Does Management Forecast Drive Growth of the Firm?

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Jun 2013

No.172

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May 14, 2013

Topics: Financial Accounting, Management Earnings Forecasts

Keywords: Management earnings forecasts, management forecast innovation, management myopia, goal setting theory

Data Availability: Data used in this study are available from public sources.

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Abstract: The purpose of this study is to analyze the relation between ex ante high goals set by managers and ex post growth of those firms. We develop our hypothesis based on knowledge from goal setting theory and over-extension strategy and test the hypothesis that firms which issued aggressive management forecasts continuously in ex ante period grow higher in ex post period than firms that issued non-aggressive management forecasts. From our analyses, we find ex ante management forecast innovation (MFI) is positively related to ex post firm growth after controlling the endogeneity of MFI via two-stage least squares regression and propensity score matching. In particular, firms that issue aggressive management forecasts continuously achieve higher growth of earnings and stock price in the future than firms that have similar fundamentals except non-aggressive management forecasts. Recently, managerial myopia associated with management forecast disclosure has gotten increased attention around the world. However, based on the findings in prior Literature, it is not always supported that there is a relation between management forecast disclosure and managerial myopia. Especially, in Japan where management forecasts are effectively mandated, this study suggests there is a possibility that managers could prompt accumulation of intangible assets and achieve sustained growth of the firms by utilizing management forecasts efficiently. In other words, we indicate management forecast disclosure issued by such a manager might have a potential to encourage "long-termism" of management.

1. Introduction

The purpose of this study is to analyze the relation between *ex ante* high goals set by managers and *ex post* growth of those firms. Substantial prior literature has revealed that management earnings forecasts have capital market effects because they contain highly suggestive information about the future states of the firms (Patell, 1976; Hassell et al., 1988; Pownall and Waymire, 1989; Williams, 1996; Lennox and Park, 2006; Ota, 2010). Especially, it becomes evident that such bad news as misses own forecasts triggers punishment from stock market (e.g., Skinner and Sloan, 2002). Therefore, managers also pay attention to the level of management forecasts and the difference between forecast earnings and actual earnings (Graham et al., 2005; Suda and Hanaeda, 2008).

Given these investors' reactions, there are some criticisms that managers dedicate considerable effort to meet or beat their own forecasts. In fact, Graham et al. [2005] and Suda and Hanaeda [2008] report that some managers decrease discretionary investment (e.g. R&D, advertising, maintenance, and so on) or delay starting a new project with positive NPV in order to meet or beat their earnings targets. This is so-called "management myopia" problem.

On the other hand, a majority of Japanese firms issue such optimistic management forecasts as fail to meet or beat their forecasts (Kato et al., 2009; Cho et al., 2011). In addition, Ota [2006] finds there is persistence of management forecast errors, defined as the difference between management forecasts and actual earnings. Then, why do Japanese managers continue to issue such optimistic management forecasts despite a high possibility of penalty from investors? On this point, prior literature has tried to identify the determinants of management forecasts from a perspective of managers' incentives and firms' fundamentals (Ota, 2006; Kato et al., 2009). In Gong et al. [2011]'s study focusing on the U.S. firms, however, they reveal that persistency of management forecast errors is not fully explained only by managers' incentives and

firms' fundamentals. Thus this study attempts to explain this phenomenon from another perspective, goal setting theory in psychology.

According to goal setting theory, it is concluded that more difficult goals encourage higher efforts and performance (Locke and Latham, 2002). Locke and Latham [2002] also indicate that specific and difficult goals consistently lead to higher performance than do-your-best-goals. To utilize knowledge from goal setting theory in the context of management forecasts, some managers might do issue difficult goals continuously to outside of their organizations, set shared specific goals with employees, and bring out their motivations and creativity. In fact, Itami [1984] explains importance of over-extension strategy from a viewpoint of sustained growth of firms and introduces some cases of the firms which intentionally prompt extension of intangible assets.

In the current study, using the context of management forecasts, we investigate whether knowledge from goal setting theory can be also applied to firm-level goals. Specifically, we analyze whether the firms with higher average values of management forecast innovation (hereafter *MFI*), defined difference between initial management forecast in the current fiscal year and actual earnings in the last fiscal year deflated by total assets at the end of the last fiscal year, in *ex ante* period tend to achieve higher firm growth (earnings growth and stock price growth) in *ex post* period. To conduct this analysis, it is substantially important to cope with an endogeneity problem of *MFI*. Therefore, we test our hypothesis via two alternative methods, two-stage least squares regression and propensity score matching.

This study focuses on Japanese firms for three reasons. First, prior management forecast literature focusing on non-Japanese firms has a self-selection bias since almost all firms voluntarily issue management forecasts (Verrecchia and Wang, 2011). On the other hand, in Japanese setting, we can use a large sample without self-selection bias because management forecast disclosure is effectively mandated. Second, when management forecast are issued voluntarily, it is difficult, if not impossible, to collect

time-series data of each firm's management forecasts as a consequence of the nature of voluntary disclosure. Rogers and Stocken [2005], for instance, investigate 925 initial management forecasts from 595 firms from 1996 to 2000. They, however, report that 377 firms issued a management forecast in only one of the five years and that only 7 firms issued management forecasts in each year. To investigate a firm-specific time-series property of management forecasts, it is beneficial for us to use Japanese firms because of their effectively mandated management forecast disclosure. Finally, since almost all initial management forecasts are provided at actual earnings announcements, each firm's forecast period of the initial management forecast is approximately same among observations. In general, it is thought that the shorter forecast periods become, the more accurately managers can forecast earnings. Therefore, we can level the playing field among firms to uniform a length of each firm's forecast period.

From our analyses, we find average *MFI* in *ex ante* period is positively related to *ex post* firm growth after controlling the endogeneity of average *MFI* in *ex ante* via two-stage least squares regression and propensity score matching. In particular, firms that issue aggressive management forecasts continuously achieve higher growth of earnings and stock price in the future than firms that have similar fundamentals except non-aggressive management forecasts.

Our findings have three implications as below. First, our findings suggest management forecast disclosure does not always induce short-termism of management. Recently, managerial myopia associated with management forecast disclosure has gotten increased attention. In fact, management forecast disclosure might be the subject of criticism because it encourages short-termism of management. Based on the findings in prior Literature (Houston et al., 2011), however, it is not always supported that there is a relation between management forecast disclosure and managerial myopia. Our evidence also reinforces this argument. Especially, in Japan where management

forecasts are effectively mandated, this study suggests there is a possibility that managers could prompt accumulation of intangible assets and achieve sustained growth of the firms by utilizing management forecasts efficiently. In other words, we indicate management forecast disclosure might have a potential to encourage “long-termism” of management.

Second, we present a new determinant of managements forecast errors, a sustained growth strategy by managers. Although extant research has tried to identify the determinants of management forecasts from a perspective of managers’ incentives and firms’ fundamentals (Ota, 2006; Kato et al., 2009), the current study indicates existence of firms which issue aggressive forecasts based on not only their fundamentals but long-term management plans and finds management forecast errors of these firms are relatively larger than those of other firms.

Third, we extend knowledge from goal setting theory developed in psychology and organization behavior over firm-level studies. Prior literature about goal setting theory has conducted individual-level and group-level experiments or field studies to test their hypotheses but rarely conducted larger organization-level experiments. We also believe our results have external validity by using archival data.

The remainder of this paper is organized as follows. Section 2 reviews the literature and presents our hypothesis. Section 3 provides details about the research design. Section 4 explains sampling methodology and descriptive statistics. Section 5 reports the estimation results. Section 6 summarizes the paper and provides concluding remarks.

