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Managerial discretion over initial earnings forecasts

Abstract: The main purpose of this study is to investigate managerial discretion over initial management earnings forecasts issued concurrently with earnings announcements. The unique reporting system for management forecasts in Japan, namely systematic bundled management forecasts, produces an earnings benchmark (i.e., forecast innovations) to which earnings management research has not paid much 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. This study investigates whether and why firm managers manage their initial forecasts to avoid negative forecast innovations, and how investors in the Japanese stock market respond to forecast management. 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 they use discretionary forecasts to do so. This result suggests that the market rewards firms that avoid negative forecast innovations, providing a sound rationale for managers' use of forecast management. Finally, our analyses of the relationship between forecast management and future performance show that managers are not likely to conduct forecast management to convey their private information on future performance to investors, suggesting opportunistic managerial behaviors concerning their earnings forecasts.

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

JEL Classification: M41

1. Introduction

The credibility of management earnings forecasts is a central concern in accounting research because of managers' incentive to bias them (Rogers and Stocken 2005). The purpose of this study is to investigate managerial discretion over initial management earnings forecasts issued concurrently with earnings announcements.[1]

For the purpose of our research, we focus on management forecast reporting in Japan because it has several worthwhile features for our study. A major difference between Japan and the United States with regard to disclosure is that, in Japan, under the reporting system required by the Tokyo Stock Exchange (TSE), most 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. In reporting systems, management earnings forecasts are one of the most important sources of information in the Japanese financial market.

Suda and Hanaeda (2008), in a survey study that replicates the questionnaire Graham, Harvey, and Rajgopal (2005) used to sample Japanese listed firms, indicate that management earnings forecasts represent the most important earnings benchmark among several performance benchmarks (97.07% agree or strongly agree that this benchmark is important). Furthermore, prior studies have indicated management earnings forecasts for year $t + 1$ have higher information content than do the actual annual earnings for year t, around the announcement date, in the Japanese stock market (Darrough and Harris 1991; Conroy, Harris, and Park 1998). The practical importance of management earnings forecasts means that understanding how and why managers manipulate these forecasts has significant implications for the financial market.

The TSE reporting requirements likely produce an earnings benchmark, called *forecast innovations*, to which earnings management research has not paid much attention (Kato, Skinner,

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

and Kunimura 2009). A forecast innovation is the difference between the management earnings forecast for year $t + 1$ and the actual earnings for year t. This earnings benchmark has a characteristic of *forward-looking* information in comparison with other common earnings benchmarks, such as zero earnings levels, earnings changes, and earnings forecasts that include analyst and management forecasts. In this study, we examine 1) whether managers manage their earnings forecasts to avoid negative forecast innovations, 2) why managers engage in forecast management, and 3) how investors in the Japanese stock market respond to forecast management.

Our first research objective is to examine the existence of forecast management. Tsumuraya (2009), in a questionnaire survey, finds that Japanese managers are likely to report their earnings forecasts for the next year while considering the level of current earnings, suggesting that managers care about the consequences of forecast innovations. Gotoh (1997) provides evidence that Japanese firms, on average, report positive forecast innovations. Furthermore, some studies indicate that forecast innovations are associated with announcement period stock returns (Kato et al. 2009; Asano 2009a). These results suggest that forecast innovations are informative to market participants and that managers understand this, which might induce them to conduct forecast management.

Based on the above argument, we predict that managers conduct forecast management to avoid negative forecast innovations for equity purposes. Our prediction assumes that managers *opportunistically* use their discretion to maximize their own benefit (Watts and Zimmerman 1986). However, some theoretical and empirical studies show 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 conduct forecast management to avoid negative forecast innovations, we expect that our results stem from managerial opportunistic behaviors because Japanese institutional features on earnings forecast systems increase the managerial opportunistic incentive, for several reasons.

First, we focus on a situation in which aggressive accounting is more likely, because prior studies have indicated that opportunistic accounting behaviors are more pervasive when the equity incentive is greater (Bergstresser and Philippon 2006; Shleifer 2004; Cheng and Warfield 2005). If firms that avoid negative forecast innovations can enjoy a higher return than firms that fail to do so,[2] such a 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) to achieve the earnings benchmarks because there is 1) no restriction on continuous use, 2) no need to be audited, and 3) the difficulty of detection. Finally, litigation costs in Japan are lower than those in Western countries (West 2001; Ginsburg and Hoetker 2006), which induces managers to conduct forecast management (Kato et al. 2009). Consequently, based on the abovementioned institutional factors in Japan, we predict that managers are likely to engage in opportunistic forecast management.

To test the hypothesis, we estimate the discretionary and non-discretionary portion of forecast innovations (hereafter, *discretionary forecasts* 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, as in the discretionary accruals in earnings management research, we can quantify the credibility of initial management forecasts more directly and accurately than prior studies have done. By examining the distributions of forecast innovations and discretionary forecasts, we show that, on average,

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[2] Note that this assumption is an empirical question. Although some studies show that forecast innovations have information content in the Japanese stock market (Kato et al. 2009), no study has 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.

managers have an incentive to conduct forecast management to avoid negative forecast innovations.

Our second research object is to explore why managers engage in forecast management to avoid negative forecast innovations. Many studies on the relationship 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 economic rationale for managers' use of earnings management to meet or beat earnings benchmarks. We also predict that the main motivation for avoiding negative forecast innovations is closely related to stock market reactions to them.

In particular, we investigate whether there is a market premium for firms that avoid negative forecast innovations after controlling for the effect of other earnings benchmarks. Consistent with our prediction, 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. The effect holds after controlling for the effects of the rewards for other earnings benchmarks (i.e., the three earnings benchmarks described above). These findings suggest that a manager with bad performance might offset the bad news for year t by predicting good prospects for year $t + 1$. Furthermore, we find that investors reward firms that avoid negative forecast innovations, even when managers use discretionary forecasts to do so. These findings rationally explain why managers engage in forecast management to avoid negative forecast innovations.

Our analysis so far reveals that firms avoiding negative forecast innovations enjoy a higher return, even when they engage in discretionary forecasts. Our final concern is whether the market premium for avoiding negative forecast innovation is driven by investors' overreaction or by rational expectation. Although it seems that our results generally support 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 relationship between avoiding negative forecast innovations using discretionary forecasts and future performance in terms of forecast errors and revisions. 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.

Finally, our additional analysis indicates that the relationship between forecast innovations and stock returns is a non-linear, S-shaped function, meaning that some small, positive (negative) forecast innovations are accompanied by large, positive (negative) returns. This result also provides a reasonable explanation as to why managers use forecast management to avoid negative forecast innovations.

This study contributes to the body of research that examines the discretion of management earnings forecasts and forecast innovations. First, our study contributes to earnings management research revealing that firm managers tend to manage earnings to meet or beat earnings benchmarks, including management earnings forecasts (Burgstahler and Dichev 1997; DeGeorge, Patel, and Zeckhauser 1999; Kasznik 1999; Abarbanell and Lehavy 2003). By showing that managers manage their initial forecasts to avoid negative forecast innovations, we clarify a new forward-looking earnings benchmark to which earnings management research has not paid much attention.

Second, our study contributes to the body of research that examines the relationship between earnings benchmarks and stock returns. Although prior studies indicate that investors reward firms that achieve their earnings benchmarks (Barth et al. 1999; Bartov et al. 2002; Lopez and Rees 2002; Brown and Caylor 2005), our study suggests that forecast innovations outperform actual earnings benchmarks in terms of stock market effects.

Third, we contribute to the literature that examines the determinants of management forecast errors by measuring the discretionary portion of management earnings forecasts. Prior studies have assessed the credibility of management forecasts based on forecast errors at the end of a fiscal year, but have not identified the discretionary portion of management forecasts at the time of their issue (Rogers and Stocken 2005; Ota 2006; Kato et al. 2009). If managers revise their forecasts owing to rapid changes in the economic environment that they could not have anticipated at the time of the initial forecasts, the measurement of credibility based on the forecast errors would be difficult to interpret. Thus, based on the findings of fundamental analysis research, we estimate the discretionary portion of management earnings forecasts, enabling us to quantify the credibility of initial management forecasts more directly and accurately than prior studies have done.

