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ABSTRACT

We investigate managers' forecasting ability by examining the impact of managerial ability on the accuracy of management forecasts. Focusing on Japan, where almost all managers issue annual earnings forecasts at the beginning of the year, we extend the literature by exploring (1) whether high-ability managers are truly good at predicting future performance and (2) how high-ability managers increase their forecast accuracy. We find that managerial ability is negatively associated with forecast errors based on initial forecasts, suggesting that high-ability managers are more likely to issue accurate forecasts at the fiscal year beginning. We then provide evidence that high-ability managers are less likely to revise their initial earnings forecasts. Finally, we show that high-ability managers are less likely to conduct earnings management to improve their accuracy in management earnings forecasts. Evidence shows that while high-ability managers are more likely to issue accurate initial management forecasts, low-ability managers are more likely to adopt revisions and earnings management to reduce their forecast errors.

Keywords: Managerial ability, management earnings forecast, forecasts accuracy, earnings management

JEL Classification: M41

I. INTRODUCTION

In this study, we examine the impact of managerial ability on management earnings forecast accuracy. Previous studies have focused extensively on the role of firm characteristics and information environment in evaluating credibility/truthfulness of earnings forecasts (Skinner 1994; Baginski et al. 2002; Rogers and Stocken 2005). However, other important factors such as the role of firms' management have been largely unexplored (Hirst et al. 2008). Specifically, it is substantially challenging even for inside managers to predict future performance accurately (Jensen 1993; DeAngelo et al. 1996) and, if this is the case, the credibility of management forecasts can systematically depend on managers' ability to assess future earnings prospect. As such, we investigate whether managerial ability is associated with the accuracy of management earnings forecasts.

Baik et al. (2011) have already examined the relation between managerial ability and management earnings forecasts. Using a sample of the U.S. listed firms, they document that the likelihood and frequency of management forecasts increase with CEO ability and forecasts by high-ability CEOs are more accurate than those by low-ability CEOs. Although the evidence is useful in understanding why managers voluntarily issue earnings forecasts, it is not yet understood as to (1) whether high-ability managers truly have better forecasting ability, and (2) how high-ability managers increase their earnings forecast accuracy. In particular, Baik et al. (2011) provide an indecisive implication in terms of managers' forecasting ability as they report that high-ability CEOs issue more accurate forecasts yet revise them *more frequently* during the fiscal year. While their findings are not necessarily contradictive each other,[1] if managers are truly good at assessing future performance, they should not revise them *ex post* (Barth 2003). Therefore, it is still in question whether high-ability managers have better forecasting ability and thus issue more accurate forecasts. Our study extends the literature by providing evidence on these issues and enhances our limited knowledge on the credibility of management earnings forecasts.

While managerial ability is difficult to observe directly, we focus on a specific aspect of managerial ability, which Demerjian et al. (2012) define as "managers' efficiency, relative to their industry peers, in transforming corporate resources to revenues." The underpinning idea of this measure is that more capable managers generate higher revenue for a given level of resources, or, conversely, minimize the resources used for a given level of revenue. For instance, competent managers should understand the industry trends better, predict product demands more reliably, invest in more profitable projects, and manage employees more efficiently than incompetent managers (Bonsall et al. 2016). Therefore, if managers are talented in this sense, we predict that they should be good at assessing future earnings prospects in given situations (Demerjian et al. 2013), leading to more accurate earnings forecasts.

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[1] Baik et al. (2011) suggest that high-ability managers tend to provide accurate forecasts in a frequent manner. In this sense, their managerial ability may capture managers' sensitivity to rapid changes in their firms' underlying economics and forecast decision makings, rather than forecasting ability itself. By contrast, this study is different from Baik et al. (2011) and focuses on the dimension of managers' longer-term forecasting ability.

To test this prediction, Japanese disclosure system provides a unique and particularly relevant research setting, at least, for four reasons. First, as recommended by the Tokyo Stock Exchange, Japanese listed companies are obliged to issue management earnings forecasts. This practice has been described as "effectively mandated" (Kato et al. 2009; Iwasaki et al. 2016) and provides us an unbiased sample of management forecasts, with which we can compare the effect of managerial ability more comprehensively.[2] In addition, the pervasiveness mitigates the effect of proprietary and/or litigation costs on the issuance and accuracy of management forecasts. Second, according to the recommendation of Tokyo Stock Exchange, Japanese managers are required to issue initial forecasts at the beginning of the fiscal year. Combined with the unbiased sample, this is particularly important because it enables us to assess managers' forecasting ability with the same forecast horizons, that is, one year. Third, Japanese stock exchange further requires listed companies to revise their forecasts if there are "significant" changes in management estimates, defined as changes in earnings estimates of 30 percent or more (Kato et al. 2009). Therefore, in the Japanese context, inaccurate initial forecasts are systematically updated and thus the frequency of forecast revisions can be a cleaner proxy for managers' forecasting ability. Finally, while the U.S. firms are more likely to issue range-estimated forecasts, almost all Japanese firms issue point-estimated forecasts. The availability

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[2] Approximately 93.5 percent of our initial sample of 30,751 firm-years issue management earnings forecasts (See also Kato et al. 2009; Iwasaki et al. 2016 for the prevalence of management forecast practice).

of point-based numbers for both forecasts and reported earnings leads us to the more *meticulous* forecast error as a proxy for management forecast accuracy. Overall, in evaluating managers' forecasting ability, the Japanese disclosure system provides a very useful natural experimental environment, where almost all managers issue earnings forecasts at the beginning of the fiscal year with the same horizon.

Using a large sample of Japanese listed companies over the period 2006–2014, we conduct a set of analyses to examine whether and how managerial ability relates to earnings forecast accuracy. First, we analyze *initial* management forecasts and document that the initial forecast accuracy increases with managerial ability. This result is consistent with our prediction that high-ability managers are good at assessing future earnings prospects.

Second, we focus on forecast revisions made after the initial forecasts. If high-ability managers can issue more accurate forecasts at the beginning of the fiscal year, they are not likely to revise them *ex post*. On the other hand, low-ability managers should revise their initial forecasts to decrease their forecast errors in order to mitigate negative consequences stemmed from missing forecasts. Consistent with this prediction, we find that high-ability managers are less likely to revise their forecasts, and their degree of revision tends to be smaller than low-ability managers.

Third, we examine a possibility of earnings management that improves the accuracy of management forecasts. Prior studies indicate that managers conduct earnings management to meet or beat management forecasts (Kasznik 1999; Shuto 2010). It is possible that managers with poor forecasting ability have stronger incentive to conduct earnings management for the purpose of reducing their forecast errors. Consistently, we show that high-ability managers are less likely to use discretionary accruals to improve forecast errors, suggesting the need for earnings management is smaller for such managers due to their innate forecasting ability.

We also perform a number of robustness tests. These tests include alternative measures of managerial ability, sensitivity of variable definitions for earnings management, possibility of real activity earnings management, and model specifications. Our results are robust and unaffected by these alternatives. Furthermore, we show that forecast accuracy based on *last* forecasts also increases with managerial ability, suggesting that the less frequent forecast revisions among high-ability managers do not necessarily lead to increased forecast errors at the fiscal year end.

Overall, our results suggest that high-ability managers are more likely to issue accurate management forecasts at the beginning of the fiscal year, and low-ability managers are more likely to use forecast revisions and earnings management to do that.

This study contributes to the literature significantly in several ways. First, we contribute to the literature that examines the effect of managerial ability on the accuracy of management earnings forecasts. Specifically, we extend Baik et al. (2011) and present similar evidence that managerial ability positively relates to management forecast accuracy. However, our evidence is remarkably different in that high-ability managers are *less* likely to revise their forecasts. The difference implies that, when management forecast is a pervasive practice in an economy, managers may attach more importance to the initial forecast accuracy than to sensitivity on the subsequent forecast making. As such, the relationship between managerial ability and forecast revision can be conditional on the reporting environment.

Second, we also show that the methods used to enhance the accuracy of management forecasts differ depending on managerial ability. Compared to high-ability managers, low-ability managers are more likely to revise their forecasts and adopt earnings management to increase management forecast accuracy. Furthermore, our evidence suggests that such efforts by low-ability managers do not necessarily reward in terms of the accuracy of *last* forecasts. Results from our study shed a new light on the mechanism behind the relationship between managerial ability and management forecast practice.

Finally, our study contributes to the literature that examines the credibility/truthfulness of management forecasts by documenting that managerial ability can be one of the main determinants. We provide consistent evidence that forecasts by high-ability managers are accurate and therefore credible, suggesting management-specific characteristics economically matter. Moreover, our evidence relates to studies using Japanese firms. For instance, Kato et al. (2009) report that initial earnings forecasts are systematically upward-biased, but managers revise their forecasts downward during the fiscal year so that most of their earnings surprises are non-negative. Our results suggest that this opportunistic behavior largely stems from low-ability managers.

The remainder of this paper is organized as follows. Section II summarizes the findings of prior studies and develops our hypotheses. Section III explains the variable measurements as well as the research design for testing our hypotheses. Section IV outlines our sample selection procedure and describes the descriptive statistics. Section V reports our empirical results on the relationship between managerial ability and accuracy of management earnings forecasts. Finally, Section VI concludes with a summary.