2. Prior Literature and Hypotheses Development

2.1. Management Forecast Disclosure and Capital Market Effect

Prior literature on management forecasts has revealed the significant effects of management forecast disclosure on capital market (Patell, 1976; Hassell et al., 1988;

Pownall and Waymire, 1989; Williams, 1996; Lennox and Park, 2006; Ota, 2010). Pownall and Waymire [1989], for example, report that management forecast earnings strongly affect those firms' stock returns than their actual earnings. Ota [2010] finds management forecasts can explain a large part of the following analyst forecast revisions (also see Hassell et al. [1988] and Williams [1996]). With regard to such analyst earnings forecasts as being affected by management earnings forecasts, several studies (Bartov et al., 2002; Kasznik and McNichols, 2002) reveal cumulative abnormal returns of those firms that failed analyst earnings forecasts are significantly lower than those of the firms that meet or beat analyst earnings forecasts. Hence, it is also found that managers tend to manage market expectations via management forecasts (Matsumoto, 2002). This evidence suggests there is an interaction between management forecasts and capital market. In addition to these findings about stock reactions, some prior literature (e.g., Kasznik and Lev, 1995; Skinner, 1997; Rogers and Buskirk, 2009) indicate a relation between management forecast disclosure and litigation risk. This means not only stock returns but also other capital market factors are related to management forecast disclosure.

As prior literature using Japanese data, Hermann et al. [2003], Ota [2006], Kato et al. [2009], and Ota [2010] investigate management forecasts. These studies found (1) managers take management forecast earnings as earnings targets, (2) the characteristics of management forecasts rely on a lot of factors including firm size, profitability, debt ratio, industry, and so on, and (3) management forecast errors are persistent.

2.2. Characteristics of Management Forecast Disclosure

We conduct several tests using Japanese firms. Because there are relatively less studies using Japanese data compared to studies using the U.S. data, at first, we discuss the difference and the similarity between management forecasts in Japan (Kato et al., 2009) and those in the U.S. (Rogers and Stocken, 2005; Hutton and Stocken, 2009).

The most apparent difference between management forecasts in Japan and those in the U.S. is that management forecast disclosure in Japan is effectively mandated in that almost all Japanese listed firms issue management forecasts while management forecasts in the U.S. are voluntary. Rogers and Stocken [2005], for instance, investigate 925 initial management forecasts from 595 firms from 1996 to 2000. They, however, report that 377 firms issued a management forecast in only one of the five years and that only 7 firms issued management forecasts in each year. On the other hand, in Japanese firms, we can collect most firms' time-series management forecasts. To the extent of avoidance of self-selection bias and availability of time-series data of management forecasts, it is meaningful to use Japanese firms in the context of management forecasts studies.

But, there is also a similarity between them. That is the aggressiveness of initial management forecasts which means managers tend to issue initial management forecasts that result in exceeding correspondent actual earnings. Following prior literature in the U.S. (Rogers and Stocken, 2005), more than seventy-five percent of initial annual management forecasts from 1996 to 2000 resulted in exceeding correspondent actual earnings. This means three-fourths managers who issued management forecasts in that period tended to issue management forecasts aggressively. Furthermore, Hutton and Stocken [2009] find that, in the U.S., average value of management forecast bias from 2000 to 2007, which calculated as the difference between actual quarterly or annual earnings and management forecasts deflated by share price, is negative and statistically significant. This tendency is also observed in Japanese firms' managers. For example, Kato et al. [2009] analyze initial management forecasts issued by Japanese firms' managers from 1997 to 2007. From the analysis, they report that the proportion of initial management forecasts that are met or beaten is about thirty-nine percent. This evidence suggests Japanese firms' managers are also apt to forecast their firms' performance aggressively.

2.3. Goal Setting Theory and Hypothesis Development

As stated above, management forecasts have capital market effects because they contain highly suggestive information about the future states of the firms (Patell, 1976; Hassell et al., 1988; Pownall and Waymire, 1989; Williams, 1996; Lennox and Park, 2006; Ota, 2010). Given these capital market reactions, focusing on the U.S. where management forecasts are voluntary, Feng and Koch [2010] find the firms that missed their own forecasts are more likely to cease management forecast disclosure than other firms[1]. On the other hand, in Japan where management forecast disclosure is voluntary but effectively mandated, few firms actually ceased management forecasts and almost all firms continue to issue point forecasts[2]. In addition, there are some criticisms that managers dedicate considerable effort to meet or beat their own forecasts. In fact, Graham et al. [2005] and Suda and Hanaeda [2008] report that some managers decrease discretionary investment (e.g. R&D, advertising, maintenance, and so on) or delay starting a new project with positive NPV in order to meet or beat their earnings targets. This is so-called “management myopia” problem. Furthermore, in keeping with a possible misinterpretation by investors, Tokyo Stock Exchange [2012] recommends listed firms to note that management forecasts are not commitments to meet or beat them.

Some prior literature, however, reports that a majority of Japanese firms issue such optimistic management forecasts as fail to meet or beat their forecasts (Kato et al., 2009; Cho et al., 2011). In addition, Ota [2006] finds there is persistence of management forecast errors, defined as the difference between management forecasts and actual earnings. Then, why do Japanese managers continue to issue such optimistic management forecasts despite a high possibility of penalty from investors? On this point,

[1] In addition, Houston et al. [2010] report that management forecast stoppers are characterized by (1) a decline in earnings before stopping, (2) a higher tendency to miss analyst consensus forecast, (3) a deterioration of earnings in the future, (4) a top management turnover, (5) a relatively low frequency of management forecast by the same industry firms.

[2] One of the reasons why Japanese managers tend to issue optimistic forecasts resulting in missing targets continuously might be a lower frequency of shareholders lawsuits than the cases in the U.S.

prior literature has tried to identify the determinants of management forecasts from a perspective of managers' incentives and firms' fundamentals (Ota, 2006; Kato et al., 2009). In Gong et al. [2011]'s study focusing on the U.S. firms, however, they reveal that persistency of management forecast errors is not fully explained only by managers' incentives and firms' fundamentals. Thus this study attempts to explain this phenomenon from another perspective, goal setting theory in psychology.

According to goal setting theory, it is found that more difficult goals encourage higher efforts and performance (Locke and Latham, 2002). A commitment to make an effort, however, is important if it is hard to achieve goals (Klein et al., 1999). One of the factors that increase goal commitment is importance of the goal. As explained above, management forecasts seem to be very important because management forecast is one part of the important information set for investors and managers also make significant efforts to attain their forecasts. Moreover, based on a survey conducted by Japan Investor Relations Association, it is found that management forecasts tend to be formed through not top-down process but bottom-up process in Japan (JIRA [2010]). This means employees are involved in the formulating process of management forecasts. It is expected that this process increases employees' commitments to achieve the forecasts[3].

Locke and Latham [2002] also conclude that specific and difficult goals consistently lead to higher performance than do-your-best-goals. Since almost all Japanese firms issue point forecasts[4], we can expect management forecasts in Japan are more likely to lead to higher performance.

Furthermore, Itami [1984] explains importance of over-extension strategy from a viewpoint of sustained growth of firms. Over-extension strategy is to choice the strategy not that is fit with a firm's current resource, capability, and organization culture but that is a little over them in order to achieve long-term growth of the firms. An aim of this

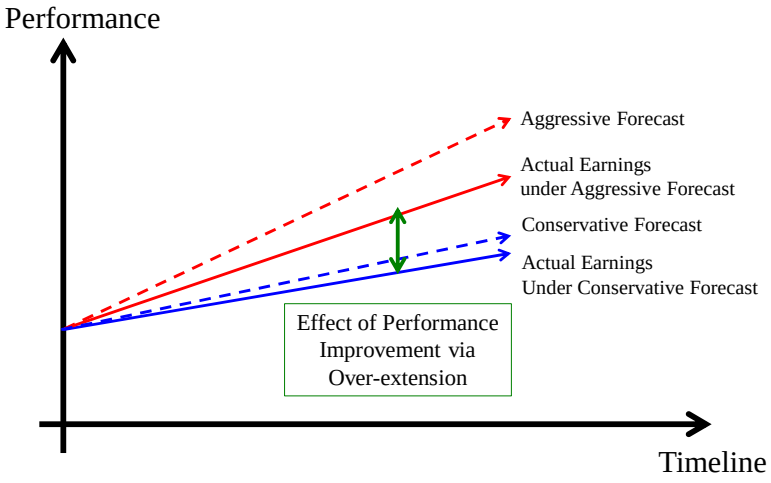
[3] With regard to a relation between participation in goal setting process and commitment, please see Locke and Latham [2002].
[4] We think other forecast forms (e.g. range forecasts, one-sided directional forecasts) are less specific than point forecasts.

strategy is to prompt extension of capabilities and resources of the firm by doing put themselves in a severe environment.