Finally, our research question is related to that of Kato et al. (2009). However, our study clearly differs from theirs, because although they provide evidence suggesting that Japanese managers bias their initial forecasts upward, they also measure the bias in initial management earnings forecasts based on an *ex-post* evaluation (i.e., forecast errors). By estimating discretionary forecasts and analyzing the distribution of forecast innovations, we ascertain the existence of forecast management at the time of the initial issue. Furthermore, in addition to the existence of forecast management, we indicate that the market reaction in response to avoiding negative forecast innovations rationally explains the managerial opportunistic incentive for forecast management.

Although our findings are based on analyses of Japanese firms, our study has an important implication for management earnings forecasting in other countries. Our results suggest that if management earnings forecasts are institutionally required to be issued with actual earnings, the stock price effect of the forecasts might outperform actual earnings at the announcement date and, thus, managers would have a strong incentive to manipulate the forecasts.[3]

[3] Specifically, our findings have implications for the practice of management earnings forecasting

The remainder of this paper is organized as follows. Section 2 describes the institutional background of management forecasting in Japan, and develops the hypotheses. Section 3 explains the variable measurements used in this study. Section 4 outlines the sample selection process and the descriptive statistics. Section 5 reports the empirical results on the existence and incentives of discretionary forecast management. Section 6 summarizes the results of the additional analysis. Finally, section 7 concludes the study.

2. Hypothesis development

2.1. Management forecast reporting in Japan

Management forecast reporting in Japan has several distinctive characteristics. First, management forecast disclosure is effectively mandated (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. In addition, the TSE requires that they simultaneously report the management forecasts of the main accounting items in this summary of financial statements.

Although the disclosure rule for management forecasts is voluntary and without legal backing, compliance has been so high that, in practice, almost all firms provide management earnings forecasts. For example, Kato et al. (2009) show that 93.7 percent of their sample (38,068 of 40,647) provide management forecasts in a sample period from 1997 to 2007. Then, based on a 2006 survey, Ota (2011) indicates that 98.9 percent of the listed firms (3,790 of 3,831) provide management forecasts. These findings suggest that management forecast disclosure in Japan is

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in U.S. firms. Some studies have indicated that many U.S. firms have recently issued management earnings forecasts with their earnings announcements (Gong, Li, and Xie 2009; Rogers and Van Buskirk 2013) and that the simultaneous issue of actual earnings and management earnings forecasts has increased steadily since the enactment of Regulation FD (Anilowski et al. 2007). These bundled management forecasts have evolved to become the most common type of management forecast in the United States (Rogers and Van Buskirk 2013). Our study contributes to the literature on U.S. firms by improving the understanding of the discretion of management earnings forecasts when they are issued concurrently with earnings announcements.

effectively mandated, implying that management forecast studies in Japan are generally free from self-selection bias.

Second, as mentioned, listed companies are required to *simultaneously* report the main accounting items of the current year and the management forecasts of these items. Management forecasts of the main accounting items include net sales, operating income,[4] ordinary income (earnings before extraordinary items and taxes), net income, earnings per share, and dividend per share for the next fiscal year. Thus, 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 (which include confirmations) when the interim summary of financial statements is reported.

Third, Japanese-listed companies provide *point*-estimated 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) indicated that the proportion of range estimates increased significantly after Regulation FD. On the other hand, listed firms in Japan generally report point-estimated forecasts, as prescribed by the TSE.[5]

Finally, the Financial Instruments and Exchange Act requires that listed firms update their management forecasts if there are *material* revisions in management estimates. The criteria for such *materiality* are specified by the Cabinet Office Ordinance on Restrictions on Securities Transactions, etc. (Article 51, paragraphs 1–4).[6] If revisions to management estimates meet either

[4] Since 2007, the TSE has required that listed firms provide forecasts of their operating income because of its growing importance for investors.

[5] The TSE prescribes that firms also 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).

[6] Specifically, the criteria specify the following: a) changes in sales estimates of 10 percent or more; b) changes in ordinary income estimates of 30 percent or more and of 5 percent or more of net assets; c) changes in net income estimates of 30 percent or more and 2.5 percent or more of net

of the above criteria, managers must announce revised management forecasts. In contrast to the initial forecasts, which are encouraged by the TSE, these revisions are required under the Act.

2.2. The hypothesis on the existence of forecast management

Management earnings forecast information is expected to resolve the problem arising from the information asymmetry among stakeholders and to improve efficiency in the stock market. Because most Japanese firms systematically report their management earnings forecasts with their actual earnings, the management forecast system has functioned as an important information source for stakeholders in Japan. Following the questionnaire of Graham et al. (2005), the survey results of Suda and Hanaeda (2008) indicate that, among several performance benchmarks, management earnings forecasts are the most important (97.07% agree or strongly agree that this benchmark is important) in Japan. This finding is quite interesting, because it differs from that of Graham et al. (2005) that many executives in U.S. firms do not care about management earnings forecasts.[7]

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 shown 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 the actual annual earnings do around the announcement date in the Japanese stock market.

In this study, we focus on managerial discretion over initial earnings forecasts. Managers are

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assets; and d) changes in the dividends of surplus estimates of 20 percent or more.

[7] Graham et al. (2005) reveal that four earnings benchmarks are particularly important: 1) same quarter last year (85.1% 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%).

likely to have much 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),[8] the feature of the management forecast system in Japan, in which 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 of an incentive to report non-negative forecast innovations. The survey analysis of 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 findings suggest that Japanese managers care about avoiding negative forecast innovations.

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

This opportunistic behaviors view is supported by the theoretical implications of positive accounting theory (Watts and Zimmerman 1986) and much of the empirical evidence presented by

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[8] 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).

earnings management research (Healy and Wahlen 1999; Dechow and Skinner 2000; Fields et al. 2001; Dechow, Ge, and Schrand 2010). For instance, recent studies provide evidence suggesting 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, some theoretical and empirical studies based on the efficient behaviors view have shown 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 pervasive 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 (Bergstresser and Philippon 2006; Shleifer 2004; Cheng and Warfield 2005). Studies on the relationship 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 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, the higher return would motivate managers to conduct forecast management.

Furthermore, we expect this incentive to be stronger in the Japanese institutional setting. Because both the 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 nature of 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, managers in Japanese firms 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. Previous studies have revealed two main 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 it has no restrictions on its continuous utilization.[9] Furthermore, the *Kessan-Tanshin*, which reports management earnings forecasts, are not subject to an audit by certified public accountants or an auditing firm, suggesting that managers have much discretion in estimating their forecasts. Furthermore, discretionary management for initial forecasts is more difficult to detect than are earnings and 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,[10] 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

[9] This argument is consistent with the finding of Kato et al. (2009) that managers' optimism with regard to forecasts is highly persistent from one year to the next.

[10] Green, Hand, and Soliman (2011) indicate that the hedge returns to accruals anomaly appears to have decayed in U.S. stock markets to the point that they are, on average, no longer reliably positive.

perceived by market participants. On the other hand, detecting the discretionary portion of management earnings forecasts is more difficult. The above 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 relatively small because of the nature of the 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 the 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.[11]

Taken together, the above factors suggest 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 managed to avoid negative forecast innovations.*

2.3. The hypothesis on the incentive for forecast management

Given the existence of discretionary forecast management by firm managers, our next concern is to explore why managers engage in forecast management. Studies on the relationship between earnings benchmarks and stock returns have indicated that, while investors reward firms that achieve their earnings benchmarks, they 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 also closely associated to the stock market reaction to

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

forecast innovations.

In particular, we investigate whether there is a market premium for firms that avoid 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), they have not revealed whether there is a market reward for firms that avoid negative forecast innovations.

The important feature of the institutional setting in Japan 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 will be a reasonable explanation for managers' forecast management. Firms that fail to meet or beat their actual earnings benchmarks (i.e., report losses, 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. Thus, we present our second hypothesis:

HYPOTHESIS 2. *Firms that avoid negative forecast innovations enjoy a higher return around the announcement date than do firms that fail to do so, after controlling for the effect of other earnings benchmarks.*

If investors can perfectly detect the discretionary portion of management earnings forecasts (i.e., discretionary forecasts), firms that avoid negative forecast innovations through discretionary forecasts are not likely to enjoy a higher return. Thus, firm managers do not have an incentive to manage their forecasts. Given the strong managerial incentive to avoid negative forecast innovations and the features of the Japanese stock market discussed from the opportunistic behaviors perspective, we expect that there is a market premium for avoiding negative forecast innovations, even when it is achieved through discretionary forecast management. This leads to our third hypothesis:

HYPOTHESIS 3. *Firms that avoid negative forecast innovations through discretionary forecasts enjoy a higher return around the announcement date than do firms that fail to do so, after controlling for the effect of other earnings benchmarks.*

2.4. The hypothesis on the consequence of forecast management

Hypotheses 1 and 2 predict that 1) firm managers manage their earnings forecasts through discretionary forecasts to avoid negative forecast innovations, and 2) firms that avoid negative forecast innovations enjoy a higher return, even when they use discretionary forecasts to do so. If our results support these hypotheses, the findings raise questions about investors' rationality. Thus, we explore whether the market premium for avoiding negative forecast innovations is driven by investors' overreactions or by rational expectation.

