and control variables.

**Table 3**

Effect of Firm Information Environment on Aggregate Analyst Forecast Revision

| **Panel A: Effect of Private Information with Earnings Surprise as the Measure of Managerial Intent** | | | | | |
|---|---|---|---|---|---|
| Dependent Variable = *Revision_Residual* | (1) | (2) | (3) | (4) | (5) |
| *IRV* | -0.526 *** | -0.489 *** | -0.162 *** | -0.140 *** | -0.333 *** |
| | (-12.40) | (-11.95) | (-4.03) | (-3.84) | (-7.40) |
| *EB_absolute* | | 0.071 *** | 0.026 *** | | |
| | | (16.62) | (5.28) | | |
| *SM_absolute* | | -0.271 *** | -0.105 *** | | |
| | | (-37.40) | (-13.54) | | |
| *EB_relative* | | | | 0.049 *** | |
| | | | | (8.44) | |
| *SM_relative* | | | | -0.198 *** | |
| | | | | (-19.52) | |
| *EB_2SD* | | | | | 0.024 *** |
| | | | | | (5.74) |
| *SM_2SD* | | | | | -0.060 *** |
| | | | | | (-8.80) |
| *IRV x EB_absolute* | | | 0.723 *** | | |
| | | | (8.51) | | |
| *IRV x SM_absolute* | | | -1.861 *** | | |
| | | | (-22.40) | | |
| *IRV x EB_relative* | | | | 0.396 *** | |
| | | | | (5.68) | |
| *IRV x SM_relative* | | | | -1.425 *** | |
| | | | | (-18.03) | |
| *IRV x EB_2SD* | | | | | 0.641 *** |
| | | | | | (10.05) |
| *IRV x SM_2SD* | | | | | -1.690 *** |
| | | | | | (-19.89) |
| *SIZE* | 0.023 *** | 0.023 *** | 0.025 *** | 0.020 *** | 0.021 *** |
| | (10.38) | (10.59) | (11.56) | (9.97) | (9.99) |
| *BM* | -0.223 *** | -0.191 *** | -0.182 *** | -0.170 *** | -0.193 *** |
| | (-20.08) | (-17.60) | (-17.08) | (-15.82) | (-17.84) |
| *LOSS* | -0.166 *** | -0.103 *** | -0.101 *** | -0.086 *** | -0.124 *** |
| | (-23.05) | (-16.31) | (-16.15) | (-14.14) | (-18.67) |
| *NAF* | -0.004 *** | -0.004 *** | -0.004 *** | -0.003 *** | -0.003 *** |
| | (-8.48) | (-9.09) | (-8.07) | (-7.68) | (-7.20) |
| *MacroUncertainty* | -0.007 *** | -0.006 *** | -0.006 *** | -0.006 *** | -0.006 *** |
| | (-17.91) | (-16.93) | (-16.73) | (-16.46) | (-16.94) |
| *Intercept* | 0.197 * | 0.238 ** | 0.169 * | 0.179 * | 0.220 ** |
| | (1.78) | (2.38) | (1.70) | (1.92) | (2.05) |
| Industry Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| N | 130,584 | 130,584 | 130,584 | 130,584 | 130,584 |
| Adjusted $R^2$ (%) | 9.10 | 14.00 | 16.10 | 17.40 | 13.60 |

This Table presents the results of the impact of firm-level private information on aggregate analyst earnings forecast revision.The interaction terms of *IRV* and *EB; IRV and SM* are the key variables of interest in the regressions. Regressions (1) & (2) are the baseline models without the interaction terms. Regressions (3) to (5) are run with the interaction terms and different measures of earnings surprise added to the baseline model. Industry (Fama-French 48 industry classification) and year fixed effects are included in all regressions. The t-statistics are reported in parentheses and standard errors are clustered at the firm level. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All variables are defined in Appendix A.

| **Panel B: Effect of Public Information with Earnings Surprise as the Measure of Managerial Intent** | | | | | |
|---|---|---|---|---|---|
| Dependent Variable = *Revision_Residual* | (1) | (2) | (3) | (4) | (5) |
| *EAV* | 0.000<br>(0.47) | 0.000<br>(-0.98) | -0.001 *<br>(-1.90) | 0.000<br>(-0.35) | 0.000<br>(-0.55) |
| *EB_absolute* | | 0.066 ***<br>(15.40) | 0.075 ***<br>(13.96) | | |
| *SM_absolute* | | -0.277 ***<br>(-37.74) | -0.300 ***<br>(-33.13) | | |
| *EB_relative* | | | | 0.098 ***<br>(17.12) | |
| *SM_relative* | | | | -0.369 ***<br>(-36.17) | |
| *EB_2SD* | | | | | 0.071 ***<br>(16.77) |
| *SM_2SD* | | | | | -0.226 ***<br>(-29.31) |
| *EAV x EB_absolute* | | | -0.003 ***<br>(-3.27) | | |
| *EAV x SM_absolute* | | | 0.010 ***<br>(5.00) | | |
| *EAV x EB_relative* | | | | -0.004 ***<br>(-3.88) | |
| *EAV x SM_relative* | | | | 0.005 *<br>(1.75) | |
| *EAV x EB_2SD* | | | | | -0.002 ***<br>(-2.65) |
| *EAV x SM_2SD* | | | | | 0.007 ***<br>(3.89) |
| *SIZE* | 0.034 ***<br>(15.31) | 0.034 ***<br>(15.34) | 0.034 ***<br>(15.35) | 0.028 ***<br>(13.18) | 0.032 ***<br>(14.60) |
| *BM* | -0.220 ***<br>(-19.52) | -0.187 ***<br>(-17.04) | -0.187 ***<br>(-17.01) | -0.173 ***<br>(-15.75) | -0.199 ***<br>(-17.89) |
| *LOSS* | -0.194 ***<br>(-25.96) | -0.129 ***<br>(-19.75) | -0.129 ***<br>(-19.71) | -0.104 ***<br>(-16.72) | -0.156 ***<br>(-22.22) |
| *NAF* | -0.005 ***<br>(-9.63) | -0.005 ***<br>(-10.22) | -0.005 ***<br>(-10.20) | -0.004 ***<br>(-9.35) | -0.004 ***<br>(-9.48) |
| *MacroUncertainty* | -0.007 ***<br>(-17.87) | -0.006 ***<br>(-16.89) | -0.006 ***<br>(-16.90) | -0.006 ***<br>(-16.59) | -0.007 ***<br>(-17.03) |
| *Intercept* | 0.101<br>(0.90) | 0.151<br>(1.50) | 0.152<br>(1.50) | 0.161 *<br>(1.74) | 0.181 *<br>(1.65) |
| Industry Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| N | 130,584 | 130,584 | 130,584 | 130,584 | 130,584 |
| Adjusted $R^2$ (%) | 8.50 | 13.50 | 13.60 | 15.70 | 11.60 |