We put above discussion into the form of a figure (Figure 1). Then, based on the discussion, we develop the hypothesis.

Hypothesis: Firms that issued aggressive management forecasts continuously in *ex ante* period, *ceteris paribus*, grow higher in *ex post* period than firms that issued non-aggressive management forecasts.

Figure 1 Image of Improvement in Performance via Over-extension Strategy



3. Research Design

We analyze whether an aggressive management forecast (i.e., high goal) drives growth of the firm in the future. Specifically, we investigate whether higher average management forecast innovation (MFI_{2004}^{2008}), defined as average values of *MFI* from FY 2004 to FY 2008 (*ex ante* period) relates to higher firm growth (measured by two earnings growth rates and stock price growth rate) from FY 2008 to FY 2012 (*ex post*

period). In order to conduct this kind of analysis, it is very important to control the endogeneity of MFI_{2004}^{2008}. This is because it is expected that the firms that achieved high growth rate of earnings in *ex ante* period had higher MFI_{2004}^{2008} in the corresponding period than other firms by the definition of MFI_{2004}^{2008}. The high value of MFI_{2004}^{2008} that comes from high growth rate of earnings, however, does not seem to be a demanding goal but seem to be a reasonable goal. Therefore, we use two types of research methods, two-stage least squares regression and propensity score matching, to avoid the endogeneity problem.

3.1. Two-Stage Least Squares Regression

As one of the methods to cope with the endogeneity of MFI_{2004}^{2008}, we use two-stage least squares regression. At the first-stage regression, MFI_{2004}^{2008} is regressed on some determinants of it known in the prior literature (Kato et al., 2009; Suzuki, 2013). Through this process, we decompose MFI_{2004}^{2008} into predicted values explained by prior literature and residuals that are unexplainable by prior literature. In the current study, we regard these residuals as the portions that are independent of micro and macro fundamentals and are affected by managers' judgments about their goals to reach for. Hence, a firm with higher residual is taken as a firm with high goal in this study. Specifically, we estimate model (1).

$$\begin{aligned} MFI_{2004}^{2008} = a &+ b_1 ASSET_{2003}^{2007} + b_2 DEBT_{2003}^{2007} + b_3 ROA_{2003}^{2007} + b_4 OIGROWTH_{2003}^{2007} \\ &+ b_5 PBR_{2003}^{2007} + b_6 R\&D_{2003}^{2007} + b_7 NONR\&D_{2003}^{2007} + b_8 FOWN_{2003}^{2007} \\ &+ \sum b_i Industry + \varepsilon_{2008} \end{aligned} \quad (1)$$

MFI_{2004}^{2008} is defined as the five-year average value of the difference between initial management forecast of ordinary income and actual ordinary income deflated by corresponding sales from FY 2004 to FY 2008. $ASSET_{2003}^{2007}$ is calculated as the

five-year average value of the natural logarithm of total assets at the end of the fiscal year from FY 2003 to FY 2007. From the finding of Kato et al. [2009], the larger firms become, the more conservatively managers issue their forecasts. The current study, therefore, includes firm size in the model.

$DEBT_{2003}^{2007}$ is defined as the five-year average value of the ratio of net debt at the end of the fiscal year to contemporary total assets from FY 2003 to FY 2007. Creditors are likely to make managers issue conservative forecasts explicitly or implicitly in consideration of collectability of their claims. In the other words, because creditors are reluctant to allow managers to execute business plan based on their optimistic expectations with hard targets, they might make obligators execute steady business plans and issue conservative management forecasts (Suzuki, 2013). With consideration for this creditors' pressure, $DEBT_{2003}^{2007}$ is included in our model.

Since some prior literature suggests firms' profitability tends to result in mean reversion, current profitable (unprofitable) firms' earnings might decrease (increase) in the future. Exacerbation (improvement) of profitability could relate to low (high) MFI_{2004}^{2008}. Kato et al. [2009] find evidence consistent with this argument. Thus, we need to control the level of profitability (ROA_{2003}^{2007}). ROA_{2003}^{2007} is calculated as the average ratio of current ordinary income to total assets at the beginning of the fiscal year from FY 2003 to FY 2007.

Furthermore, because it is expected that a firm's lifecycle would affect the firm's MFI_{2004}^{2008} and firms in early stage of their lifecycles would have high MFI_{2004}^{2008}, we control growth rates of ordinary income ($OIGROWTH_{2003}^{2007}$). $OIGROWTH_{2003}^{2007}$ is defined as the average value of the difference between current ordinary income and ordinary income in last fiscal year deflated by total sales[5] in last fiscal year from FY 2003 to FY 2007.

[5] When we use ordinary income in last fiscal year as a deflator, we cannot compute a firm's growth rate of ordinary income if the firm's ordinary income in last fiscal year is negative. This is why we use total sales in last fiscal year as a deflator.

In prior literature, market to book ratio (PBR_{2003}^{2007}) is regarded as a degree of investment opportunity. Since we can expect that the more a firm has investment opportunity, the more earnings of the firm would grow. Hence, PBR_{2003}^{2007} is included in our model. PBR_{2003}^{2007} is computed by the average value of the ratio of market capitalization at the end of the month which is three month later from the end of the fiscal year to book value of net assets at the end of fiscal year from FY 2003 to FY 2007. We also include research and development investment ($R\&D_{2003}^{2007}$) in our model because a firm which invests research and development actually is expected to grow in the future[6]. $R\&D_{2003}^{2007}$ is defined as the average value of research and development investment in the current fiscal year deflated by contemporary total sales from FY 2003 to FY 2007. However, since there are some observations without research and development investment in our sample period, a dummy variable ($NONR\&D_{2003}^{2007}$) which indicates one if firms do not invest research and development at all in *ex ante* period and zero otherwise is included in our model.

As argued by Suzuki [2013], managers might have incentives to report good news when there is a high pressure from shareholders. Especially, in Japanese market, it is widely acknowledged that foreign investors are relatively more active investors than other investors. In line with this perspective, recent research focusing on Japanese firms has used foreign ownership as a proxy for active investors. Foreign ownership ($FOWN_{2003}^{2007}$) is defined as the average value of the ratio of the number of shares holding by foreign investors to the number of outstanding shares at the end of the current fiscal year from FY 2003 to FY 2007.

We also include industry dummy variables based on Tokyo Stock Exchange industrial codes in order to fixed industry effects.