The assumption of hypothesis 1 is that managers engage in forecast management for their own benefit (i.e., the opportunistic behaviors view). In this research context, the opportunistic behaviors view predicts that managers manipulate their earnings forecasts to mislead investors, and that investors naively respond to the sign and magnitude of managed forecast innovations.

As discussed in the development of hypothesis 1, there is an alternative explanation for the results concerning the market reward for avoiding negative forecast innovations: the efficient management behaviors view. We cannot deny the possibility that managers might use discretionary forecasts to convey their prospects for future good performance to investors. Some theoretical studies suggest that managerial discretion, such as earnings management, can be used to convey inside information about future performance to investors (Demski and Sappington 1986, 1990; Kirschenheiter and Melumad 2002; Ronen and Sadan 1981; Sankar and Subramanyam 2001; Demski 1998).[12] Furthermore, some studies provide empirical evidence consistent with the efficient management behaviors view, suggesting that managers are likely to engage in earnings management to convey private information about future prospects to investors (Subramanyam 1996; Collins et al. 1994; Tucker and Zarowin 2006).[13]

To address this concern, we analyze the relationship between avoiding negative forecast innovations through discretionary forecasts and future performance in terms of forecast errors and revisions. If managers inflate their earnings forecasts to convey positive prospects of their future performance, as the efficient management view suggests, there will be a positive relationship between discretionary forecasts and future performance. On the other hand, the opportunistic behaviors view predicts that there is not a positive relationship between discretionary forecasts and future performance. Because we predict the opportunistic behaviors view, our final hypothesis is as follows:

HYPOTHESIS 4. *Discretionary forecasts used to avoid negative forecast innovations are not positively associated with future performance.*

3. Variable measurements

In this section, we describe the estimation procedure for measuring the discretionary portion of

[12] For example, Demski and Sappington (1990) argue that discretionary accruals can be used to convey inside information about future performance to investors, including new firm strategies, changes in firm characteristics, and changes in market conditions. Other studies argue that income smoothing improves earnings informativeness if managers use their discretion to communicate their assessment of future earnings (Kirschenheiter and Melumad 2002; Ronen and Sadan 1981; Sankar and Subramanyam 2001; Demski 1998).

[13] Subramanyam (1996) provides evidence that the stock market responds positively to the current period's discretionary accruals, consistent with the implications in Demski and Sappington (1990). Other studies suggest that income smoothing improves earnings informativeness (Collins et al. 1994; Tucker and Zarowin 2006).

management earnings forecasts (discretionary forecasts: DF). We summarize the estimation procedure for measuring 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 $t - 1$. Estimating the expected value of the change in one-year-ahead earnings refers to the non-discretionary portion of forecast innovations.

We use an estimation model similar to that used by Matsumoto (2002), which estimates the expected portion of analysts' forecasts. She estimates the expected analysts' forecasts by modeling the seasonal change in earnings as a function of the prior quarter's seasonal change in earnings and the cumulative excess return of year $t - 1$. We estimate the model to measure the expected value of the change in one-year-ahead earnings:

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

where,

$CROA_t$ = (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 $t - 1$.[14] The inventory variable is merchandise and finished goods when available; otherwise, it is total inventory.

AR_{t-1} = Δ Accounts receivable in year $t - 1$ – Δ Sales in year $t - 1$. The accounts receivable

[14] The Δ operator represents the percentage change in the variable based on a two-year average expectation model, which is the same as that in Lev and Thiagarajan (1993) and Abarbanell and Bushee (1997). For example, Δ *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 the Δ operator in this paper are calculated using the same procedure.

variable is accounts receivable when available; otherwise, it is accounts and notes receivable.

$CAPX_{t-1}$ = Δ Industry capital expenditure in year $t-1$ – Δ Firm capital expenditure in year $t-1$. Industry capital expenditure = aggregated 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.

TAC_{t-1} = (total accruals for year $t-1$ – total accruals for year $t-2$) / total assets at the end of year $t-1$.[15]

AQ_{t-1} = dummy variable, set to 0 if auditor's opinion in year $t-1$ is unqualified, and 1 if auditor's opinion is qualified, or other.[16]

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 $t-1$.[17] Stock returns are accumulated from three days after the year $t-2$ earnings announcement to 20 days before the

[15] 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.

[16] In the regression analysis from 2006 to 2009, we cannot estimate the parameter of *AQ* because all *AQ* observations are 0 (i.e., all observations are unqualified opinions). Therefore, we exclude *AQ* from the regression model from 2006 to 2009.

[17] We compute market-adjusted returns based on the TOPIX (Tokyo Stock Price Index) Index. All other market-adjusted returns in this paper are calculated using this index.

year t – 1 earnings announcement.

In accordance with the findings of prior studies 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 in the model.[18] Furthermore, 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*), we use fundamental signals variables that are empirically supported by previous fundamental analysis research (Lev and Thiagarajan 1993; Abarbanell and Bushee 1997). 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 showing that these fundamental signals can predict changes in one-year-ahead earnings and five-year earnings growth rates.[19]

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 to be 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

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[18] 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 (not lagged assets, as in *CROA*).

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

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 (*TAC*) will lead to a decrease (increase) in future earnings owing to the reversing nature of accruals. Thus, *TAC* is also considered a negative signal.[20] A reduction in the labor force (i.e., an increase in *LF*) is expected to increase wage-related expenses, such as severance pay. Therefore, a positive *LF* is expected to reduce the 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 previously 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. Given that 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 that managers use to estimate future earnings.[21] The relationship between *CROA* and *CRET* is expected to be positive.

We estimate the model for each year and calculate the parameter estimates for each variable. The sample for this regression model consists of 18,300 observations drawn from the period 2002–2009. Each sequential variable is winsorized at 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*, *TAC*, *AQ*, and *LF* are negative, while those on

[20] For earnings quality measures, Abarbanell and Bushee (1997) use a dummy variable, set to 1 if a firm adopts LIFO, and 0 otherwise. We adopt the *TAC* 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 do.

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

AR and *ETR* signals are positive.[22] The coefficient of *CRET* is significantly positive, consistent with the results of Matsumoto (2002). Overall, we find that the fundamental signals and the cumulative returns have incremental explanatory power for the 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:

$$\begin{aligned} NDF_t = (&\hat{\alpha}_{t-1} + \hat{\beta}_{1t-1}CHGROA_{t-1} + \hat{\beta}_{2t-1}INV_{t-1} + \hat{\beta}_{3t-1}AR_{t-1} + \hat{\beta}_{4t-1}CAPX_{t-1} + \hat{\beta}_{5t-1}GM_{t-1} \\ &+ \hat{\beta}_{6t-1}S\&A_{t-1} + \hat{\beta}_{7t-1}ETR_{t-1} + \hat{\beta}_{8t-1}TAC_{t-1} + \hat{\beta}_{9t-1}AQ_{t-1} + \hat{\beta}_{10t-1}LF_{t-1} \\ &+ \hat{\beta}_{11t-1}CRET_{t-1}) \times Total\ Assets_{t-1}. \end{aligned} \tag{2}$$

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 by 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 shown in equation (3):

$$DF_t = FI_t - NDF_t. \tag{3}$$

[22] The positive relationship between *AR* and *CROA* is contrary to our predictions, but consistent with the results of Abarbanell and Bushee (1997), which 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 several prior studies. For example, Schmidt (2006) finds a positive association between the effective tax rate and future earnings.