This Table presents the results of the impact of firm-level public information on aggregate analyst earnings forecast revision using earnings surprises to measure managerial preference for upward or downward revision. The variable IRV used in Panel A is replaced by the variable EAV in this Panel B.

**Panel C: Effect of Private and Public Information with Management Earnings Guidance as the Measure of Managerial Intent**

| | Private Information *(IRV)* | | Public Information *(EAV)* | |
|---|---|---|---|---|
| | Compared with Concensus Forecast | Compared with Earlier Forecast | Compared with Concensus Forecast | Compared with Earlier Forecast |
| Dependent Variable = *Revision_Residual* | (1) | (2) | (3) | (4) |
| *IRV or EAV* | -0.513 *** | -0.519 *** | 0.000 | 0.000 |
| | (-12.24) | (-12.38) | (0.38) | (0.48) |
| *MF_NeutralGuidance* | 0.015 * | 0.012 * | 0.081 *** | 0.068 *** |
| | (2.48) | (1.93) | (13.08) | (10.35) |
| *IRV or EAV x MF_NeutralGuidance* | 1.492 *** | 1.178 *** | -0.001 | -0.001 |
| | (9.16) | (7.07) | (-1.36) | (-1.20) |
| *MF_UpwardGuidance* | 0.033 * | 0.006 | 0.248 *** | 0.255 *** |
| | (1.80) | (0.32) | (12.88) | (12.35) |
| *IRV or EAV x MF_UpwardGuidance* | 6.392 *** | 8.939 *** | -0.006 | -0.005 |
| | (9.56) | (10.29) | (-0.80) | (-0.53) |
| *MF_DownwardGuidance* | -0.006 | 0.003 | -0.237 *** | -0.263 *** |
| | (-0.45) | (0.24) | (-17.01) | (-16.40) |
| *IRV or EAV x MF_DownwardGuidance* | -5.672 *** | -6.666 *** | 0.004 * | 0.005 * |
| | (-13.54) | (-13.85) | (1.65) | (1.71) |
| *SIZE* | 0.021 *** | 0.021 *** | 0.034 *** | 0.034 *** |
| | (9.96) | (9.90) | (15.34) | (15.45) |
| *BM* | -0.216 *** | -0.216 *** | -0.215 *** | -0.214 *** |
| | (-19.88) | (-19.90) | (-19.32) | (-19.28) |
| *LOSS* | -0.160 *** | -0.159 *** | -0.191 *** | -0.191 *** |
| | (-22.59) | (-22.64) | (-25.82) | (-25.86) |
| *NAF* | -0.004 *** | -0.004 *** | -0.004 *** | -0.004 *** |
| | (-8.05) | (-7.93) | (-9.27) | (-9.23) |
| *MacroUncertainty* | -0.006 *** | -0.006 *** | -0.007 *** | -0.007 *** |
| | (-17.09) | (-16.85) | (-17.28) | (-17.06) |
| *Intercept* | 0.193 * | 0.189 * | 0.098 | 0.091 |
| | (1.73) | (1.70) | (0.85) | (0.80) |
| Industry Fixed Effects | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| N | 130,584 | 130,584 | 130,584 | 130,584 |
| Adjusted $R^2$ (%) | 12.00 | 12.10 | 10.70 | 10.70 |

This Table presents the results of the impact of firm-level private and public information on aggregate analyst earnings forecast revision using management earnings guidance to measure managerial preference for upward or downward revision.The interaction terms of *IRV or EAV and MF_NeutralGuidance, MF_UpwardGuidance, MF_DownwardGuidance* are the key variables of interest in the regressions. Regressions (1) & (3) compare the management earnings guidance to the consensus analyst forecast at the time of issuing guidance. Regressions (2) & (4) compare the management earnings guidance to the earlier consensus analyst forecast used to calculate the analyst forecast revision. Industry and year fixed effects are included in all regressions. The t-statistics are reported in parentheses and standard errors are clustered at the firm level. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All variables are defined in Appendix A.

