Management Forecast Bias and Corporate Social Responsibility Awareness:

Evidence from Japan

**Abstract**

This study examines the influence of corporate social responsibility (CSR) awareness, measured by corporate social performance (CSP), on management earnings forecasts and estimated implied cost of equity (ICE) capital in the context of Japanese listed firms in the period 2007-2015. The empirical results demonstrate that CSP mitigates optimistic forecasts and enhances forecast accuracy after controlling the firm size effect on CSP. Considering the possibility of excess conservatism in management forecasts to avoid negative public reaction to downward forecast revisions, we investigate the effects of CSP on ICE for upward and downward forecast biased firms, respectively, and find that among the downward forecast bias group, some firms implement excess conservatism in their earnings forecasts. Thus, excess conservatism may be a possible bias in management earnings forecasts peculiar to the Japanese disclosure system.

Keywords: Corporate Social Responsibility, Management Forecast, Implied Cost of Equity

## 1. Introduction

Whether or not the implied cost of equity or the internal cost of capital can successfully capture variations in expected rates of return has been a growing topic among researchers. Many studies of US firms have been concerned with the estimation of the implied cost of equity using analyst short-term and long-term earnings forecasts; however, their empirical results have been mixed (Guay et al., 2011). For example, Kang and Sadka (2015) find a negative relation between analyst forecasts and realized future returns and suggest that analyst forecasts are generally systematically optimistic earnings forecasts.

In the case of Japanese firms, managers of listed companies are requested to disclose management forecasts for one-year financial performance data, such as net income and sales, in their financial reports to the stock exchange. Most listed companies actually publish management forecasts for the next fiscal year when they disclose their annual financial statements. This is one of the unique points of Japanese financial disclosure. Thus, such managers may be more careful or conservative than analysts in predicting future returns because they have to be accountable for the disclosed figures. Accordingly, management earnings forecasts for net income are available as proxies of the internal cost of equity for Japanese companies. The accuracy of such forecasts can be seen by analysts as honest reflections of the beliefs of managers as presented to their shareholders.

Gu, Kubota, and Takehara (2017) find that at firms with higher corporate social performance (CSP), the measurement of corporate social responsibility awareness, accounting earnings are less managed in terms of accrual and real-activity based strategies. Their study indicates that corporate social responsibility (CSR) activities may improve the earnings quality of Japanese firms and CSR conscious firms are likely to gain investors' confidence. Suto and Takehara (2016a) find a negative relationship between the cost of equity and CSP in the Japanese firms' context, based on the conditional version of the Fama and French three-factor model (Fama and French, 1997). The result suggests that CSP may negatively influence the internal rate of return of the firm or implied cost of equity. According to these prior studies, an interesting research question is whether or not a firm's CSR awareness can restrain management forecast optimism and enhance management forecast accuracy as a proxy of the internal rate of return.

The purpose of this study is twofold; to investigate the influence of CSR awareness on a firm's estimated implied cost of equity in the context of the listed Japanese firms, and to explore the linkage between CSR awareness and the quality of management earnings forecasts as a proxy for the internal rate of return. In this study, we estimate the internal cost of capital based on the residual income valuation model in Frankel and Lee (1998). Then, we identify the accuracy of the management forecast of net income in the following fiscal year and management behavioral bias from discretional forecasting. With respect to the accuracy of the forecast, we analyze the link between any forecast error found at the end of the fiscal year and the CSP of the firm reported in the

middle of the fiscal year. An increase in management forecast accuracy could contribute to mitigating information asymmetry between managers and shareholders regarding future cash flow, and to improving the firm's valuation in the market. From a longer-term view, CSR awareness could encourage management to avoid opportunistic behavior so as to build confidence among investors in the sustainable development or long-term success of the firm. Therefore, we analyze the link between optimistic bias of management forecasts (forecast net income > realized net income) and CSP.

The empirical results show that CSP mitigates both forecast errors and optimistic bias in terms of net income. The results, from firm size controlled sub-samples, suggest that CSP can reduce implied cost of equity in firm size groups. Considering the possibility of firms' implementing discretional downward forecast bias to avoid negative assessments of management, we divide the sample into two groups (upward forecast bias and downward forecast bias firms) and find that excess conservative bias may be a notable forecast earnings bias in the context of Japanese listed firms.

This rest of this paper is organized as follows. In Section 2, prior research on CSP and its background, management forecasting, and the implied cost of equity are discussed. Section 3 develops hypotheses for CSP and the implied cost of equity and for CSP and management forecast biases. In Section 4, after explaining our methodology and data in the empirical analyses, regression models and estimated results are presented. Section 5 sums up the empirical results and discusses implications and future research topics.