II. PRIOR STUDIES AND HYPOTHESES DEVELOPMENT

Managerial Ability and Accuracy of Management Earnings Forecasts

Prior studies have shown what determine the accuracy of management earnings forecasts, such as the litigation environment, equity incentive, financial distress, external financing, industry concentration, and macro-economic condition (Skinner 1994; Frankel et al. 1995; Frost 1997; Aboody and Kasznik 2000; Lang and Lundholm 2000; Baginski et al. 2002; Rogers and Stocken 2005; Ota 2006). Baik et al. (2011) extend these studies by revealing the effect of managerial ability on the accuracy of management forecasts. Trueman (1986) theorizes that managers who have incentives for maximizing firm value are motivated to release earnings forecasts so that investors have a more favorable assessment of the manager’s ability to anticipate the changes in economic environment and adjust their production plans accordingly. On the assumption that management forecasts convey information about managerial ability and that forecast accuracy reflects this ability, Baik et al. (2011) hypothesize that managers are motivated to release more accurate forecasts. In support of this hypothesis, they provide evidence that high-ability managers have an incentive to enhance the accuracy of management forecasts in order to signal their ability.

On the managers' forecasting ability, several recent studies document relevant evidence. Demerjian et al. (2013) argue that high-ability managers have more knowledge about the firm and macro-economic conditions and are therefore in a better position to synthesize information into reliable forward-looking estimates. Following this argument, they hypothesize and show that more able managers are more likely to provide accurate estimate in accruals and thus report higher quality of earnings. Similarly, Demerjian et al. (2017) show that high-ability managers are more likely to intentionally smooth earnings, implying those managers can correctly assess the future performance in order to smooth current earnings. Finally, Lee et al. (2012) examine whether management forecast accuracy indicates managerial ability by investigating the relationship between management forecast errors and CEO turnover. They find the probability of CEO turnover positively related to the magnitude of absolute forecast errors, implying that the board of directors uses management forecast accuracy as a signal of the CEO's managerial ability and that managers bear a cost for inaccurate forecasts.

One of the common arguments in these studies is that high-ability managers are more capable of issuing accurate forecasts than low-ability managers, suggesting that managerial ability is positively associated with management forecast accuracy.

This study re-examines the hypothesis presented by Baik et al. (2011), who follow Trueman's (1986) theory. That is, competent managers are more likely to issue accurate earnings forecasts. Although Baik et al. (2011) have already provided useful evidence on the linkage between managerial ability and management forecast accuracy, they leave several important questions as opened: (1) whether high-ability managers are truly good at predicting future performance, and (2) how high-ability managers increase their earnings forecast accuracy. Our study extends the literature by providing evidence on these two issues.

For the former, Baik et al. (2011) provide an indecisive implication in terms of managers' forecasting ability as they report that high-ability CEOs issue more accurate earnings forecasts yet revise them *more frequently* during the fiscal year. While their findings are not contradictive, it provides limited knowledge on whether high-ability managers have better forecasting ability because if managers can correctly predict future performance at a certain point, they should not have to revise them afterwards (Barth 2003). In discussing managerial ability, Baik et al. (2011) follow Trueman (1986) and define this as one "to anticipate changes in their firms' economic environment (p.1648)." Therefore, the findings of Baik et al. (2011) may capture managers' endowment in sensitivity to rapid/unexpected changes in environment rather than forecasting ability itself, leading more frequent and accurate forecast practice.

For the latter point, because Baik et al. (2011) use the *last* earnings forecasts (i.e., immediately prior to the earnings announcement date) to measure the accuracy of management earnings forecasts,[3] it is unclear whether the accuracy of management forecasts is substantially due to managerial ability. Managers generally have two discretionary options to increase their forecast accuracy, one, to revise their forecasts *ex post*, and the other, to conduct earnings management. Opportunistic managers can use these options to decrease their forecast errors instead of trying to issue accurate initial forecasts. We also extend the literature by investigating whether and how managerial ability relates to those discretionary options that enhance forecast accuracy.

Uniqueness of Management Forecasts in Japan

To address these issues, Japanese disclosure system provides a unique and relevant research setting, at least, for following four reasons. First, by contrast to the U.S. reporting environment, Japanese listed companies are obliged to issue management earnings forecasts in accordance with the recommendation of the Tokyo Stock Exchange. The reporting practice has been described as "effectively mandated" (Kato et al. 2009; Iwasaki et al. 2016) and provides us an

[3] Baik et al. (2011) report that they also use the first (initial) forecast and obtain similar results (p.1659). However, they do not provide the details and arguments for their choice of the timing of earnings forecasts. As a result, it is unclear why managers frequently revise their "accurate" initial forecasts.

unbiased observations of management earnings forecasts. This is particularly important in our examination because it mitigates the effect of proprietary and/or litigation costs on the issuance and accuracy of management forecasts, which is very difficult to theoretically and empirically control for.[4]

Second, according to the recommendation of Tokyo Stock Exchange, Japanese managers are effectively required to issue initial forecasts at the beginning of the fiscal year. The so-called Timely Disclosure Rules (*Kessan-Tannsin* or "summary of financial statements") of Japanese stock exchange strongly encourage managers to report both their earnings for the current year and earnings forecasts for the next year within 45 days, at latest, after the fiscal year end. Hence, Japanese environment enables us to assess managers' forecasting ability with the same forecast horizon, that is, one year. One possible challenge in Baik et al. (2011) is the differences in forecast horizon and timing of first forecast among issuers. Under the voluntary disclosure environment in the U.S., it is substantially difficult to set a well-controlled situation where managers issue their first forecasts with the same horizon at the same time, consequently difficult to assess who have better forecasting ability in a rigorous manner.[5]

Third, Japanese stock exchange further requires listed companies to revise their forecasts

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[4] Several papers have examined the relationship between proprietary costs and disclosure (Ajinkya, Bhojraj, and Sengupta 2005; Wang 2007) and the effect of litigation costs on disclosure (Francis, Philbrick, and Schipper 1994; Skinner 1994; Kasznik and Lev 1995; Baginski et al. 2002; Miller 2002).

[5] Prior studies examining the U.S. firms provide evidence that the longer the horizon, the more likely are the forecasts to be inaccurate (Baginski and Hassell 1997; Baik et al. 2011).

if there are "significant" changes in management estimates, defined as changes in earnings estimates of 30 percent or more ("Significance Rule," Kato et al. 2009, p.1577). Therefore, in the Japanese context, inaccurate initial forecasts are systematically updated *ex post* and thus the frequency of forecast revisions can be a cleaner proxy for managers' forecasting ability. The feature is especially useful in alleviating the effect of managers' reluctance or opportunism for issuing bad news under voluntary disclosure system (Kothari et al. 2009; Malmendier and Tate 2009), which makes the implication of forecast revisions ambiguous.

Finally, while the U.S. firms are more likely to issue range-estimated forecasts, almost all Japanese firms report point-estimated forecasts. Prior studies tend to use the mid-point of a range forecast (Rogers and Stocken 2005), but this can result in systematic noise in measuring forecast accuracy especially when the range is set wider. The pervasiveness of point-based forecasts in Japan leads to the more *meticulous* forecast errors as proxy for management forecast accuracy.

In sum, to test managers' forecasting ability, Japanese disclosure system provides a very useful natural experimental environment, in which almost all managers issue annual earnings forecasts at the beginning of the fiscal year with the same horizons.

Hypotheses Development

On the relationship between managerial ability and management forecast accuracy, we conduct three analyses to assess whether high-ability managers have better forecasting ability. First, we examine the relationship between *initial* management forecast and managerial ability. As discussed in the previous section, the common underpinning logic on why managerial ability is associated with forecast accuracy is that high-ability managers know more about the firm and macro-economic conditions and are more capable to forecast the firm's future earnings (Demerjian et al. 2013). Therefore, if this is the case, we predict that competent managers can issue more accurate earnings forecasts.

Furthermore, in the Japanese setting, where management forecast is a pervasive practice, managers who want to signify their ability may attach more importance to the accuracy than to sensitivity on the forecast revisions. This could happen while a subsequent revision can be a result of either an opportunistic initial forecast or sudden change in economic prospect, it may be difficult for outside investors to distinguish them. Kato et al. (2009) suggest that market participants discount forecasts by managers whose forecasts were overly optimistic, indicating managers need to bear costs for their inaccurate initial forecasts. In addition, Lee et al. (2012) and Ishida and Hachiya (2018) report that the initial forecast error positively relates to the likelihood of CEO turnovers using the U.S. and Japanese firms, respectively. These arguments highlight the importance of accurate initial forecasts, leading to our first hypothesis:

H1: High-ability managers are more likely to issue accurate initial earnings forecasts.

Second, we examine the relationship between managerial ability and forecast revisions. For Japanese firms, Kato et al. (2009) find the initial earnings forecasts of managers for the fiscal year systematically upward-biased. They indicate that managers revise their forecasts downward during the fiscal year so that most earnings surprises become non-negative. This is consistent with prior studies that document that forecast errors result in large stock price shocks (Ng et al. 2013), CEO turnovers (Lee et al. 2012), and decline in management compensation (Hui and Matsunaga 2015). The evidence suggests that managers generally have an incentive to revise their forecasts in order to increase the accuracy of management forecasts.

However, if high-ability managers issue more accurate initial earnings forecasts at the beginning of the fiscal year, they would less frequently revise their forecasts afterward. Moreover, even if they do so, the degree of revisions would be relatively small because of their accurate initial forecasts. On the other hand, low-ability managers are more likely to adopt forecast revisions to decrease forecast errors and make up for their low forecasting ability. Accordingly, this argument leads to our following hypotheses:

H2: High-ability managers are less likely to revise their earnings forecasts.

H3: The degree of revisions is smaller for high-ability managers.