In Panel B of Figure 1, we summarize the components of the management earnings forecasts considered in this study. Panel B shows 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 2009. 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 30,192 firm-year observations. Second, we eliminate 1,577 observations that do not have forecast data. About 95 percent of our sample issue management earnings forecasts, which is generally consistent with the findings of prior studies (Kato et al. 2009; Ota 2011). Third, we eliminate 1,155 observations because their accounting periods change during our analysis period. This procedure results in 27,460 observations, which are used for the earnings distribution analysis. Finally, we delete observations with missing data in order to calculate discretionary forecasts (11,807) and other variables (4,884). Thus, our final sample consists of 10,769 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 actual earnings for year *t* minus the initial management earnings forecasts for year *t*, deflated by lagged total assets, is -0.009 (-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 the findings of prior studies (Kato et al. 2009; Ota 2006). The mean value of forecast innovations (*FI*) is 0.008, which is relatively large because the mean value of ROA in Japan is roughly 2 percent. This means that net income is forecast to increase by a mean (median) of 0.8 percent (0.3%) of assets. The average of *POSFI*, a dummy variable set to 1 if *FI* is greater than or equal to 0, and 0 otherwise, indicates that about 70 percent 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 shows that the positive *DF* is 0.519, indicating that about 51.9 percent of observations in our sample conduct income-increasing forecast management. We define *MPOSFI* as a dummy variable, set to 1 if *FI* is greater than or equal to 0 and *NDF* is negative, and 0 otherwise. About 25.1 percent 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

To test hypothesis 1, Figure 2 presents the distribution of the scaled forecast innovations. We can observe clear discontinuities at zero in the distribution of scaled forecast innovations. Based on the implications of 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.[23] 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 and Dichev (1997).[24] Panel A shows 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 in Figure 3. In contrast to the results of Figure 2, the irregularities at zero in the distribution of non-discretionary forecasts are not observed in Figure 3. Panel A of TABLE 4 shows that the standardized differences to the left (or right) of zero are not 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 in Panel B of TABLE 4 indicates that the EM ratio of the distribution of forecast innovations, 2.493, is significantly higher than the

[23] 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 and on the incentive and consequence of forecast management.

[24] 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 $Np_i(1 - p_i) + (1/4)N(p_{i-1} + p_{i+1})(1 - p_{i-1} - p_{i+1})$.

ratio of the distribution of non-discretionary forecast innovations (1.003). This 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.

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

As a preliminary analysis to test hypothesis 2 on the relationship between management forecasts and stock returns, we present TABLE 5, which shows 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 shows 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 (i.e., 0.025 in the case of $ES \geq 0$, and 0.017 in the case of $ES < 0$, respectively), and significantly greater than those of firms with negative *FI*. Note that firms that report non-negative forecast innovations can have positive returns (0.017), even when they report a negative earnings surprise. The lower cells in the tables show that firms reporting negative forecast innovations cannot have positive returns (–0.009), even when they report a positive earnings surprise. These results suggest that market participants are likely to have a higher value of forecast innovations.

Similarly, Panel B of TABLE 5 shows 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*, showing that the mean (median) of the group's *CAR* is positive, 0.018 (0.011), suggesting that firms that avoid negative forecast innovations have positive returns when they report earnings decreases. Panel C of TABLE 5 summarizes the *CAR*s of the firms, sorted by the signs of *FI* and levels of earnings (*ROA*). It reveals a similar tendency: the mean (median) of the *CAR* of the upper-right group is 0.020 (0.013), 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 meeting or beating forecast innovation benchmarks creates a higher and constant positive abnormal return, regardless of the achievements of other earnings benchmarks, which is consistent with hypothesis 2.

Finally, Panel D of TABLE 5 shows 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 0.022 (0.013), which is not significantly different from that of the upper-left group that can avoid negative forecast innovation benchmarks without forecast management, 0.022 (0.013). These results suggest that avoiding negative forecast innovations yields an economic benefit to firms' managers, even if achieved by discretionary management, which is consistent with the basic implication of hypothesis 3.

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):[25]

$$CAR_t = \alpha + \beta_1 POSFI_t + \beta_2 POSES_t + \beta_3 POSCROA_t + \beta_4 POSROA_t$$
$$+ \beta_5 FI_t + \beta_6 DS_t + \beta_7 SIZE_t + \beta_8 BM_t + Year\ dummy + Industry\ dummy + \varepsilon_t, \quad (4)$$
$$CAR_t = \alpha + \beta_1 MPOSFI_t + \beta_2 POSES_t + \beta_3 POSCROA_t + \beta_4 POSROA_t$$
$$+ \beta_5 FI_t + \beta_6 DS_t + \beta_7 SIZE_t + \beta_8 BM_t + Year\ dummy + Industry\ dummy + \varepsilon_t, \quad (5)$$

where,

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

Forecast innovation benchmark:

$POSFI_t$ = dummy 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 $t - 1$.

$MPOSFI_t$ = dummy variable, set to 1 if *FI* for year *t* is greater than or equal to 0 and the *NDF* for year *t* is negative, and 0 otherwise. NDF_t = nondiscretionary forecasts for year *t* / total assets at the end of year $t - 1$.

Earnings Benchmark:

$POSES_t$ = dummy 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 $t - 1$.

$POSCROA_t$ = dummy variable, set to 1 if the change in net income for year *t* is greater than or

[25] Petersen (2009) indicates that standard errors clustered by firm and time can be useful in simultaneously controlling for time-series correlation and heteroskedasticity. Specifically, *t*-statistics are adjusted for cross-sectional and inter-temporal dependence using two-way cluster-robust standard errors. We use this estimation method for all our analyses. If clustering standard errors does not allow for the inclusion of all our currently included industry dummy variables, we combine at least two industry dummy variables into one industry dummy variable to estimate the regression.

equal to 0, and 0 otherwise.

$POSROA_t$ = dummy variable, set to 1 if the net income 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 $t – 1$.

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.

In both models, the dependent variable is *CAR* (defined in TABLE 5). To test hypothesis 2, in addition to *FI*, 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 decreases (*POSCROA*), and 3) avoiding losses (*POSROA*). Our main concern is whether firms that avoid negative forecast innovations have a higher return, after controlling for the effect of other earnings benchmarks. Thus, if the relationship between management forecasts and stock returns is consistent with the prediction of hypothesis 2, the coefficient of *POSFI* will be positive. We also control for the effect of firm size (*SIZE*), the book-to-market ratio (*BM*), and the dividend surprise measure (*DS*) on *CAR* in order to assess the information content of forecast information in our model (Bartov et al. 2002; Kato et al. 2009).[26] Furthermore, to test hypothesis 3, instead of *POSFI*, we use *MPOSFI* to capture the firms that avoid negative forecast innovations through discretionary forecasts in the model defined in (5). In accordance with the prediction of hypothesis 3, we expect the coefficient of *MPOSFI* to be positive.

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[26] We included 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.

TABLE 6 summarizes the regression results. The result for model (4) indicates that the coefficient of *FI*, 0.226, 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* (i.e., our main concern) is 0.033, and significantly positive at a level less than 0.01; thus, the coefficient of *POSFI* is not simply attributable to the general relationship between forecast innovations and stock returns. The table also shows that the coefficients on other earnings benchmark variables, namely, *POSES*, *POSCROA*, and *POSROA*, are all significantly positive (0.012, 0.009, and 0.013, 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 controlling for the effect of other earnings benchmark measures. Our *F*-test indicates that the coefficient of *POSFI*, 0.033, is significantly greater than those on other earnings benchmark variables (*POSES* = 0.012, *POSCROA* = 0.009, and *POSROA* = 0.013). These results are consistent with hypothesis 2. All control variables (*FI*, *DS*, *SIZE*, and *BM*) have the expected signs, and most variables (except for *SIZE*) are statistically significant at the conventional levels.

The regression results for model (5), which tests hypothesis 3, show that while the coefficients on three earnings benchmark measures (*POSES*, *POSCROA*, and *POSROA*) are all significantly positive, the coefficient of *MPOSFI*, 0.012, is significantly positive at a level less than 0.01. This reveals that firms that avoid negative forecast innovations enjoy a higher return, after controlling for other earnings benchmark measures, even when they use discretionary forecasts to avoid negative forecast innovations. This result supports hypothesis 3.

In summary, the analyses in this section provide evidence 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, the market premium for meeting or beating forecast innovation benchmarks exists, even when it is achieved through discretionary forecast management. These findings appear to explain why firm managers engage in forecast management to avoid negative forecast innovations.