We define residuals ($\hat{\varepsilon}$) calculated by estimation of model (1) as the proxy for

[6] We also include capital expenditure in the model and estimate that model. The coefficient of capital expenditure, however, is not statistically significant. Rather, including capital expenditure could impair preciseness of the model specification. Therefore, we exclude capital expenditure from our model.

manager's aggressiveness of their forecasts (MFI^{*}_{2008}). Including MFI^{*}_{2008}, we estimate model (2) and analyze the effect of aggressiveness of managements forecasts on future growth of the firm.

$$GROWTH^{2012}_{2008} = a + b_1 MFI^{*}_{2008} + b_2 ASSET^{2007}_{2003} + b_3 DEBT^{2007}_{2003} + b_4 ROA^{2007}_{2003} + b_5 OIGROWTH^{2007}_{2003} + b_6 PBR^{2007}_{2003} + b_7 R\&D^{2007}_{2003} + b_8 NONR\&D^{2007}_{2003} + b_9 FOWN^{2007}_{2003} + \sum b_i Industry + \varepsilon_{2008} \quad (2)$$

$$GROWTH^{2012}_{2008} \in \{OIGROWTH^{2012}_{2008}, NIGROWTH^{2012}_{2008}, RETURN^{2012}_{2008}\}$$

As dependent variables, we use three growth measures: growth of ordinary income ($OIGROWTH^{2012}_{2008}$), growth of net income ($NIGROWTH^{2012}_{2008}$), and growth of stock price ($RETURN^{2012}_{2008}$). $OIGROWTH^{2012}_{2008}$ ($NIGROWTH^{2012}_{2008}$) is calculated as the average value of the difference between current ordinary income (net income) and ordinary income (net income) in last fiscal year deflated by total sales in last fiscal year from FY 2008 to FY 2012. $RETURN^{2012}_{2008}$ is defined as average monthly buy and hold returns for sixty months from the beginning of FY 2008 to the end of FY 2012.

If aggressiveness of management forecasts (setting high goals by managers) drives growth of the firms, the coefficient of MFI^{*}_{2008} in model (2) (i.e., b_1) will be significantly positive.

Although we include industry dummy variables in model (1) and (2), we also conduct an alternative method for adjusting industry effects which deducts industry average value of each variable from each pre-adjusted variable in order to ensure robustness of the results. Prefix "*Adj*" in each variable denotes the industry-adjusted variable[7]. Using this alternative method, we estimate model (3) and model (4) as the first-stage regression and second-stage regression, respectively.

[7] For example, $AdjASSET^{2007}_{2003}$ is calculated as the difference between $ASSET^{2007}_{2003}$ and industry average value of ASSET.

$$AdjMFI_{2004}^{2008} = a + b_1 AdjASSET_{2003}^{2007} + b_2 AdjDEBT_{2003}^{2007} + b_3 AdjROA_{2003}^{2007} + b_4 AdjOIGROWTH_{2003}^{2007} + b_5 AdjPBR_{2003}^{2007} + b_6 AdjR\&D_{2003}^{2007} + b_7 AdjFOWN_{2003}^{2007} + \varepsilon_{2008} \quad (3)$$

$$AdjGROWTH_{2004}^{2008} = a + b_1 AdjMFI_{2008}^{*} + b_2 AdjASSET_{2003}^{2007} + b_3 AdjDEBT_{2003}^{2007} + b_4 AdjROA_{2003}^{2007} + b_5 AdjOIGROWTH_{2003}^{2007} + b_6 AdjPBR_{2003}^{2007} + b_7 AdjR\&D_{2003}^{2007} + b_8 AdjFOWN_{2003}^{2007} + \varepsilon_{2008} \quad (4)$$

$$AdjGROWTH_{2008}^{2012} \in \{AdjOIGROWTH_{2008}^{2012}, AdjNIGROWTH_{2008}^{2012}, AdjRETURN_{2008}^{2012}\}$$

In estimation of each model, we adjust standard errors by White's (1980) method.

3.2. Propensity Score Matching

As the other method to cope with the endogeneity of MFI_{2004}^{2008}, we use propensity score matching. Following Rosenbaum and Rubin [1983, p.41], propensity score "is the conditional probability of assignment to a particular treatment given a vector of observed covariates." When there are multiple covariates, propensity score matching is effective in order to avoid sample selection bias and endogeneity problem.

To compute propensity score, treatment variable has to be a binary variable. Our treatment variable (MFI_{2004}^{2008}), however, is a continuous variable. Therefore, we convert MFI_{2004}^{2008} to binary variable in order to calculate propensity score. First, we divide the sample into two groups on the basis of the extent of MFI_{2004}^{2008}. Specifically, observations whose values of MFI_{2004}^{2008} are in the top twenty-five percent of all are assigned to High MFI_{2004}^{2008} group and the other observations are assigned to Non-High MFI_{2004}^{2008} group. Second, we define a dummy variable ($MFI_{2008}^{25\%}$) whose value is 1 if an observation belongs to High MFI_{2004}^{2008} group and 0 otherwise. Thus, we use $MFI_{2008}^{25\%}$ as treatment variable in propensity score matching. We regard observations whose values of $MFI_{2008}^{25\%}$ are 1 as treatment group.

Probit regressions are run in order to specify control group matched with treatment group. In the probit regressions, a new treatment variable ($MFI_{2008}^{25\%}$) is regressed on several covariates that affect a firm's *MFI*. These covariates are already discussed above. Specifically, we estimate model (5) and (6).

$$\begin{aligned}\Pr(MFI_{2008}^{25\%} = 1) &= a + b_1 ASSET_{2003}^{2007} + b_2 DEBT_{2003}^{2007} + b_3 ROA_{2003}^{2007} \\ &+ b_4 OIGROWTH_{2003}^{2007} + b_5 PBR_{2003}^{2007} + b_6 R\&D_{2003}^{2007} + b_7 NONR\&D_{2003}^{2007} \\ &+ b_8 FOWN_{2003}^{2007} + \sum b_i Industry \\ &+ \varepsilon_{2008} \qquad (5)\end{aligned}$$

$$\begin{aligned}\Pr(AdjMFI_{2008}^{25\%} = 1) &= a + b_1 AdjASSET_{2003}^{2007} + b_2 AdjDEBT_{2003}^{2007} + b_3 AdjROA_{2003}^{2007} \\ &+ b_4 AdjOIGROWTH_{2003}^{2007} + b_5 AdjPBR_{2003}^{2007} + b_6 AdjR\&D_{2003}^{2007} \\ &+ b_7 AdjFOWN_{2003}^{2007} + \varepsilon_{2008} \qquad (6)\end{aligned}$$

Predicted probability of each observation estimated from model (5) and (6) is regarded as estimated value of propensity score. Based on these propensity score, we match treatment group with control group. As matching methods, we adopt 1 vs. 1 matching method, 1 vs. 3 matching method, and kernel matching method.

Using treatment group and control group, we perform univariate analysis and compare the average value of three future growth measures ($OIGROWTH_{2008}^{2012}$, $NIGROWTH_{2008}^{2012}$, and $RETURN_{2008}^{2012}$) between two groups.

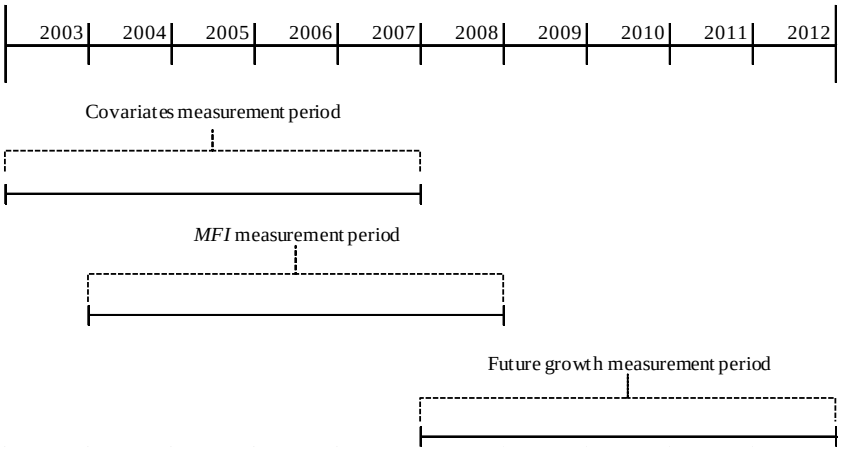
4. Sampling Procedures and Descriptive Statistics

4.1. Sampling Procedures

The empirical analysis is based on Japanese non-financial firms over the 2003 – 2012 period. We use both management forecast data from 2004 to 2008 and financial and

market data from 2003 to 2008 in order to measure aggressiveness of MFI_{2004}^{2008} (*ex ante* period). Furthermore, we use financial and market data from 2008 to 2012 in order to test our hypothesis (*ex post* period). Our analysis window is presented in Figure 2. The data is collected from Nikkei NEEDS Financial QUEST 2.0 provided by Nikkei Digital Media, Inc.