Finally, we investigate the effect of earnings management on the relationship between managerial ability and forecast accuracy. Prior studies indicate that managers issuing annual earnings forecasts tend to manage their reported earnings toward their forecasts (Kasznik 1999; Shuto 2010). Therefore, we examine whether high-ability managers increase their accuracy of management forecasts through earnings management. Given that high-ability managers are more capable to forecast their firm's future earnings, they are less likely to adopt earnings management to increase their management forecast accuracy. Consistent with this inference, Demerjian et al. (2013) show that high-ability managers are more likely to report higher quality earnings. Thus, we set the following hypothesis.

H4: High-ability managers are less likely to conduct earnings management to improve the accuracy of their forecasts.

III. RESEARCH DESIGN

Proxy for Managerial Ability

To measure manager ability, we employ the MA Score method developed by Demerjian et al. (2012); this method uses data envelopment analysis (DEA) and regressions to construct a measure for manager-specific ability. Specifically, Demerjian et al. (2012) first calculate a measure of firm efficiency that is related to industry peers using DEA, and then estimate the MA Score as the management-specific portion of firm efficiency using Tobit regressions. The underpinning idea is that more capable managers generate higher revenue for a given level of resources, or, conversely, minimize the resources used for a given level of revenue. Therefore, if managers are talented in this sense, they should be good at assessing the industry trends and predicting future prospects in given situations (Demerjian et al. 2013).

To estimate the capability of managers, prior studies relied largely on measures such as stock prices (Hayes and Schaefer 1999; Fee and Hadlock 2003), industry-adjusted return on assets (Rajgopal et al. 2006; Carter et al. 2010), CEO tenure and compensation (Milbourn 2003; Carter et al. 2010), and media mention (Milbourn 2003; Francis et al. 2008). Of all such measurements, MA Score has several advantages (Demerjian et al. 2012). First, since the MA Score is derived from publicly available accounting numbers, it is relatively free from data constraints and sample selection bias. Second, unlike stock prices and media citation, the MA Score is manager-specific and less dependent on stakeholder assessments. Finally, the DEA methodology provides a score relative to its industry peers rather than industrial *average*, which is lowered disproportionately by inefficient industry peers.[6] Overall, Demerjian et al. (2012) conclude that the MA Score is a cleaner depiction of manager capability than prior measures.

We present our MA Score measurement process in the appendix, using Japanese data. Although we basically follow the methodology of Demerjian et al. (2012), our calculation slightly differs from theirs because of the difference in disclosure between the United States and Japan in terms of firms' operating lease assets. Specifically, Demerjian et al. (2012) calculate the operating lease assets at the discounted present value of the required operating

[6] We also use some of the alternative measurements on managerial ability to test the robustness of our empirical results in the additional analysis section.

lease payments for the next five years, which is available in the firms' footnotes to the financial statements and on Compustat. However, in Japan, firms are required to disclose only their total future minimum lease payments and the payments within one year. Hence, we use the present value of the net operating lease assets, following Kusano et al. (2015) (see the appendix for details).[7]

Empirical Specifications for Testing Hypotheses

Following Baik et al. (2011) and other relevant prior studies, we apply the following ordinary least squares model to examine the association between managerial ability and management earnings forecasts (from H1 to H4):

$$\begin{aligned} MF = {} & \alpha + \beta_1 \mathit{Managerial\ Ability} + \beta_2 \mathit{Size} + \beta_3 \mathit{Loss\_D} + \beta_4 \mathit{Increase\_D} + \beta_5 \mathit{StdDevEarn} \\ & + \beta_6 \mathit{Beta} + \beta_7 \mathit{StdDevResidual} + \beta_8 \mathit{Sales\_Conc} + \beta_9 \mathit{ManagerOwn\%} + \\ & \beta_{10} \mathit{OutsideDir\%} + \beta_{11} \mathit{InstOwn\%} + \beta_i \mathit{Firm} + \beta_t \mathit{Year} + \varepsilon \qquad (1) \end{aligned}$$

$$MF = \{\mathit{Initial\ Forecast\ Error}, \mathit{No.Forecast\ Revision}, \mathit{Forecast\ Revision}, \mathit{Improve}\}$$

Initial Forecast Error is the absolute value of the price-deflated initial management earnings forecast error multiplied by 100 (i.e., 100*|actual earnings – initial management earnings forecast|/lagged market value of equity) (H1); *No.Forecast Revision* is the number of

[7] Chang et al. (2018) examine the validity of MA Score using Japanese firms and report that the measure is also useful to a non-US setting. Following Demerjian et al. (2012) and Chang et al. (2018), we conduct validation tests for our estimated MA Score and find that the measure is correlated with manager-fixed effects and associated with the stock price reactions to CEO turnovers and changes in future ROA following CEO turnovers, consistent with prior studies.

management forecast revisions issued after the initial management forecasts (H2); *Forecast Revision* is the absolute value of the price-deflated management earnings forecast revisions multiplied by 100 (i.e., 100*|last management earnings forecast – initial management earnings forecast|/ lagged market value of equity) (H3); and *Improve* is an indicator variable taking the value of one when the absolute value of the last management forecast error is less than the first tertile of the last forecast error's absolute value before discretionary accruals (i.e., 100*|actual earnings – discretionary accruals – latest management earnings forecast|/lagged market value of equity) and the absolute value of the last forecast error before discretionary accruals is larger than the first tertile, and zero otherwise (H4). The last forecasts used in this study are ones issued by the fiscal year end (Skinner 1997; Rogers and Stocken 2005) and all forecast errors are deflated by the lagged market value of equity (Rogers and Stocken 2005; Baik et al. 2011).

For *Improve*, we compare the actual reported and pre-managed earnings and examine whether managers approximate their actual earnings to their forecasts. If a firm's pre-managed forecasts error is larger than the first tertile and the firm shifts within the first tertile by reporting discretionary accruals, we deem the firm as conducting earnings management in order to reduce the forecast error. We estimate discretionary accruals based on Dechow et al. (1995) and calculate the value of tertile by year. All earnings above are defined in terms of net income. Note that although the dependent variable is binary for H4, we apply OLS regression (i.e., linear probability model) because binominal regressions with firm-fixed effects inevitably exclude firm-year observations with perfect correlation and result in a smaller testing sample size. We will consider this issue later under robustness tests.

Our variable of interest is *Managerial Ability*, derived through DEA and Tobit regressions by industry (see the appendix). Because the raw MA Score value indicates *within-industry* relative management ability, it is difficult to compare it across industries. For example, since the mean and variance can differ across industries, we cannot conclude that the managers of a firm in industry A are superior to those of a different firm in industry B based on raw value. Therefore, we use the MA Score decile rank by industry and year, following Demerjian et al. (2013). To infer the causal relationship, we use the *Managerial Ability* in year $t-1$. We also use the continuous measures/raw values of the MA Score in the robustness section. According to our hypotheses, we expect the coefficient to be negative for all estimations.

We consider the following control variables, which Baik et al. (2011) and prior studies have linked to management earnings forecast error: *Size*, *Loss_D*, *Increase_D*, *StdDevEarn*, *Beta*, *StdDevResidual*, *Sales_Conc*, *ManagerOwn%*, *OutsideDir%*, and *InstOwn%*. First, we control for firm size (*Size*) proxied as the natural log of total sales. We predict the sign of the coefficient to be both positive and negative, because firm size can proxy for both business stableness and business complexity. *Loss_D* and *Increase_D* are indicator variables to control for the firm's earnings stream. Firms suffering losses are less sensitive to forecasts (Baik et al. 2011), and those with poor earnings history are more likely to be optimistic and hence less accurate in terms of forecasting (Kato et al. 2009). *StdDevEarn*, *Beta*, and *StdDevResidual* are controls for earnings and business uncertainty, which consequently increase forecast errors. *Sales_Conc* is the firm's sales concentration (i.e., market share), a proxy for proprietary costs (Bamber and Chenon 1998; Baik et al. 2011). However, we do not predict the sign because firms with higher market share are subject to higher pressure to meet forecasts, and yet, on the other hand, are also exposed to higher market competition and less reluctant to release forecasts based on accurate information. *ManagerOwn%* is the percentage of managerial ownership. As managerial ownership increases, meeting forecasts becomes less important because of less outside demands for precise information (Nagar et al. 2003). Finally, *OutsideDir%* and *InstOwn%* are the percentages of outside directors on the board of directors and shares held by institutional investors, respectively, both controlling for strength of outside monitoring and pressure for accurate earnings forecasts. We use the control variables in year $t-1$. Table 1 presents the definitions of all testing variables.

Moreover, we include firm- and year-fixed effects. Prior studies show that the earnings forecast error is persistent and subject to serial correlation (Ota 2006; Kato et al. 2009; Gong et al. 2011; Hilary et al. 2014), suggesting that an unobservable firm-specific factor can systematically affect forecast accuracy. For example, in a sample of Japanese firms, Ota (2006) finds management forecast errors positively related to lagged forecast errors, and Kato et al. (2009) report highly persistent manager forecast optimism from year to year. Therefore, we control for firm- as well as year-fixed effects by including both firm and year dummies.

Insert Table 1 about here

IV. SAMPLE SELECTION AND DESCRIPTIVE STATISTIC

We summarize our sample selection procedure in Table 2. We collect our initial sample from a database called *Nikkei NEEDS-FinancialQUEST*, a most comprehensive commercial database for Japanese companies. The database provides financial, stock price, and management forecast data for all listed companies in Japan, including delisted companies. Moreover, we collect our data on shareholder and board structures using *Nikkei NEEDS-Cges*, a commercial database for corporate governance in Japanese listed companies.

