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Managerial discretion over initial earnings forecasts

Abstract

We investigate managerial discretion over initial management earnings forecasts issued concurrently with earnings announcements. Japan's unique reporting environment, particularly its systematic bundled management forecasts, produces an earnings benchmark (i.e., forecast innovations) to which most studies have paid little attention. A forecast innovation is the difference between management earnings forecasts for year t+1 and actual earnings for year t at the earnings announcement date. We investigate whether and why managers manipulate their initial forecasts to avoid negative forecast innovations, and how investors respond to them. First, we find that managers engage in forecast management through discretionary forecasts to avoid negative forecast innovations. Second, we reveal that firms that avoid negative forecast innovations enjoy a higher return, even when managers manipulate their forecasts. Finally, we indicate that firms that avoid negative forecast innovations using discretionary forecasts report lower future performance. Overall, our evidence suggests that managers bias their forecasts opportunistically, which has significant implications for investors and regulators.

Keywords: management forecast, forecast management, forecast innovation, Japan

JEL Classification: M41

Data availability: The data are publicly available from sources identified in the paper.

1. Introduction

The credibility of management earnings forecasts is a primary concern in accounting research because of managers' incentive to bias them (Rogers and Stocken 2005). We investigate managerial discretion over initial management earnings forecasts, issued along with earnings announcements.[2] Focusing on Japanese listed firms, we examine whether managers manipulate their earnings forecasts to avoid forecasting a negative change in earnings (the change in earnings forecasted by managers is hereafter referred to as "forecast innovations"). This earnings benchmark has the unique feature of being *forward-looking*; other common benchmarks, such as zero earnings, prior-year earnings, and earnings forecasts (made by either analysts or managers) are backward-looking. However, most studies have not focused on these forecasts.

We focus on management forecasts in Japan because they have several useful features. First, a major difference between Japan and the United States with regard to disclosure is that, under Japan's reporting environment required by the Tokyo Stock Exchange (TSE), most Japanese listed companies (about 98.3% in our sample) report their accounting earnings for the current year and their point-estimated earnings forecasts for the following year simultaneously. Because of this feature, studies on Japanese firms are free from sample selection bias and can use earnings forecasts with less noise. As a sample of Japanese listed firms (38,813 observations) from 1997 to 2019, we examine them from the following three perspectives.

Our primary research objective is to examine the existence of forecast management conducted to avoid negative forecast innovations. We predict that managers conduct forecast management to avoid negative forecast innovations for equity purposes. Our prediction assumes

[2] Recent studies refer to this reporting practice as "bundled management forecasts"; these are forecasts of future earnings issued concurrently with earnings announcements (Anilowski, Feng, and Skinner 2007; Rogers and Van Buskirk 2013).

that managers *opportunistically* use their discretion to maximize their own benefits (Watts and Zimmerman 1986). However, several theoretical and empirical studies find that managerial discretion such as earnings management could be used *efficiently* to convey inside information to investors about future performance (c.f. Demski and Sappington 1986, 1990; Demski 1998; Collins, Kothari, Shanken, and Sloan 1994; Subramanyam 1996; Tucker and Zarowin 2006). Although both the opportunistic and efficient behavior views predict that managers will conduct forecast management to avoid negative forecast innovations, we expect that our results stem from managerial opportunistic behaviors because the institutional features of Japan's earnings forecast systems increase the managerial opportunistic incentive, for several reasons.

First, we focus on a situation in which aggressive accounting is more likely, as studies have indicated that opportunistic accounting behaviors are more pervasive when the equity incentive is greater (Shleifer 2004; Cheng and Warfield 2005; Bergstresser and Philippon 2006). If firms that avoid negative forecast innovations can enjoy a return higher than that obtained by firms that do not avoid them,[3] the market response should intensify managerial equity incentives related to forecast management. Second, the costs of forecast management at the announcement date are expected to be lower than those of other management methods (i.e., earnings management or expectation management) conducted to achieve earnings benchmarks because there is (1) no restriction on continuous use, (2) no requirement that they audited, and (3) detection is difficult. Finally, litigation costs in Japan are lower than those in Western countries (West 2001; Ginsburg and Hoetker 2006), which induces managers to conduct forecast

[3] Note that this assumption is an empirical question. Although some studies find that forecast innovations have information content in the Japanese stock market (Kato et al. 2009), no study has yet examined whether a premium for meeting or beating forecast innovation benchmarks exists. Thus, our second analysis investigates whether firms that avoid negative forecast innovations through forecast management enjoy a higher return after controlling for the effect of other earnings benchmarks.

management (Kato, Skinner, and Kunimura 2009). Consistent with the opportunistic behaviors view, studies reveal that Japanese firms are likely to report positive and optimistic forecast innovations (Gotoh, 1997; Kato et al., 2009). However, the studies do not examine whether initial forecasts are intentionally manipulated by managers aiming at avoiding negative forecasts innovations. Consequently, given the Japanese institutional factors discussed previously, we predict that managers are likely to engage in opportunistic forecast management.

We test our hypothesis using an earnings distribution approach, regarded as useful for detecting earnings management, especially for earnings benchmarks such as losses, earnings decreases, and earnings forecasts (Burgstahler and Dichev 1997; DeGeorge et al. 1999; Jacob and Jorgensen 2007; Jorgensen et al. 2014; Burgstahler and Chuk 2017). This approach focuses on the discontinuity around zero in the distribution of forecast innovations and allows us to examine whether managers intentionally manipulate initial forecasts to report non-negative forecast innovations. Further, we estimate the discretionary and non-discretionary portion of forecast innovations (referred to hereafter as "discretionary" and "non-discretionary" forecasts, respectively) at the time of issue using a prediction model based on research in fundamental analysis (Lev and Thiagarajan 1993; Abarbanell and Bushee 1997). Using this model, we can quantify the credibility of initial management forecasts more directly and accurately than prior studies have done. Our results are consistent with our predictions. By examining the distributions of forecast innovations and discretionary forecasts, we reveal that, on average, managers have an incentive to conduct forecast management to avoid negative forecast innovations. We also find that discretionary forecasts are used to report non-negative forecast innovations.

Our second research objective is to explore *why* managers engage in forecast management to avoid negative forecast innovations. Many studies on the relation between earnings benchmarks and stock returns have indicated that investors reward (penalize) firms that achieve (miss) their earnings benchmarks (Barth, Elliott, and Finn 1999; Bartov, Givoly, and Hayn 2002; Lopez and Rees 2002; Brown and Caylor 2005). These results provide an incentive for managers' use of earnings management to meet or beat earnings benchmarks. Similarly, to explore managers' motives for forecasts management, we focus on the relationship between forecast innovations and stock price reaction. Some studies indicate that forecast innovations are associated with announcement-period stock returns (Kato, Skinner, and Kunimura 2009; Asano 2009a). We investigate whether firms enjoy a market premium for avoiding negative forecast innovations through forecasts manipulation. If such a result is obtained, it can be regarded as a motivation for managers to manipulate forecast innovation.

We find that firms that avoid negative forecast innovations enjoy a higher return at the announcement date than do firms that report negative forecast innovations. This effect holds after the effects of the rewards for other earnings benchmarks (i.e., the three earnings benchmarks described previously) are controlled for. Moreover, the stock price reactions to the avoidance of negative forecast innovations are significantly larger than are those to the meeting or beating of other earnings benchmarks. These results suggest that a poorly performing manager might offset the bad news for year t by predicting good prospects for year $t + 1$. More importantly, we also find that investors reward firms that avoid negative forecast innovations, even when managers use discretionary forecasts to do so. These results explain why managers engage in forecast management to avoid negative forecast innovations. That is, the discretionary forecasts appear to be justified on market premiums.

Our final concern is whether the market premium for avoiding negative forecast innovations is attributable to investors' overreaction or rational expectations. Although our results seem to generally validate the opportunistic behaviors view, we cannot deny the possibility that managers use discretionary forecasts to convey their prospects for future performance to investors. To address this concern, we examine the relation between avoiding negative forecast innovations using discretionary forecasts and future performance in terms of forecast errors and revisions. Kato et al. (2009) find that the future performance of firms with optimistic initial forecasts decreases, which is consistent with the opportunistic behaviors view. We investigate whether this result holds for cases in which managers use discretionary forecasts to report non-negative forecast innovations. Our results reveal that firms that avoid negative forecast innovations using discretionary forecasts report lower future performance, suggesting that discretionary forecasts are not used to signal managers' private information, which is consistent with the opportunistic behaviors view.

We contribute to the literature on the discretion of management earnings forecasts in several ways. First, to our knowledge, our study is the first to reveal that managers *intentionally* manipulate initial earnings forecasts to avoid negative forecast innovations. Kato et al. (2009) find that most initial forecasts are positive but that managers revise their forecasts downward during the fiscal year. While the results suggest that managers' initial forecasts are optimistic, they do not directly examine whether the initial forecast optimism is due to managers' discretionary behaviors. We reveal by examining the discontinuity around zero in the forecast innovations distribution that managers intentionally manipulate initial forecasts to avoid negative forecast innovations.

Second, we contribute to the literature on the determinants of management forecast errors by measuring the discretionary portion of management earnings forecasts. Prior studies have assessed the credibility of management forecasts on the basis of forecast errors at the end of a fiscal year, but none has identified the discretionary portion of management forecasts at the time of their issue (Rogers and Stocken 2005; Ota 2006; Kato et al. 2009). Based on evidence from the fundamental analysis literature (Lev and Thiagarajan 1993; Abarbanell and Bushee 1997), we estimate the discretionary portion of management earnings forecasts at the time of their issue, enabling us to quantify the credibility of initial management forecasts more directly than prior studies have done.

By using discretionary forecasts, we reveal that (1) discretionary forecasts are used to report non-negative forecast innovation, (2) investors reward firms that avoid negative forecast innovations, even when managers use discretionary forecasts to do so, and (3) firms that avoid negative forecast innovations using discretionary forecasts report lower future performance. These results rationally explain how and why managers engage in forecast management to avoid negative forecast innovations. Thus, our results lead to a deeper understanding of whether managers engage in opportunistic (rather than merely optimistic) behaviors regarding earnings forecasts and whether stock investors can see through this type of opportunistic behavior. Our findings that managers opportunistically manipulate their forecasts have significant implications for investors and regulators.

2. Hypothesis Development

2.1. *Management forecast reporting in Japan*

Management forecast reporting in Japan has several features that are useful for our study. First, management forecast disclosure is effectively mandated in Japan (Kato et al. 2009). The TSE requires that listed companies submit a non-audited overview of their main accounting items (referred to as *Kessan-Tanshin*) within 45 days of the end of the fiscal period and quarterly period. Although this disclosure for management forecasts is voluntary and without legal force, compliance has been so high that almost all Japanese firms provide management earnings forecasts (about 98.3% of the firms in our sample do). Kato et al. (2009) also find that 93.7% of their sample (38,068 of 40,647 firms) provide management forecasts from 1997 to 2007. Ota (2011) indicates that 98.9% of the sample's listed firms (3,790 of 3,831) provide management forecasts. This evidence suggests that studies in the Japanese setting are free from sample selection bias. On the other hand, US studies have had to adopt research designs such as Heckman two-stage estimation to treat sample selection bias (e.g., Feng et al. 2009; Hui et al., 2009; Gong et al. 2011; Xu 2010; Shivakumar et al. 2011; Zhang 2012; Feng and Li 2014). However, some studies indicate that Heckman two-stage estimation has problems (e.g., Lenox et al., 2011), suggesting that solving the sample selection bias is not easy.