Figure 2: Analysis Window



Data is screened as follows (Table 1). First, the initial sample includes 12,825 firm-years (2,849 firms). Second, in order to measure *MFI*, we use three criteria: (1) management forecast data should be initial management forecast data, (2) both forecast earnings and actual earnings should be commonly based either on consolidated earnings or on non-consolidated earnings, (3) both current earnings and earnings in the last year should be commonly based either on consolidated earnings or on non-consolidated earnings. Then, with regard to *MFI* in *ex ante* period, we eliminate observations with *MFI* in the top and bottom 0.5 percent in each year. In the results, 11,938 firm-years (2,781 firms) remain as a sample with initial management forecast. Furthermore, we eliminate firms that do not have initial management forecasts in five consecutive years (i.e. in *ex ante* period). After this criterion, 9,595 firm-years (1,919 firms) remain. We also delete firms with insufficient data to calculate other variables and firms with

variables in the top and bottom 0.5 percent in each year.

Through this screening process, a final sample of 1,529 firms is generated.

Table 1: Sampling Procedures

		Observations	Firms
Calculation of *MFI*			
	Firms with management forecast of ordinary income	12,825	2,849
	Firms announcing their forecasts more than three months after the end of the fiscal year*	567	
	Both forecast earnings and actual earnings are not commonly based either on consolidated earnings or on non-consolidated earnings*	110	
	Both current earnings and earnings in the last year are not commonly based either on consolidated earnings or on non-consolidated earnings*	329	
	Eliminating outliers	127	
	Observations with initial management forecast	11,938	2,781
	Firms without *MFI* in five consecutive years	2,343	862
Firms with *MFI* in five consecutive years (*ex ante* period)			1,919
	Firms without data to calculate control variables in *ex ante* period		180
	Firms without data to calculate future growth variables in *ex post* period		210
Final sample			1,529

4.2. Descriptive Statistics

Although this study uses two alternative models (two-stage least squares regression and propensity score matching), we only show descriptive statistics of variables used in two-stage least squares regression model because almost all variables are common between two models. Also, since there are few differences between our variables and our industry adjusted variable, we only report descriptive statistics of non-industry adjusted variables. Table 2 indicates descriptive statistics. While the average value of MFI_{2004}^{2008} is 0.64%, the median value of MFI_{2004}^{2008} is 0.46%. This suggests there are some firms with relatively high MFI_{2004}^{2008}. Moreover, since the first quartile point of MFI_{2004}^{2008} (0.08%) is slightly positive, over seventy-five percent of our sample firms issue earnings growth forecasts.

The median values of the growth variables in *ex post* period used in the second-stage regression are all negative. The average value of $RETURN_{2008}^{2012}$ is also negative. This means Japan was in a tight economic environment in this period because the period

includes Lehman's fall (September in 2008), subsequent worldwide recessions, and the Great East Japan Earthquake (March 2011).

Table 3 reports correlation matrixes of variables used in first-stage regression (Panel A), second-stage regression (Panel B), and probit model in propensity score matching (Panel C). As you can see, there are high correlations among some variables. In order to cope with multicollinearity issues, we calculate VIF (variance inflation factor); the VIFs for all variables are under three. Because the VIFs are small and less than ten—the level suspected in the presence of multicollinearity—, it would appear that the effect of multicollinearity issues is negligible.

Table 2: Descriptive Statistics

First Stage Varialbles

	N	*Mean*	*S.D.*	*MIN*	*25 %*	*50 %*	*75%*	*MAX*
MFI^{2008}_{2004}	1,529	0.0064	0.0103	-0.0246	0.0008	0.0046	0.0099	0.0882
$ASSET^{2007}_{2003}$	1,529	10.8974	1.4113	7.9665	9.8668	10.7005	11.7216	15.5893
$DEBT^{2007}_{2003}$	1,529	0.1368	0.1523	0.0000	0.0000	0.0834	0.2366	0.6206
ROA^{2007}_{2003}	1,529	0.0496	0.0347	-0.0506	0.0264	0.0433	0.0682	0.1944
$OIGROWTH^{2007}_{2003}$	1,529	0.0095	0.0146	-0.0326	0.0009	0.0060	0.0142	0.1125
PBR^{2007}_{2003}	1,529	1.3161	0.8097	0.3379	0.7736	1.1042	1.6204	7.0936
$R\&D^{2007}_{2003}$	1,529	0.0156	0.0219	0.0000	0.0000	0.0070	0.0234	0.1589
$NONR\&D^{2007}_{2003}$	1,529	0.2577	0.4375	0.0000	0.0000	0.0000	1.0000	1.0000
$FOWN^{2007}_{2003}$	1,529	0.0782	0.0871	0.0000	0.0123	0.0461	0.1142	0.4401

Second Stage Varialbles

	N	*Mean*	*S.D.*	*MIN*	*25 %*	*50 %*	*75%*	*MAX*
MFI^{*}_{2008}	1,529	0.0000	0.0086	-0.0306	-0.0044	-0.0004	0.0037	0.0685
$OIGROWTH^{2012}_{2008}$	1,529	0.0000	0.0106	-0.0451	-0.0045	-0.0003	0.0038	0.1226
$NIGROWTH^{2012}_{2008}$	1,529	0.0010	0.0125	-0.0511	-0.0030	-0.0001	0.0033	0.1803
$RETURN^{2012}_{2008}$	1,529	-0.0023	0.0081	-0.0214	-0.0074	-0.0033	0.0012	0.0506

Table 3: Correlation Matrices

Panel A: Two-Stage Least Squares Regression Model First Stage

		a	b	c	d	e	f	g	h	i
a	MFI^{2008}_{2004}	1	-0.1586	-0.015	-0.0732	0.1085	0.2578	0.1493	-0.0791	0.0291
b	$ASSET^{2007}_{2003}$	-0.1752	1	0.1433	0.0936	0.1382	0.3237	0.1907	-0.1676	0.6652
c	$DEBT^{2007}_{2003}$	-0.0383	0.1889	1	-0.3343	0.0328	0.2121	-0.1447	0.0978	-0.1805
d	ROA^{2007}_{2003}	-0.1164	0.0665	-0.3121	1	0.3531	0.4108	0.1604	-0.024	0.4162
e	$OIGROWTH^{2007}_{2003}$	0.1213	0.1023	-0.0141	0.3436	1	0.3698	0.3157	-0.174	0.2688
f	PBR^{2007}_{2003}	0.2573	0.2551	0.2021	0.3607	0.3472	1	0.1945	-0.073	0.3818
g	$R\&D^{2007}_{2003}$	0.1147	0.1632	-0.1792	0.1808	0.2728	0.1407	1	-0.7641	0.3083
h	$NONR\&D^{2007}_{2003}$	-0.0481	-0.1643	0.1192	-0.0052	-0.1576	-0.0162	-0.4208	1	-0.207
i	$FOWN^{2007}_{2003}$	0.0259	0.6271	-0.1422	0.3956	0.2496	0.3195	0.3185	-0.1763	1

Pearson (Spearman) correlations are reported below (above) the diagonal.