Our initial sample consists of 30,751 firm-year observations for the period 2006–2014. Our sample period begins from 2006 because we require research and development (R&D) data for the preceding five years to estimate MA Score, and the data on R&D expense are available from 2000 (see the appendix). Following Demerjian et al. (2012), we exclude the financial sector firms, that is, firms in the banking, securities, and insurance sectors. Moreover, we exclude firms that prepare financial statements in accordance with U.S. GAAP or IFRS to consider the differences in underlying accounting procedures from Japanese GAAP. When firms do not have consolidated financial statements, we use their unconsolidated accounting data. As a result, the final sample consists of 17,872 firm-year observations.

Insert Table 2 about here

Table 3 reports the descriptive statistics of our testing variables. To rule out the impact of outliers, we use data winsorized at the bottom 1 percent and top 99 percent levels for each variable by year, except for the indicator variables. The table shows that the mean and standard deviation of *Initial Forecast Error* (7.201 and 14.558) are much larger than those (1.703 and 3.964) reported in Baik et al. (2011), who measure forecast errors based on forecasts issued immediately prior to the earnings announcement date. This is apparent but suggests that it is much difficult for managers to issue accurate forecasts at the beginning of the fiscal year. For the number of forecast revisions, the mean and median are 1.039 and 1.000, respectively, suggesting that, on average, firms revise their earnings forecasts at least once after initial forecasts.[8] Furthermore, the mean value of *Improve* indicates 0.621, suggesting that 62.1 percent of our sample tend to bring their earnings nearer to their forecast by using discretionary accruals.

Insert Table 3 about here

Table 4 gives the correlation matrix of the variables used in our regression models. The upper right-hand side of the table reports the Spearman rank-order correlations, while the lower left-hand side presents the Pearson correlations. The analyses of both correlations show

[8] Kato et al. (2009) document more frequent forecast revisions among Japanese firms. However, in counting the frequency, they include forecasts that confirm the initial forecasts (Kato et al. 2009, p.1596). In this study, we count the number of forecast revisions based on the difference from prior forecasts, that is, we define revisions as observations that change their forecasts during the fiscal year.

Managerial Ability significantly and negatively associated with *Initial Forecast Error*, *No.Forecast Revision*, and *Forecast Revision*, which is consistent with our hypotheses. On the other hand, the correlation coefficient between *Managerial Ability* and *Improve* is negative but insignificant. For the robustness, we come back to this issue and conduct sensitivity tests for our measure of *Improve*.

Insert Table 4 about here

V. EMPIRICAL RESULTS

Main Results

Table 5 reports the regression analyses results. We estimate our models using firm- and year-fixed OLS regressions, and the reported *t*-value is based on standard errors clustered at both the firm and year levels (Petersen 2009).

We first examine the relationship between managerial ability and earnings forecast errors based on *initial* forecast (H1). The regression result summarized in the column of H1 in Table 5, shows that the coefficient on *Managerial Ability*, −0.482, is significantly negative (*p*-value < 0.01). Consistent with our hypothesis, this finding suggests that high-ability managers are more accurate in terms of earnings prediction at the beginning of the fiscal year. For the economic significance, moving from the first quartile to third quartile of the distribution of *Managerial Ability* reduces forecast error by 2.41 percent. Given that the mean value is 7.20

percent (Table 3), the result appears to be economically significant.

Our second analysis examines the relationship between managerial ability and forecast revision behaviors. The columns of H2 and H3 in Table 5 highlight the finding. Consistent with our hypotheses, all coefficients on *Managerial Ability* are significant and negative (p-value < 0.01), indicating that high-ability managers are less likely to revise their initial earnings forecasts (H2) and show a relatively small degree of revisions (H3). Moving from the first quartile to third quartile of the distribution of *Managerial Ability* decreases the number of forecast revisions by 0.063 (H2) and degree of forecast revisions by 1.586 (H3), respectively. These results appear to be economically significant given that the mean values are 1.039 and 4.857, respectively (per Table 3).

Finally, we examine whether managerial ability relates to earnings management that improves the accuracy of management earnings forecast (H4). The column of H4 indicates that the coefficient on *Managerial Ability* is negative and significant (p-value = 0.02). This result suggests that high-ability managers are less likely to improve their forecast errors through earnings management, which is consistent with hypothesis 4. For the economic significance, moving from the first to third quartiles decreases the likelihood of earnings management by 0.035, which accounts for 5.7 percent of the mean value of *Improve*.

Overall, the results in Table 5 support our hypotheses and confirm the view that more able managers are good at predicting future earnings at the beginning of the fiscal year.

Insert Table 5 about here

Robustness Tests

Alternative MA Score Measures

In this section, we check the robustness of our empirical results. First, for our main analyses, we use the MA Score estimated in accordance with Demerjian et al. (2012). However, as noted in our research design (Section III), our DEA calculation is slightly different with regard to operating lease assets, and this could lead to a measurement bias. To address this issue, we remove operating lease assets from the DEA and calculate the MA Score based on six inputs.[9] Second, although our main analyses used the decile rank of the MA Score to make the score more comparable across time and industries (Demerjian et al. 2013), we also use raw MA Score values as an alternative.

Table 6 reports the results. Panel A gives the results using the MA Score based on six inputs, and Panel B presents the results using raw MA Score values. To avoid redundancy, we hereafter report only the coefficients on the variable for managerial ability. Table 6 shows results similar to those in Table 5, suggesting that the use of alternative measurements for MA Score does not materially affect our results.

Insert Table 6 about here

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[9] Demerjian et al. (2012, note 7) also acknowledge the difficulty of estimating operating lease assets and conduct a sensitivity test by excluding operating lease assets.

Sensitivity Tests on Earnings Management to Meet Management Forecasts

To test for the sensitivity of our results on H4, earnings management for improving forecast accuracy, we conduct three additional analyses on the validity for the variable *Improve*. First, we examine whether our results are robust to alternative discretionary accruals measures. Specifically, we estimate alternative discretionary accruals following Kothari et al. (2005) and test whether the choice of estimation models affect our results. Second, we apply alternative benchmarks to see whether managers use discretionary accruals to meet their forecasts. In our main analysis, we construct *Improve* by setting the discriminant point considering the first tertile of the absolute value of the last forecast error before discretionary accruals. Here, we use the *first quartile* and the *median* of the last forecast error before discretionary accruals for sensitivity analyses. Finally, we additionally examine whether managers conduct real activities manipulation. It can be more likely of managers to engage in real activities to manage their earnings rather than through accrual management (Graham et al. 2005). On this possibility, we estimate abnormal expenses for selling, general, and administrative (SG&A) (Gunny 2010) and construct *Improve*.

Table 7 presents the sensitivity analyses results for H4. Panel A uses discretionary accruals based on Dechow et al. (1995) yet different benchmarks; Panel B uses discretionary accruals based on Kothari et al. (2005); and Panel C applies abnormal SG&A based on Gunny (2010). Each column shows results using different definition for *Improve* that combines three different measures of earnings management and three different benchmarks (i.e., the first quartile, the first tertile, and median). With one exception of column (1) in Panel C, all coefficients on *Managerial Ability* are negative and significant, suggesting that selecting a particular estimation model for discretionary accruals and benchmarks does not affect our results. Moreover, from Panel C, we obtain similar results for real earnings management and find that high-ability managers are less likely to conduct activity-based manipulation, which again confirms our prediction.

Insert Table 7 about here

Alternative Managerial Ability Measurements

While prior studies use several metrics to estimate managerial ability (such as stock returns, industry-adjusted ROA, CEO tenure, and media mentions), we apply the MA Score in our analyses because of its noteworthy advantages as described above. However, we cannot deny the possibility that those alternative measures can capture a part of the managerial ability that our MA Score cannot measure. To address this issue, we follow Baik et al. (2011) and construct a single index based on principal component analysis using the following three managerial ability variables: that is, MA Score (*MA_RawValue*), industry-adjusted stock return (*Historical Return*), and industry-adjusted ROA (*Historical ROA*).[10] We define *Historical Return*$_{i,t-1}$ and

[10] Although Baik et al. (2011) use media mention/press citation as a CEO ability measure, we do not apply this metric because of the absence of an equivalent database for searching articles in Japan. Most

Historical $ROA_{i,t-1}$ from the preceding three years' data (year $t-3$ to year $t-1$).

The results, reported in Table 8, are similar to those of our main analyses using the MA Score. Specifically, the coefficients on *Principal Component* are negative and statistically significant at the 1 percent levels for each column, supporting our hypotheses.[11]

Insert Table 8 about here

Model Specification

Finally, we conduct robustness tests based on our model specifications and sampling. First, because we applied OLS regressions for testing H4, where the dependent variables are binary, we conduct re-estimation using a logit regression model with firm- and year-fixed effects. From our untabulated results, the testing samples dropped by 15,451 firm-years, while the coefficients of *Managerial Ability* are negative and significant at the 1 percent level (z-values = −3.108).

Second, following Baik et al. (2011), we include industry-fixed effects instead of firm-fixed effects. Our untabulated results show that this leads to even higher negative t-values for

importantly, press citation is more likely for larger firms and thus could result in sample bias (Demerjian et al. 2012). Instead of the media mention/press citation variable, we added the industry-adjusted stock return because many prior studies have used it as a proxy for managerial ability (Hayes and Schaefer 1999; Fee and Hadlock 2003; Demerjian et al. 2012; Demerjian et al. 2013).