5.3. Forecast management and future performance

To test hypothesis 4 on the relationship between forecast management and future performances, we estimate the following model:

$$\begin{aligned} &\textit{Future performance dummy}_{t+1} = \alpha + \beta_1 \textit{Forecast Innovations Benchmark}_t \\ &\quad + \beta_2 GROWTH_t + \beta_3 SIZE_t + \beta_4 POSUE_t + \beta_5 MFE_t + \textit{Year dummy} \\ &\quad + \textit{Industry dummy} + \varepsilon_t , \end{aligned} \tag{6}$$

where,

Future performance dummy:

$DREVISION_{t+1}$ = dummy variable, set to 1 if *REVISION* for year $t + 1$ is larger than 0, and 0 otherwise. $REVISION_{t+1}$ = (initial management forecasts for year $t + 1$ – the latest management forecasts for year $t + 1$) / total assets at the end of year $t – 1$.

$DERROR_{t+1}$ = dummy variable, set to 1 if *ERROR* for year $t + 1$ is larger than 0, and 0 otherwise. $ERROR_{t+1}$ = (initial management forecasts for year $t + 1$– actual earnings for year $t + 1$) / total assets at the end of year $t – 1$.

$MPOSFI_t$ = dummy variable, set to 1 if *FI* for year *t* is greater than or equal to 0 and *NDF* for year *t* are negative, and 0 otherwise. NDF_t = nondiscretionary forecasts for year *t* / total assets at the end of year $t – 1$.

$GROWTH_t$ = (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*.

$POSUE_t$ = dummy 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.

We use two *ex post* performance measures, namely a forecast errors dummy (*DERROR*) and a forecast revisions dummy (*DREVISION*), in order to capture the bad *ex post* performance. TABLE 7 reports the regression results for model (6). In column 3, the model's dependent variable is *DREVISION*, which is the dummy variable indicating *downward* revisions of management forecasts during the period. The table shows that the coefficient of *MPOSFI*, 0.104, is significantly positive at a level less than 0.01. This result suggests that firms that avoid negative *FI* through discretionary forecasts at the beginning of the period are likely to revise their initial forecasts downward during the fiscal period.

The results for the relationship between discretionary forecasts and the forecast errors are summarized in column 4. For this dependent variable, we use *DERROR*, the dummy variable indicating negative forecast errors at the end of the period. The table reveals that the coefficient of *MPOSFI*, 0.092, is significantly positive at a level less than 0.01, suggesting that firms that conduct upward forecast management at the beginning of the period tend to miss their earnings forecasts at the end of the fiscal year.

Hence, the overall results are consistent with hypothesis 4 that the use of discretionary forecasts to avoid negative forecast innovations decreases future performance. The results are not consistent with the efficient behaviors view that managers signal positive private information using discretionary forecasts for investors to incorporate rationally in their investment decisions.

6. Additional analysis

Our main results indicate that firms that avoid negative forecast innovations have a higher return at the announcement of actual and forecasted earnings. The results provide a reasonable explanation for managers' forecast management behavior to avoid negative forecast innovations. To further support the argument, we examine whether the relationship between forecast innovations and stock returns is a non-linear (i.e., S-shaped) function. Studies have shown an S-shaped relationship between earnings surprises and stock returns (c.f. Kinney, Burgstahler, and Martin 2002; Skinner and Sloan 2002). In an S-shaped relationship, the average stock price response to large earnings surprises is proportionately much smaller than is the response to smaller magnitude earnings surprises. This suggests that while reporting a slight positive earnings surprise produces a larger positive stock return, on average, a slight negative earnings surprise causes a larger negative stock return. This relationship induces firm managers to report a slight positive earnings surprise and to conduct earnings management, because they obtain a higher reward for meeting their earnings benchmarks. Therefore, in the context of management earnings forecasts, we hypothesize that the relationship between forecast innovations and stock returns is S-shaped.

We illustrate this relationship following a method similar to that of Skinner and Sloan (2002) and Kinney et al. (2002) by grouping firm-year observations into 10 portfolios, based on the magnitude of *FI*. Specifically, we group observations with non-negative *FI* into five portfolios, based on the magnitude of *FI*, and group the rest (i.e., observations with negative *FI*) into five portfolios also based on the magnitude of *FI*. Figure 4 presents the mean of the distribution of abnormal returns for the portfolios.

Figure 4 reveals that the relationship between forecast innovations and returns has a steeper slope around zero forecast innovations, and a flatter slope for more extreme values. Thus, the figure shows that the overall relationship between forecast innovations and returns is S-shaped, meaning that some small, positive (negative) forecast innovations are accompanied by large, positive (negative) returns.[27]

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[27] Figure 5 also indicates that the relationship between forecast innovations and returns is

As a statistical test of the visual evidence in Figure 4 that suggests that the relationship between forecast innovations and returns is S-shaped, we estimate the following regression model. The model regresses stock returns on forecast innovations, with dummy variables indicating ranges of forecast innovation around zero:

$$CAR_t = \alpha + \beta_1 FI_t + \Sigma \beta_{2k} FI_t \times D[-k, k) + \beta_3 DS_t + \beta_4 SIZE_t + \beta_5 BM_t$$
$$+ \textit{Year dummy} + \textit{Industry dummy} + \varepsilon_t, \quad (7)$$

where,

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

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

$D[-k, k)$ = dummy variable, set to 1 if FI for year t fall in $[-k, k)$, and 0 otherwise, where, k = 0.02, 0.01, 0.005, 0.0025, 0.001.

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.

All variables except for $D[-k, k)$ are defined above. To define $D[-k, k)$, we extract five ranges

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generally symmetric, but we can see a slightly different response to positive and negative forecast innovations (i.e., an asymmetric relationship in a narrower range around zero). For example, in the range of forecast innovations from –0.02 to +0.02, when forecasts innovations are positive, returns climb steeply over a small range of forecast innovations to a maximum of a little over 3 percent. On the other hand, when forecast innovations are negative in the same range, the effect is not as dramatic because the minimum value of the returns is about –2 percent. These results also likely induce firm managers to avoid negative forecast innovations because reporting slight positive forecast innovations involves a larger positive stock reaction. However, our regression results do not strongly support this asymmetric relation.

around zero from the distribution of *FI* for all observations. Specifically, *D*[–0.02, 0.02) comprises *FI* in the range [–0.02, 0.02) (greater than or equal to –0.02 and less than or equal to 0.02). Similarly, *D*[–0.01, 0.01) comprises *FI* in the range [–0.01, 0.01), *D*[–0.005, 0.005) comprises *FI* in the range [–0.005, 0.005), *D*[–0.0025, 0.0025) comprises *FI* in the range [–0.0025, 0.0025), and *D*[–0.001, 0.001) comprises *FI* in the range [–0.001, 0.001). To test whether the ERC is steeper for forecast innovations around zero, we include the dummy variables *D*[–*k*, *k*), which allow a separate ERC to be estimated for forecast innovations in each of the five ranges. We expect that the coefficient of *FI***D*[–*k*, *k*) will be higher in the narrower range.

The regression results are summarized in TABLE 8. In columns 4 to 8, we include each of the *D*[–*k*, *k*) variables in the regression models separately. While the coefficients of *FI* are significantly positive in all models, the coefficients of *FI***D*[–*k*, *k*) are also significantly positive in all models. The table further shows that *FI***D*[–*k*, *k*) in the narrower ranges have significantly higher slopes. As the range of forecast innovation narrows, the slopes continues to rise: *FI***D*[–0.02, 0.02) = 1.600, *FI***D*[–0.01, 0.01) = 2.188, *FI***D*[–0.005, 0.005) = 2.416, *FI***D*[–0.0025, 0.0025) = 3.284, and *FI***D*[–0.001, 0.001) = 9.053. Finally, in column 3, we include all *D*[–*k*, *k*) variables in the regression model simultaneously. The table reveals that the coefficient of *FI***D*[–0.001, 0.001), which is the narrowest range in our setting, has a significantly positive slope (7.711) and is the highest of the coefficients of all *FI***D*[–*k*, *k*) variables.

Therefore, our overall results indicate that the average stock price response to larger forecast innovations is, proportionately, much smaller than the response to smaller forecast innovations. This indicates that the relationship between forecast innovations and returns is *S*-shaped, which is consistent with our prediction. These results suggest that the high reward for non-negative forecast innovations by a small margin might encourage firm managers to discretionally manage their earnings forecasts to avoid negative forecast innovations.

7. Conclusion

In this study, 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 manage their earnings forecasts to avoid negative forecast innovations, 2) why managers engage in the forecast management, and 3) how investors in the Japanese stock market respond to forecast management. In developing our hypotheses, we predict that firm managers are more likely to manage their initial earnings forecasts opportunistically because of 1) a strong managerial equity incentive, 2) the lower cost of forecast management (i.e., no restriction on continuous use, no need to be audited, and the difficulty of detection), and 3) Japan's small 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 reporting non-negative forecast innovations, thus explaining why managers engage in forecast management. Finally, our analyses of the relationship between forecast management and future performance show that managers are not likely to use discretionary forecasts to convey private information about future performance to investors. This suggests that managers bias their forecasts in an opportunistic manner.