Panel B: Two-Stage Least Squares Regression Model Second Stage

		a	b	c	d	e	f	g	h	i	j	k
a	$OIGROWTH^{2012}_{2008}$	1	0.799	0.542	0.101	-0.098	0.045	-0.218	-0.227	-0.079	-0.057	0.044
b	$NIGROWTH^{2012}_{2008}$	0.705	1	0.432	0.075	-0.107	0.031	-0.18	-0.161	-0.101	-0.008	0.024
c	$RETURN^{2012}_{2008}$	0.464	0.34	1	0.09	-0.048	0.085	-0.11	-0.093	-0.019	0.017	-0.033
d	MFI^{*}_{2008}	0.159	0.119	0.125	1	0.069	0.032	0.039	-7E-04	0.078	0.032	-0.022
e	$ASSET^{2007}_{2003}$	-0.129	-0.144	-0.09	0	1	0.143	0.094	0.138	0.324	0.191	-0.168
f	$DEBT^{2007}_{2003}$	-0.016	-0.035	0.083	0	0.189	1	-0.334	0.033	0.212	-0.145	0.098
g	ROA^{2007}_{2003}	-0.215	-0.18	-0.138	0	0.067	-0.312	1	0.353	0.411	0.16	-0.024
h	$OIGROWTH^{2007}_{2003}$	-0.136	-0.02	-0.09	0	0.102	-0.014	0.344	1	0.37	0.316	-0.174
i	PBR^{2007}_{2003}	-0.068	-0.069	-0.026	0	0.255	0.202	0.361	0.347	1	0.195	-0.073
j	$R\&D^{2007}_{2003}$	0.004	0.021	0.004	0	0.163	-0.179	0.181	0.273	0.141	1	-0.764
k	$NONR\&D^{2007}_{2003}$	0.01	-0.005	-0.04	0	-0.164	0.119	-0.005	-0.158	-0.016	-0.421	1
l	$FOWN^{2007}_{2003}$	-0.096	-0.079	-0.087	0	0.627	-0.142	0.396	0.25	0.32	0.319	-0.176

Pearson (Spearman) correlations are reported below (above) the diagonal.

Panel C: Propensity Score Matching (Probit Model)

		a	b	c	d	e	f	g	h	i
a	$MFI^{25\%}_{2008}$	1	-0.1827	-0.0384	-0.0558	0.1126	0.2126	0.1152	-0.0706	0.0138
b	$ASSET^{2007}_{2003}$	-0.1758	1	0.1433	0.0936	0.1382	0.3237	0.1907	-0.1676	0.6652
c	$DEBT^{2007}_{2003}$	-0.0579	0.1889	1	-0.3343	0.0328	0.2121	-0.1447	0.0978	-0.1805
d	ROA^{2007}_{2003}	-0.0235	0.0665	-0.3121	1	0.3531	0.4108	0.1604	-0.024	0.4162
e	$OIGROWTH^{2007}_{2003}$	0.1692	0.1023	-0.0141	0.3436	1	0.3698	0.3157	-0.174	0.2688
f	PBR^{2007}_{2003}	0.2595	0.2551	0.2021	0.3607	0.3472	1	0.1945	-0.073	0.3818
g	$R\&D^{2007}_{2003}$	0.1385	0.1632	-0.1792	0.1808	0.2728	0.1407	1	-0.7641	0.3083
h	$NONR\&D^{2007}_{2003}$	-0.0706	-0.1643	0.1192	-0.0052	-0.1576	-0.0162	-0.4208	1	-0.207
i	$FOWN^{2007}_{2003}$	0.0469	0.6271	-0.1422	0.3956	0.2496	0.3195	0.3185	-0.1763	1

Pearson (Spearman) correlations are reported below (above) the diagonal.

5. Primary Results

5.1. Results of Two-Stage Least Squares

Table 3: Results of Two Stage Ordinary Least Square Regression

Panel A：Model with Industry Dummies

	First_Stage	Model1	Model2	Model3
Dependent Variable	MFI^{2008}_{2004}	$OIGROWTH^{2012}_{2008}$	$NIGROWTH^{2012}_{2008}$	$RETURN^{2012}_{2008}$
Cons	0.0372	0.0152	0.0218	0.0064
	[10.41]***	[4.11]***	[3.91]***	[2.55]**
MFI^{*}_{2008}		0.1974	0.1739	0.1191
		[4.57]***	[4.51]***	[4.85]***
$ASSET^{2007}_{2003}$	-0.0026	-0.0011	-0.0015	-0.0008
	[-10.19]***	[-3.51]***	[-4.12]***	[-4.07]***
$DEBT^{2007}_{2003}$	-0.0084	-0.0029	-0.0042	0.0085
	[-4.29]***	[-1.33]	[-1.52]	[4.82]***
ROA^{2007}_{2003}	-0.1348	-0.0801	-0.0924	-0.0168
	[-9.38]***	[-5.83]***	[-5.15]***	[-1.96]*
$OIGROWTH^{2007}_{2003}$	0.0823	-0.0759	0.0168	-0.0417
	[2.98]***	[-1.96]**	[0.42]	[-2.17]**
PBR^{2007}_{2003}	0.0050	0.0009	0.0003	0.0001
	[9.83]***	[2.08]**	[0.64]	[0.31]
$R\&D^{2007}_{2003}$	0.0543	0.0101	-0.0015	0.0069
	[3.05]***	[0.43]	[-0.06]	[0.49]
$NOR\&D^{2007}_{2003}$	-0.0019	0.0011	0.0006	0.0007
	[-1.92]*	[1.52]	[0.73]	[0.95]
$FOWN^{2007}_{2003}$	0.0278	0.0096	0.0130	0.0042
	[6.34]***	[1.73]*	[2.04]**	[1.28]
Industry	Yes	Yes	Yes	Yes
Adj R^2	0.2927	0.1327	0.0918	0.0980
N	1,529	1,529	1,529	1,529

* p<0.1, ** p<0.05, *** p<0.01

PanelB：Models Adjusted by Industry

	First_Stage	Model1	Model2	Model3
Dependent Variable	$AdjMFI^{2008}_{2004}$	$AdjOIGROWTH^{2012}_{2008}$	$AdjNIGROWTH^{2012}_{2008}$	$AdjRETURN^{2012}_{2008}$
Cons	-0.0011	-0.0006	-0.0005	-0.0002
	[-4.43]***	[-2.34]**	[-1.56]	[-1.05]
$AdjMFI^{*}_{2008}$		0.2087	0.1825	0.1197
		[4.79]***	[4.81]***	[4.99]***
$AdjASSET^{2007}_{2003}$	-0.0026	-0.0012	-0.0015	-0.0008
	[-10.15]***	[-3.74]***	[-4.16]***	[-4.21]***
$AdjDEBT^{2007}_{2003}$	-0.0085	-0.0028	-0.0041	0.0084
	[-4.25]***	[-1.26]	[-1.49]	[4.81]***
$AdjROA^{2007}_{2003}$	-0.1360	-0.0815	-0.0933	-0.0172
	[-9.55]***	[-5.99]***	[-5.29]***	[-2.01]**
$AdjOIGROWTH^{2007}_{2003}$	0.0823	-0.0764	0.0154	-0.0408
	[2.99]***	[-1.99]**	[0.39]	[-2.12]**
$AdjPBR^{2007}_{2003}$	0.0050	0.0009	0.0004	0.0001
	[9.96]***	[2.02]**	[0.67]	[0.27]
$AdjR\&D^{2007}_{2003}$	0.0605	0.0131	0.0003	0.0061
	[3.36]***	[0.56]	[0.01]	[0.43]
$AdjFOWN^{2007}_{2003}$	0.0278	0.0098	0.0129	0.0042
	[6.35]***	[1.78]*	[2.06]**	[1.30]
Adj R^2	0.2339	0.1024	0.0719	0.0588
N	1,529	1,529	1,529	1,529

* p<0.1, ** p<0.05, *** p<0.01

Table 3 indicates results of two-stage least squares. In Table 3, Panel A presents estimation results of model (1) and model (2). The second row from the left in Panel A shows the estimation result of first-stage OLS regression, model (1). From the Panel, it is evident that all of the coefficients of control variables are statistically significant. The third, fourth, and fifth rows from the left in Panel A presents estimation results of two-stage regressions in which $OIGROWTH_{2008}^{2012}$, $NIGROWTH_{2008}^{2012}$, and $RETURN_{2008}^{2012}$ in *ex post* period are regressed on MFI_{2008}^{*} and other control variables in ex *ante* period. With regard to the coefficients of MFI_{2008}^{*}, all of them are positive and statistically significant. This means aggressiveness of management forecasts in ex *ante* period could affect firm growth in *ex post* even when the endogeneity of MFI_{2004}^{2008} is are under control.