[11] We further use *Historical Return* and *Historical ROA* themselves as managerial ability measures. While the significance of estimated coefficients relatively decreases, particularly, for *Historical ROA*, the results are similar to those in Table 5. This is potentially because ROA is more likely to be firm-specific (Demerjian et al. 2012) and subject to intentional earnings management (Demerjian et al. 2017), consequently failing to capture manager-specific forecasting ability.

every estimation compared to those in Table 5, which again suggests that our results are robust to alternative model specification.

Furthermore, we exclude observations with CEO turnover during year *t*. It is possible that CEOs who issued initial earnings forecasts leave from the firm during the fiscal year, which results in a mismatch between the forecasts and reported earnings. We identify 2,756 CEO turnovers in our sample. However, untabulated results are very similar to those in Table 5.

Additional Analysis

Our findings obtained so far consistently suggests that high-ability managers are more likely to issue accurate initial earnings forecasts and less likely to conduct forecast revisions and earnings management for improving their accuracy. However, in such cases, it is possible that such high-ability managers bear the costs for missing their forecasts at the end of fiscal year end. In other words, high-ability managers may be beaten by those with low-ability who use discretionary options in terms of the *last* forecast accuracy, suggesting “honesty doesn’t pay.”

To test this possibility, we additionally conduct tests using last forecast accuracy, which is very similar to Baik et al. (2011). Specifically, we estimate following OLS regression:

$$\begin{aligned} \textit{Last Forecast Error} = {} & \alpha + \beta_1 \textit{Managerial Ability} + \beta_2 \textit{Size} + \beta_3 \textit{Loss\_D} + \beta_4 \textit{Increase\_D} \\ & + \beta_5 \textit{StdDevEarn} + \beta_6 \textit{Beta} + \beta_7 \textit{StdDevResidual} + \beta_8 \textit{Sales\_Conc} \\ & + \beta_9 \textit{ManagerOwn\%} + \beta_{10} \textit{OutsideDir\%} + \beta_{11} \textit{InstOwn\%} + \beta_{12} \textit{Timeliness} \\ & + \beta_i \textit{Firm} + \beta_t \textit{Year} + \varepsilon \qquad (2) \end{aligned}$$

where *Last Forecast Error* is the absolute value of the price-deflated last management earnings forecast error multiplied by 100 (i.e., 100*|actual reported earnings – last management earnings forecast|/lagged market value of equity). Here, last management forecasts denote the forecasts issued immediately prior to the fiscal year end.[12] For firms that do not review their forecasts for the current year, the variable takes the initial management earnings forecast error. Compared to Equation (1), we add an independent variable of *Timeliness* and measure it as the number of days between the last forecast data and the fiscal year end, controlling the effect of forecast horizons (Baginski and Hassel 1997; Baik et al. 2011).

Panel A of Table 9 shows the descriptive statics for *Last Forecast Error* and *Timeliness*. The mean value of *Last Forecast Error* (2.980) is much smaller than for *Initial Forecast Error* (7.201) reported in Table 3. This is consistent with the notion that firms tend to revise their forecasts in order to reduce forecast errors (Kato et al. 2009).

Panel B of Table 9 reports the results of Equation (2). Consistent with those in Table 5, we report negative and significant coefficient on *Managerial Ability* (p-value < 0.01), suggesting that the forecast accuracy based on last forecasts increase with managerial ability. Untabulated results are very similar when we use alternative MA Score (raw values and six inputs based) and alternative measures for managers' ability (principal component index).

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[12] In Japan, a certain number of firms revise their forecasts after the fiscal year end (i.e., between the fiscal year end and date of earnings announcement), which is often referred to as "rush revisions" (Tsumuraya 2008). In this case, firms tend to issue final earnings forecasts identical to the actual reported earnings. Accordingly, we define last earnings forecast relative to fiscal year end, rather than earnings announcement dates.

Insert Table 9 about here

Taken together with our main results, the finding in Table 9 provides a further implication about managers' forecasting ability and its consequences. That is, it suggests the less frequent forecast revisions among high-ability managers do not necessarily lead to increased forecast errors at the fiscal year end. Rather, the evidence indicates that such competent managers are also more accurate in terms of *last* forecast errors than those of incompetent who utilize discretionary options. Overall, the result confirms our view that high-ability managers are truly good at assessing future performance and thus do not have incentives to rely on discretionary revisions and earnings management.

VI. CONCLUSION

In this study, we examine the impact of managerial ability on the accuracy of management earnings forecasts. Baik et al. (2011) showed that high-ability managers are more likely to issue earnings forecasts and the accuracy increases with CEO ability. We extend that study by examining (1) whether high-ability managers have better forecasting ability, and (2) how high-ability managers increase their earnings forecast accuracy.

Using a large sample of Japanese firms in which management earnings forecasts are effectively mandated, we first find that managerial ability is negatively associated with forecast errors based on initial forecasts, suggesting that high-ability managers are more likely to issue accurate initial earnings forecasts. We then show that high-ability managers are less likely to revise their initial earnings forecasts. Finally, we reveal that high-ability managers are less likely to conduct earnings management so as to increase the accuracy of management earnings forecasts. Overall, our results suggest that high-ability managers are good at assessing future performance and issue more accurate forecasts at the beginning of the fiscal year, whereas low-ability managers are more likely to depend on forecast revisions and earnings management to enhance the accuracy of management forecasts.

Our study has several limitations. First, we use the MA Score presented by Demerjian et al. (2012) to capture managerial ability; future research needs to develop a better proxy for manager ability. Second, we focus on Japanese firms to examine the generalizability of the results of prior studies. However, for any specific features of management earnings forecasts in Japan, our sample may have a bias.

APPENDIX: MA SCORE ESTIMATION

To measure managerial ability, we follow Demerjian et al. (2012) and replicate their two-stage estimation process using Japanese data. For the first stage, we use DEA for calculating firm efficiency and solve the following optimization problem:

$$\max\theta = \frac{(Sales)}{(v_1 CoGS + v_2 SG\&A + v_3 PPE + v_4 OpsLease + v_5 R\&D + v_6 Goodwill + v_7 OtherIntan)} \tag{A1}$$

where *Sales* is the net revenue earned by the firm; *CoGS* is the costs of goods sold; *SG&A* is the selling, general, and administrative expenses; *PPE* is the net plant, property, and equipment; *OpsLease* is net operating lease assets; *R&D* is net research and development capital assets (Lev and Sougiannis 1996); *Goodwill* is acquired intangible assets; and *OtherIntan* is other intangible assets. Demerjian et al. (2012) set a single output, *Sales*, and show that seven inputs contribute to the generation of revenue. For every firm-year observation, each input is assigned a weight expressed as a vector (v) for calculating the efficiency score. The maximization process determines each weight to maximize equation (A1) for every firm-year relative to its peer in an industry (i.e., varying weights). We then use these weights to calculate the firm-year efficiency score (*FE Score*) in the industry and scale using the most efficient firm observation; this yields a relative efficiency score between zero and one. Observations having a value of one are the most efficient, and a set of these firms forms the efficient frontier for the industry.

Observations enveloped by the frontier (i.e., below the frontier) are inefficient in terms of generating output over the set of possible input combinations. The degree of inefficiency is calculated as the distance from the frontier; it indicates how much the observation should increase revenue or decrease capital and expenses to reach the given input and output levels, respectively. Following Demerjian et al. (2012, footnote 11), we form the efficiency frontier using the variable returns-to-scale (VRS) model (Banker, Charnes, and Cooper 1984), where the frontier takes the form of piecewise line connecting the most efficient observations in the industry. Specifically, we use the input-oriented VRS model to calculate the efficiency score.[13]

Our DEA procedure is different from Demerjian et al.'s (2012) procedure in the following two points. First, while Demerjian et al. (2012) use the industry classification based on Fama and French (1997), we use the Tokyo Stock Exchange (TSE) industry classification (33 industries). This is because we do not have the equivalent classifications for Japanese firms. Also, compared to other industry classifications, such as the Nikkei Industry Classification, the TSE industry classification yields a relatively well-balanced distribution of firms in each industry.[14] Second, while Demerjian et al. (2012) estimate net operating leases as the

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[13] In the VRS model, one must determine the orientation in calculating the efficiency score. That is, input-oriented models consider the horizontal distance between an inefficient observation and the efficiency frontier indicating the "excess" of inputs given the current level of outputs. Output-oriented models focus on the vertical distance indicating the "shortage" of outputs, given the current level of inputs. Unlike the constant returns-to-scale (CRS) model, the efficiency score can differ depending on this orientation.

[14] The sample size for each industry is important in DEA. When there are too few firms in the industry, a large percentage of firms will be on the frontier (Demerjian et al. 2012), resulting in higher firm efficiency score. To avoid this sample-size effect, we adopt the TSE industry classification.

discounted present value of the required operating lease payments (appearing as footnotes to financial statements in the United States), Japanese firms do not disclose such information, but instead disclose the total future operating lease payments and amounts due within one year. Under this condition, we follow Kusano et al. (2015) and calculate the present value of the net operating lease assets.