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, our findings are subject to the validity of our estimation model for discretionary forecasts. Second, our results on the relationship between forecast innovations and stock returns suggest that investors are likely to misprice the discretionary forecasts. While these findings provide a valid rationale for forecast management, future research should examine the mispricing effect in order to better understand the efficiency of the Japanese stock market.

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TABLE 1

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

Dependent Variables	Independent variables											
	CONSTANT	$CHGROA_{t\text{-}1}$	$INV_{t\text{-}1}$	$AR_{t\text{-}1}$	$CAPX_{t\text{-}1}$	$GM_{t\text{-}1}$	$S\&A_{t\text{-}1}$	$ETR_{t\text{-}1}$	$TAC_{t\text{-}1}$	$AQ_{t\text{-}1}$	$LF_{t\text{-}1}$	$CRET_{t\text{-}1}$
$CROA_t$	-0.00127	-0.40967	-0.00304	0.00303	-0.00006	-0.00729	-0.00249	0.05672	-0.01383	-0.00177	-0.01957	0.01622
Positive	5 (4)	0 (0)	0 (0)	6 (1)	2 (1)	3 (1)	3 (1)	5 (1)	3 (0)	2 (1)	0 (0)	8 (5)
Negative	3 (3)	8 (8)	8 (4)	2 (0)	6 (2)	5 (2)	5 (1)	3 (0)	5 (0)	2 (0)	8 (3)	0 (0)
Adjusted R^2 = 0.15405												

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 *TAC*) 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, Δ*Sales* in year *t*-1 = $\{Sales_{\text{t-1}} - E(Sales_{\text{t-1}})\} / E(Sales_{\text{t-1}})$, where $E(Sales_{\text{t-1}}) = (Sales_{\text{t-2}} + Sales_{\text{t-3}}) / 2$. 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.

$CHGROA_{t\text{-}1}$ = (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. The Inventory variable reflects merchandise and finished goods when available and total inventory otherwise.

$AR_{t\text{-}1}$ = 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.

$CAPX_{t\text{-}1}$ = 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.

$GM_{t\text{-}1}$ = 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.

$TAC_{t\text{-}1}$ = (total accruals for year *t*-1 minus total accruals for year *t*-2) / total assets at the end of year *t* -1. 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.

$AQ_{t\text{-}1}$ = dummy 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.

$CRET_{t\text{-}1}$ = 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 18,300 observations between 2002 and 2009.

In regression analysis from 2006 to 2009, we cannot estimate parameter of $AQ_{t\text{-}1}$ because all the observations are zero (i.e., all observations are unqualified opinion). Therefore, we exclude $AQ_{t\text{-}1}$ 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 - 2009[1]	30,192
Less:	
Missing management forecast data	(1,577)
Changing in accounting month within firm-years necessary for our analyses	(1,155)
Sample for distribution analysis	27,460
Less:	
Missing data for calculating discretionary forecasts (*DF*)[2]	(11,807)
Missing financial statements, stock returns and the latest management forecast data necessary for our analyses	(4,884)
Sample for regression analysis	10,769

TABLE 3
Descriptive statistics

	Mean	Min	p25	Median	p75	Max	SD	Skewness	Kurtosis	*N*
FI_t	0.008	-0.095	-0.002	0.003	0.011	0.346	0.030	3.323	25.466	10,769
DF_t	0.005	-0.104	-0.009	0.001	0.013	0.244	0.031	1.901	12.274	9,664
NDF_t	0.003	-0.090	-0.003	0.003	0.010	0.086	0.015	-0.117	9.518	9,664
CAR_t	0.010	-0.190	-0.029	0.005	0.041	0.301	0.067	0.747	5.211	10,769
$POSFI_t$	0.700	0.000	0.000	1.000	1.000	1.000	0.458	-0.872	1.761	10,769
$MPOSFI_t$	0.251	0.000	0.000	0.000	1.000	1.000	0.434	1.147	2.316	9,664
$POSES_t$	0.664	0.000	0.000	1.000	1.000	1.000	0.473	-0.692	1.479	10,769
$POSCROA_t$	0.538	0.000	0.000	1.000	1.000	1.000	0.499	-0.152	1.023	10,769
$POSROA_t$	0.846	0.000	1.000	1.000	1.000	1.000	0.361	-1.915	4.666	10,769
ES_t	0.000	-0.062	-0.001	0.000	0.002	0.020	0.005	-3.603	38.133	10,709
$CROA_t$	-0.001	-0.228	-0.011	0.001	0.011	0.260	0.038	-0.229	11.991	10,709
ROA_t	0.021	-0.302	0.007	0.020	0.039	0.180	0.041	-1.200	10.652	10,709
DS_t	0.000	-0.005	0.000	0.000	0.000	0.007	0.001	2.721	30.039	10,769
$SIZE_t$	9.884	6.199	8.682	9.698	10.882	14.551	1.620	0.489	2.842	10,769
BM_t	1.330	0.090	0.755	1.142	1.676	5.401	0.825	1.620	6.681	10,769

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.

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

$MPOSFI_t$ = dummy 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.

$POSES_t$ = dummy 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.

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

$POSROA_t$ = dummy 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.	-10.955***	10.460***	-0.050	0.000	-2.323	1.904
Fig. 3.	-0.436	0.488	-0.040	-0.028	-2.655	2.451

Panel B: The EM ratio

	EM ratio	χ^2-value[3]	
Fig. 2.	2.493	82.538***	(Fig 2 vs Fig 3)
Fig. 3.	1.003		

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.

TABLE 5

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
	$ES_t \geqq 0$	$ES_t < 0$	
$FI_t \geqq 0$	0.025（0.016） *n* = 7,975	0.017（0.009） *n* = 5,984	0.008***†††
$FI_t < 0$	-0.009（-0.010） *n* = 3,584	-0.025（-0.023） *n* = 1,331	0.016***†††
Positive Group–Negative Group	0.034***†††	0.043***†††	

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
	$CROA_t \geqq 0$	$CROA_t < 0$	
$FI_t \geqq 0$	0.025 (0.015) *n* = 7,271	0.018 (0.011) *n* = 6,688	0.007***†††
$FI_t < 0$	-0.011（-0.010） *n* = 3,387	-0.019（-0.021） *n* = 1,528	0.008***†††
Positive Group–Negative Group	0.036***†††	0.037***†††	

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
	$ROA_t \geqq 0$	$ROA_t < 0$	
$FI_t \geqq 0$	0.021 (0.013) *n* = 10,509	0.023 (0.012) *n* = 3,450	-0.002
$FI_t < 0$	-0.013 (-0.013) *n* = 4,810	-0.029 (-0.032) *n* = 105	0.016***†††
Positive Group–Negative Group	0.034***†††	0.052***†††	

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
	$NDF_t \geqq 0$	$NDF_t < 0$	
$FI_t \geqq 0$	0.022（0.013） *n* = 10,590	0.022（0.013） *n* = 3,369	-0.000
$FI_t < 0$	-0.013（-0.013） *n* = 3,512	-0.014（-0.016） *n* = 1,403	0.001
Positive Group–Negative Group	0.035***†††	0.036***†††	

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 6

Relationship 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		-0.032**	-0.022*
		(-2.462)	(-1.718)
$POSFI_t$	+	0.033***	
		(11.162)	
$MPOSFI_t$	+		0.012***
			(5.935)
$POSES_t$	+	0.012***	0.010***
		(8.450)	(9.423)
$POSCROA_t$	+	0.009***	0.009***
		(14.661)	(14.103)
$POSROA_t$	+	0.013***	0.015***
		(3.844)	(2.882)
FI_t	+	0.226**	0.501***
		(2.470)	(4.621)
DS_t	+	4.881***	4.196***
		(3.661)	(3.168)
$SIZE_t$	−	-0.001	0.000
		(-1.077)	(-0.332)
BM_t	+	0.004**	0.004***
		(2.402)	(3.129)
Industry dummy		Yes	Yes
Year dummy		Yes	Yes
Adj. R^2		0.097	0.069
N		10,769	9,664

Notes:

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

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

$MPOSFI_t$ = dummy 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.