Second, Japanese listed companies provide point-estimated forecasts. American firms generally provide range forecasts. Kasznik (1999) indicates that, for U.S. firms, the frequencies of these point and range estimates are similar (54.7% and 45.3%, respectively) in his sample period (1987–1991). More recently, Heflin, Subramanyam, and Zhang (2003) and Kwak, Ro, and Suk (2012) indicate that the proportion of range estimates increased significantly after Regulation FD. Studies typically use the midpoint as the proxy for managers' earnings expectations (e.g., Baginski et al. 1993). However, range forecasts can introduce a measurement error problem. For example, Ciconte et al. (2014) find that managers place significantly more weight on the upper bound of forecast ranges, suggesting that using midpoint estimates introduces an upward (downward) bias into management forecast errors (management forecast surprises).[4] Japanese management forecasts do not include this type of noise because listed firms in Japan generally report point-estimated forecasts, as prescribed by the TSE.[5]

Third, listed companies are expected to provide initial forecasts of these items for year $t + 1$, when the summary of the financial statements for year t are reported in Kessan-Tanshin, and revisions (including confirmations) when the interim summary of financial statements is reported. This logic suggests that investors can estimate the discretionary portion of earnings forecasts (i.e., discretionary forecasts) by using fundamental analysis at the earnings announcement date. Thus, the Japanese setting enables us to evaluate whether investors efficiently incorporate the effect of discretionary forecasts into stock prices.

2.2. *Hypothesis on the existence of forecast management*

Management earnings forecast information is expected to mitigate the problem arising from the information asymmetry among stakeholders in the stock market. Because most Japanese firms systematically report their management earnings forecasts with their actual earnings, Japan's management forecast system has functioned as an important information source for stakeholders. A survey conducted by Suda and Hanaeda (2008), based on a questionnaire created by Graham et al. (2005), indicates that management earnings forecasts are considered the most important performance benchmark in Japan (97.07% of respondents agree or strongly agree that this benchmark is most important). This result is interesting because it differs from that of

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[4] Ciconte et al. (2014) investigate U.S. firms that provide range forecasts with a lower bound and an upper bound and find that actual earnings do not fall at the midpoint but fall close to the upper bound because of managers' asymmetric loss functions regarding earnings surprises.

[5] The TSE also requires that firms release range estimates if point estimates can be misleading to investors. However, only the dividend per share is sometimes reported as a range estimate (Gotoh 1997; Ota 2010).

Graham et al. (2005), who find that many U.S. executives do not care about management earnings forecasts.[6]

Consistent with this argument, several recent studies have provided systematic evidence of the importance of management earnings forecasts in the Japanese stock market. Some studies have compared the information content of actual annual earnings for year *t* with management earnings forecasts for year *t* + 1 (Darrough and Harris 1991; Conroy et al. 1998). These studies have found that stock price reactions around the announcement date are more pronounced for forecasts earnings than they are for actual earnings, suggesting that management earnings forecasts have higher information content than actual annual earnings do around the announcement date in the Japanese stock market.

We focus on managerial discretion over initial earnings forecasts. Managers are likely to have a great deal of discretion in estimating their forecasts and to use their discretion to manage their initial forecasts for their own benefit. Although earnings management studies have revealed behaviors on several earnings benchmarks (Burgstahler and Dichev 1997; DeGeorge et al. 1999; Kasznik 1999; Abarbanell and Lehavy 2003),[7] the fact that Japanese firms issue initial earnings forecasts with the actual earnings announcements is likely to produce a new earnings benchmark targeted by managers: a forecast innovation, defined as the difference between the management earnings forecasts for year *t* + 1 and the actual earnings for year *t*.

We predict that Japanese firm managers have an incentive to manage their earnings forecasts to avoid negative forecast innovations. Several recent studies have provided evidence

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[6] Graham et al. (2005) reveal that four earnings benchmarks are particularly important: 1) same quarter last year (85.1% of respondents agree or strongly agree that this metric is important); 2) analyst consensus estimate (73.5%); 3) reporting a profit (65.2%); and 4) previous quarter EPS (54.2%).

[7] The earnings management research has revealed that managers engage in earnings management to achieve three actual-based earnings benchmarks: 1) zero earnings levels; 2) earnings changes; and 3) earnings forecasts, including analyst and management forecasts (Burgstahler and Dichev 1997; DeGeorge et al. 1999; Kasznik 1999; Abarbanell and Lehavy 2003).

of an incentive to report non-negative forecast innovations. A survey analysis by Tsumuraya (2009) indicates that a significant portion (37.8%) of Japanese managers report their earnings forecasts for the next year while considering the level of current earnings. Gotoh (1997) provides evidence that Japanese firms, on average, report positive forecast innovations. These results suggest that Japanese managers care about avoiding negative forecast innovations.

Furthermore, Kato et al. (2009) examine the relation between announcement period returns and forecast innovations for Japanese firms and find that forecast innovations are associated with announcement period stock returns. Asano (2009a) finds similar results for the information content of forecast innovations, indicating that forecast innovations are informative to market participants. These results are likely to induce managers to conduct opportunistic forecast management.

This "opportunistic behaviors" view is consistent with the theoretical implications of positive accounting theory (Watts and Zimmerman 1986) and much of the empirical evidence presented by earnings management research (Healy and Wahlen 1999; Dechow and Skinner 2000; Fields et al. 2001; Dechow, Ge, and Schrand 2010). For instance, recent studies suggest that managers are likely to manage earnings to meet or beat earnings benchmarks for equity purposes (Burgstahler and Dichev 1997; DeGeorge et al. 1999; Kasznik 1999; Abarbanell and Lehavy 2003) and that investors tend to overreact to managed earnings (Sloan 1996; Xie 2001). Therefore, based on this view, we expect that firm managers engage in forecast management to avoid negative forecast innovations for equity purposes.

On the other hand, several theoretical and empirical studies based on the efficient behaviors view have found that managerial discretion such as earnings management can be used to convey inside information about future performance to investors (c.f. Demski and Sappington 1986, 1990; Demski 1998; Collins et al. 1994; Subramanyam 1996; Tucker and Zarowin 2006). For example, managers may signal good future prospects based on private information such as capital expenditures and product development activities by reporting positive forecast innovations.

Considering the two alternative predictions, we expect that the opportunistic behaviors view will be dominant in our study, for several reasons. First, we focus on a situation in which aggressive accounting is more likely. Some have argued that opportunistic accounting behaviors are more pervasive when the equity incentive is greater (Shleifer 2004; Cheng and Warfield 2005; Bergstresser and Philippon 2006). Studies on the relation between earnings benchmarks and stock returns have indicated that markets reward firms that meet or beat their earnings benchmarks (Barth et al. 1999; Bartov et al. 2002; Lopez and Rees 2002; Brown and Caylor 2005), suggesting that managers concerned about short-term stock price performance are likely to conduct earnings management to achieve their earnings benchmarks (Burgstahler and Dichev 1997; DeGeorge et al. 1999; Kasznik 1999; Abarbanell and Lehavy 2003). If firms that avoid negative forecast innovations can enjoy a higher return, that higher return would motivate managers to conduct forecast management.

Furthermore, we expect this incentive to be stronger in the Japanese institutional setting. Because both actual earnings performance and management earnings forecasts are released simultaneously, a manager with bad earnings performance might offset the bad news for year t by predicting good earnings forecasts for year $t + 1$. If the Japanese market is favorable to forward-looking information, as previous studies have suggested (Darrough and Harris 1991; Conroy et al. 1998; Suda and Hanaeda 2008), announced actual earnings might be stale information. Therefore, Japanese managers are likely to have a strong incentive to manipulate their earnings forecasts because of their equity incentives.

Second, the costs of forecast management are expected to be lower than those of other management methods used to meet or beat earnings benchmarks. Studies have revealed two methods of achieving earnings benchmarks: earnings management and expectations management. Accruals-based earnings management is restricted by the use of accruals in the preceding period because of the effect of accruals reversion (Barton and Simko 2002). We conjecture that forecast management is less costly because its continuous utilization is unrestricted.[8] Furthermore, the Kessan-Tanshin, which reports management earnings forecasts, are not subject to an audit by certified public accountants or auditing firms, suggesting that managers have wide discretion in estimating their forecasts. Moreover, discretionary management for initial forecasts is more difficult to detect than is earnings or expectations management (i.e., forecast revisions during the period). In general, we can identify the discretionary portion (i.e., the discretionary accruals) of net income using a financial statement analysis,[9] and the information about forecast revisions is immediately announced to the stock market, meaning that the value of managed earnings resulting from these methods can be perceived by market participants. On the other hand, detecting the discretionary portion of management earnings forecasts is more difficult. These three factors are likely to decrease the cost of forecast management and increase the managerial incentive to conduct it.

Finally, Kato et al. (2009) argue that Japan's lower litigation costs induce firm managers to conduct forecast management and that the legal costs of biasing earnings forecasts in Japan are

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[8] This argument is consistent with Kato et al.'s (2009) evidence that managers' optimism with regard to forecasts is highly persistent from one year to the next.
[9] Green, Hand, and Soliman (2011) indicate that the hedge returns to accruals anomalies appear to have decayed in U.S. stock markets to the point that they are, on average, no longer reliably positive.

relatively small because of the nature of Japan's legal and regulatory environments. Litigation in Japan has traditionally been much less common than in Western countries (Ginsburg and Hoetker 2006). West (2001) provides evidence that, although Japan's litigation rate (including security litigation) has increased since around 1990, expected litigation costs are still much lower in Japan than they are in the United States.[10]

Consistent with the opportunistic behaviors view, Kato et al. (2009) find that around 80% of initial forecast innovations are positive and that managers revise their forecasts downward during the fiscal year, so that most earnings surprises are non-negative. These results suggest that managers' initial forecasts are optimistic. However, they do not directly examine whether and how managers intentionally manipulate their initial forecasts. Although Kato et al. (2009) indicate that most initial forecast innovations are positive, they do not examine whether initial forecasts are intentionally manipulated by managers to avoid negative forecast innovations. Further, if managers revise their forecasts due to rapid changes in the economic environment that they could not have anticipated when the initial forecasts were made, it is difficult to regard the initial forecasts as managerial discretionary behavior.

We address this issue using an earnings distribution approach frequently employed in the earnings management research to detect earnings management (Burgstahler and Dichev 1997; DeGeorge et al. 1999; Jacob and Jorgensen 2007; Jorgensen et al. 2014; Burgstahler and Chuk 2017). Specifically, observing the discontinuity around zero in the distribution of forecast innovations allows us to examine whether managers intentionally manipulate initial forecasts to avoid negative forecast innovation. The discontinuity around zero (i.e., unusually fewer observations to the immediate left of zero and an unusually large number of observations to the

[10] Kato et al. (2009, footnote 4) provide a useful summary of the institutional background and practice of litigation in Japan.

immediate right of zero) means that initial earnings forecasts are managed to avoid negative forecast innovations. Further, we estimate the discretionary portion of earnings forecasts and then examine whether discretionary forecasts are used to avoid negative forecast innovations. These analyses can allow us to examine whether managers intentionally manipulate initial forecasts to avoid negative forecasts innovation.

Taken together, these argument suggests that Japanese firms have an incentive to avoid reporting negative forecast innovations. This argument leads to our first hypothesis:

Hypothesis 1. *Management earnings forecasts are discretionally managed to avoid negative forecast innovations*.

2.3. *Hypothesis on incentive for forecast management*

Having examined that firm managers engage in discretionary forecast management, we next explore why they do it. Studies on the relation between earnings benchmarks and stock returns have indicated that investors reward firms that achieve their earnings benchmarks and penalize firms that miss them (Barth et al. 1999; Bartov et al. 2002; Lopez and Rees 2002; Brown and Caylor 2005). These results provide an economic rationale for the use of earnings management to meet or beat earnings benchmarks. We expect that the motivation for forecast management is closely associated to the stock market reaction to forecast innovations.

In particular, we investigate whether firms enjoy a market premium for avoiding negative forecast innovations after controlling for the effect of other earnings benchmarks. Although prior studies find that forecast innovations are positively associated with stock returns around the announcement date (Kato et al. 2009), the studies have not revealed whether firms obtain a market reward for avoiding negative forecast innovations.