In the second stage, we remove the effects of firm-specific factor through Tobit regressions. Based on Demerjian et al. (2012), we estimate the following equation by industry:

$$FE\ Score_i = \alpha + \beta_1 \ln(Total\ Assets)_i + \beta_2 Market\ Share_i + \beta_3 FCF\_D_i + \beta_4 \ln(Age)_i + \beta_5 Business\ Segment\ Concentration_i + \beta_6 Foreign\ Currency\_D_i + Year_i + \varepsilon_i \quad \text{(A2)}$$

where *FE Score* is measured using DEA in the first stage; *Total Assets* is the total assets at the end of year *t*; *Market Share* is the percentage of revenue earned by the firm in its industry (TSE industry classification) in year *t*; *FCF_D* is a dummy variable that takes the value of one when the firm has non-negative free cash flow in year *t* and zero otherwise; *Age* is the number of years since the firm has been established;[15] *Business Segment Concentration* is the sum of the squares of sales from each business segment as a percentage of total sales in year *t* (Bushman, Chen, Engel, and Smith 2004); *Foreign Currency_D* is a dummy variable that takes the value of one when the firm reports a non-zero value for foreign currency adjustments in year *t* and

[15] Our variable of *Age* is slightly different from that of Demerjian et al. (2012), who use the number of years the firm has been listed on Compustat. Because we use the Japanese database *Nikkei NEEDS FinacialQUEST*, we cannot obtain the data used in Demerjian et al. (2012). Alternatively, we can calculate the firm age directly since the database gives the date of establishment of each firm.

zero otherwise; and *Year* denotes a set of year dummies. Demerjian et al. (2012) consider these six factors as firm-specific and thus less relevant to manager-specific ability. *Total Asset* and *Market Share* control for the effect of bargaining power over suppliers and customers. *FCF_D* controls for firms' investment capacity for pursuing positive net present value projects. *Age* gives the life cycle of the firm. Younger firms are less efficient due to the required start-up investment costs. Both *Business Segment Concentration* and *Foreign Currency_D* represent the diversification and/or business complexity of the firm. The greater the diversification, the more challenging is it for management teams to efficiently allocate capitals. Finally, *Year* controls year-fixed effects as *FE_Score* is estimated by-industry in DEA. The residual from the estimation of equation (A2) gives Demerjian et al.'s (2012) managerial ability measurement.

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Table 1. Definitions of Testing Variables

Description	*Variable*	*Definition*
Management Earnings Forecasts	*Initial Forecast Error*	The absolute value of forecast error based on the initial forecast, multiplied by 100 (i.e., 100*|actual earnings – initial management earnings forecast|/lagged market value of equity), where earnings are defined as net income.
	No.Forecast Revision	The number of management earnings forecast revised for the earnings in year *t*.
	Forecast Revision	The absolute value of the management forecast revisions, multiplied by 100 (i.e., 100*|last management earnings forecast – initial management earnings forecast|/lagged market value of equity), where earnings are defined as net income.
	Improve	An indicator variable that takes one if the absolute value of last management forecast error is less than the first tertile of the absolute value of the last forecast error before discretionary accruals (i.e., 100*|actual earnings – discretionary accruals – latest management earnings forecast|/lagged market value of equity) and if the absolute value of the last forecast error before discretionary accruals is larger than the first tertile, and otherwise zero. Discretionary accruals are based on Dechow et al. (1995) and tertile is calculated by year.
Managerial Ability	*Managerial Ability*	The decile rank by industry and year of MA Score based on Demerjian et al. (2012). See Appendix for the detail.
Control Variables	*Size*	The natural log of total sales.
	Loss_D	An indicator variable that takes one if the firm reports net losses, and zero otherwise.
	Increase_D	An indicator variable that takes one if the firm's net income increases compared to the previous year, and zero otherwise.
	StdDevEarn	The standard deviation of annual changes in earnings scaled by lagged total assets over past five years.
	Beta	The market model beta estimated using daily stock return and market return (TOPIX) over the past 240 days starting on the previous fiscal year end.
	StdDevResidual	The standard deviation of the residual from estimations of market model estimated over 240 days starting on the previous fiscal year end.
	Sales_Con	The Herfindahl index measured as the sum of the squares of the sales share of all firms within the same industry (Tokyo Stock Exchange Industry Classification, 33 industries)
	ManagerOwn%	The percentage of ownership held by managers.
	OutsideDir%	The percentage of outside directors on the board of directors.
	InstOwn%	The percentage of ownership held by institutional investors.
Additional Analysis	*Last Forecast Error*	The absolute value of forecast error based on the last forecast, multiplied by 100 (i.e., 100*|actual earnings – last management earnings forecast|/lagged market value of equity), where earnings are defined as net income. The last forecasts denote forecasts issued immediately prior to the fiscal year end.
	Timeliness	The difference between the last management forecast date and the date of the fiscal year end.

Table 2. Sample Selection Reconciliation

Criteria	# firm-year observations
Firm-years that listed on Japanese stock markets for 2006-2014	30,751
Less:	
Fiscal year period does not have just 12 months	(2,956)
The industry classification cannot be identified nor is as financial	(483)
Firm-years with financial statements prepared in U.S. GAAP or IFRS	(372)
Missing data available for the estimation of Eq. (1)	(9,068)
Final Sample	17,872

Table 3. Descriptive Statistics

	Mean	SD	Min	P25	Median	P75	Max	N
Initial Forecast Error$_{i,t}$	7.201	14.558	0.017	0.846	2.415	6.599	146.915	17,872
No.Forecast Revision$_{i,t}$	1.039	0.862	0.000	0.000	1.000	2.000	4.000	17,872
Forecast Revision$_{i,t}$	4.857	10.606	0.000	0.000	1.274	4.499	100.291	17,872
Improve$_{i,t}$	0.621	0.485	0.000	0.000	1.000	1.000	1.000	17,872
Managerial Ability$_{i,t-1}$	−0.007	0.077	−0.225	−0.051	−0.007	0.036	0.240	17,872
Size$_{i,t-1}$	10.534	1.589	6.443	9.392	10.431	11.556	14.594	17,872
Loss_D$_{i,t-1}$	0.186	0.389	0.000	0.000	0.000	0.000	1.000	17,872
Increase_D$_{i,t-1}$	0.547	0.498	0.000	0.000	1.000	1.000	1.000	17,872
StdDevEarn$_{i,t-1}$	0.046	0.064	0.002	0.013	0.025	0.050	0.497	17,872
Beta$_{i,t-1}$	0.677	0.454	−0.201	0.302	0.647	1.004	2.032	17,872
StdDevResidual$_{i,t-1}$	0.023	0.011	0.007	0.016	0.021	0.028	0.085	17,872
Sales_Conc$_{i,t-1}$	0.062	0.041	0.021	0.037	0.050	0.075	0.294	17,872
ManagerOwn%$_{i,t-1}$	0.037	0.085	0.000	0.000	0.002	0.022	0.496	17,872
OutsideDir%$_{i,t-1}$	0.077	0.118	0.000	0.000	0.000	0.143	0.500	17,872
InstOwn%$_{i,t-1}$	0.132	0.146	0.000	0.010	0.077	0.211	0.602	17,872

Notes: *Initial Forecast Error* is the absolute value of forecast error based on the initial forecast, multiplied by 100 (i.e., 100*|actual earnings – initial management earnings forecast|/lagged market value of equity), where earnings are defined as net income. *No.Forecast Revision* is the number of management earnings forecast revised for the earnings in year *t*. *Forecast Revision* is the absolute value of the management forecast revisions, multiplied by 100 (i.e., 100*|last management earnings forecast – initial management earnings forecast|/lagged market value of equity), where earnings are defined as net income. *Improve* is an indicator variable that takes one if the absolute value of last management forecast error is less than the first tertile of the absolute value of the last forecast error before discretionary accruals (i.e., 100*|actual earnings – discretionary accruals – latest management earnings forecast|/lagged market value of equity) and if the absolute value of the last forecast error before discretionary accruals is larger than the first tertile, and otherwise zero. *Managerial Ability* is the decile rank by industry and year of MA Score based on Demerjian et al. (2012). *Size* is the log of total sales. *Loss_D* is an indicator variable that takes one if the firm reports net losses, and zero otherwise. *Increase_D* is an indicator variable that takes one if the firm's net income increases compared to the previous year, and zero otherwise. *StdDevEarn* is the standard deviation of annual change in earnings scaled by lagged total assets over past five years. *Beta* is the market model beta estimated using daily stock return and market return (TOPIX) over the past 240 days starting on the previous fiscal year end. *StdDevResidual* is the standard deviation of the residual from estimations of market model estimated over 240 days starting on the previous fiscal year end. *Sales_Conc* is the Herfindahl index measured as the sum of the squares of the sales share of all firms within the same industry (TSE Industry Classification). *ManagerOwn%* is the percentage of managerial ownership. *OutsideDir%* is the percentage of outside directors on the board of directors. *InstOwn%* is the percentage of ownership held by institutional investors. All continuous variables are winsorized by year at the bottom 1 percent and top 99 percent levels.