## 2. Prior research and basic concepts

### 2.1 Corporate social responsibility and risk premium

CSR can be narrow or broad in scope in the management of social issues by corporations. According to McWilliams et al. (2006), *CSR activities have been posited to include incorporating social characteristics or features into products* and *manufacturing processes* (p.2). Many prior studies have discussed and examined whether CSR aware firms explore business opportunities, improve organizational efficiency, build the trust of stakeholders, and are rewarded for meeting the expectations of shareholders by enhancing long-term market value of the corporation. In the years of discussion and examination of CSR, it has generally become a core concept in corporate management. In this study, we narrowly define CSR practices as the corporate strategy for sustainability and long-term success of the firm in society.

The current importance and ubiquity of CSR imply that firms now measure the extent to which in their business strategy they practically handle such responsibility for stakeholders. Thus, CSP is taken as a measure of firm CSR awareness. Wood (1991) defines CSP as *a business organization's configuration of principles of social responsibility, processes of social responsiveness, and policies, programs and observable outcomes as they relate to the firm's social relationships* (p. 693). There is

a good deal of empirical research that examines the relationship between CSP and corporate financial performance (CFP), focusing on conceptualizing, specifying, and testing this link (e.g., Cochran and Wood, 1984; Graves and Waddock, 1994; Russo and Fouts, 1997).

Empirically, numerous studies examine the association between CSP and profitability and the results are inconclusive, but many prior studies do confirm the risk reduction aspect of CSP (Orlitzky et al., 2003; Van Beurden and Gossling, 2008). Recently, a number of studies have focused on the financial market's perception of CSR in the determination of risk premium, and many of them find a negative relation between CSP and idiosyncratic risk (Boutin-Dufresne and Savaria, 2004; Girerd-Potin et al., 2014; Mishra and Modi, 2013). Theoretically, CSR could influence the risk premium in the market and the cost of equity through several channels: reduction of uncertainty of future business development or business risk, mitigating information asymmetry between managers and shareholders, and lowering financial constraints (e.g., difficulties accessing external financing), or friction in the financial market by enhancing trust in management. Responsible firm actions in society could reduce uncertainty about the firm's future cash flow in responding to changes in social demands and emerging new business opportunities in society in the long run.

There are many empirical studies that focus on CSP and risk premiums using US firm data. El Ghoul et al. (2011) demonstrate a negative relationship between a firm's CSP and its implied equity risk premium calculated using four different models. Gregory et al. (2014) explore the risk reducing effects of CSR and their implications for financial performance and show that CSR performance is associated with better long-term growth and lower cost of equity. Dhaliwal et al. (2011) examine the benefits of the voluntary disclosure of CSR practices using several different models of implied cost of equity, while Dhaliwal et al. (2012) find that the issuance of standalone CSR reports is associated with lower analyst forecast error. More recently, Ioannou and Serafeim (2015) find a positive impact of CSR on sell-side analyst recommendations. Chen et al. (2014) investigate whether CSR activities alleviate financial constraints or friction in the market by enhancing investor trust in the management of the firm and find that stakeholder engagement has been shown to limit the likelihood of short-term opportunistic behavior.

In the context of Japanese firms, in the period 2007-2013, Suto and Takehara (2016a) find that firm CSP metrics are significantly negatively related to most risk measures, including those that are market-based and accounting-based. With respect to CSP dimensions, it is remarkable that environment and social contributions show a strong negative relationship with market-based risk. Suto and Takehara (2017) investigate the influence of CSP on cost of equity and find that institutional ownership, which is widely defined as non-individual investors, influences on the relation between CSP and cost of equity and reduces the cost of equity by using CSP as information.

The firm's corporate management awareness of the CSR strategy could be a key determinant of

voluntary non-financial disclosure, which could influence the cost of capital of the firm. Suto and Takehara (2016b) investigate differences in CFP between the respondents and non-respondents of a CSR survey conducted by Toyo Keizai Inc. among listed Japanese firms. They found that there were statistically significant differences in CFP and stock ownership structure between the respondents and non-respondents. They assumed that the respondents are more aware about CSR than the non-respondents and found the non-respondent firms had lower profitability and higher risks, and less institutional ownership than the responding firms. They further estimated the CSP of non-respondents under certain assumptions of CSP-CFP relations and confirmed that the CSP of non-respondents could be much lower than that of respondents. These findings suggest that the non-respondents with lower corporate performance may have been indifferent to societal changes or may have intentionally hidden their low CSP.