The important feature of Japan's institutional setting is that management earnings forecasts are issued along with actual earnings at the same time. If investors reward firms that avoid negative forecast innovations and the reward effect is robust over other earnings benchmarks, this evidence will serve as a reasonable explanation for managers' forecast management. Firms that do not meet or beat their actual earnings benchmarks (i.e., that report losses, revenue decreases, or negative forecasts errors) are expected to be penalized by the stock market (Barth et al. 1999; Bartov et al. 2002; Lopez and Rees 2002; Brown and Caylor 2005). However, as described in the previous section, managers might offset their negative news by issuing positive news on future performance. We suppose that the penalty for missing earnings benchmarks is softened or outweighed by the premium for avoiding negative forecast innovations.

If investors can accurately detect the discretionary portion of management earnings forecasts (i.e., discretionary forecasts), firms that avoid negative forecast innovations through discretionary forecasts will not be likely to enjoy a higher return, and firm managers will have no incentive to manage their forecasts. Given the strong managerial incentive to avoid negative forecast innovations and the features of the Japanese stock market from the opportunistic behaviors perspective, we expect that a market premium is obtained for avoiding negative forecast innovations, even when it is achieved through discretionary forecast management. Thus, we propose the second hypothesis:

Hypothesis 2. *Firms that avoid negative forecast innovations through discretionary forecasts enjoy a higher return around the announcement date than do firms that do not avoid negative forecast innovations after the effect of other earnings benchmarks is controlled for.*

2.4. *Hypothesis on consequence of forecast management*

Our final concern is to examine the effect of forecast management on future performance. Our hypothesis development so far has relied on the opportunistic behaviors view, which predicts that managers manipulate their earnings forecasts to mislead investors and that investors respond to manipulated forecast innovations naively. This opportunistic behaviors view predicts that initial discretionary forecasts decrease future performance.[11]

Consistent with the opportunistic behaviors view, Kato et al. (2009) find that initial forecasts are generally positive and that initial optimism is negatively related to firm performance. We extend their study by examining the relation between avoiding negative forecast innovations through *discretionary forecasts* and future performance in terms of forecast errors and revisions. In other words, we examine whether opportunistic managerial behaviors decrease future performance. We predict that firms that use discretionary forecasts to report non-negative forecast innovations are more likely to revise their initial forecasts downward and miss their earnings forecasts. Hence, our final hypothesis is as follows:

[11] As discussed in the development of hypothesis 1, some theoretical and empirical studies suggest that managerial discretion such as earnings management can be used to convey inside information about future performance to investors (Ronen and Sadan 1981; Demski and Sappington 1986, 1990; Collins et al. 1994; Subramanyam 1996; Demski 1998; Sankar and Subramanyam 2001; Kirschenheiter and Melumad 2002; Tucker and Zarowin 2006). If managers inflate their earnings forecasts to convey positive prospects for future performance, this action will indicate a positive relation between discretionary forecasts and future performance.

Hypothesis 3. *Discretionary forecasts used to avoid negative forecast innovations are negatively associated with future performance.*

3. Variable Measurements

We next describe the estimation procedure used to measure the discretionary portion of management earnings forecasts (discretionary forecasts; DF). Basically, we estimate the expected change in earnings based on the fundamental analysis research (Ou and Penman, 1989; Lev and Thiagarajan 1993; Abarbanell and Bushee 1997) and define the differences between the expected change in earnings and forecast innovations as the discretionary forecasts. We summarize the estimation procedure used to measure the discretionary portion of management earnings forecasts in Panel A of Figure 1. In the firsts step, we estimate the non-discretionary portion of management forecasts (non-discretionary forecast innovations; NDF). Specifically, we model the change in annual earnings as a function of 1) the prior annual change in earnings, 2) fundamental signals, and 3) returns accumulated over year $t-1$ (i.e., equation (1)). Estimating the expected value of the change in one-year-ahead earnings produces the non-discretionary portion of forecast innovations:

$$CROA_t = \alpha + \beta_1 CHGROA_{t\text{-}1} + \beta_2 INV_{t\text{-}1} + \beta_3 AR_{t\text{-}1} + \beta_4 CAPX_{t\text{-}1} + \beta_5 GM_{t\text{-}1} + \beta_6 S\&A_{t\text{-}1} + \beta_7 ETR_{t\text{-}1} + \beta_8 CTAC_{t\text{-}1} + \beta_9 AQ_{t\text{-}1} + \beta_{10} LF_{t\text{-}1} + \beta_{11} CRET_{t\text{-}1} + \varepsilon_t , \quad (1)$$

In accordance with prior studies' results on earnings persistence (Brown and Kennelly 1972; Freeman and Tse 1989; Bernard and Thomas 1990), our estimation model is based on the first-order serial correlation model for the changes in annual earnings. Thus, we include the current change in ROA (*CHGROA*) as an explanatory variable.[12] Furthermore, we use

[12] Note that *CHGROA* is not the same as *CROA*. Following the definition of Abarbanell and Bushee (1997), for the *CHGROA*, we deflate the change in earnings by *contemporaneous* assets (rather than lagged assets, as in *CROA*).

fundamental signals variables that are empirically consistent with previous fundamental analysis research (Lev and Thiagarajan 1993; Abarbanell and Bushee 1997) to improve the explanatory power of the model and to more precisely predict the expected value of the change in one-year-ahead earnings (*CROA*). Lev and Thiagarajan (1993) indicate that most of these variables have incremental value-relevance over current earnings. Abarbanell and Bushee (1997) extend the analysis of Lev and Thiagarajan (1993) by providing evidence that these fundamental signals can predict changes in one-year-ahead earnings and five-year earnings growth rates.[13]

Following the prediction of Lev and Thiagarajan (1993) and Abarbanell and Bushee (1997), we expect that each fundamental signal will be negatively associated with subsequent earnings changes. Specifically, inventory signal (*INV*) is expected to have a negative association with *CROA* because of difficulties in generating sales. An increase in accounts receivables (*AR*) is a negative signal because of increases in bad debt expenses. A reduction in capital expenditure (i.e., an increase in *CAPX*) is a negative signal because the reduction could be considered a discretionary attempt by managers to boost current and future earnings.

A decrease in the gross margin balance (*GM*) and an increase in selling and administrative expenses (*S&A*) are considered negative signals reflecting a loss of managerial cost control. A decrease in the effective tax rate (*ETR*) reflects lower earnings persistence and can be interpreted as a negative signal. A large increase (decrease) in total accruals (*CTAC*) will lead to a decrease (increase) in future earnings owing to the reversing nature of accruals. Thus, *CTAC* is also considered a negative signal.[14] A reduction in the labor force (i.e., an increase in *LF*) is expected

[13] Abarbanell and Bushee (1998) find that the application of an investment strategy using these fundamental signals can lead to excess returns.

[14] As earnings quality measures, Abarbanell and Bushee (1997) use an indicator variable set to 1 if a firm adopts LIFO and 0 otherwise. We adopt the *CTAC* instead of the LIFO measure because total accruals are expected to be able to capture earnings quality more accurately than a single accounting procedure can manage.

to increase wage-related expenses, such as severance pay. Therefore, a positive *LF* is expected to reduce future ROA. A qualified audit opinion is a signal to the market that a firm's earnings are noisier or less persistent (or both) than had been assumed. Therefore, *AQ* is expected to have a negative association with *CROA*.

Finally, following Matsumoto (2002), we include the cumulative returns over the year (prior to the earnings announcement) to capture additional value-relevant information that managers might use to estimate earnings. In other words, *CRET* is expected to capture additional information not reflected in fundamental signal variables. Since managers have superior information about future earnings that is not reflected in public information such as financial statements, we assume that stock prices will incorporate some of the private information managers use to estimate future earnings.[15] The relation between *CROA* and *CRET* is expected to be positive (for detailed variable definitions, see Appendix A).

We estimate the model for each year and calculate the parameter estimates for each variable. The sample for this regression model consists of 48,109 observations drawn from 2003 to 2019. Each sequential variable is winsorized at the 1 and 99 percentiles by year. Table 1 reports the results of the regressions of equation (1). In line with our prediction, the average coefficients on *CHGROA*, *INV*, *CAPX*, *GM*, *S&A*, *CTAC*, *AQ*, and *LF* are negative, while those on *AR* and *ETR* signals are positive.[16] The coefficient of *CRET* is significantly positive, consistent with the results of Matsumoto (2002). Overall, we find that fundamental signals and

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[15] Matsumoto (2002) uses *CRET* to capture additional value-relevant information that an analyst might use to estimate earnings.

[16] The positive relation between *AR* and *CROA* is contrary to our predictions but consistent with the results of Abarbanell and Bushee (1997), who argue that *AR* is positively associated with *CROA* because of the growth in sales and earnings caused by the expansion of credit. In addition, the positive coefficient of *ETR* is not surprising because it is consistent with evidence from several prior studies. For example, Schmidt (2006) finds a positive association between the effective tax rate and future earnings.

cumulative returns have incremental explanatory power for future change in earnings, suggesting that the model is reasonably specified.

In the second step, we use the parameters from the previous year estimated by equation (1) and actual data from the current year to determine the expected change in ROA. As in Matsumoto (2002), we use only the data available when managers made their forecasts. The expected change in ROA corresponds to non-discretionary forecast innovations (*NDF*) and is defined as follows:

$$NDF_t = (\hat{\alpha}_{t-1} + \hat{\beta}_{1t-1}CHGROA_t + \hat{\beta}_{2t-1}INV_t + \hat{\beta}_{3t-1}AR_t + \hat{\beta}_{4t-1}CAPX_t + \hat{\beta}_{5t-1}GM_t$$
$$+ \hat{\beta}_{6t-1}S\&A_t + \hat{\beta}_{7t-1}ETR_t + \hat{\beta}_{8t-1}CTAC_t + \hat{\beta}_{9t-1}AQ_t + \hat{\beta}_{10t-1}LF_t$$
$$+ \hat{\beta}_{11t-1}CRET_t) \times Total\ Assets_{t-1}\,. \quad (2)$$

In the final step, we subtract the non-discretionary forecast innovations (*NDF*) for year t from the forecast innovations (*FI*) for year t. As defined earlier, *FI* for year t is measured as the management forecasts for year $t + 1$ minus the actual earnings for year t. Both *NDF* and *FI* are divided by total assets at the end of year $t – 1$. This procedure provides discretionary forecast (*DF*), as in equation (3):

$$DF_t = FI_t - NDF_t\,. \quad (3)$$

Panel B of Figure 1 summarizes the components of management earnings forecasts. Panel B indicates that the forecasts for year $t + 1$ can be divided into net income for year t and forecast innovations (*FI*) for year t. Furthermore, by estimating the prediction model, forecast innovations are classified into two parts: discretionary forecasts (*DF*) and non-discretionary forecasts (*NDF*). Our central concern is *DF* because it is expected to capture the discretionary portion of management earnings forecasts.

4. Sample Selection and Descriptive Statistics

Our sample selection procedure is summarized in Table 2. First, we identify the listed companies that report consolidated financial statements for the calendar years from 1997 to 2019. We obtain financial statements and management forecasts from the Nikkei NEEDS Financial QUEST database. The necessary data on stock price data are obtained from the Nikkei Portfolio-Master database. We exclude financial institutions (e.g., banks, securities companies, and insurance companies) and other financial institutions (credit and leasing). Our initial sample comprises 73,971 firm-year observations. Second, we eliminate 9,495 observations that lack forecast data. Third, we eliminate 376 observations because their accounting periods change during our analysis period. This filtering procedure produces 64,100 observations for the earnings distribution analysis. Finally, we delete observations with missing data to calculate discretionary forecasts (23,729) and other variables (1,558). Thus, our final sample consists of 38,813 firm-year observations.