**Table 4**

Effect of Star Analyst Coverage on the Relationship between Firm-Specific Information and Earnings Forecast Revision

| | Private Information *(IRV)* | | Public Information *(EAV)* | |
|---|---|---|---|---|
| | With Star Analyst | Without Star Analyst | With Star Analyst | Without Star Analyst |
| Dependent Variable = *Revision_Residual* | (1) | (2) | (3) | (4) |
| *IRV* | -0.211 *** | -0.105 | | |
| | (-3.10) | (-1.66) | | |
| *EAV* | | | -0.001 | -0.001 |
| | | | (-1.33) | (-1.09) |
| *EB_relative* | 0.066 *** | 0.045 *** | 0.093 *** | 0.111 *** |
| | (7.64) | (4.61) | (10.49) | (11.39) |
| *SM_relative* | -0.209 *** | -0.227 *** | -0.401 *** | -0.408 *** |
| | (-12.30) | (-14.68) | (-20.64) | (-23.08) |
| *IRV x EB_relative* | 0.255 * | 0.539 *** | | |
| | (1.92) | (5.01) | | |
| *IRV x SM_relative* | -1.726 *** | -1.275 *** | | |
| | (-10.99) | (-10.39) | | |
| *EAV x EB_relative* | | | -0.002 | -0.004 ** |
| | | | (-1.10) | (-2.14) |
| *EAV x SM_relative* | | | 0.007 | 0.012 *** |
| | | | (1.42) | (2.96) |
| *SIZE* | 0.021 *** | 0.042 *** | 0.030 *** | 0.048 *** |
| | (6.54) | (10.85) | (8.87) | (11.77) |
| *BM* | -0.180 *** | -0.178 *** | -0.191 *** | -0.179 *** |
| | (-10.87) | (-10.30) | (-11.24) | (-10.20) |
| *LOSS* | -0.080 *** | -0.083 *** | -0.109 *** | -0.095 *** |
| | (-7.95) | (-7.72) | (-10.19) | (-8.79) |
| *NAF* | -0.003 *** | -0.006 *** | -0.004 *** | -0.007 ** |
| | (-5.54) | (-5.56) | (-6.91) | (-5.99) |
| *VIX* | -0.005 *** | -0.006 *** | -0.005 *** | -0.007 *** |
| | (-9.74) | (-10.77) | (-9.71) | (-10.95) |
| *Intercept* | 0.294 *** | 0.185 | 0.243 *** | 0.164 |
| | (3.28) | (0.91) | (2.71) | (0.83) |
| Industry Fixed Effects | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| N | 47,426 | 39,029 | 47,426 | 39,029 |
| Adjusted $R^2$ (%) | 19.40 | 17.00 | 17.20 | 15.80 |

This Table presents the results of the impact of star analyst coverage on the relation between firm information environment and analyst forecast revision.The interaction terms of *IRV* and *EB; IRV and SM; EAV and EB; EAV and SM* are the key variables of interest. Columns (1) & (2) present the results for the differences in the effect of private information between firms with and without star analyst coverage. Columns (3) & (4) present the results for the differences in the effect of public information. Industry (Fama-French 48 industry classification) and year fixed effects are included in all regressions. The t-statistics are reported in parentheses and standard errors are clustered at the firm level.

**Table 5**

Effect of Corporate Governance on the Relationship between Firm-specific Information and Forecast Revision

| **Panel A: *Private Information*** | *Private Information (IRV)* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | BG IndexI | | | | BG IndexII | | | |
| | Weak CG | | Strong CG | | Weak CG | | Strong CG | |
| Dependent Variable = *Revision_Residual* | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| *IRV* | -0.652 *** | -0.588 *** | -0.233 | -0.176 | -0.560 *** | -0.466 *** | -0.318 ** | -0.294 * |
| | (-4.08) | (-3.98) | (-1.57) | (-1.07) | (-3.44) | (-3.12) | (-2.18) | (-1.80) |
| *EB_absolute* | 0.003 | | 0.034 *** | | 0.009 | | 0.029 *** | |
| | (0.36) | | (3.48) | | (1.00) | | (2.88) | |
| *SM_absolute* | -0.107 *** | | -0.089 *** | | -0.094 *** | | -0.101 *** | |
| | (-6.74) | | (-6.12) | | (-5.98) | | (-6.91) | |
| *EB_relative* | | 0.032 *** | | 0.066 *** | | 0.040 *** | | 0.034 *** |
| | | (2.91) | | (5.61) | | (3.57) | | (5.05) |
| *SM_relative* | | -0.222 *** | | -0.204 *** | | -0.211 *** | | -0.213 *** |
| | | (-9.95) | | (-10.44) | | (-9.54) | | (-10.96) |
| *IRV x EB_absolute* | 1.214 *** | | 0.345 | | 1.120 *** | | 0.412 | |
| | (4.80) | | (1.34) | | (4.30) | | (1.62) | |
| *IRV x SM_absolute* | -2.131 *** | | -2.528 *** | | -2.366 *** | | -2.329 *** | |
| | (-8.26) | | (-9.64) | | (-8.98) | | (-9.11) | |
| *IRV x EB_relative* | | 0.607 *** | | -0.005 | | 0.494 ** | | 0.090 |
| | | (2.66) | | (-0.02) | | (2.15) | | (0.39) |
| *IRV x SM_relative* | | -1.586 *** | | -1.800 *** | | -1.834 *** | | -1.588 *** |
| | | (-6.31) | | (-6.77) | | (-7.33) | | (-6.11) |
| Control Variables Included | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry and Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 30,242 | 30,242 | 29,448 | 29,448 | 30,242 | 30,242 | 29,448 | 29,448 |
| Adjusted $R^2$ (%) | 17.00 | 17.90 | 15.60 | 16.80 | 12.20 | 14.60 | 14.30 | 16.30 |

This Table presents the results of the impact of board governance on the relation between firm-specific private information and analyst earnings forecast revision.The interaction terms of *IRV* and *EB; IRV and SM* are the key variables of interest in the regressions. Columns (1) to (4) present the results of the effect of private information for weakly and strongly governed firms with *BG IndexI* as the proxy for the strength of board governance. Columns (5) to (8) present the results with *BG IndexII* as the proxy for the strength of board governance. Industry (Fama-French 48-industry classification) and year fixed effects are included in all regressions. The t-statistics are reported in parentheses and standard errors are clustered at the firm level. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All variables are defined in Appendix A.