Thus, CSP could motivate managerial behavior from the long-term perspective of corporate valuation. If so, the more CSR aware the corporate managers are, the more averse they may be to opportunistic disclosure or to supplying biased information to the market in the short-term.

## 2.2 Management forecast and internal rate of return

Many studies examining US firm data find that analyst forecasts are biased as a proxy of implied cost of equity. Kang and Sadka (2015) investigate whether analyst forecasts at the firm level have a negative association with realized returns. The study suggests that analysts tend to have an optimistic bias. Their study also provides evidence that market participants do not efficiently assess analysts' biases of firms with a high internal cost of capital and they caution against using analyst forecasts as a proxy for cost of equity. Guay et al. (2011) examine predictable error in implied cost of equity estimates resulting from analyst forecasts that are sluggish with respect to information in past stock returns.

In the US, management earnings forecast disclosure is voluntary. There is a large amount of prior research on the information value of management forecasts on stock prices and corporate valuations. Some studies are concerned with management optimism in earnings forecasts; and, the empirical results of these are inconclusive. Koch (2002) finds that optimism tends to relate to firms' financial distress, however, Frankel et al. (1995) find no optimistic bias of management forecasts before disclosure.

In contrast, Japanese companies listed on a stock exchange are required to disclose management forecasts of financial performance data of the next fiscal year, or the mid-year financial results in the prompt report of the financial statement at the end of each term report, in terms of sales, operating profits, net income, and dividends. In each quarterly report, the realized financial performance for the previous quarter is also disclosed. Moreover, a company is required to disclose by Company Law any important revision of a management forecast. Thus, the mandatory provision of management

earnings forecasts is a unique feature of Japan's financial disclosure system (Ota, 2006).

As Japanese corporate managers are exposed to reputational risk from their forecast errors, management forecasts from listed Japanese companies may be considered more reliable than that of their US counterparts in terms of building investor confidence over the long run. On the other hand, they may tend to portray an optimistic bias in their earnings forecasts or profitable operation in the short run, especially when in financial distress.

As a research topic, it is of interest for external analysts to analyze the informational value of the management earnings forecast as a proxy of the internal rate of return, especially for investors in the capital market. If the management forecast is reliable, investors could use it as a proxy for the cost of equity in firm valuations. On the other hand, if the management forecast were opportunistically biased, it would amplify the uncertainty of the firm valuation and increase the risk investors face.

In the context of Japanese firms, Muramiya (2005) finds a negative relation between the accuracy of the management earnings forecast and the implied cost of equity estimated with the residual income model. The result suggests that published management forecasts play an important role in the pricing of risk premiums. However, some other studies find an optimistic bias in the management forecast for firms in financial distress (Ota, 2006; Suda and Shuto, 2001). These results suggest that in Japan, the information value of the management forecast depends on the financial situations of the firms.

## 2.3 Implied cost of equity and internal rate of return

In this study, we estimate the cost of equity of individual firms based on the residual income valuation model (1).

$$V_t = BV_t + \sum_{i=1}^{\infty} \frac{NI_{t+i} - r_E BV_{t+i-1}}{(1+r_E)^i} \tag{1}$$

In the valuation equation (1), $V_t$ is an intrinsic value of the firm and $NI_t$ and $BV_t$ denote net income and book value of equity at fiscal year $t$. $r_E$ denotes the cost of equity, which we will estimate.

Frankel and Lee (1998) assumed that the residual income streams after fiscal year $t$ are constant. Under this perpetuity assumption, we obtain the following simple valuation formula (2).[1]

$$V_t = BV_t + \frac{E[NI_{t+1}] - r_E BV_t}{(1+r_E)} + \frac{E[NI_{t+1}] - r_E BV_t}{(1+r_E)r_E} \tag{2}$$

If the stock price is at fair level, namely, when intrinsic value $V_t$ is equal to the market value of equity $MV_t$, after some calculations, cost of equity is given as the earnings-to-price ratio.