Descriptive statistics are provided in Table 3. The average (median) value of earnings surprise (*ES*), the actual earnings for year *t* minus the latest management earnings forecasts for year *t*, deflated by lagged total assets, is 0.000 (0.000). In addition, the untabulated mean (median) value of management forecast errors, the initial management earnings forecasts for year *t* minus the actual earnings for year *t*, deflated by lagged total assets, is 0.008 (0.002). These results indicate that managers' net income forecasts in Japan are optimistic and are revised in the subsequent period, which is in line with prior studies' results (Kato et al. 2009; Ota 2006). The mean value of forecast innovations (*FI*) is 0.009, which is relatively large because the mean value of *ROA* is 2.8%. This evidence suggests that net income is forecasted to increase by a mean (median) of 0.9% (0.3%) of assets. The average of *POSFI*, an indicator variable set to 1 if *FI* is greater than or equal to 0 and 0 otherwise, indicates that 69.7% of earnings forecasts are predicted to result in earnings increases in the next year.

The table also provides details on the characteristics of the forecast management variables. The average value of discretionary forecasts (*DF*) is positive and accounts for a significant portion of *FI*. Our untabulated result suggests that the positive *DF* is 0.510, indicating that about 51.0% of observations in our sample conduct income-increasing forecast management. We define *POSFI (with forecast management)* as an indicator variable set to 1 if *FI* is greater than or equal to 0 and *NDF* is negative and 0 otherwise. About 19.6% of observations in our sample use positive discretionary forecasts to report a non-negative *FI*.

5. Main Results

5.1. ***Forecast management to avoid reporting negative forecast innovations***

Figure 2 presents the distribution of the scaled forecast innovations for the test of hypothesis 1. We can observe clear discontinuities at zero in the distribution of scaled forecast innovations. Given the implications found in the earnings management research (Burgstahler and Dichev 1997; Degeorge et al. 1999), this result suggests that managers of Japanese firms engage in discretionary forecast management to avoid reporting negative forecast innovations.[17] Table 4 summarizes the standardized differences and the earnings management ratio (i.e., EM ratio) in the distributions. The standardized differences are used to test the significance of the irregularities at the near-zero forecast innovations using a statistical test based on Burgstahler

[17] Asano (2009b) presents similar evidence indicating the discontinuities at zero in the distribution of scaled forecast innovations. However, he does not conduct his analysis based on discretionary forecasts or on the incentive and consequences of forecast management.

and Dichev (1997).[18] Panel A indicates that the standardized differences of the test intervals (i.e., the intervals at the left and right sides of zero) are statistically significant, indicating that the irregularities near zero in the distribution of forecast innovations are statistically significant.

We also present the distribution of the scaled *non-discretionary* forecast innovations (i.e., the scaled non-discretionary forecasts; *NDF*) to compare them with the results for the distribution of the scaled forecast innovations presented in Figure 3. In contrast to the results presented in Figure 2, the irregularities at zero in the distribution of non-discretionary forecasts are not observed in Figure 3. Panel A of Table 4 suggests that the standardized differences to the right of zero are negatively and statistically significant. Furthermore, we use the EM ratio to test for differences in the degrees of the discontinuities around zero between the discretionary and non-discretionary forecast innovation distributions. The EM ratio is defined as the number of observations in the interval to the immediate right of (and including) zero divided by the number of observations in the interval to the immediate left of zero (Beatty, Ke, and Petroni 2002; Dechow, Richardson, and Tuna 2003; Brown and Caylor 2005). The chi-square test of the EM ratios shown in Panel B of Table 4 indicates that the EM ratio of the distribution of forecast innovations (2.698) is significantly higher than the ratio of the distribution of non-discretionary forecast innovations (0.943). This evidence suggests that the discontinuity of the distribution is more pervasive for forecast innovations than it is for non-discretionary forecast innovations, and that discretionary forecast management creates the discontinuity at zero in the distribution of forecast innovations in Figure 2.

[18] The standardized difference is the difference between the actual and expected numbers of observations in an interval (operationally defined as the average of the number in the two adjacent intervals) divided by the estimated standard deviation of the difference. Denoting the probability that an observation will fall into interval i by p_i, the variance of the differences between the observed and expected number of observations for interval i is approximately $Np_i(1-p_i) + (1/4)N(p_{i-1}+p_{i+1})(1-p_{i-1}-p_{i+1}$; e.g., Burgstahler and Dichev 2007; Shuto 2009).

Additionally, we examine whether discretionary forecasts are really used to avoid negative forecast innovations using methods employed in prior studies (Beatty et al. 2002; Abarbanell and Lehavy 2003). If firm managers use *DF* to avoid negative forecast innovations, we expect that managers issue income-increasing (positive) discretionary forecasts when non-discretionary forecast innovations are negative. Table 5 summarizes the frequencies of positive and negative forecast innovations in small regions centered on zero and the ratio of firms that avoid negative forecast innovation to all firms in the regions. Table 5 indicates that, in all intervals, the percentages of firms avoiding negative *FI* are much higher than the ratios based on non-discretionary forecast innovations. For example, the interval between -0.0005 and +0.0005 comprises 2,169 observations, and the share of firms that avoid negative forecast innovations (1,627 observations) in all firms (2,169 observations) is 75.012%. On the other hand, in the distribution of non-discretionary forecast innovations, we observe that the share of firms that avoid forecast innovation (1,536 observations) in all firms (2,169 observations) is 70.816%. The difference in shares is significant at a 1% level.

Further, Table 6 reports the mean and median *DF* for the observations presented in Table 5. The table indicates that, in the distribution based on non-discretionary forecast innovation, the means (medians) *DF* of firms with negative forecast innovations are significantly positive and higher than are those of firms avoiding negative forecast innovations in all intervals. For example, in the interval between -0.0005 and +0.0005, the average *DF* of firms with negative forecast innovations, 0.010, is positive and significantly higher than that of firms avoiding negative forecast innovations, -0.008. By contrast, we do not observe this tendency in the distribution of forecast innovations. The averages (medians) of *DF* for firms with negative forecast innovations are all negative in all intervals. The overall evidence are consistent with our prediction that managers use positive discretionary forecasts when non-discretionary forecast innovations are negative.

Overall, the results suggest that managers of Japanese firms have a strong incentive to avoid negative forecast innovations by using the discretion of management forecasts, which is consistent with hypothesis 1.

5.2. *Forecast management and stock market reaction*

We present Table 7 as a preliminary analysis of the relation between management forecasts and stock returns, suggesting a two-by-two analysis of *CAR*, defined as the market-adjusted stock return accumulated over the five trading days around the forecast release date (days –3 to +1). In Panel A, the columns partition the data according to the sign of earnings surprise (*ES*), and the rows partition the data according to the sign of the forecast innovations. Panel A indicates that reporting non-negative *FI* can lead to higher *CAR*. Regardless of the sign of *ES*, the average *CAR*s of firms with non-negative *FI* are always positive (0.022 for $ES \geq 0$ and 0.006 for $ES < 0$) and are significantly greater than those of firms with negative *FI*. Note that firms that report non-negative forecast innovations can have positive returns (0.006), even when they report a negative earnings surprise. The lower cells in the tables indicate that firms reporting negative forecast innovations cannot have positive returns (–0.018), even when they report a positive earnings surprise. These results suggest that market participants are likely to place a higher value on forecast innovations.

Similarly, Panel B of Table 7 presents the *CAR* in each cell, obtained by sorting the data according to the sign of forecast innovations and the change in earnings (i.e., *CROA*). The table indicates that the *CAR*s of firms reporting non-negative *FI* are significantly greater than those of firms reporting negative *FI* for both non-negative changes in earnings ($CROA_t \geq 0$) and negative changes in earnings ($CROA_t < 0$). The upper-right cell contains firms with negative *CROA* and non-negative *FI*, indicating that the mean (median) of the group's *CAR* is positive, 0.009 (0.004), suggesting that firms that avoid negative forecast innovations have positive returns when they report earnings decreases. Panel C of Table 7 summarizes the *CAR*s of the firms, sorted by the signs of *FI* and earnings levels (*ROA*). It reveals a similar tendency: The mean (median) of the *CAR* of the upper-right group is 0.009 (0.003), similar to that of the upper-left group. Surprisingly, this result suggests that firms can obtain a positive return by reporting non-negative forecast innovations, even when they report earnings losses. These overall results suggest that the announcement of having met or beaten forecast innovation benchmarks creates a higher and constant positive abnormal return, regardless of the achievements of other earnings benchmarks.

Finally, Panel D of Table 7 presents the results for the analysis of *CAR*, partitioning the data according to the signs of non-discretionary forecast innovations (*NDF*) and *FI* in the columns and rows, respectively. In general, the *CAR*s of firms reporting non-negative *FI* are significantly greater than those of firms reporting negative *FI*. The upper-right cell presents the *CAR*s of firms reporting negative non-discretionary forecast innovations and positive forecast innovations, meaning that firms report positive forecast innovations through discretionary forecasts. The mean (median) of the group's *CAR* is 0.027 (0.019), which is significantly higher than that of the upper-left group that avoids negative forecast innovation benchmarks without forecast management, 0.012 (0.007). These results suggest that stock market evaluates avoiding negative forecast innovations through discretionary forecasts as positive surprise, and that firms enjoy an economic benefit from forecast management. This is consistent with the basic implication of hypothesis 2.

Next, to test hypotheses 2 and 3, we estimate the following regression models using pooled regressions and report the *t*-statistics based on the standard errors clustered at the firm and year levels, following the analyses of Petersen (2009; for detailed variable definitions, see Appendix B):

$$CAR_t = \alpha + \beta_1 POSFI_t + \beta_2 POSES_t + \beta_3 POSCROA_t + \beta_4 POSROA_t + \beta_5 FI_t$$
$$+ \beta_6 DS_t + \beta_7 SIZE_t + \beta_8 BM_t + Year\ indicator + Industry\ indicator + \varepsilon_t, \quad (4)$$

$$CAR_t = \alpha + \beta_1 POSFI\ (with\ forecast\ management)_t$$
$$+ \beta_2 POSFI\ (without\ forecast\ management)_t + \beta_3 POSES_t + \beta_4 POSCROA_t$$
$$+ \beta_5 POSROA_t + \beta_6 FI_t + \beta_7 DS_t + \beta_8 SIZE_t + \beta_9 BM_t + Year\ indicator$$
$$+ Industry\ indicator + \varepsilon_t, \quad (5)$$

In both models, the dependent variable is *CAR* (defined in Table 7). We include *POSFI* in the model defined in (4) as an independent variable indicating whether firms avoid negative forecast innovations. We also add other earnings benchmark variables, including (1) meeting or beating the latest management earnings forecast (*POSES*), (2) avoiding revenue decreases (*POSCROA*), and (3) avoiding losses (*POSROA*). If firms that report positive forecast innovations have a higher return, the coefficient of *POSFI* will be positive after the effect of other earnings benchmarks is controlled for. We include the level of forecast innovations (*FI*) so that *POSFI* captures the effect of avoiding negative forecast innovations. We also control for the effect of firm size (*SIZE*), the book-to-market ratio (*BM*), and the dividend surprise measure (*DS*) on *CAR* to assess the information content of forecast information in our model (Bartov et al. 2002; Kato et al. 2009).[19] Furthermore, to test hypothesis 2, we decompose *POSFI* into two

[19] We include the dividend measure because the forecasts of the dividend are also disclosed in Kessan-Tanshin along with the management earnings forecasts, as described in section 2.1. The expected signs of the control variables are described in the table.

indicator variables: (1) *POSFI (with forecast management*, an indicator variable set to 1 if $FI \geq 0$ and $NDF < 0$ and 0 otherwise, and (2) *POSFI (without forecast management*, an indicator variable set to 1 if $FI \geq 0$ and $NDF \geq 0$ and 0 otherwise. The former captures firms that avoid negative forecast innovations through discretionary forecasts while the latter captures firms that avoid negative forecast innovations without discretionary forecasts. Using these indicator variables allows us to examine whether the market treats firms that obtained a positive *FI* through discretionary means differently from the way it treats firms that did not.