| ***Panel B: Public Information*** | *Public Information (EAV)* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | BG IndexI | | | | BG IndexII | | | |
| | Weak CG | | Strong CG | | Weak CG | | Strong CG | |
| Dependent Variable = *Revision_Residual* | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| *EAV* | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | (-0.64) | (-0.10) | (-0.35) | (0.50) | (-0.68) | (-0.19) | (-0.24) | (0.56) |
| *EB_absolute* | 0.064 *** | | 0.053 *** | | 0.066 *** | | 0.050 *** | |
| | (7.41) | | (4.97) | | (7.41) | | (4.77) | |
| *SM_absolute* | -0.288 *** | | -0.301 *** | | -0.287 *** | | -0.303 *** | |
| | (-14.56) | | (-15.61) | | (-14.22) | | (-15.75) | |
| *EB_relative* | | 0.081 *** | | 0.080 *** | | 0.083 *** | | 0.077 *** |
| | | (7.54) | | (6.96) | | (7.94) | | (6.57) |
| *SM_relative* | | -0.395 *** | | -0.380 *** | | -0.397 *** | | -0.379 *** |
| | | (-15.61) | | (-16.25) | | (-15.45) | | (-16.31) |
| *EAV x EB_absolute* | -0.003 ** | | -0.001 | | -0.003 ** | | -0.001 | |
| | (-2.20) | | (-0.89) | | (-2.15) | | (-0.87) | |
| *EAV x SM_absolute* | 0.013 *** | | 0.015 *** | | 0.013 *** | | 0.015 *** | |
| | (3.83) | | (4.10) | | (3.79) | | (4.14) | |
| *EAV x EB_relative* | | -0.004 ** | | -0.002 | | -0.003 * | | -0.002 |
| | | (-2.07) | | (-0.87) | | (-1.94) | | (-0.88) |
| *EAV x SM_relative* | | 0.011 ** | | 0.009 * | | 0.010 ** | | 0.011 * |
| | | (2.14) | | (1.67) | | (1.96) | | (1.89) |
| Control Variables Included | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 30,736 | 30,736 | 28,954 | 28,954 | 30,736 | 30,736 | 28,954 | 28,954 |
| Adjusted $R^2$ (%) | 16.60 | 17.40 | 16.00 | 17.30 | 12.60 | 15.10 | 13.90 | 15.80 |

**Table 6**

Effect of Firm-specific Information Environment on Individual Analyst Forecast Revision

**Panel A: Effect of Private Information with Earnings Surprise as the Measure of Managerial Intent**

| Dependent Variable = *Revision_Residual* | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| *IRV* | -0.689 *** | -0.615 *** | -0.496 *** | -0.364 *** | -0.560 *** |
| | (-17.21) | (-15.70) | (-12.26) | (-9.38) | (-12.00) |
| *EB_absolute* | | 0.109 *** | 0.044 *** | | |
| | | (44.63) | (15.41) | | |
| *SM_absolute* | | -0.190 *** | -0.091 *** | | |
| | | (-54.10) | (-23.07) | | |
| *EB_relative* | | | | 0.106 *** | |
| | | | | (28.18) | |
| *SM_relative* | | | | -0.111 *** | |
| | | | | (-28.76) | |
| *EB_2SD* | | | | | 0.046 *** |
| | | | | | (19.46) |
| *SM_2SD* | | | | | -0.066 *** |
| | | | | | (-19.66) |
| *IRV x EB_absolute* | | | 1.552 *** | | |
| | | | (21.98) | | |
| *IRV x SM_absolute* | | | -1.536 *** | | |
| | | | (-22.18) | | |
| *IRV x EB_relative* | | | | 0.773 *** | |
| | | | | (11.46) | |
| *IRV x SM_relative* | | | | -1.206 *** | |
| | | | | (-20.99) | |
| *IRV x EB_2SD* | | | | | 0.828 *** |
| | | | | | (16.64) |
| *IRV x SM_2SD* | | | | | -1.259 *** |
| | | | | | (-19.95) |
| *Horizon* | 0.001 *** | 0.001 *** | 0.001 *** | 0.001 *** | 0.001 *** |
| | (21.02) | (21.12) | (21.03) | (21.06) | (21.19) |
| *Frequency* | 0.007 *** | 0.009 *** | 0.009 *** | 0.009 *** | 0.009 *** |
| | (5.54) | (7.03) | (6.57) | (6.50) | (6.80) |
| *NFIRM* | 0.001 *** | 0.001 ** | 0.001 ** | 0.001 ** | 0.001 ** |
| | (2.64) | (2.45) | (2.46) | (2.23) | (2.17) |
| *NIND* | -0.003 *** | -0.003 *** | -0.003 *** | -0.003 *** | -0.002 *** |
| | (-3.22) | (-3.59) | (-3.48) | (-3.15) | (-3.11) |
| *Experience* | -0.001 *** | -0.001 ** | -0.001 *** | -0.001 *** | -0.001 *** |
| | (-3.33) | (-2.97) | (-3.01) | (-2.82) | (-2.57) |
| *BrokerSize* | 0.000 ** | 0.000 ** | 0.000 ** | 0.000 ** | 0.000 ** |
| | (2.23) | (2.16) | (2.21) | (2.20) | (2.36) |
| *TopBroker* | -0.003 | -0.003 | -0.003 | -0.003 | -0.004 |
| | (-0.80) | (-0.82) | (-0.86) | (-0.88) | (-0.95) |
| *SIZE* | 0.050 *** | 0.048 *** | 0.049 *** | 0.056 *** | 0.042 *** |
| | (17.40) | (17.20) | (17.75) | (20.12) | (15.10) |
| *BM* | -0.277 *** | -0.244 *** | -0.233 *** | -0.232 *** | -0.237 *** |
| | (-29.37) | (-27.04) | (-26.05) | (-25.88) | (-26.41) |
| *TACC* | 0.441 *** | 0.354 *** | 0.324 *** | 0.319 *** | 0.353 ** |
| | (21.04) | (17.47) | (16.15) | (15.96) | (17.46) |
| *Following* | -0.006 *** | -0.004 *** | -0.004 *** | -0.004 *** | -0.004 ** |
| | (-26.59) | (-20.97) | (-20.95) | (-19.62) | (-17.53) |
| *MacroUncertainty* | -0.004 *** | -0.003 *** | -0.003 *** | -0.003 *** | -0.003 ** |
| | (-14.77) | (-13.56) | (-13.18) | (-12.74) | (-13.48) |
| *Intercept* | -0.066 *** | -0.068 *** | -0.102 *** | -0.148 *** | 0.047 * |
| | (-2.66) | (-2.79) | (-4.23) | (-6.15) | (-1.92) |
| Firm Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| N | 502,936 | 502,936 | 502,936 | 502,936 | 502,936 |
| Adjusted $R^2$ (%) | 3.18 | 6.07 | 7.04 | 7.48 | 6.16 |