Panel B of Table 3 shows the estimation results of model (3) and (4) in which industry adjusted variables are used instead of industry dummy variables. These estimation results are consistent with the results presented in Panel A of Table 3.

The results indicated in Table 3 are consistent with our hypothesis that aggressiveness of management forecasts (i.e., stretch goals) drives future growth of the firms.

5.2. Results of Propensity Score Matching

5.2.1. Covariates in *Ex Ante* Period

Table 4 shows the results of probit estimations in which high MFI_{2004}^{2008} dummies ($MFI_{2008}^{25\%}$, $AdjMFI_{2008}^{25\%}$) in *ex ante* period are regressed on contemporary covariates. From the Table, in both model (5) and (6), All of our covariates are significantly relete to high MFI_{2004}^{2008} dummies.

Based on the propensity scores estimated from model (5) and (6), we match treatment group (high MFI_{2004}^{2008} dummy is equal to one) with control group derived from full sample except treatment group. Although we use theree matching methods (1 vs. 1 matcing, 1 vs. 3 matching, and kernel matching) in our research, we only present results using 1 vs. 3 matching in order to save space. However, the results remain unchanged even when we use 1vs. 1 matching and kernel matching.

Table 4: Results of Probit Estimation

Model (5)	Dependent Variable: $MFI^{25\%}_{2008}$		Model (6)	Dependent Variable: $AdjMFI^{25\%}_{2008}$	
	Coefficients	[z-stat]		Coefficients	[z-stat]
Cons	4.0887	[8.37]***	Cons	-0.7090	[-18.52]***
$ASSET^{2007}_{2003}$	-0.4834	[-10.68]***	$AdjASSET^{2007}_{2003}$	-0.4443	[-10.62]***
$DEBT^{2007}_{2003}$	-1.2877	[-3.61]***	$AdjDEBT^{2007}_{2003}$	-1.0001	[-3.01]***
ROA^{2007}_{2003}	-15.6330	[-9.84]***	$AdjROA^{2007}_{2003}$	-15.3618	[-10.00]***
$OIGROWTH^{2007}_{2003}$	12.2899	[3.90]***	$AdjOIGROWTH^{2007}_{2003}$	9.6408	[3.11]***
PBR^{2007}_{2003}	0.7336	[10.55]***	$AdjPBR^{2007}_{2003}$	0.7400	[10.98]***
$R\&D^{2007}_{2003}$	7.3549	[2.69]***	$AdjR\&D^{2007}_{2003}$	8.4099	[3.19]***
$NONR\&D^{2007}_{2003}$	-0.3592	[-2.44]**			
$FOWN^{2007}_{2003}$	4.5897	[6.57]***	$AdjFOWN^{2007}_{2003}$	4.4828	[6.61]***
Industry	Yes				
Pseudo R^2		0.2447	Pseudo R^2		0.1735
ROC Statistics		0.8261	ROC Statistics		0.7719
N		1,515	N		1,529

* p<0.1, ** p<0.05, *** p<0.01

In table 5, Panel A and Panel B indicate the results of univariate tests about the covariates in *ex ante* period between treatment group and control group. In the Table, "Unmatched" means comparisons between treatment group and full sample except treatment group. On the other hand, "ATT" in the Table means avearge treatment effect for treated and shows the results of comparisons between treatment group and (matched) control group. As we can see, there are no significant differences between treatment group and control group. This means treatment group issues such management forecasts in *ex ante* period as cause higher *MFI* in *ex ante* period than those of control group despite no significant differences in determinants of *MFI* in *ex ante* period between two groups.

Table 5: Results of Covariates

Panel A：Model with Industry Dummies

Covariates	Sample	Treated	Controls	Difference	S.E.	t-stat	
$ASSET^{2007}_{2003}$	Unmatched	10.4676	11.0122	-0.5446	0.0809	-6.73	***
	ATT	10.4676	10.4896	-0.0220	0.1221	-0.18	
$DEBT^{2007}_{2003}$	Unmatched	0.1216	0.1383	-0.0167	0.0088	-1.89	*
	ATT	0.1216	0.1322	-0.0107	0.0130	-0.82	
ROA^{2007}_{2003}	Unmatched	0.0482	0.0503	-0.0020	0.0021	-1.00	
	ATT	0.0482	0.0490	-0.0007	0.0032	-0.23	
$OIGROWTH^{2007}_{2003}$	Unmatched	0.0138	0.0081	0.0056	0.0009	6.58	***
	ATT	0.0138	0.0148	-0.0010	0.0015	-0.70	
PBR^{2007}_{2003}	Unmatched	1.6801	1.1952	0.4849	0.0464	10.44	***
	ATT	1.6801	1.6579	0.0222	0.0806	0.27	
$R\&D^{2007}_{2003}$	Unmatched	0.0209	0.0140	0.0069	0.0013	5.36	***
	ATT	0.0209	0.0210	-0.0001	0.0021	-0.05	
$NONR\&D^{2007}_{2003}$	Unmatched	0.2042	0.2780	-0.0738	0.0259	-2.85	***
	ATT	0.2042	0.1946	0.0096	0.0368	0.26	
$FOWN^{2007}_{2003}$	Unmatched	0.0853	0.0759	0.0093	0.0052	1.81	*
	ATT	0.0853	0.0844	0.0008	0.0086	0.09	

Panel B：Models Adjusted by Industry

Covariates	Sample	Treated	Controls	Difference	S.E.	t-stat	
$AdjASSET^{2007}_{2003}$	Unmatched	-0.2310	0.2356	-0.4667	0.0783	-5.96	***
	ATT	-0.2310	-0.2286	-0.0025	0.1101	-0.02	
$AdjDEBT^{2007}_{2003}$	Unmatched	0.0026	-0.0045	0.0070	0.0082	0.85	
	ATT	0.0026	0.0013	0.0013	0.0113	0.12	
$AdjROA^{2007}_{2003}$	Unmatched	-0.0035	0.0031	-0.0066	0.0020	-3.38	***
	ATT	-0.0035	-0.0002	-0.0034	0.0029	-1.16	
$AdjOIGROWTH^{2007}_{2003}$	Unmatched	0.0030	-0.0007	0.0038	0.0008	4.89	***
	ATT	0.0030	0.0036	-0.0006	0.0012	-0.49	
$AdjPBR^{2007}_{2003}$	Unmatched	0.3005	-0.1242	0.4247	0.0449	9.46	***
	ATT	0.3005	0.3215	-0.0210	0.0727	-0.29	
$AdjR\&D^{2007}_{2003}$	Unmatched	0.0022	-0.0005	0.0027	0.0009	3.15	***
	ATT	0.0022	0.0017	0.0006	0.0013	0.45	
$AdjFOWN^{2007}_{2003}$	Unmatched	0.0067	0.0035	0.0032	0.0049	0.65	
	ATT	0.0067	0.0060	0.0007	0.0075	0.09	

5.2.2. Results of *Ex Post* Growth

In Table6, both Panel A and Panel B compare future growth (earnings growth and stock growth) of the firms between treatment group and control group. On the basis of estimation results of model (5), Panel A indicates the growth of ordinary income ($OIGROWTH^{2012}_{2008}$) and that of share price ($RETURN^{2012}_{2008}$) in treatment group are

significantly higher than those of control group. On the other hand, with regard to the growth of net income ($NIGROWTH_{2008}^{2012}$,), the growth of treatment group is insignificantly higher than that of control group. This might be because uncontrollable factors for firms, such as firm-specific exogenous shocks recognized in extraordinary items, affect net income.

Panel B of the Table compares *ex post* growth of the firms between treatment group and control group based on estimation results of model (6). From the Panel, All of the differences between treatment group and control group are statistically significant. These results indicate future growth of the firms measured by ordinary income, net income, and stock return in treatment group is significantly higher than those of control group.