Table 8 summarizes the regression results. The result for model (4) indicates that the coefficient of *FI*, 0.352, is significantly positive at a level less than 0.01, suggesting that forecast innovations have incremental information content for market participants, consistent with the results of Kato et al. (2009). The coefficient of *POSFI* is 0.035 and is significantly positive at a level less than 0.01; thus, the coefficient of *POSFI* is not attributable simply to the general relation between forecast innovations and stock returns. The table also suggests that the coefficients on other earnings benchmark variables—*POSES*, *POSCROA*, and *POSROA*—are all significantly positive (0.014, 0.011, and 0.025, respectively). Thus, the *CAR* of firms that avoid negative forecast innovations is higher than that of firms that report negative forecast innovations, which holds after the effect of other earnings benchmark measures are controlled for. Our *F*-test indicates that the coefficient of *POSFI*, 0.033, is significantly greater than are the coefficients on *POSES*, *POSCROA*, and *POSROA* (*F*-values are 239.20, 135.11, and 12.00, respectively). To assess the economic significance of the effect of positive forecast innovations on stock returns, note that the coefficient on *POSFI* is about 1% to 2% larger (1.4 to 3.2 times larger) than the coefficient on other earning benchmark variables (*POSES*, *POSCROA*, *POSROA*). These results suggest that the meeting or beating forecast innovations have greater economic significance than the achievement of other earnings benchmarks. All the control variables except *SIZE* have the expected signs and statistically significant at the conventional levels.

The regression results for model (5), which tests hypothesis 2, indicate that the coefficient on *POSFI (with forecast management)* is significantly positive (0.041) after the three earnings benchmark measures (*POSES*, *POSCROA*, and *POSROA*) are controlled for, suggesting that firms that avoid negative forecast innovations enjoy a higher return even when they use discretionary forecasts to avoid negative forecast innovations. This result is consistent with hypothesis 2. Furthermore, the coefficient on *POSFI (without forecast management)* is also significantly positive (0.032), and significantly smaller than that on *POSFI (with forecast management)*. These results suggest that investors more reward firms that avoid negative forecast innovations by using discretionary forecasts.

In summary, this evidence indicates that firms that avoid negative forecast innovations enjoy a higher return at the announcement date than do firms that report negative forecast innovations, given the effects of other earnings benchmarks. Furthermore, they reveal the existence of a market premium for meeting or beating forecast innovation benchmarks even when this is achieved through discretionary forecast management. These results appear to explain why firm managers engage in forecast management to avoid negative forecast innovations.

5.3. ***Forecast management and future performance***

We estimate the following model to test hypothesis 3 on the relation between forecast management and future performance (for detailed variable definitions, see Appendix B):

$$Future\ performance_{t+1} = \alpha + \beta_1 Forecast\ Innovations\ Benchmark_t$$
$$+ \beta_2 GROWTH_t + \beta_3 SIZE_t + \beta_4 POSUE_t + \beta_5 MFE_t + Year\ Indicator$$
$$+ Industry\ Indicator + \varepsilon_t\ , \qquad (6)$$

We use two ex post performance measures, forecast errors (*ERROR*) and forecast revisions (*REVISION*), to capture poor ex post performance. Table 9 reports the regression results for model (6). In the left column, the model's dependent variable is *REVISION*, reflecting revisions of management forecasts during the period. The table reveals that the coefficient of *POSFI (with forecast management)*, 0.005, is significantly positive at a level less than 0.01. The coefficient on *POSFI (without forecast management),* 0.002, is also positive but significant at only 0.1 level, and significantly smaller than that on *POSFI (with forecast management)*. This result suggests that only firms that avoid negative *FI* through discretionary forecasts at the beginning of the period are more likely to revise their initial forecasts downward during the fiscal period.

The results for the relation between discretionary forecasts and forecast errors are summarized in the right column. The table reveals that the coefficient of *POSFI (with forecast management)*, 0.006, is significantly positive at a level less than 0.01, while *POSFI (without forecast management)*, 0.003, is not significant. These results suggest that firms that avoid negative forecast innovations using discretionary forecasts report lower future performance while firms that avoid negative forecast innovations without discretionary forecasts do not. Furthermore, the difference between the coefficient on *POSFI (with forecast management)* and that on *POSFI (without forecast management)* means that firms that avoid negative forecast innovations with forecast management revise and miss their forecast downward by 0.3 percent of total assets than those that avoid negative forecast innovations without forecast management.

This corresponds to 42.9% (=0.003/0.007) of the average value (0.007) and therefore appears to be economically significant.

Hence, the overall results are consistent with the proposition of hypothesis 3 that using discretionary forecasts to avoid negative forecast innovations decreases future performance.

6. Conclusion

We investigate managerial discretion over initial earnings forecasts. Considering the practical importance of management earnings forecasts in Japan, we predict that firm managers engage in forecast management for their own benefit. In particular, we examine (1) whether managers intentionally manipulate their earnings forecasts to avoid negative forecast innovations, (2) why managers engage in forecast management, and (3) how Japanese stock market investors respond to forecast management. We predict that firm managers are more likely to manage their initial earnings forecasts opportunistically because of a strong managerial equity incentive, the lower cost of forecast management (i.e., no restriction on continuous use, no need to be audited, and the difficulty of detection), and Japan's low litigation costs.

First, consistent with our prediction, we find that managers engage in forecast management using discretionary forecasts to avoid reporting negative forecast innovations. Second, we find that firms that avoid negative forecast innovations enjoy a higher return, even when they use discretionary forecasts to do so. This result suggests that the market rewards firms that report non-negative forecast innovations, thus explaining why managers engage in forecast management. Finally, our analyses indicate that firms that avoid negative forecast innovations using discretionary forecasts report lower future performance. This result suggests that managers bias their forecasts opportunistically.

Our results have several implications for stakeholders, especially investors and regulators. They must be aware that managers have a strong incentive to manage their initial forecasts and that investors might overreact to these biased forecasts.

Finally, we close with two caveats. First, the strength of our results reflects the validity of our estimation model for discretionary forecasts. We cannot deny the possibility that our estimation model may contain a measurement error. For example, the model does not include managers' true beliefs about future earnings since they are unobservable. Therefore, the estimated discretionary forecast may reflect managers' true expectations in addition to their intentional bias. Second, our results on the relation between forecast innovations and stock returns suggest that investors are likely to misprice discretionary forecasts. While our results provide a valid rationale for forecast management, future research should examine the mispricing effect to better understand the efficiency of the Japanese stock market. Finally, we note that our analysis uses the Japanese reporting environment where managers effectively mandatory disclose their point-estimate forecasts with earnings announcements. Therefore, to further assess the external validity of our results, we should examine other countries where firms *voluntarily* issue their earnings forecasts with range-estimate, such as the US.

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Appendix A

The definition of variables in model 1 (DF estimation model)

Variables	Definitions
$CROA_t$	(net income for year *t* – net income for year *t*-1) / total assets at the end of year *t*-1.
$CHGROA_{t\text{-}1}$	(net income for year *t* – 1 – net income for year *t* – 2) / total assets at the end of year *t* – 1.
$INV_{t\text{-}1}$	Δ Inventory in year *t*-1 – Δ Sales in year *t*-1.[a] The inventory variable is merchandise and finished goods when available; otherwise, it is total inventory.
$AR_{t\text{-}1}$	Δ Accounts receivable in year *t*-1 – Δ Sales in year *t*-1. The accounts receivable variable is accounts receivable when available; otherwise, it is accounts and notes receivable.
$CAPX_{t\text{-}1}$	Δ Industry capital expenditure in year *t*-1 – Δ Firm capital expenditure in year *t*-1. Industry capital expenditure = aggregating capital expenditure for all firms with the same Nikkei medium classification industry code. Firm capital expenditure = change in gross property, plant, and equipment for a firm.
$GM_{t\text{-}1}$	Δ Sales in year *t*-1 – Δ Gross margin in year *t*-1.
$S\&A_{t\text{-}1}$	Δ Selling and administrative expenses in year *t*-1 – Δ Sales in year *t*-1.
$ETR_{t\text{-}1}$	Average effective tax rate from year *t*-5 to year *t*-2 – effective tax rate in year *t*-1. Effective tax rate = income taxes / income before income taxes. Each variable was acquired from the parent-only financial statement.
$CTAC_{t\text{-}1}$	(total accruals for year *t*-1 minus total accruals for year *t*-2) / total assets at the end of year *t*-1.[b]
$AQ_{t\text{-}1}$	Indicator variable set to "0" if auditor's opinion in year *t*-1 is unqualified and "1" if auditor's opinion is qualified or other.
$LF_{t\text{-}1}$	(sales revenue per employee for year *t*-2 – sales revenue per employee for year *t*-1) / sales revenue per employee for year *t*-2. Sales revenue per employee = sales / the number of employees at year-end.
$CRET_{t\text{-}1}$	The cumulative daily excess (market-adjusted) returns in year *t*-1. Stock returns are accumulated from three days after the year *t*-2 earnings announcement to 20 days before the year *t*-1 earnings announcement. We compute market-adjusted returns based on the TOPIX (Tokyo Stock Price Index) Index.

Note:

[a] The Δ operator represents the percentage change in the variable based on a two-year average expectation model, which is the same as in Lev and Thiagarajan (1993) and Abarbanell and Bushee (1997). For example, $\Delta Sales$ in year *t*-1 $= \{Sales_{t\text{-}1} - E(Sales_{t\text{-}1})\} / E(Sales_{t\text{-}1})$, where $E(Sales_{t\text{-}1}) = (Sales_{t\text{-}2} + Sales_{t\text{-}3}) / 2$. All other variables with the Δ operator in this paper are calculated using the same procedure.

[b] Total accruals are calculated as follows. Total accruals = (change in current assets – change in cash and deposits) – (change in current liabilities – change in financing items) – (change in allowance for doubtful debts + change in provision for retirement benefits or provision for retirement allowance + change in provision for directors' retirement benefits + change in other long-term provision + depreciation). Financing items = change in short-term loans payable + change in commercial papers + change in current portion of long-term loans payable + change in current portion of straight bonds and convertible bonds.

Appendix B

The definition of variables in models 4, 5, 6, and 7 (the other regression models)

Variables	Definitions
Dependent variables:	
CAR_t	Market-adjusted stock return, cumulated over the five days around the forecast release date (days –3 to +1) in year *t*. We compute market-adjusted returns based on the TOPIX (Tokyo Stock Price Index) Index.
$REVISION_{t+1}$	(initial management forecasts for year *t*+1 – the latest management forecasts for year *t*+1) / total assets at the end of year *t*-1.
$ERROR_{t+1}$	(initial management forecasts for year *t*+1– actual earnings for year *t*+1) / total assets at the end of year *t*-1.
Independent variables (forecast innovation benchmark):	
$POSFI_t$	Indicator variable set to 1 if *FI* for year *t* is greater than or equal to 0, and 0 otherwise. FI_t = (management forecasts for year *t*+1 – actual earnings for year *t*) / total assets at the end of year *t*-1.
POSFI (with forecast management) $_t$	Indictor variable set to "1" if *FI* for year *t* is greater than or equal to zero and *NDF* for year *t* is negative, and "0" otherwise. FI_t = (management forecast for year *t*+1 minus actual earnings for year *t*)/total assets at the end of year *t*-1. *NDF* = non-discretionary forecasts for year *t*.
POSFI (without forecast management) $_t$	Indicator variable set to "1" if *FI* for year *t* is greater than or equal to zero and *NDF* for year *t* is greater than or equal to zero, and "0" otherwise. FI_t = (management forecast for year *t*+1 minus actual earnings for year *t*)/total assets at the end of year *t*-1. *NDF* = non-discretionary forecasts for year *t*.
Independent variables (earnings benchmarks):	
$POSES_t$	Indicator variable, set to 1 if the *ES* for year *t* is greater than or equal to 0, and 0 otherwise. ES_t = (actual earnings for year *t* – the latest management earnings forecast for year *t*) / total assets at the end of year *t*-1.
$POSCROA_t$	Indicator variable, set to 1 if the change in net income for year *t* is greater than or equal to 0, and 0 otherwise.
$POSROA_t$	Indicator variable, set to 1 if the net income for year *t* is greater than or equal to 0, and 0 otherwise.
Independent variables (the other variables):	
FI_t	(management forecasts for year *t*+1 – actual earnings for year *t*) / total assets at the end of year *t*-1.
DF_t	Discretionary forecasts / total assets at the end of year *t*-1. We use the model (1), (2) and (3) to measure discretionary forecasts.
NDF_t	Nondiscretionary forecasts / total assets at the end of year *t*-1. We use the model (1) and (2) to measure nondiscretionary forecasts.