This Table presents the results of the impact of firm-level private information on individual analyst earnings forecast revisions using earnings surprises to measure managerial preference for upward or downward revision.The interaction terms of *IRV* and *EB; IRV* and *SM* are the key variables of interest in the regressions. Regressions (1) & (2) are the baseline models without the interaction terms. Regressions (3) to (5) are run with the interaction terms and different measures of earnings surprise to determine which one of the three groups (i.e. Easily Beat, Struggle to Meet, or the base group) the firm belongs to. Firm and year fixed effects are included in all regressions. The t-statistics are reported in parentheses and standard errors are clustered at the analyst level. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All variables are defined in Appendix A.

| **Panel B: Effect of Public Information with Earnings Surprise as the Measure of Managerial Intent** | | | | | |
|---|---|---|---|---|---|
| Dependent Variable = *Revision_Residual* | (1) | (2) | (3) | (4) | (5) |
| *EAV* | 0.001 *** | 0.000 | 0.000 | 0.000 | 0.000 |
| | (3.22) | (0.72) | (0.86) | (-0.49) | (1.42) |
| *EB_absolute* | | 0.108 *** | 0.108 *** | | |
| | | (43.89) | (37.50) | | |
| *SM_absolute* | | -0.195 *** | -0.194 *** | | |
| | | (-54.51) | (-40.62) | | |
| *EB_relative* | | | | 0.145 *** | |
| | | | | (39.45) | |
| *SM_relative* | | | | -0.194 *** | |
| | | | | (-47.51) | |
| *EB_2SD* | | | | | 0.085 *** |
| | | | | | (37.80) |
| *SM_2SD* | | | | | -0.149 *** |
| | | | | | (-39.19) |
| *EAV x EB_absolute* | | | 0.000 | | |
| | | | (-0.01) | | |
| *EAV x SM_absolute* | | | 0.000 | | |
| | | | (-0.36) | | |
| *EAV x EB_relative* | | | | 0.002 *** | |
| | | | | (3.09) | |
| *EAV x SM_relative* | | | | -0.002 * | |
| | | | | (-1.95) | |
| *EAV x EB_2SD* | | | | | 0.000 |
| | | | | | (-0.90) |
| *EAV x SM_2SD* | | | | | 0.001 |
| | | | | | (1.31) |
| Control Variables Included | Yes | Yes | Yes | Yes | Yes |
| Firm Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| N | 502,936 | 502,936 | 502,936 | 502,936 | 502,936 |
| Adjusted $R^2$ (%) | 2.92 | 5.94 | 5.94 | 6.78 | 5.23 |

This Table presents the results of the impact of firm-level public information on individual analyst earnings forecast revisions using earnings surprises to measure managerial preference for upward or downward revision. The variable *IRV* used in Panel A is replaced by the variable *EAV* in this Panel B.

**Panel C: Effect of Private and Public Information with Management Earnings Guidance as the Measure of Managerial Intent**