Table 4. Correlations Matrix among the Variables for Our Regression Analyses

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Initial Forecast Error$_{i,t}$	(1)		**0.390**	**0.691**	**0.091**	**−0.077**	**−0.197**	**0.285**	**−0.132**
No.Forecast Revision$_{i,t}$	(2)	**0.236**		**0.751**	−0.005	**−0.029**	**0.101**	**0.080**	**−0.057**
Forecast Revision$_{i,t}$	(3)	**0.858**	**0.353**		**0.059**	**−0.050**	**−0.069**	**0.211**	**−0.119**
Improve$_{i,t}$	(4)	0.013	−0.007	**0.030**		**−0.021**	**−0.037**	**0.042**	**−0.039**
Managerial Ability$_{i,t-1}$	(5)	**−0.078**	**−0.030**	**−0.074**	−0.024		**0.038**	**−0.194**	**0.106**
Size$_{i,t-1}$	(6)	**−0.154**	**0.113**	**−0.118**	**−0.033**	−0.017		**−0.193**	**0.043**
Loss_D$_{i,t-1}$	(7)	**0.305**	**0.078**	**0.281**	**0.042**	**−0.189**	**−0.198**		**−0.320**
Increase_D$_{i,t-1}$	(8)	**−0.120**	**−0.055**	**−0.120**	**−0.039**	**0.102**	**0.043**	**−0.320**	
StdDevEarn$_{i,t-1}$	(9)	**0.212**	0.018	**0.180**	−0.018	−0.012	**−0.318**	**0.241**	−0.002
Beta$_{i,t-1}$	(10)	**−0.029**	**0.135**	−0.010	**−0.031**	−0.001	**0.340**	−0.013	**0.059**
StdDevResidual$_{i,t-1}$	(11)	**0.297**	0.021	**0.253**	**0.050**	0.003	**−0.442**	**0.305**	**−0.029**
Sales_Conc$_{i,t-1}$	(12)	0.005	**0.126**	0.020	−0.020	**−0.059**	−0.024	0.013	−0.014
ManagerOwn%$_{i,t-1}$	(13)	**0.065**	**−0.079**	**0.042**	0.001	0.023	**−0.324**	**0.056**	−0.014
OutsideDir%$_{i,t-1}$	(14)	0.011	−0.002	0.008	**−0.038**	0.005	**−0.030**	**0.032**	−0.001
InstOwn%$_{i,t-1}$	(15)	**−0.141**	**0.123**	**−0.109**	**−0.140**	0.022	**0.630**	**−0.152**	**0.055**

		(9)	(10)	(11)	(12)	(13)	(14)	(15)
Initial Forecast Error$_{i,t}$	(1)	**0.266**	**−0.035**	**0.311**	**0.028**	**0.124**	**−0.027**	**−0.220**
No.Forecast Revision$_{i,t}$	(2)	**0.060**	**0.135**	**0.039**	**0.108**	**−0.096**	0.001	**0.123**
Forecast Revision$_{i,t}$	(3)	**0.181**	**0.045**	**0.199**	**0.070**	**0.025**	**−0.019**	**−0.063**
Improve$_{i,t}$	(4)	0.012	**−0.034**	**0.072**	**−0.051**	**0.038**	**−0.043**	**−0.131**
Managerial Ability$_{i,t-1}$	(5)	**−0.051**	0.004	0.008	**−0.060**	−0.004	−0.004	**0.035**
Size$_{i,t-1}$	(6)	**−0.323**	**0.374**	**−0.426**	**−0.099**	**−0.501**	**0.021**	**0.644**
Loss_D$_{i,t-1}$	(7)	**0.298**	**−0.019**	**0.276**	**0.033**	**0.059**	**0.016**	**−0.163**
Increase_D$_{i,t-1}$	(8)	**−0.029**	**0.058**	**−0.053**	**−0.027**	**−0.031**	−0.004	**0.047**
StdDevEarn$_{i,t-1}$	(9)		**0.170**	**0.449**	**0.087**	**0.088**	**0.069**	**−0.141**
Beta$_{i,t-1}$	(10)	**0.125**		**0.151**	**0.069**	**−0.337**	**0.037**	**0.502**
StdDev(Residual)$_{i,t-1}$	(11)	**0.486**	**0.140**		**0.066**	**0.197**	**0.015**	**−0.269**
Sales_Conc$_{i,t-1}$	(12)	0.021	**0.081**	0.025		**−0.036**	**0.057**	**0.029**
ManagerOwn%$_{i,t-1}$	(13)	**0.127**	**−0.148**	**0.195**	**−0.050**		**−0.157**	**−0.389**
OutsideDir%$_{i,t-1}$	(14)	**0.136**	0.020	**0.085**	0.011	**−0.033**		**0.050**
InstOwn%$_{i,t-1}$	(15)	**−0.127**	**0.421**	**−0.249**	0.014	**−0.186**	0.023	

Notes: This table reports Pearson correlation coefficients below the diagonal and Spearman rank correlation coefficients above the diagonal. Correlations are presented in bold when they are statistically significant at the 5% level using a two-tailed test. *Initial Forecast Error* is the absolute value of forecast error based on the initial forecast, multiplied by 100 (i.e., 100*|actual earnings – initial management earnings forecast| /lagged market value of equity), where earnings are defined as net income. *No.Forecast Revision* is the number of management earnings forecast revised for the earnings in year *t*. *Forecast Revision* is the absolute value of the management forecast revisions, multiplied by 100 (i.e., 100*|last management earnings forecast – initial management earnings forecast|/lagged market value of equity), where earnings are defined as net income. *Improve* is an indicator variable that takes one if the absolute value of last management forecast error is less than the first tertile of the absolute value of the last forecast error before discretionary accruals (i.e., 100*|actual earnings – discretionary accruals – latest management earnings forecast|/lagged market value of equity) and if the absolute value of the last forecast error before discretionary accruals is larger than the first tertile, and otherwise zero. *Managerial Ability* is the decile rank by industry and year of MA Score based on Demerjian et al. (2012). *Size* is the log of total sales. *Loss_D* is an indicator variable that takes one if the firm reports net losses, and zero otherwise. *Increase_D* is an indicator variable that takes one if the firm's net income increases compared to the previous year, and zero otherwise. *StdDevEarn* is the standard deviation of annual change in earnings scaled by lagged total assets over past five years. *Beta* is the market model beta estimated using daily stock return and market return (TOPIX) over the past 240 days starting on the previous fiscal year end. *StdDevResidual* is the standard deviation of the residual from estimations of market model estimated over 240 days starting on the previous fiscal year end. *Sales_Conc* is the Herfindahl index measured as the sum of the squares of the sales share of all firms within the same industry (TSE Industry Classification). *ManagerOwn%* is the percentage of managerial ownership. *OutsideDir%* is the percentage of outside directors on the board of directors. *InstOwn%* is the percentage of ownership held by institutional investors. All continuous variables are winsorized by year at the 1 percent and 99 percent levels.

Table 5. Regression Results

	Predict Sign	H1 *Initial Forecast Error$_{i,t}$* Coef.	[*t*-value]	H2 *No.Forecast Revision$_{i,t}$* Coef.	[*t*-value]	H3 *Forecast Revision$_{i,t}$* Coef.	[*t*-value]	H4 *Improve$_{i,t}$* Coef.	[*t*-value]
Managerial Ability$_{i,t-1}$	−	−0.482	[−7.053]***	−0.013	[−3.482]***	−0.317	[−8.420]***	−0.007	[−2.401]**
Size$_{i,t-1}$	+/−	3.070	[1.652]*	0.118	[1.827]*	2.593	[1.946]*	0.006	[0.313]
Loss_D$_{i,t-1}$	+	3.026	[3.872]***	0.018	[0.481]	2.447	[4.723]***	0.013	[0.871]
Increase_D$_{i,t-1}$	−	−0.299	[−0.538]	−0.033	[−1.583]	−0.269	[−0.763]	−0.015	[−2.046]**
StdDevEarn$_{i,t-1}$	+	−27.807	[−2.087]**	−0.761	[−2.281]**	−17.013	[−1.799]*	−0.036	[−0.240]
Beta$_{i,t-1}$	+	−2.071	[−1.578]	−0.006	[−0.130]	−1.410	[−1.539]	−0.017	[−0.932]
StdDevResidual$_{i,t-1}$	+	9.168	[0.150]	−1.817	[−1.152]	−11.917	[−0.257]	−0.907	[−1.598]
Sales_Conc$_{i,t-1}$	+/−	−28.724	[−1.549]	−0.125	[−0.157]	−19.313	[−1.465]	0.614	[1.793]*
ManagerOwn%$_{i,t-1}$	+	1.609	[0.356]	−0.011	[−0.040]	2.719	[0.844]	−0.052	[−0.681]
OutsideDir%$_{i,t-1}$	−	−2.013	[−0.916]	0.006	[0.058]	−0.287	[−0.226]	−0.048	[−0.771]
InstOwn%$_{i,t-1}$	−	−15.214	[−3.161]***	−0.259	[−1.423]	−8.624	[−2.317]**	−0.337	[−2.640]***
Firm Fixed Effects		Included		Included		Included		Included	
Year Fixed Effects		Included		Included		Included		Included	
Adj-R^2		0.338		0.268		0.278		0.156	
N		17,872		17,872		17,872		17,872	

Notes: This table reports the regression results for Eq.(1). *Initial Forecast Error* is the absolute value of forecast error based on the initial forecast, multiplied by 100 (i.e., 100*|actual earnings – initial management earnings forecast|/lagged market value of equity), where earnings are defined as net income. *No.Forecast Revision* is the number of management earnings forecast revised for the earnings in year *t*. *Forecast Revision* is the absolute value of the management forecast revisions, multiplied by 100 (i.e., 100*|last management earnings forecast – initial management earnings forecast|/lagged market value of equity), where earnings are defined as net income. *Improve* is an indicator variable that takes one if the absolute value of last management forecast error is less than the first tertile of the absolute value of the last forecast error before discretionary accruals (i.e., 100*|actual earnings – discretionary accruals – latest management earnings forecast|/lagged market value of equity) and if the absolute value of the last forecast error before discretionary accruals is larger than the first tertile, and otherwise zero. *Managerial Ability* is the decile rank by industry and year of MA Score based on Demerjian et al. (2012). *Size* is the log of total sales. *Loss_D* is an indicator variable that takes one if the firm reports net losses and zero otherwise. *Increase_D* is an indicator variable that takes one if the firm's net income increases compared to the previous year and zero otherwise. *StdDevEarn* is the standard deviation of annual change in earnings scaled by lagged total assets over past five years. *Beta* is the market model beta estimated using daily stock return and market return (TOPIX) over the past 240 days starting on the previous fiscal year end. *StdDevResidual* is the standard deviation of the residual from estimations of market model estimated over 240 days starting on the previous fiscal year end. *Sales_Conc* is the Herfindahl index measured as the sum of the squares of the sales share of all firms within the same industry (TSE Industry Classification). *ManagerOwn%* is the percentage of managerial ownership. *OutsideDir%* is the percentage of outside directors on the board of directors. *InstOwn%* is the percentage of ownership held by institutional investors. *t*-values are two-tailed and based on standard errors clustered at both firm and year levels. ***, **, and * indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Table 6. Robustness Tests: Alternative MA Score