DS_t	(actual dividends for year t – the latest management forecasts dividends for year t) / total assets at the end of year t-1.
$SIZE_t$	Natural log of market value of equity at the end of year t.
BM_t	Book-to-market ratio at the announcement date of year t.
$GROWTH_t$	(sales for year t – sales for year t-1) / sales for year t-1.
$POSUE_t$	Indicator variable, set to 1 if the change in year t earnings from the prior year is greater than or equal to 0, and 0 otherwise.
MFE_t	Absolute value of the management forecast error for year t. Management forecast error for year t = (actual earnings for year t – initial management forecasts for year t) / total assets at the end of year t-1.

Table 1
Regressions of future change in *ROA* on prior changes in *ROA*, fundamental signals, and *CRET*

Dependent Variables	Independent variables											
	$CONSTANT$	$CHGROA_{t-1}$	INV_{t-1}	AR_{t-1}	$CAPX_{t-1}$	GM_{t-1}	$S\&A_{t-1}$	ETR_{t-1}	$CTAC_{t-1}$	AQ_{t-1}	LF_{t-1}	$CRET_{t-1}$
$CROA_t$	0.003	-0.313	-0.005	0.003	0.000	0.004	0.013	0.035	-0.009	0.019	-0.029	0.008
Positive	14 (11)	0 (0)	2 (0)	13 (2)	5 (0)	8 (3)	11 (4)	12 (2)	2 (0)	12 (5)	0 (0)	15 (7)
Negative	3 (1)	17 (16)	15 (3)	4 (0)	12 (2)	9 (1)	6 (1)	5 (0)	15 (2)	1 (1)	17 (11)	2 (0)
Adjusted R^2 = 0.105												

Notes:

Rows include mean coefficients from yearly regressions and the number of positive and negative yearly coefficients, with the number of significant yearly coefficients in parentheses.

All test of the fundamental signal coefficients are two-tailed. When a coefficient is positive (negative), we indicate whether it is different from zero.

The definitions of all of the fundamental signals (except *ETR* and *CTAC*) are from Lev and Thiagarajan (1993). The Δ operator represents a percentage change in the variable based on a two-year average expectation model, which is the same as that of prior studies (Lev and Thiagarajan, 1993; Abarbanell and Bushee, 1997). For example, $\Delta Sales$ in year *t*-1 = $\{Sales_{t-1} - E(Sales_{t-1})\} / E(Sales_{t-1})$, where $E(Sales_{t-1}) = (Sales_{t-2} + Sales_{t-3}) / 2$. All other variables with Δ operator in this paper are calculated using the same procedure.

$CROA_t$ = (net income for year *t* – net income for year *t*-1) / total assets at the end of year *t*-1.

$CHGROA_{t-1}$ = (net income for year *t*-1 – net income for year *t*-2) / total assets at the end of year *t*-1.

INV_{t-1} = Δ Inventory in year *t*-1 – Δ Sales in year *t*-1. The Inventory variable reflects merchandise and finished goods when available and total inventory otherwise.

AR_{t-1} = Δ Accounts receivable in year *t*-1 – Δ Sales in year *t*-1. The accounts receivable variable reflects accounts receivable when available and accounts and notes receivable otherwise.

$CAPX_{t-1}$ = Δ Industry capital expenditure in year *t*-1 – Δ Firm capital expenditure in year *t*-1. Industry capital expenditure = aggregate capital expenditure for all firms with the same Nikkei medium classification industry code. Firm capital expenditure = change in gross property, plant, and equipment for a firm.

GM_{t-1} = Δ Sales in year *t*-1 – Δ Gross margin in year *t*-1.

$S\&A_{t-1}$ = Δ Selling and administrative expenses in year *t*-1 – Δ Sales in year *t*-1.

ETR_{t-1} = average effective tax rate from year *t*-5 to year *t*-2 – effective tax rate in year *t*-1. Effective tax rate = income taxes / income before income taxes. Each variable was acquired from the parent-only financial statement.

$CTAC_{t-1}$ = (total accruals for year *t*-1 minus total accruals for year *t*-2) / total assets at the end of year *t* -1. Total accruals = (change in current assets – change in cash and deposits) – (change in current liabilities – change in financing items) – (change in allowance for doubtful debts + change in provision for retirement benefits or provision for retirement allowance + change in provision for directors' retirement benefits + change in other long-term provision + depreciation). Financing items = change in short-term loans payable + change in commercial papers + change in current portion of long-term loans payable + change in current portion of straight bonds and convertible bonds.

AQ_{t-1} = indicator variable set to "0" if auditor's opinion in year *t*-1 is unqualified and "1" if auditor's opinion is qualified or other.

LF_{t-1} = (sales revenue per employee for year *t*-2 – sales revenue per employee for year *t*-1) / sales revenue per employee for year *t*-2. Sales revenue per employee = sales / the number of employees at year-end.

$CRET_{t-1}$ = cumulative daily excess (market-adjusted) returns in year *t*-1. Stock returns are cumulated from three days after the year *t*-2 earnings announcement to 20 days before the year *t*-1 earnings announcement.

The $CROA_t$ regression has 48,109 observations between 2003 and 2019.

In regression analysis in 4 out of 17 years, we cannot estimate parameter of AQ_{t-1} because all the observations are zero (i.e., all observations are unqualified opinion). Therefore, we exclude AQ_{t-1} from the regression model for these years.

Table 2
Sample selection criteria

Criteria	Firm-years
Firm-years with data on consolidated financial statements during 1997 - 2019	73,971
Less:	
Missing management forecast innovation (*FI*) data	(9,495)
Changing in accounting month within firm-years necessary for our analyses	(376)
Sample for distribution analysis	64,100
Less:	
Missing data for calculating discretionary forecasts (*DF*)	(23,729)
Missing financial statements, stock returns and the latest management forecast data necessary for our analyses	(1,558)
Sample for regression analysis	38,813

Table 3
Descriptive statistics

	Mean	Min	p25	Median	p75	Max	SD	Skewness	Kurtosis	*N*
FI_t	0.009	-0.097	-0.002	0.003	0.011	0.250	0.032	2.860	16.680	38,813
DF_t	0.006	-0.099	-0.008	0.000	0.012	0.263	0.032	2.508	14.485	38,813
NDF_t	0.003	-0.129	-0.002	0.004	0.010	0.080	0.016	-1.326	12.602	38,813
CAR_t	0.005	-0.215	-0.033	0.002	0.039	0.320	0.070	0.485	4.767	38,813
$POSFI_t$	0.697	0.000	0.000	1.000	1.000	1.000	0.460	-0.857	1.734	38,813
POSFI (with forecast management)$_t$	0.196	0.000	0.000	0.000	0.000	1.000	0.397	1.535	3.357	38,813
POSFI (without forecast management)$_t$	0.501	0.000	0.000	1.000	1.000	1.000	0.500	-0.005	1.000	38,813
$POSES_t$	0.682	0.000	0.000	1.000	1.000	1.000	0.466	-0.782	1.611	38,813
$POSCROA_t$	0.592	0.000	0.000	1.000	1.000	1.000	0.492	-0.373	1.139	38,813
$POSROA_t$	0.868	0.000	1.000	1.000	1.000	1.000	0.339	-2.171	5.714	38,813
ES_t	0.000	-0.061	-0.001	0.000	0.003	0.027	0.007	-2.127	18.594	38,813
$CROA_t$	0.004	-0.228	-0.008	0.003	0.015	0.459	0.043	1.190	18.282	38,813
ROA_t	0.028	-0.253	0.010	0.026	0.049	0.211	0.047	-0.859	8.149	38,813
DS_t	0.000	-0.006	0.000	0.000	0.000	0.016	0.001	4.985	35.690	38,813
$SIZE_t$	9.893	6.255	8.650	9.698	10.933	15.004	1.679	0.525	2.892	38,813
BM_t	1.245	0.082	0.671	1.076	1.622	5.771	0.801	1.413	5.987	38,813

Notes:

FI_t = (management forecasts for year *t*+1 minus actual earnings for year *t*) / total assets at the end of year *t*-1.

DF_t = discretionary forecasts / total assets at the end of year t-1.

NDF_t = nondiscretionary forecasts / total assets at the end of year t-1.

CAR_t = market-adjusted stock return cumulated over the five days around the forecast release date (days "-3" to "+1") in year *t*.

$POSFI_t$ = indicator variable set to "1" if *FI* for year *t* are greater than or equal to 0 and "0" otherwise.

POSFI (with forecast management)$_t$ = indicator variable set to "1" if *FI* for year *t* are greater than or equal to 0 and *NDF* for year *t* are negative and "0" otherwise.

POSFI (without forecast management)$_t$ = indicator variable set to "1" if *FI* for year *t* are greater than or equal to 0 and *NDF* for year *t* are greater than or equal to 0 and "0" otherwise.

$POSES_t$ = indicator variable set to "1" if *ES* for year *t* are greater than or equal to 0 and "0" otherwise. ES_t = (actual earnings for year *t* – the latest management forecasts earnings for year *t*) / total assets at the end of year *t*-1.

$POSCROA_t$ = indicator variable set to "1" if change in net income for year *t* are greater than or equal to 0 and "0" otherwise.

$POSROA_t$ = indicator variable set to "1" if net income for year *t* are greater than or equal to 0 and "0" otherwise.

ES_t = (actual earnings for year *t* – the latest management forecasts earnings for year *t*) / total assets at the end of year *t*-1.

$CROA_t$ = (net income for year *t* – net income for year *t*-1) / total assets at the end of year *t*-1.

ROA_t = net income for year *t* / total assets at the end of year *t*-1.

DS_t = (actual dividends for year t – the latest management forecasts dividends for year t) / total assets at the end of year *t*-1.

$SIZE_t$ = natural log of market value of equity at the end of year *t*.

BM_t = book-to-market ratio at the announcement date of year *t*.

Table 4
Standardized differences in Figs. 2 and 3

Panel A: Standardized differences

	Values for test intervals		Values for standardized differences of remaining 97 intervals[2]			
	Standardizes difference to the left of 0	Standardizes difference to the right of 0	Mean	Median	Minimum	Maximum
Fig. 2.	-18.134***	16.598***	-0.061	0.106	-2.671	2.614
Fig. 3.	0.679	-2.454**	-0.007	-0.024	-2.495	2.501

Panel B: The EM ratio

	EM ratio	χ^2-value[3]	
Fig. 2.	2.698	261.281***	(Fig 2 vs Fig 3)
Fig. 3.	0.943		

Notes:

[1] The standardized difference is the difference between the observed and expected number of firm-years in an interval, standardized by estimated standard deviation of the difference.

[2] This includes standardized differences belonging to 97 of 101 intervals shown in each of the figures, where the four omitted standardized differences correspond to the most extreme intervals adjacent to zero and the most extreme negative and the most extreme positive intervals. The standardized differences for the most extreme interval are undefined because an adjacent interval exists on only one side.

[3] The chi-square statistics for the EM ratio differences are computed using the usual 2×2 contingency table.