| | Private Information *(IRV)* | | Public Information *(EAV)* | |
|---|---|---|---|---|
| | Compared with Concensus Forecast | Compared with Earlier Forecast | Compared with Concensus Forecast | Compared with Earlier Forecast |
| Dependent Variable = *Revision_Residual* | (1) | (2) | (3) | (4) |
| *IRV or EAV* | -0.654 *** | -0.650 *** | 0.001 *** | 0.001 *** |
| | (-16.64) | (-16.60) | (4.05) | (4.34) |
| *MF_NeutralGuidance* | 0.004 | 0.003 | 0.059 *** | 0.045 *** |
| | (1.19) | (0.83) | (17.44) | (12.82) |
| *IRV or EAV x MF_NeutralGuidance* | 1.535 *** | 1.009 *** | 0.000 | -0.001 |
| | (13.44) | (9.16) | (-0.55) | (-1.59) |
| *MF_UpwardGuidance* | 0.019 ** | 0.016 ** | 0.215 *** | 0.251 *** |
| | (2.43) | (2.19) | (28.15) | (31.92) |
| *IRV or EAV x MF_UpwardGuidance* | 6.538 *** | 7.878 *** | 0.007 *** | 0.002 |
| | (23.50) | (27.50) | (3.91) | (1.17) |
| *MF_DownwardGuidance* | -0.047 *** | -0.049 *** | -0.181 *** | -0.208 *** |
| | (-9.95) | (-9.89) | (-35.98) | (-38.02) |
| *IRV or EAV x MF_DownwardGuidance* | -3.877 *** | -4.672 *** | -0.001 * | -0.001 |
| | (-27.89) | (-30.49) | (-1.71) | (-1.61) |
| *Horizon* | 0.001 *** | 0.001 *** | 0.001 *** | 0.001 *** |
| | (20.90) | (21.57) | (21.87) | (22.40) |
| *Frequency* | 0.007 *** | 0.008 *** | 0.006 *** | 0.007 *** |
| | (5.14) | (5.77) | (4.66) | (5.21) |
| *NFIRM* | 0.001 ** | 0.001 ** | 0.001 ** | 0.001 ** |
| | (2.30) | (2.56) | (2.17) | (2.31) |
| *NIND* | -0.002 *** | -0.002 *** | -0.002 *** | -0.002 *** |
| | (-2.92) | (-3.01) | (-2.73) | (-2.76) |
| *Experience* | -0.001 *** | -0.001 *** | -0.001 *** | -0.001 *** |
| | (-3.06) | (-3.00) | (-2.78) | (-2.72) |
| *BrokerSize* | 0.000 ** | 0.000 * | 0.000 ** | 0.000 * |
| | (2.53) | (1.69) | (2.49) | (1.87) |
| *TopBroker* | -0.003 | -0.002 | -0.003 | -0.003 |
| | (-0.79) | (-0.43) | (-0.75) | (-0.65) |
| *SIZE* | 0.052 *** | 0.052 *** | 0.060 *** | 0.059 *** |
| | (18.73) | (18.59) | (20.01) | (19.89) |
| *BM* | -0.252 *** | -0.257 *** | -0.271 *** | -0.275 *** |
| | (-27.99) | (-28.31) | (-29.40) | (-29.60) |
| *TACC* | 0.415 *** | 0.435 *** | 0.419 *** | 0.442 *** |
| | (20.43) | (21.39) | (20.37) | (21.47) |
| *Following* | -0.005 *** | -0.005 *** | -0.005 *** | -0.006 *** |
| | (-22.95) | (-23.97) | (-24.95) | (-26.05) |
| *MacroUncertainty* | -0.003 *** | -0.003 *** | -0.003 *** | -0.003 *** |
| | (-13.67) | (-13.53) | (-14.19) | (-14.07) |
| *Intercept* | -0.108 *** | -0.101 *** | -0.200 *** | -0.193 *** |
| | (-4.44) | (-4.14) | (-7.82) | (-7.54) |
| Firm Fixed Effects | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| N | 502,936 | 502,936 | 502,936 | 502,936 |
| Adjusted $R^2$ (%) | 6.19 | 6.98 | 5.21 | 5.79 |

This Table presents the results of the impact of firm-level private and public information on individual analyst earnings forecast revisions using management earnings guidance to measure managerial preference for upward or downward revision.The interaction terms of *IRV or EAV and MF_NeutralGuidance, MF_UpwardGuidance, MF_DownwardGuidance* are the key variables of interest in the regressions. Regressions (1) & (3) compare the management earnings guidance to the consensus analyst forecast at the time of issuing guidance. Regressions (2) & (4) compare the management earnings guidance to the earlier individual analyst forecast used to calculate the analyst forecast revision. Firm and year fixed effects are included in all regressions. The t-statistics are reported in parentheses and standard errors are clustered at the analyst level. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

**Panel D: Effect of Private and Public Information with Stock Option Grant as the Measure of Managerial Intent**

| | IRV | | | EAV | | |
|---|---|---|---|---|---|---|
| Dependent Variable = *Revision_Residual* | 45 Days | 30 Days | 15 Days | 45 Days | 30 Days | 15 Days |
| *Stock Option Grant* | -0.008 ** | -0.007 | -0.013 * | -0.034 *** | -0.046 *** | -0.043 *** |
| | (-1.98) | (-1.31) | (-1.76) | (-6.06) | (-6.75) | (-3.33) |
| *IRV* | -0.540 *** | -0.537 *** | -0.543 *** | | | |
| | (-20.07) | (-19.95) | (-20.19) | | | |
| *IRV x Stock Option Grant* | -0.348 ** | -0.710 *** | -0.497 | | | |
| | (-1.97) | (-2.95) | (-0.97) | | | |
| *EAV* | | | | 0.001 *** | 0.001 *** | 0.001 *** |
| | | | | (4.13) | (4.25) | (4.68) |
| *EAV x Stock Option Grant* | | | | 0.007 *** | 0.010 *** | 0.017 * |
| | | | | (3.61) | (3.66) | (1.80) |
| *Horizon* | 0.000 *** | 0.000 *** | 0.000 *** | 0.000 *** | 0.000 *** | 0.000 *** |
| | (6.95) | (7.54) | (7.13) | (7.49) | (8.05) | (7.61) |
| *Frequency* | 0.013 *** | 0.014 *** | 0.014 *** | 0.013 *** | 0.014 *** | 0.014 *** |
| | (9.67) | (10.25) | (10.11) | (9.28) | (9.85) | (9.71) |
| *NFIRM* | 0.000 ** | 0.000 ** | 0.000 ** | 0.000 ** | 0.000 * | 0.000 * |
| | (2.07) | (1.93) | (1.96) | (1.96) | (1.81) | (1.84) |
| *NIND* | -0.001 ** | -0.001 *** | -0.001 *** | -0.001 ** | -0.001 * | -0.001 * |
| | (-2.29) | (-2.11) | (-2.14) | (-2.05) | (-1.87) | (-1.90) |
| *Experience* | -0.001 *** | -0.001 *** | -0.001 *** | -0.001 *** | -0.001 *** | -0.001 *** |
| | (-4.40) | (-4.22) | (-4.35) | (-3.93) | (-3.75) | (-3.88) |
| *BrokerSize* | 0.000 *** | 0.000 *** | 0.000 *** | 0.000 *** | 0.000 *** | 0.000 *** |
| | (4.16) | (4.45) | (4.71) | (4.28) | (4.58) | (4.84) |
| *TopBroker* | -0.003 | -0.003 | -0.003 | -0.003 | -0.003 | -0.003 |
| | (-0.86) | (-0.98) | (-1.12) | (-0.86) | (-0.98) | (-1.11) |
| *SIZE* | 0.035 *** | 0.035 *** | 0.034 *** | 0.043 *** | 0.043 *** | 0.042 *** |
| | (17.02) | (17.00) | (16.77) | (19.51) | (19.47) | (19.29) |
| *BM* | -0.257 *** | -0.256 *** | -0.255 *** | -0.267 *** | -0.266 *** | -0.265 *** |
| | (-36.20) | (-35.89) | (-35.91) | (-37.25) | (-36.93) | (-36.97) |
| *TACC* | 0.279 *** | 0.276 *** | 0.273 *** | 0.277 *** | 0.274 *** | 0.271 *** |
| | (17.46) | (17.42) | (17.35) | (17.22) | (17.16) | (17.11) |
| *MacroUncertainty* | -0.005 *** | -0.005 *** | -0.005 *** | -0.005 *** | -0.005 *** | -0.005 *** |
| | (-23.08) | (-23.04) | (-23.39) | (-23.22) | (-23.20) | (-23.54) |
| *Intercept* | 0.048 *** | 0.044 *** | 0.049 *** | -0.039 ** | -0.042 ** | -0.038 ** |
| | (2.84) | (2.60) | (2.88) | (-2.23) | (-2.41) | (-2.17) |
| Firm Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 764,226 | 763,397 | 763,397 | 764,226 | 763,397 | 763,397 |
| Adjusted $R^2$ (%) | 3.09 | 3.08 | 3.08 | 2.70 | 2.69 | 2.69 |