Panel A: Managerial Ability using 6 inputs

		H1		H2		H3		H4	
	Predict Sign	*Initial Forecast Error$_{i,t}$*		*No.Forecast Revision$_{i,t}$*		*Forecast Revision$_{i,t}$*		*Improve$_{i,t}$*	
		Coef.	[*t*−value]	Coef.	[*t*−value]	Coef.	[*t*-value]	Coef.	[*t*-value]
MA_6inputs$_{i,t-1}$	−	−0.569	[−6.327]***	−0.013	[−2.978]***	−0.362	[−6.869]***	−0.009	[−3.108]***
Contorls		Included		Included		Included		Included	
Firm Fixed Effects		Included		Included		Included		Included	
Year Fixed Effects		Included		Included		Included		Included	
Adj−R^2		0.340		0.268		0.279		0.156	
N		17,872		17,872		17,872		17,872	

Panel B: Raw Value of Managerial Ability

		H1		H2		H3		H4	
	Predict Sign	*Initial Forecast Error$_{i,t}$*		*No.Forecast Revision$_{i,t}$*		*Forecast Revision$_{i,t}$*		*Improve$_{i,t}$*	
		Coef.	[*t*−value]	Coef.	[*t*−value]	Coef.	[*t*-value]	Coef.	[*t*-value]
MA_RawValue$_{i,t-1}$	−	−20.647	[−6.106]***	−0.432	[−2.771]***	−14.363	[−5.845]***	−0.282	[−2.875]***
Contorls		Included		Included		Included		Included	
Firm Fixed Effects		Included		Included		Included		Included	
Year Fixed Effects		Included		Included		Included		Included	
Adj−R^2		0.339		0.268		0.279		0.156	
N		17,872		17,872		17,872		17,872	

Notes: This table reports the regression results using alternative measures of MA Score. *MA_6inputs* is the decile rank by industry and year of MA Score based on DEA using 6 inputs (i.e., without operating lease assets). *MA_RawValue* is the raw value of MA Score which is continuous. *Controls* indicate a set of control variables defined in Eq.(1). All other variables are defined in Table 1. *t*-values are two-tailed and based on standard errors clustered at both firm and year levels. *** indicates statistical significance at the 1 percent level.

Table 7. Sensitivity Tests on Earnings Management to Meet Forecast (H4)

Panel A: Discretionary Accruals based on Dechow et al. (1995)

	(1)		(2)	
	25 percentile		*50 percentile*	
	Coef.	[*t*−value]	Coef.	[*t*-value]
Managerial Ability$_{i,t-1}$	−0.006	[−2.728]***	−0.007	[-3.037]***
Controls	Included		Included	
Firm Fixed Effects	Included		Included	
Year Fixed Effects	Included		Included	
Adj−R^2	0.121		0.248	
N	17,872		17,872	

Panel B: Discretionary accruals based on Kothari et al. (2005)

	(1)		(2)		(3)	
	25 percentile		*33 percentile*		*50 percentile*	
	Coef.	[*t*−value]	Coef.	[*t*-value]	Coef.	[*t*-value]
Managerial Ability$_{i,t-1}$	−0.006	[−2.690]***	−0.006	[−2.913]***	−0.007	[−2.329]**
Controls	Included		Included		Included	
Firm Fixed Effects	Included		Included		Included	
Year Fixed Effects	Included		Included		Included	
Adj−R^2	0.127		0.158		0.222	
N	17,872		17,872		17,872	

Panel C: Abnormal SG&A based on Gunny (2010)

	(1)		(2)		(3)	
	25 percentile		*33 percentile*		*50 percentile*	
	Coef.	[*t*−value]	Coef.	[*t*-value]	Coef.	[*t*-value]
Managerial Ability$_{i,t-1}$	−0.002	[−1.052]	−0.004	[−2.275]**	−0.008	[−3.346]***
Controls	Included		Included		Included	
Firm Fixed Effects	Included		Included		Included	
Year Fixed Effects	Included		Included		Included	
Adj−R^2	0.311		0.384		0.490	
N	17,872		17,872		17,872	

Notes: This table reports the regression results using alternative variables for *Improve*. Panel A uses discretionary accruals based on Dechow et al. (1995), Panel B uses discretionary accruals based on Kothari et al. (2005), and Panel C uses abnormal SG&A based on Gunny (2010). In each panel, we apply alternative three discriminant points: the first quartile, tertile, and median of the absolute value of the last forecast error before discretionary components of earnings (i.e., discretionary accruals or expenses). Each column shows the results using different definition for *Improve* that combines discretionary components and three discriminant points. *Controls* indicate a set of control variables defined in Eq.(1). All other variables are defined in Table 1. *t*-values are two-tailed and based on standard errors clustered at both firm and year levels. *** and ** indicate statistical significance at the 1 percent and 5 percent levels, respectively.

Table 8. Robustness Tests: An Alternative Measure of Managerial Ability

	Predict	H1		H2		H3		H4	
		Initial Forecast Error$_{i,t}$		*No.Forecast Revision$_{i,t}$*		*Forecast Revision$_{i,t}$*		*Improve$_{i,t}$*	
	Sign	Coef.	[*t*−value]	Coef.	[*t*−value]	Coef.	[*t*-value]	Coef.	[*t*-value]
Principal Component$_{i,t-1}$	−	−0.517	[−7.079]***	−0.012	[−2.807]***	−0.305	[−6.313]***	−0.012	[−4.007]***
Contorls		Included		Included		Included		Included	
Firm Fixed Effects		Included		Included		Included		Included	
Year Fixed Effects		Included		Included		Included		Included	
Adj−R^2		0.339		0.271		0.272		0.159	
N		17,607		17,607		17,607		17,607	

Notes: This table reports the regression results using an alternative measure derived from principal component analysis. *Principal Component* is the decile rank by industry and year of the factor yielded from principal component analysis using *MA RawValue*, *Historical Return*, and *Historical ROA*. *MA_RawValue* is the raw value of MA Score in year *t−1* which is continuous. *Historical Return* is the value-weighted industry-adjusted historical stock return in year *t−1*, where the historical stock return in year *t−1* is defined as the buy-and-hold return from year *t−3* to *t−1*. *Historical ROA* is the value-weighted industry-adjusted ROA in year *t−1*, where ROA is defined as the percentage of the cumulative earnings before extraordinary items from year *t−3* to *t−1* on the average total assets for the three years. *Controls* indicate a set of control variables defined in Eq.(1). All other variables are defined in Table 1. *t*-values are two-tailed and based on standard errors clustered at both firm and year levels. *** indicates statistical significance at the 1 percent level.

Table 9. Additional Tests using Last Forecast Errors

Panel A: Descriptive Statistics for *Last Forecast Error* and *Timeliness*

	Mean	SD	Min	P25	Median	P75	Max	N
Last Forecast Error$_{i,t}$	2.980	6.300	0.005	0.383	1.017	2.678	65.256	17,844
Timliness$_{i,t}$	204.503	111.173	40.000	97.000	185.000	362.000	371.000	17,844

Panel B: Regression Results using Equation (2): *Last Forecast Error*

	Predict Sign	*Last Forecast Error*$_{i,t}$ Coef.	[*t*-value]
Managerial Ability$_{i,t-1}$	−	−0.138	[−5.425]***
Size$_{i,t-1}$	+/−	0.559	[1.062]
Loss_D$_{i,t-1}$	+	0.958	[3.350]***
Increase_D$_{i,t-1}$	−	−0.015	[−0.081]
StdDevEarn$_{i,t-1}$	+	−7.354	[−1.882]*
Beta$_{i,t-1}$	+	−0.423	[−0.782]
StdDev(Residual)$_{i,t-1}$	+	13.574	[0.551]
Sales_Conc$_{i,t-1}$	+/−	−8.674	[−1.589]
ManagerOwn%$_{i,t-1}$	+	−0.731	[−0.312]
OutsideDir%$_{i,t-1}$	−	−0.822	[−1.100]
InstOwn%$_{i,t-1}$	−	−6.210	[−3.516]***
Timeliness$_{i,t}$	+	0.001	[1.557]
Firm Fixed Effects		Included	
Year Fixed Effects		Included	
Adj-R^2		0.305	
N		17,844	

Notes: This table reports the regression results for Eq. (2). *Last Forecast Error* is the absolute value of forecast error based on the last forecast, multiplied by 100 (i.e., i.e., 100*|actual earnings – last management earnings forecast|/lagged market value of equity). The last earnings forecasts denote the forecasts issued immediately prior to the fiscal year end. *Timliness* is the difference between the last management forecast date and the date of firm's fiscal year end. All other variables are defined in Table 1. *t*-values are two-tailed and based on standard errors clustered at both firm and year levels. *** and * indicate statistical significance at the 1 percent and 10 percent levels, respectively.