*** Statistically significant at the 0.01 level.

** Statistically significant at the 0.05 level.

Table 5
The frequencies of positive and negative forecast innovations

Interval	*N*	The distribution based on *NDF*			The distribution based on *FI*		
		NDF < 0	0 ≤ *NDF*	The percentage of positive *NDF* [a]	*FI* < 0	0 ≤ *FI*	The percentage of positive *FI*
-0.0005≤ *FI* <0.0005	2,169	633	1,536	70.816%***	542	1,627	75.012%
-0.0010≤ *FI* <0.0010	4,144	1,236	2,908	70.174%***	1072	3,072	74.131%
-0.0015≤ *FI* <0.0015	5,971	1,791	4,180	70.005%***	1544	4,427	74.142%
-0.0020≤ *FI* <0.0020	7,671	2,335	5,336	69.561%***	2062	5,609	73.120%
-0.0025≤ *FI* <0.0025	9,258	2,854	6,404	69.173%***	2553	6,705	72.424%

Note:

a: Calculates chi-square tests on differences between the ratio based on non-discretionary forecasts (*NDF*) and the ratio based on forecast innovations (*FI*).

*** Statistically significant at the 0.01 level of significance.

Table 6
The mean and median discretionary forecasts in small regions centered on zero

			The distribution based on *NDF*			The distribution based on *FI*		
			DF	*DF*	*t*-value [a]	*DF*	*DF*	*t*-value [a]
Interval		All	*NDF* < 0	0 ≤ *NDF*	*z*-value [b]	*FI* < 0	0 ≤ *FI*	*z*-value [b]
	N	2,169	633	1,536		542	1,627	
-0.0005 ≤ *FI* < 0.0005	Mean	-0.002	0.010	-0.008	36.715***	-0.003	-0.002	-1.505
	Median	-0.003	0.005	-0.006	36.644***	-0.004	-0.003	-1.770
	N	4,144	1,236	2,908		1,072	3,072	
-0.0010 ≤ *FI* <0.0010	Mean	-0.002	0.010	-0.008	52.145***	-0.003	-0.002	-1.162
	Median	-0.003	0.005	-0.006	50.868***	-0.004	-0.003	-3.078***
	N	5,971	1,791	4,180		1,544	4,427	
-0.0015 ≤ *FI* <0.0015	Mean	-0.002	0.010	-0.008	63.551***	-0.003	-0.002	-2.967***
	Median	-0.003	0.005	-0.006	60.997***	-0.004	-0.003	-5.732***
	N	7,671	2,335	5,336		2,062	5,609	
-0.0020 ≤ *FI* <0.0020	Mean	-0.002	0.010	-0.007	72.214***	-0.003	-0.002	-4.671***
	Median	-0.003	0.005	-0.006	69.071***	-0.005	-0.003	-8.250***
	N	9,258	2,854	6,404		2,553	6,705	
-0.0025 ≤ *FI* <0.0025	Mean	-0.002	0.010	-0.007	75.498***	-0.003	-0.001	-5.524***
	Median	-0.003	0.006	-0.006	75.741***	-0.005	-0.003	-10.466***

Note:
a: *t*-value is based on two-sample *t*-tests.
b: *z*-value is based on Wilcoxon two-sample tests.
*** Statistically significant at the 0.01 level of significance.

Table 7
Forecast innovation benchmark, earnings benchmarks, and stock returns

Panel A: CAR_t around the forecast announcement date based on the sign of FI_t and ES_t

Forecast Innovations	*Earnings Surprises*		Positive Group–Negative Group
	$ES_t \geqq 0$	$ES_t < 0$	
$FI_t \geqq 0$	0.022 (0.015) n = 17,319	0.006 (0.002) n = 9,728	0.015***†††
$FI_t < 0$	-0.018 (-0.015) n = 9,152	-0.031 (-0.026) n = 2,614	0.013***†††
Positive Group–Negative Group	0.040***†††	0.037***†††	

Panel B: CAR_t around the forecast announcement date based on the sign of FI_t and $CROA_t$

Forecast Innovations	*Change in actual earnings*		Positive Group–Negative Group
	$CROA_t \geqq 0$	$CROA_t < 0$	
$FI_t \geqq 0$	0.022 (0.015) n = 14,534	0.009 (0.004) n = 12,513	0.013***†††
$FI_t < 0$	-0.019 (-0.016) n = 8,430	-0.024 (-0.022) n = 3,336	0.005***†††
Positive Group–Negative Group	0.041***†††	0.034***†††	

Panel C: CAR_t around the forecast announcement date based on the sign of FI_t and ROA_t

Forecast Innovations	*Actual earnings*		Positive Group–Negative Group
	$ROA_t \geqq 0$	$ROA_t < 0$	
$FI_t \geqq 0$	0.018 (0.011) n = 22,072	0.009 (0.003) n = 4,975	0.009***†††
$FI_t < 0$	-0.020 (-0.018) n = 11,608	-0.037 (-0.031) n = 158	0.017***†††
Positive Group–Negative Group	0.038***†††	0.046***†††	

Panel D: CAR_t around the forecast announcement date based on the sign of FI_t and NDF_t

Forecast Innovations	*Non-discretionary Forecast Innovations*		Positive Group–Negative Group
	$NDF_t \geqq 0$	$NDF_t < 0$	
$FI_t \geqq 0$	0.012 (0.007) n = 10,590	0.027 (0.019) n = 3,369	-0.015***†††
$FI_t < 0$	-0.025 (-0.020) n = 6,811	-0.015 (-0.014) n = 4,955	-0.010***†††
Positive Group–Negative Group	0.037***†††	0.042***†††	

Notes:
CAR_t = market-adjusted stock return cumulated over the five days around the forecast release date (days “-3” to “+1”) in year t.
FI_t = (management forecasts for year t+1 minus actual earnings for year t) / total assets at the end of year t -1.

ES_t = (actual earnings for year *t* minus the latest management forecasts for year *t*) / total assets at the end of year *t* -1.
$CROA_t$ = (net income for year *t* – net income for year *t*-1) / total assets at the end of year *t*-1.
ROA_t = net income for year *t* / total assets at the end of year *t*-1.
NDF_t = nondiscretionary forecasts / total assets at the end of year t-1.
The table shows mean (median) values of CAR_t.
*** Mean values are significantly different at the 0.01 level of significance using a two-tailed *t*-test
** Mean values are significantly different at the 0.05 level of significance using a two-tailed *t*-test
* Mean values are significantly different at the 0.1 level of significance using a two-tailed *t*-test
††† Median values are significantly different at the 0.01 level of significance using a two-tailed z-test
†† Median values are significantly different at the 0.05 level of significance using a two-tailed z-test
† Median values are significantly different at the 0.1 level of significance using a two-tailed z-test

Table 8
Relation between forecast innovations and stock returns after controlling for the other earnings benchmarks

Independent Variable	Expected Sign	Model 4 CAR_t Coefficient (*t*-value)	Model 5 CAR_t Coefficient (*t*-value)
Constant		-0.064***	-0.063***
		(-6.474)	(-6.312)
$POSFI_t$	+	0.035***	
		(26.632)	
POSFI (with forecast management) $_t$	+		0.041***
			(22.516)
POSFI (without forecast management) $_t$	+		0.032***
			(23.384)
$POSES_t$	+	0.014***	0.014***
		(10.558)	(10.542)
$POSCROA_t$	+	0.011***	0.010***
		(12.474)	(11.551)
$POSROA_t$	+	0.025***	0.025***
		(9.146)	(9.068)
FI_t	+	0.352***	0.356***
		(10.328)	(10.743)
DS_t	+	2.163***	2.125***
		(8.069)	(7.998)
$SIZE_t$	−	0.000	0.000
		(0.331)	(0.543)
BM_t	+	0.008***	0.008***
		(7.880)	(8.122)
Industry indicator		Yes	Yes
Year indicator		Yes	Yes
Adj. R^2		0.106	0.108
N		38,813	38,813
			Coeff. (Prob. > *F*)
POSFI (with forecast management) $_t$ = *POSFI (without forecast management)* $_t$			0.009*** (0.000)

Notes:

CAR_t = market-adjusted stock return cumulated over the five days around the forecast release date (days “-3” to “+1”) in year *t*.
$POSFI_t$ = indicator variable set to “1” if *FI* for year *t* are greater than or equal to 0 and “0” otherwise.
POSFI (with forecast management) = indicator variable set to “1” if *FI* for year *t* is greater than or equal to zero and *NDF* for year *t* is negative, and “0” otherwise. FI_t = (management forecast for year *t*+1 minus actual earnings for year *t*)/total assets at the end of year *t*-1. *NDF* = non-discretionary forecasts for year *t*.
POSFI (without forecast management) = indicator variable set to “1” if *FI* for year *t* is greater than or equal to zero and *NDF* for year *t* is greater than or equal to zero, and “0” otherwise. FI_t = (management forecast for year *t*+1 minus actual earnings for year *t*)/total assets at the end of year *t*-1. *NDF* = non-discretionary forecasts for year *t*.
$POSES_t$ = indicator variable set to “1” if *ES* for year *t* are greater than or equal to 0 and “0” otherwise. ES_t = (actual earnings for year *t* – the latest management forecasts earnings for year *t*) / total assets at the end of year *t*-1.
$POSCROA_t$ = indicator variable set to “1” if change in net income for year *t* are greater than or equal to 0 and “0” otherwise.
$POSROA_t$ = indicator variable set to “1” if net income for year *t* are greater than or equal to 0 and “0” otherwise.
FI_t = (management forecasts for year *t*+1 minus actual earnings for year *t*) / total assets at the end of year *t*-1.
DS_t = (actual dividends for year *t* – the latest management forecast dividends for year *t*) / total assets at the end of year *t*-1.
$SIZE_t$ = natural log of market value of equity at the announcement date of year *t*.
BM_t = book-to-market ratio at the announcement date of year *t*.

t-statistics are corrected for heteroskedasticity, and cross-sectional and time-series correlation using a two-way cluster at the firm and year level proposed by Petersen (2009).

*** Statistically significant at the 0.01 level of significance using a two-tailed *t*-test

* Statistically significant at the 0.1 level of significance using a two-tailed *t*-test

Table 9
Relation between forecast management and future forecast revisions and errors

Independent Variable	Expected Sign	Model 6 $REVISION_{t+1}$ Coefficient (*t*-value)	Model 6 $ERROR_{t+1}$ Coefficient (*t*-value)
Constant		0.009***	0.011***
		(3.155)	(3.769)
POSFI (with forecast management) $_t$	+	0.005***	0.006***
		(7.609)	(8.516)
POSFI (without forecast management) $_t$	?	0.002*	0.003
		(1.876)	(1.562)
$GROWTH_t$	−	-0.004	-0.003
		(-1.353)	(-1.103)
$SIZE_t$	−	-0.001***	-0.001***
		(-4.264)	(-6.103)
$POSUE_t$	−	-0.003***	-0.004***
		(-7.445)	(-8.382)
MFE_t	+	0.205***	0.247***
		(8.779)	(9.315)
Year indicator		Yes	Yes
Industry indicator		Yes	Yes
Adj. R^2		0.120	0.128
N		38,708	38,763
		Coeff. (Prob > *F*)	Coeff. (Prob > *F*)
POSFI (with forecast management) $_t$ = *POSFI (without forecast management)* $_t$		0.003*** (0.000)	0.003*** (0.000)

Notes:

$REVISION_{t+1}$ = (initial management forecasts for year *t*+1 – the latest management forecasts for year *t*+1) / total assets at the end of year *t*-1.

$ERROR_{t+1}$ = (initial management forecasts for year *t*+1– actual earnings for year *t*+1) / total assets at the end of year *t*-1.

POSFI (with forecast management) = indicator variable set to "1" if *FI* for year *t* is greater than or equal to zero and *NDF* for year *t* is negative, and "0" otherwise. FI_t = (management forecast for year *t*+1 minus actual earnings for year *t*)/total assets at the end of year *t*-1. *NDF* = non-discretionary forecasts for year *t*.

POSFI (without forecast management) = indicator variable set to "1" if *FI* for year *t* is greater than or equal to zero and *NDF* for year *t* is greater than or equal to zero, and "0" otherwise. FI_t = (management forecast for year *t*+1 minus actual earnings for year *t*)/total assets at the end of year *t*-1. *NDF* = non-discretionary forecasts for year *t*.

$GROWTH_t$ = (sales for year *t* – sales for year *t*-1) / sales for year *t*-1.