This Table presents the results of the impact of firm-level private and public information on individual analyst earnings forecast revisions using stock option grant to measure managerial preference for upward or downward revision.The interaction terms of *IRV or EAV and SO_Grant* are the key variables of interest in the regressions. Regressions are run with forecast revisions that occur within 15, 30, and 45 days prior to stock option grant dates respectively. Firm and year fixed effects are included in all regressions. The t-statistics are reported in parentheses and standard errors are clustered at the analyst level. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 7**

Effect of Regulations on the Relationship Between Private Information and Analyst Forecast Revision

| Dependent Variable = *Revision_Residual* | EB / SM_Absolute | EB / SM_Relative | EB / SM_2SD |
|---|---|---|---|
| *IRV* | 0.027 | -0.002 | -0.229 *** |
| | (0.49) | (-0.04) | (-3.40) |
| *EB* | 0.029 * | 0.080 *** | -0.015 |
| | (1.75) | (3.87) | (-1.56) |
| *SM* | -0.052 *** | -0.133 *** | 0.003 |
| | (-2.90) | (-5.78) | (0.24) |
| *PostRegulation* | 0.057 | 0.062 | 0.019 |
| | (1.12) | (1.26) | (0.35) |
| *IRV x EB* | 0.437 ** | 0.049 | 0.539 *** |
| | (2.39) | (0.27) | (4.84) |
| *IRV x SM* | -1.997 *** | -1.493 *** | -1.626 *** |
| | (-13.37) | (-9.74) | (-11.48) |
| *IRV x PostRegulation* | -0.519 *** | -0.400 *** | -0.384 *** |
| | (-5.31) | (-4.70) | (-3.68) |
| *EB x PostRegulation* | -0.013 | -0.036 * | 0.040 *** |
| | (-0.73) | (-1.65) | (3.42) |
| *SM x PostRegulation* | -0.068 *** | -0.081 *** | -0.084 *** |
| | (-3.27) | (-3.16) | (-4.94) |
| *IRV x EB x PostRegulation* | 0.388 ** | 0.323 | 0.362 ** |
| | (2.00) | (1.63) | (2.14) |
| *IRV x SM x PostRegulation* | 0.082 | 0.016 | -0.336 * |
| | (0.45) | (0.09) | (-1.83) |
| Control Variables Included | Yes | Yes | Yes |
| Industry and Year Fixed Effects | Yes | Yes | Yes |
| N | 110,663 | 110,663 | 110,663 |
| Asjusted $R^2$ (%) | 16.00 | 17.10 | 13.90 |

This Table presents results of the impact of regulations and enforcements (e.g. Reg FD, Global Settlement) during the 2000-2003 period on the relation between firm-level private information and analyst forecast revision. The observations in the 2000-2003 period are excluded in this test to examine the difference of analyst forecast revision in the pre and post regulation period. The indicator variable *PostRegulation* is set to 1 for the observations in the period after 2003. Industry and year fixed effects are included in all regressions. The t-statistics are reported in parentheses and standard errors are clustered at the firm level. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 8**

Effect of Firm Information Environment on Target Price Forecast

**Panel A : Effect of Private Information**

| Regression | Dependent Variable | | | |
|---|---|---|---|---|
| | OLS | | Probit | |
| Variable | *TP_ERROR* | \|*TP_ERROR*\| | *TP_METEND* | *TP_METANY* |
| *IRV* | -0.744 *** | 1.383 *** | -1.843 *** | -1.311 *** |
| | (-20.07) | (59.00) | (-22.79) | (-16.93) |
| *Lag_TP_PEFORM* | 0.046 *** | 0.061 *** | 0.136 *** | 0.225 *** |
| | (10.77) | (20.96) | (11.51) | (18.64) |
| *PRCMOM* | 0.074 *** | -0.113 *** | 0.101 *** | 0.273 *** |
| | (16.77) | (-35.49) | (10.08) | (26.62) |
| *STDPRC* | -0.003 *** | 0.003 *** | -0.007 *** | 0.003 *** |
| | (-7.90) | (11.11) | (-7.68) | (3.54) |
| *MKTRET* | 0.018 *** | 0.005 *** | 0.045 *** | 0.037 *** |
| | (26.62) | (9.87) | (23.84) | (18.57) |
| *LOGMV* | 0.001 | -0.026 *** | -0.012 *** | -0.047 *** |
| | (0.56) | (-36.22) | (-4.43) | (-16.15) |
| *Intercept* | -0.276 *** | 0.728 *** | -0.307 *** | 0.679 *** |
| | (-7.04) | (31.48) | (-2.94) | (6.69) |
| Industry Fixed Effects | Yes | Yes | Yes | Yes |
| Semi-annual period Fixed Effects | Yes | Yes | Yes | Yes |
| N | 790,035 | 790,035 | 790,035 | 790,035 |
| Adjusted $R^2$ or Pseudo $R^2$ (%) | 18.40 | 20.20 | 9.91 | 6.27 |