To summarize, Table 6 generally shows higher goal setting by managers through management forecasts drives future growth of those firms. This finding supports our hypothesis.

Table 6: Results of Future Growth Analysis

Panel A：Model with Industry Dummies

Dependent Variables	Sample	Treated	Controls	Difference	S.E.	t-stat	
$OIGROWTH_{2008}^{2012}$	Unmatched	0.0026	-0.0007	0.0033	0.0006	5.35	***
	ATT	0.0026	0.0001	0.0026	0.0010	2.49	**
$NIGROWTH_{2008}^{2012}$	Unmatched	0.0040	0.0001	0.0039	0.0007	5.40	***
	ATT	0.0040	0.0023	0.0018	0.0013	1.36	
$RETURN_{2008}^{2012}$	Unmatched	-0.0005	-0.0028	0.0024	0.0005	4.92	***
	ATT	-0.0005	-0.0034	0.0029	0.0007	3.92	***

Panel B：Models Adjusted by Industry

Dependent Variables	Sample	Treated	Controls	Difference	S.E.	t-stat	
$AdjOIGROWTH_{2008}^{2012}$	Unmatched	0.0019	-0.0018	0.0037	0.0006	6.01	***
	ATT	0.0019	-0.0021	0.0040	0.0009	4.26	***
$AdjNIGROWTH_{2008}^{2012}$	Unmatched	0.0017	-0.0016	0.0033	0.0007	4.58	***
	ATT	0.0017	-0.0016	0.0034	0.0010	3.42	***
$AdjRETURN_{2008}^{2012}$	Unmatched	0.0013	-0.0009	0.0023	0.0005	4.85	***
	ATT	0.0013	-0.0011	0.0024	0.0007	3.61	***

5.2.3. **Time-series Comparisons of Management Forecasts between High and Non-High MFI Groups**

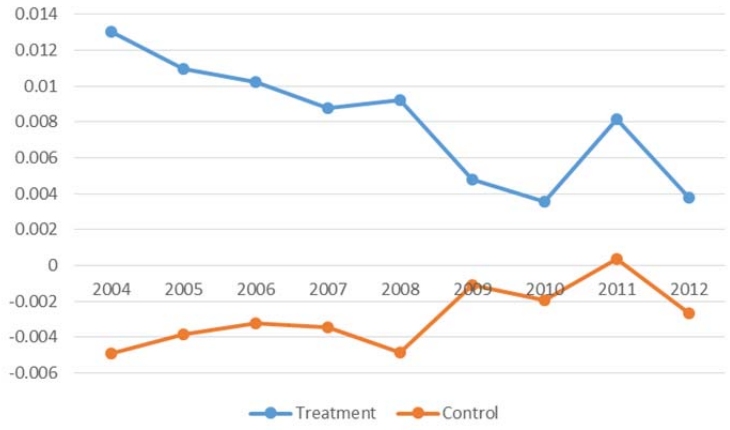
As stated above, we find that aggressiveness of management forecasts drives future growth of the firms. In this section, we also draw a comparison in time-series characteristics of management forecasts between High *MFI* group (treatment group) and Non-High *MFI* group (control group). Panel A and Panel B in Figure 3 indicate the results of time-series comparisons of management forecast innovation, defined as the difference between initial management forecasts in the current fiscal year and actual earnings in the last fiscal year deflated by total assets at the end of the last fiscal year, and time-series comparisons of management forecast errors (*MFE*), defined as the difference between initial management forecasts in the current fiscal year and actual earnings in the current fiscal year deflated by total assets at the end of the last fiscal year. To cope with industry effects on *MFI* and *MFE*, we deduct industry-year average values of *MFI* and *MFE* from raw values of *MFI* and *MFE*. Then, we plot average values of our treatment group and control group with respect to each year.

From Panel A, it is evident that average values of *MFI* in our treatment group are always higher than those of our control group. On the other hand, from Panel B, it is also evident that average values of *MFE* in our treatment group are always lower than those of our control group and negative values. These results mean firms that issued aggressive (conservative) management forecasts continuously in *ex ante* period, on average, tend to issue aggressive (conservative) forecasts in *ex post* period. It is also found that while the aggressive forecasting firms missed their forecast largely in *ex ante* period, these forecast errors tend to decrease in *ex post* period despite still issuing aggressive forecasts in this period. This might suggest that over-extension strategies by these firms are bearing fruit[8].

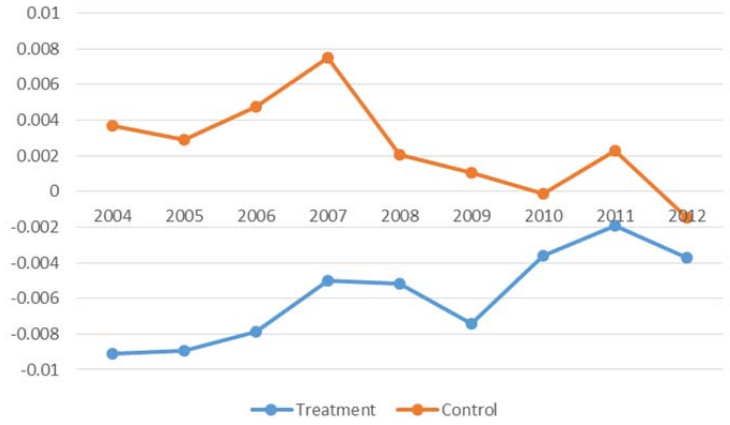
[8] Of course, it might be possible that decrease in *MFI* in *ex post* period leads to this result.

Figure 3: Time-series Comparisons of Characteristics of Management Forecasts between High and Non-High MFI Groups

Panel A: Time-series Comparisons of Management Forecast Innovations



Panel B: Time-series Comparisons of Management Forecast Errors



6. Conclusion

In this paper, we develop our hypothesis based on knowledge from goal setting theory and over-extension strategy and test the hypothesis that firms which issued aggressive management forecasts continuously in *ex ante* period grow higher in *ex post* period than firms that issued non-aggressive management forecasts. From our analyses, we find *ex ante MFI* is positively related to *ex post* firm growth after controlling the endogeneity of *MFI* via two-stage least squares regression and propensity score matching. In particular, firms that issue aggressive management forecasts continuously

achieve higher growth of earnings and stock price in the future than firms that have similar fundamentals but issuing non-aggressive management forecasts.

Recently, managerial myopia associated with management forecast disclosure has gotten increased attention around the world. Particularly, there are some criticisms that management forecast disclosure encourages short-termism of management (CFA Institute, 2006; U.S. Chamber of Commerce, 2007). Based on the findings in prior Literature (Houston et al., 2011), however, it is not always supported that there is a relation between management forecast disclosure and managerial myopia. Especially, in Japan where management forecasts are effectively mandated, this study suggests there is a possibility that managers could prompt accumulation of intangible assets and achieve sustained growth of the firms by utilizing management forecasts efficiently. In other words, we indicate management forecast disclosure issued by such a manager might have a potential to encourage “long-termism” of management.

This study, of course, has several limitations. First, our analysis might suffer from survivor bias since we use firms with data in ten consecutive years. In our tests, although we try to mitigate the effect of the bias by using propensity score matching, we cannot fully eliminate the impact on our results. In that sense, we need shorter window analysis.

Moreover, prior literature in goal setting theory finds when a goal is too high to achieve, an outcome becomes low because of decrease in self-efficacy. In our context, there is a possibility that employees’ self-efficacy might decrease because firms that issue aggressive forecasts continuously are less likely to meet or beat their forecasts. Although we eliminate observations with *MFI* in the top and bottom 0.5% in each year as outliers, this procedure might not completely delete firms with extremely high goals. We might have to conduct some sensitivity analyses eliminating firms that miss their forecast continuously or have extremely large forecast errors. These points should be checked in the future research.

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