$SIZE_t$ = natural log of market value of equity at the end of year *t*.

$POSUE_t$ = indicator variable set to "1" if the change in year *t* earnings from the prior year is greater than or equal to 0, and "0" otherwise.

MFE_t = absolute value of the management forecasts error for year *t*. Management forecasts error for year *t* = (actual earnings for year *t* – initial management forecasts for year *t*) / total assets at the end of year *t*-1.

All variables are winsorized at one percent by year.

t-statistics are corrected for heteroskedasticity, and cross-sectional and time-series correlation using a two-way cluster at the firm and year level proposed by Petersen (2009).

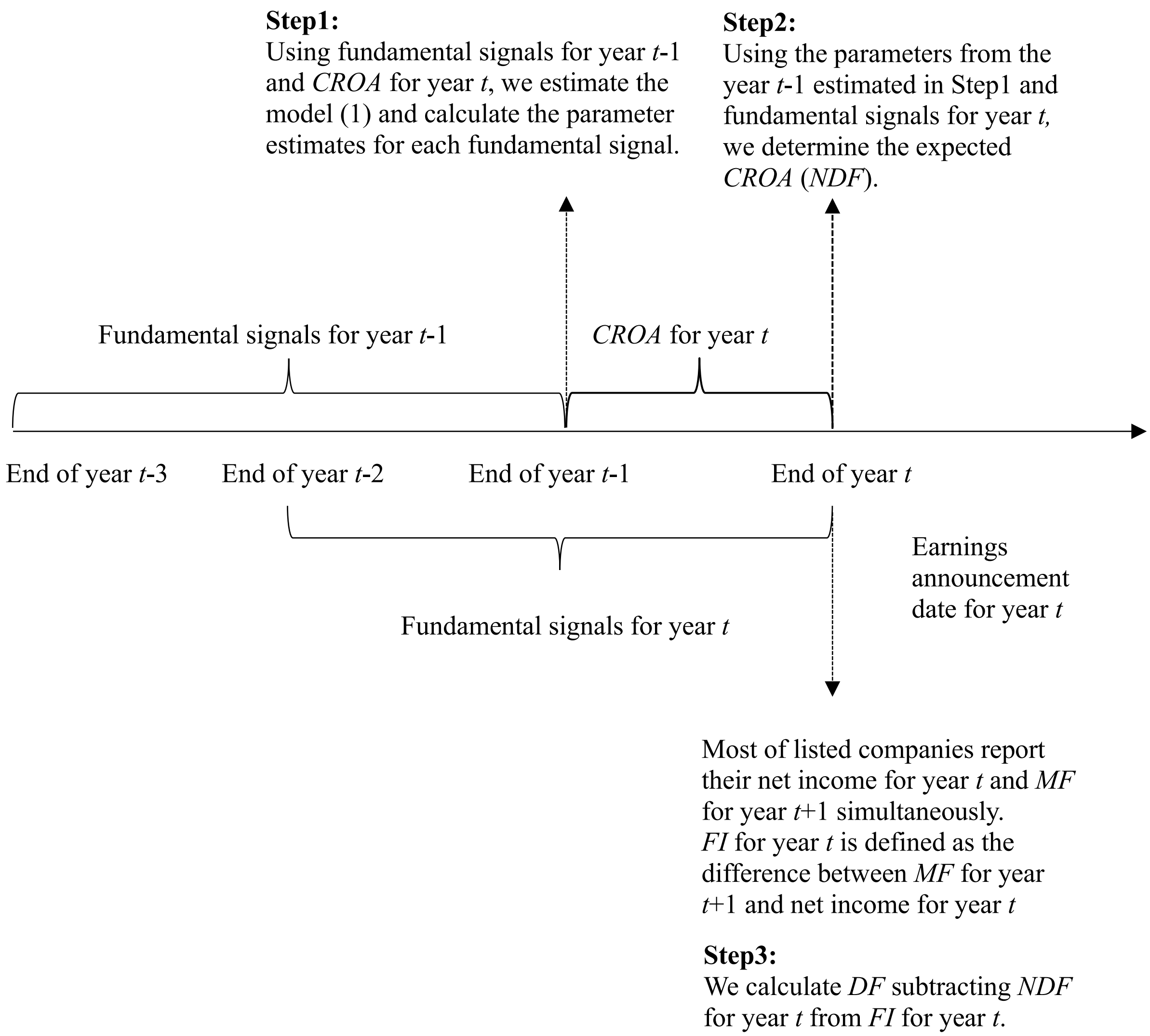
*** Statistically significant at the 0.01 level of significance using a two-tailed *t*-test.

** Statistically significant at the 0.05 level of significance using a two-tailed *t*-test.

* Statistically significant at the 0.1 level of significance using a two-tailed *t*-test.

Figure 1 Estimating discretionary forecasts

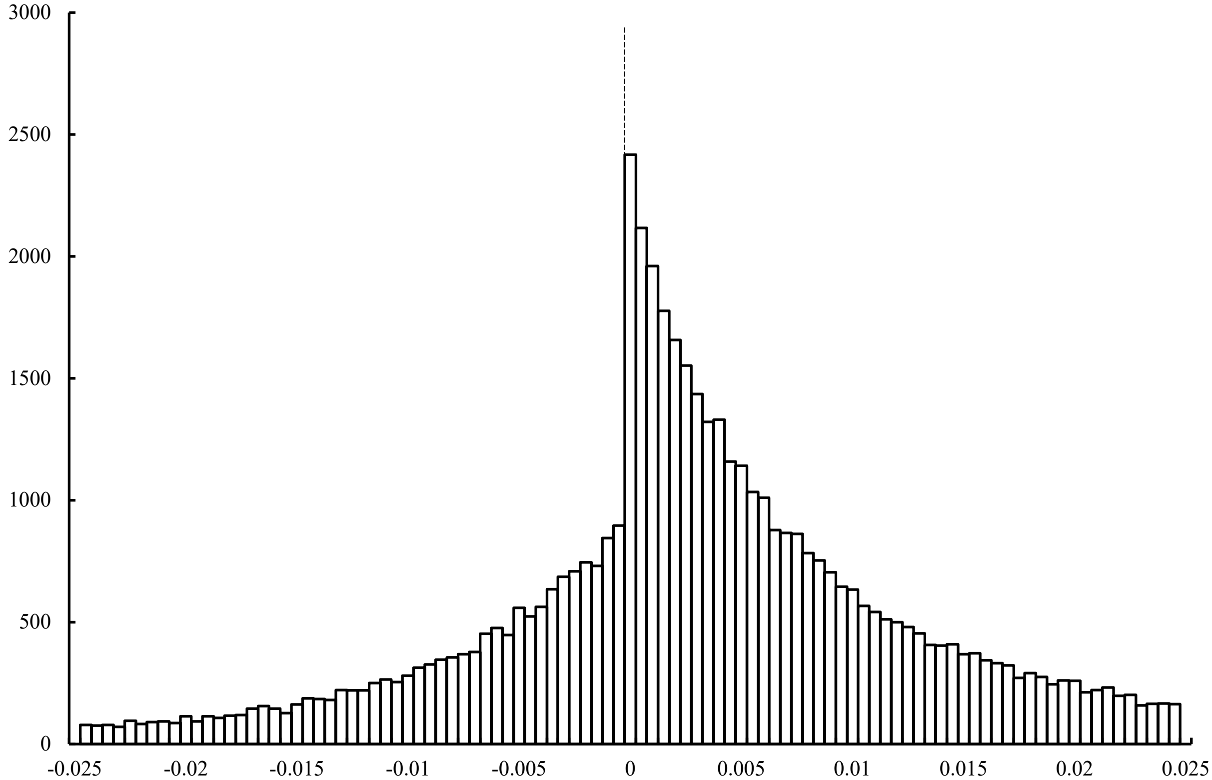
Panel A: Estimation procedure for measuring discretionary forecasts



Panel B: Components of management earnings forecasts

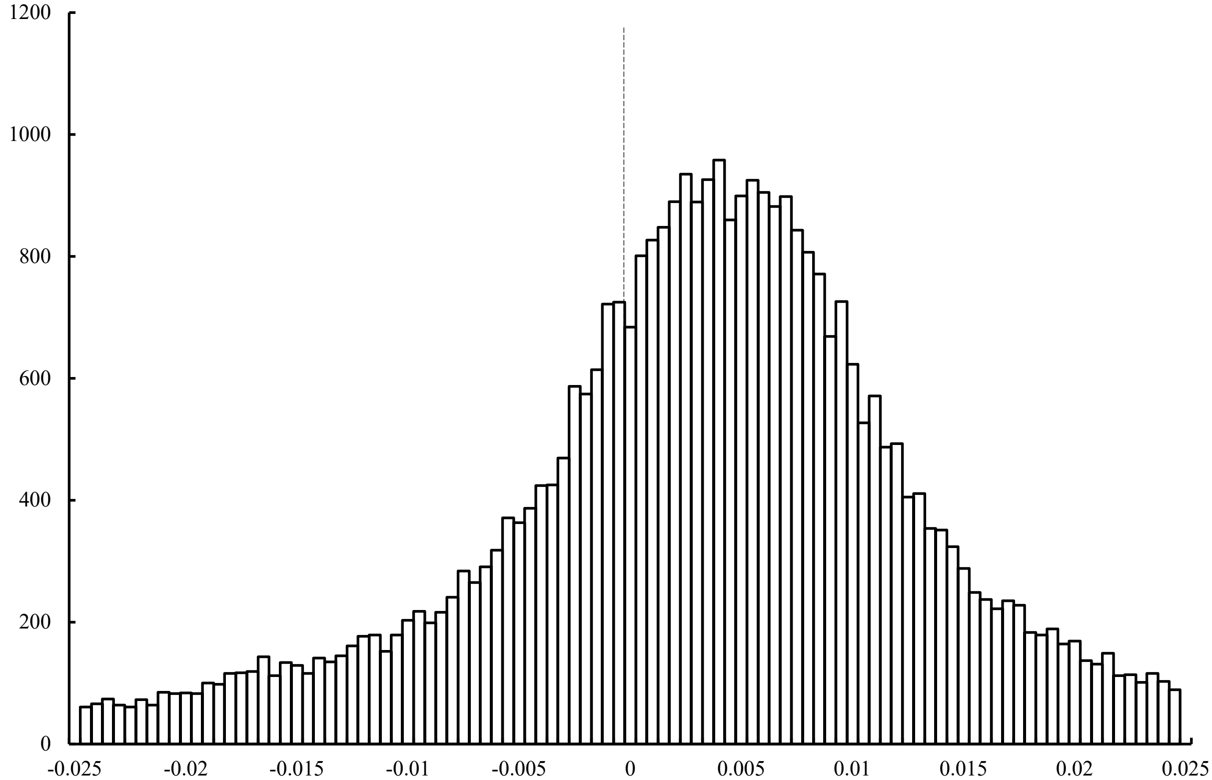
Management earnings forecasts for year *t*+1 (*MF*)		
Forecast innovations for year *t* (*FI*)		Net income for year *t*
Discretionary forecasts for year *t* (*DF*)	Non-discretionary forecast innovations for year *t* (*NDF*)	Net income for year *t*

Figure 2 The distribution of scaled forecast innovations



Notes: The distribution interval widths are 0.0005, and the location of zero on the horizontal axis is indicated by the dashed line. The first interval to the right of zero contains observations in the [0.000, 0.0005), the second interval contains [0.0005, 0.0010), and so forth. The large positive firm-years (0.025 or more) and the large negative firm years (less than -0.025) are excluded.

Figure 3 The distribution of scaled non-discretionary forecast innovations



Notes: The distribution interval widths are 0.0005, and the location of zero on the horizontal axis is indicated by the dashed line. The first interval to the right of zero contains observations in the [0.000, 0.0005), the second interval contains [0.0005, 0.0010), and so forth. The large positive firm-years (0.025 or more) and the large negative firm years (less than -0.025) are excluded.