This Table presents results of the impact of firm-level private information on analyst target price forecast optimism and accuracy for the period 2000 to 2016. *IRV* is the key variable of interest. Either OLS or Probit regression is employed based on the dependent variable used. Industry (Fama-French 48-industry classification) and semi-annual period fixed effects are included in all regressions. Standard errors are clustered at the analyst level. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

**Panel B : Effect of Public Information**

| Regression | Dependent Variable | | | |
|---|---|---|---|---|
| | OLS | | Probit | |
| Variable | *TP_ERROR* | *\|TP_ERROR\|* | *TP_METEND* | *TP_METANY* |
| *EAV* | 0.002 *** | -0.001 *** | 0.005 *** | 0.005 *** |
| | (12.59) | (-9.33) | (9.73) | (9.83) |
| *Lag_TP_PEFORM* | 0.053 *** | 0.093 *** | 0.149 *** | 0.228 *** |
| | (12.33) | (30.00) | (12.46) | (18.85) |
| *PRCMOM* | 0.063 *** | -0.094 *** | 0.071 *** | 0.256 *** |
| | (14.54) | (-29.20) | (7.26) | (25.19) |
| *STDPRC* | -0.004 *** | 0.005 *** | -0.010 *** | 0.001 |
| | (-10.75) | (16.97) | (-10.34) | (1.21) |
| *MKTRET* | 0.018 *** | 0.004 *** | 0.045 *** | 0.037 *** |
| | (26.57) | (8.60) | (23.65) | (18.62) |
| *LOGMV* | 0.010 *** | -0.043 *** | 0.011 *** | -0.030 *** |
| | (9.85) | (-53.10) | (4.24) | (-11.06) |
| *Intercept* | -0.484 *** | 1.086 *** | -0.809 *** | 0.313 *** |
| | (-12.09) | (42.39) | (-7.89) | (3.15) |
| Industry Fixed Effects | Yes | Yes | Yes | Yes |
| Semi-annual period Fixed Effects | Yes | Yes | Yes | Yes |
| N | 790,035 | 790,035 | 790,035 | 790,035 |
| Adjusted $R^2$ or Pseudo $R^2$ (%) | 18.00 | 17.40 | 9.70 | 6.17 |

**Table 9**

Alternative Measures of Firm-Specific Private Information

| | IRV_F&F 5-Factor | | | Bid-Ask_Spread | | |
|---|---|---|---|---|---|---|
| Dependent Variable = *Revision_Residual* | (1) | (2) | (3) | (4) | (5) | (6) |
| *IRV* | -0.170 *** | -0.148 *** | -0.344 *** | 0.014 *** | 0.012 *** | 0.013 *** |
| | (-4.10) | (-3.93) | (-7.44) | (4.21) | (3.86) | (3.40) |
| *EB_absolute* | 0.026 *** | | | 0.001 *** | | |
| | (5.27) | | | (11.69) | | |
| *SM_absolute* | -0.104 *** | | | -0.002 *** | | |
| | (-13.45) | | | (-25.97) | | |
| *EB_relative* | | 0.048 *** | | | 0.001 *** | |
| | | (8.37) | | | (13.29) | |
| *SM_relative* | | -0.197 *** | | | -0.003 *** | |
| | | (-19.46) | | | (-31.20) | |
| *EB_2SD* | | | 0.024 *** | | | 0.001 *** |
| | | | (5.83) | | | (15.49) |
| *SM_2SD* | | | -0.059 *** | | | -0.002 *** |
| | | | (-8.73) | | | (-24.74) |
| *IRV or BA_Spread x EB_absolute* | 0.745 *** | | | 0.064 *** | | |
| | (8.51) | | | (8.82) | | |
| *IRV or BA_Spread x SM_absolute* | -1.914 *** | | | -0.065 *** | | |
| | (-22.49) | | | (-7.33) | | |
| *IRV or BA_Spread x EB_relative* | | 0.413 *** | | | 0.038 *** | |
| | | (5.76) | | | (6.09) | |
| *IRV or BA_Spread x SM_relative* | | -1.458 *** | | | -0.023 *** | |
| | | (-18.03) | | | (-2.54) | |
| *IRV or BA_Spread x EB_2SD* | | | 0.652 *** | | | 0.011 *** |
| | | | (9.96) | | | (2.81) |
| *IRV or BA_Spread x SM_2SD* | | | -1.733 *** | | | -0.023 *** |
| | | | (-19.94) | | | (-3.13) |
| Control Variables Included | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry and Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 130,584 | 130,584 | 130,584 | 122,001 | 122,001 | 122,001 |
| Adjusted $R^2$ (%) | 16.20 | 17.40 | 13.70 | 14.20 | 16.00 | 12.30 |

This Table presents results on the impact of firm-level private information on analyst earnings forecast revision bias using different measures of private information. Regressions (1) to (3) are run using the *IRV* derived from the Fama-French 5-Factor model instead of the 3-Factor model. Regressions (4) to (6) are run using the bid-ask spread as the alternative measure. Industry and year fixed effects are included in all regressions. The t-statistics are reported in parentheses and standard errors are clustered at the firm level. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.