$POSES_t$ = dummy 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.

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

$POSROA_t$ = dummy 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 7

Relationship between forecast management and future forecast revisions and errors

Independent Variable	Expected Sign	Model 6 $DREVISION_{t+1}$ Coefficient (*t*-value)	Model 6 $DERROR_{t+1}$ Coefficient (*t*-value)
Constant		1.382*	1.129*
		(1.846)	(1.691)
$MPOSFI_t$	+	0.104**	0.092**
		(2.246)	(2.332)
$GROWTH_t$	−	-1.219***	-1.046***
		(-8.777)	(-5.450)
$SIZE_t$	−	-0.087*	-0.081**
		(-1.926)	(-2.131)
$POSUE_t$	−	-0.435***	-0.403***
		(-6.961)	(-9.980)
MFE_t	+	0.372	1.526
		(0.306)	(1.195)
Year dummy		Yes	Yes
Industry dummy		Yes	Yes
Pseudo R^2		0.116	0.103
N		8,907	10,553

Notes:

$DREVISION_{t+1}$ = dummy variable set to "1" if *REVISION* for year *t*+1 are larger than 0 and "0" otherwise. $REVISION_{t+1}$ = (initial management forecasts for year *t*+1 – the latest management forecasts for year *t*+1) / total assets at the end of year *t*-1.

$DERROR_{t+1}$ = dummy variable set to "1" if *ERROR* for year *t*+1 are larger than 0 and "0" otherwise. $ERROR_{t+1}$ = (initial management forecasts for year *t*+1– actual earnings for year *t*+1) / total assets at the end of year *t*-1.

$MPOSFI_t$ = dummy variable set to "1" if FI_t for year *t* are greater than or equal to 0 and NDF_t for year *t* are negative, and "0" otherwise.

$GROWTH_t$ = (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*.

$POSUE_t$ = dummy 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.

TABLE 8
Nonlinear relationship between forecast innovations and stock returns

Independent Variable	Expected Sign	Model 7 CAR_t Coefficient (*t*-value)	Model 7 CAR_t Coefficient (*t*-value)	Model 7 CAR_t Coefficient (*t*-value)	Model 7 CAR_t Coefficient (*t*-value)	Model 7 CAR_t Coefficient (*t*-value)	Model 7 CAR_t Coefficient (*t*-value)
Constant		0.011	0.011	0.013	0.013	0.013	0.014*
		(1.300)	(1.399)	(1.446)	(1.595)	(1.611)	(1.701)
FI_t	+	0.259***	0.255***	0.302***	0.320***	0.322***	0.322***
		(4.186)	(4.172)	(3.865)	(3.782)	(3.763)	(3.764)
$FI_t \times D[-0.02, 0.02)$	+	1.361***	1.611***				
		(8.176)	(10.752)				
$FI_t \times D[-0.01, 0.01)$	+	0.857***		2.188***			
		(2.818)		(7.270)			
$FI_t \times D[-0.005, 0.005)$	+	0.363			2.416***		
		(1.227)			(4.833)		
$FI_t \times D[-0.0025, 0.0025)$	+	0.986				3.284***	
		(1.010)				(2.596)	
$FI_t \times D[-0.001, 0.001)$	+	7.711***					9.053***
		(3.384)					(3.140)
DS_t	+	6.103***	6.107***	5.918***	5.830***	5.785***	5.825***
		(4.825)	(4.793)	(4.901)	(4.661)	(4.650)	(4.652)
$SIZE_t$	−	-0.001	-0.001	0.000	0.000	0.000	0.000
		(-0.994)	(-0.904)	(-0.617)	(-0.412)	(-0.331)	(-0.342)
BM_t	+	0.003	0.003	0.003	0.003	0.003	0.003
		(1.371)	(1.335)	(1.290)	(1.280)	(1.265)	(1.249)
Year dummy		Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy		Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2		0.074	0.072	0.060	0.049	0.047	0.047
N		10,769	10,769	10,769	10,769	10,769	10,769

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.

$D[-k, k)$ = dummy variable set to "1" if *FI* for year *t* fall in $[-k, k)$ and "0" otherwise. Where, k=0.02, 0.01, 0.005, 0.0025, 0.001.

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*.

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).

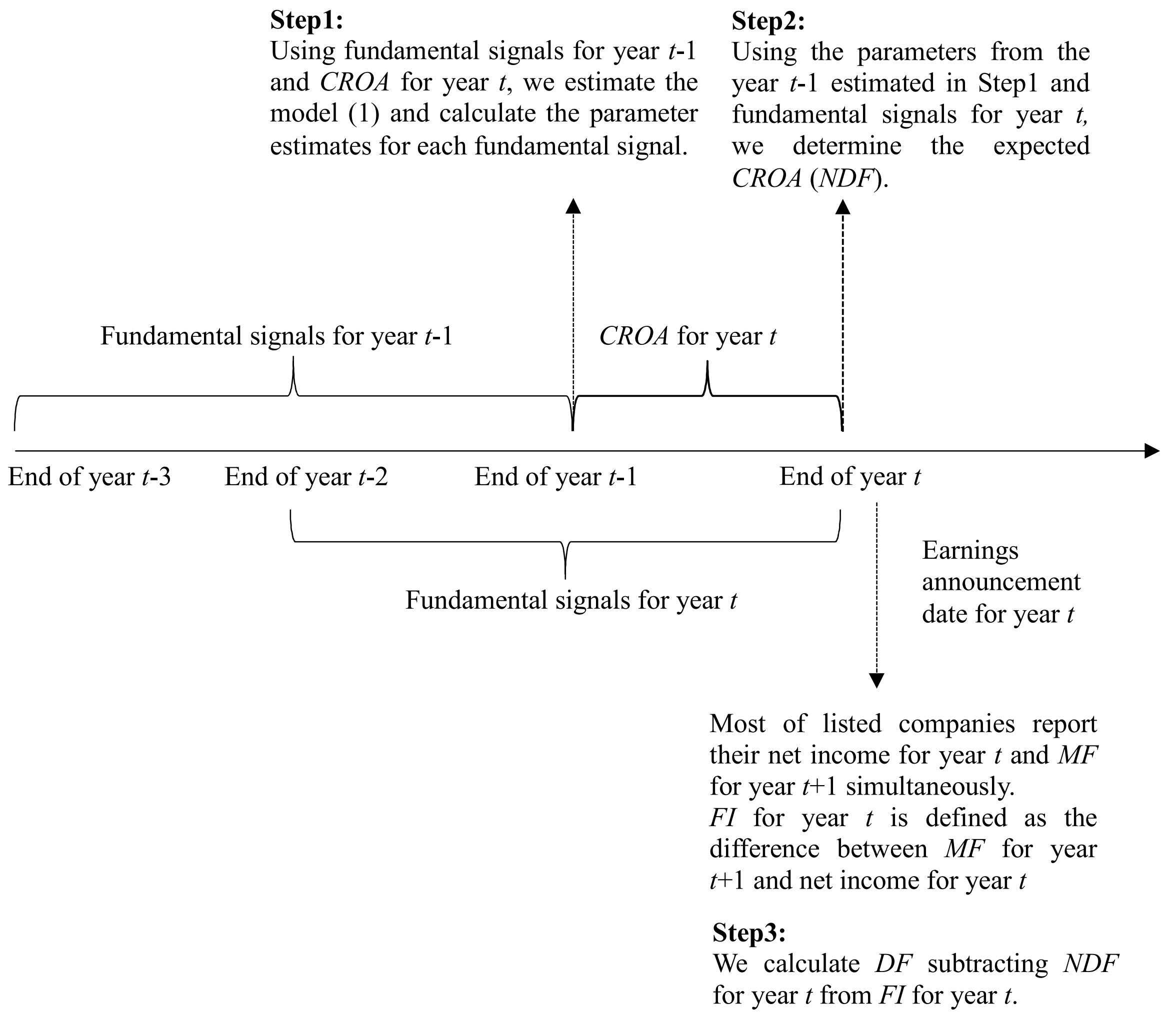
*** Statistically significant at the 0.01 level of significance using a two-tailed *t*-test.

** 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

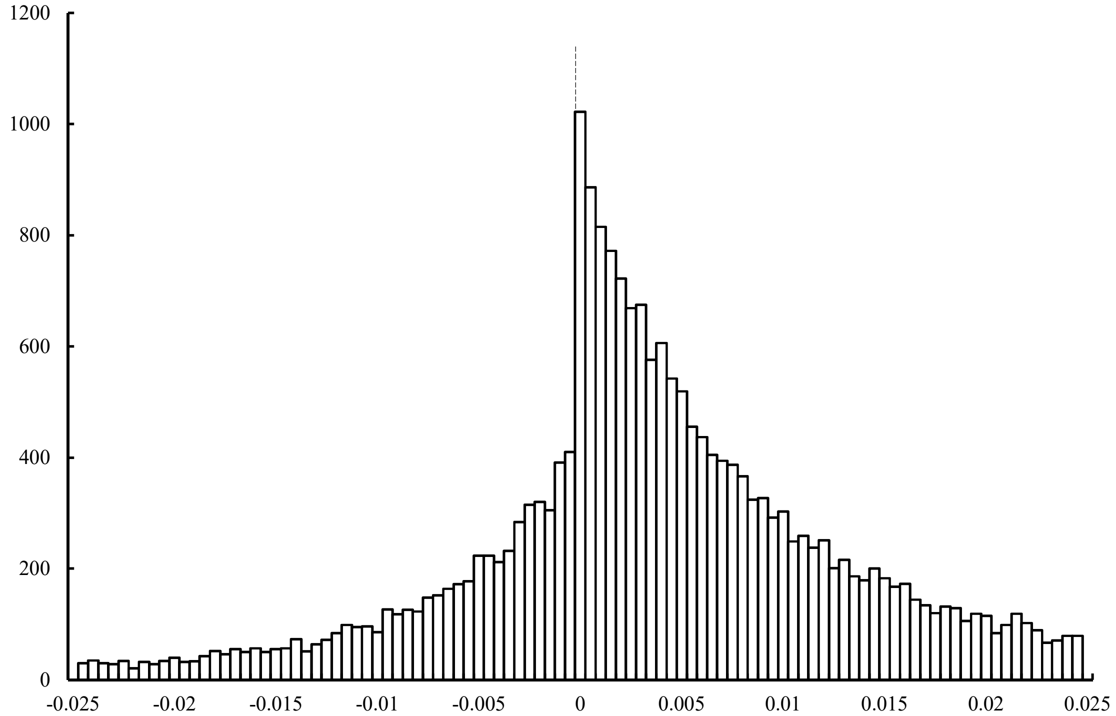
Panel A: Estimation procedure for measuring discretionary forecasts



Panel B: Components of management earnings forecasts

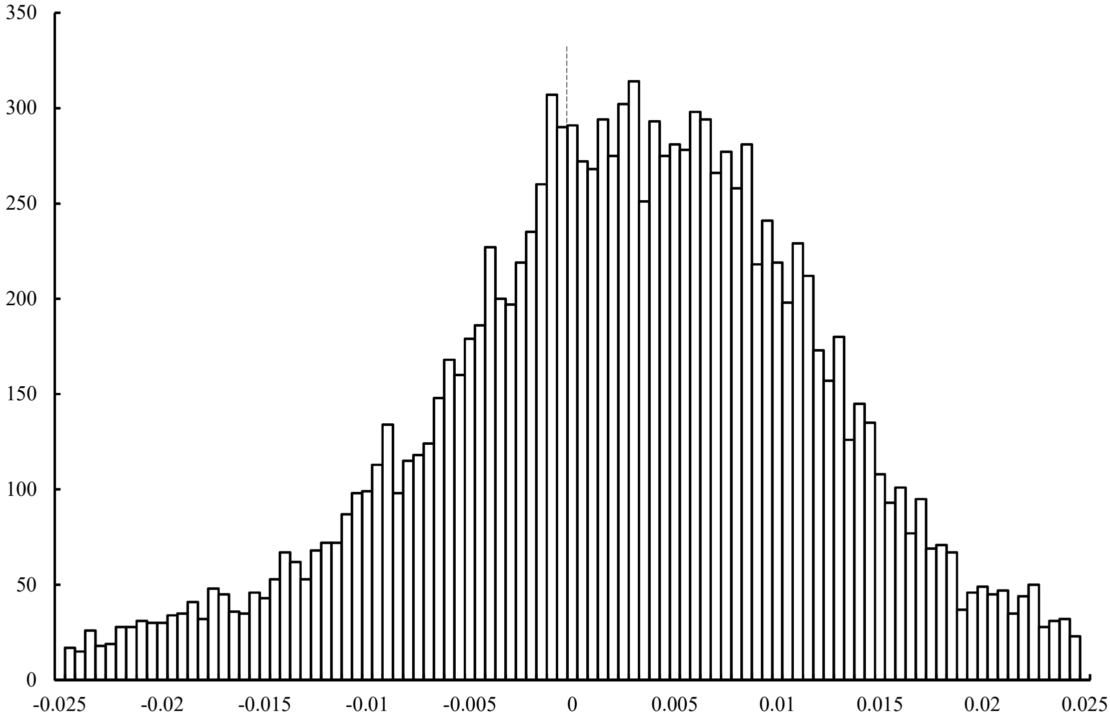
<table>
<tr><td colspan="3">Management earnings forecasts for year t+1 (MF)</td></tr>
<tr><td colspan="2">Forecast innovations for year t (FI)</td><td>Net income for year t</td></tr>
<tr><td>Discretionary forecasts for year t (DF)</td><td>Non-discretionary forecast innovations for year t (NDF)</td><td>Net income for year t</td></tr>
</table>

Figure 2 The distribution of scaled forecast innovations



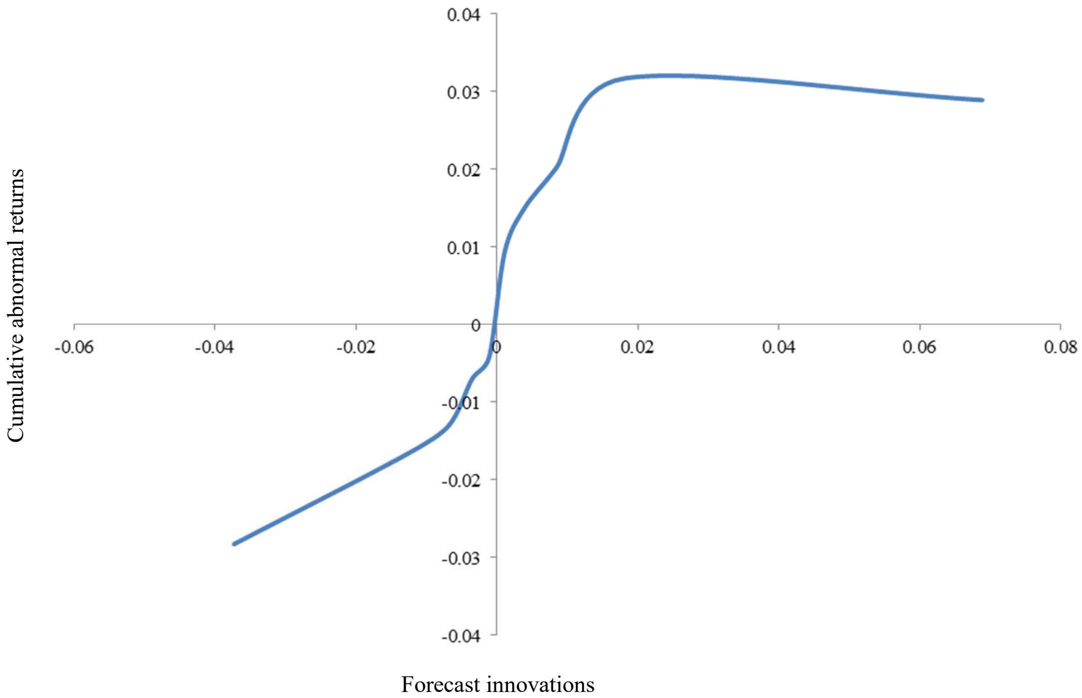
Notes: The distribution interval widths are 0.0005, and the location of zero on the horizontal axis is indicated by the dashed line. The first interval to the right of zero contains observations in the [0.000, 0.0005), the second interval contains [0.0005, 0.0010), and so forth. The large positive firm-years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

Figure 4 Distributions of forecast innovation response coefficients



Notes: Figure 5 presents the plot of mean portfolio abnormal returns and forecast innovations. Each plot is formed by dividing the stocks into five portfolios based on the magnitude of the zero or positive forecast innovations and five portfolios based on the magnitude of the negative forecast innovations. The resulting points are joined using smoothed lines.