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[1] This equation (2) is equivalent to the equation (3.1) in Frankel and Lee (1998, p.289).

$$MV_t = BV_t + \frac{(E[ROE_{t+1}]-r_E)BV_t}{1+r_E} + \frac{(E[ROE_{t+1}]-r_E)BV_t}{(1+r_E)r_E},$$

$$\frac{MV_t}{BV_t} = \left(1 + \frac{E[ROE_{t+1}]-r_E}{1+r_E} + \frac{E[ROE_{t+1}]-r_E}{(1+r_E)r_E}\right),$$

$$= \left(1 + \frac{E[ROE_{t+1}]-r_E}{r_E}\right) = \frac{E[ROE_{t+1}]}{r_E},$$

$$r_E = \frac{BV_t}{MV_t}E[ROE_{t+1}] = \frac{BV_t}{MV_t}\frac{E[NI_{t+1}]}{BV_t} = \frac{E[NI_{t+1}]}{MV_t}. \tag{3}$$

Replacing the expected value of $NI_{t+1}$ in (3) with the management forecast $FNI_{t+1}$, which becomes publicly available at the time of the prompt report, the implied cost of equity, *ICE*, here is defined as in (4).

$$ICE_t = \frac{FNI_{t+1}}{MV_t} \tag{4}$$

Let $RNI_{t+1}$ denote the realized value of $NI_{t+1}$, which will be revealed one year after the initial forecast. Then, the accuracy of the manager's earnings forecast should be defined by the difference between forecasted EPR and realized EPR. We use a variable named $PNI_t$ as a measure of earnings forecast optimism.

$$PNI_t = \frac{FNI_{t+1} - RNI_{t+1}}{MV_t} \tag{5}$$

Since net income is a stochastic variable, $PNI_t$, defined in (5), is the sum of the stochastic forecast error and the manager's intentional earnings bias. If we can further assume that the expected value of the forecast error for net income is zero, positive PNI means that the manager discloses a more optimistic earnings forecast and a negative PNI means a more conservative earnings forecast. For this reason, we pay particular attention to PNI as a measure of management forecast bias in the empirical analyses. It should also be noted that the quality of the earnings forecast will be low if the magnitude of PNI is large. Thus, we use an absolute value for PNI ($ABSPNI_t=|PNI_t|$) as a measure of forecast accuracy.

## 3. Hypotheses development

### 3.1 Corporate social responsibility awareness and management forecast biases

As already mentioned, CSR has become a core concept in corporate management for long-term success and sustainability in today's changing societal and environmental surroundings. Many studies discuss and examine whether firms explore business opportunities, improve organizational efficiency, build stakeholder trust, and successful risk management and are rewarded for meeting the expectations of shareholders by enhanced long-term corporate market value.

If CSR contributes to adding discipline to corporate governance and to building strong stakeholder relationships in the long run, higher CSP firms may enhance investor confidence in the

information they disclose in the market and thereby reduce the risk premium demanded by investors. On the other hand, there are incentives that motivate managers to avert a negative response in terms of market price through profit manipulation in the short-term or to provide optimistic forecasts to attract investors with myopic decision-making. There could be a potential conflict of interest among corporate managers between building shareholder confidence in the long-term and opportunistic manipulation of earnings in the short-term. Our question is whether high CSR awareness influences management forecast biases. Actually, CSR practices need corporate resources while, at the same time, they take time to achieve the expected CSR effects and the results are uncertain. In this situation, corporate managers can be motivated to pursue myopic behavior to gain short-term evaluations of their businesses. A more myopic manager may be less aware of CSR strategy and instead follow opportunistic behaviors.

In this study, we identify two types of management forecast biases; forecast inaccuracy and forecast optimism (conservatism). With respect to inaccuracy, we employ a measure of management forecast error. A more accurate management forecast for the coming year could contribute to mitigating information asymmetry between managers and shareholders around future cash flow and thereby improve the firm's valuation in the market. In the long term, optimistic management forecasts lessen investor confidence in management and can thus damage long-term success of the firm. Similarly, excessive conservative forecasts could stem from management opportunistic behaviors, which obstruct information asymmetry between management and shareholders and harm corporate value.

## 3.2 Hypotheses

When there is no information asymmetry between managers and shareholders, the ex-ante measure of expected return is a proper proxy for the cost of equity. If realized returns deviate from investor expectations, there could be an agency cost due to the asymmetry of information between managers and shareholders regarding future cash flows. If a firm's CSR strategy, from a long-term perspective, provides information to the public that reduces uncertainty about future cash flows, its internal rate of return could be influenced by firm CSR awareness. Thus, the following hypothesis is introduced.

Hypothesis 1: *CSP has a negative relation with implied cost of equity.*

In fact, the implied cost of equity can be influenced by the quality of the management earnings forecast. For long-term success, rather than a short-term share price increase, managers may choose to improve forecast accuracy or minimize forecast error and restrain optimistic forecasting to temporarily attract investors. However, when focus is on the short-term or on financial distress,

managers have to address pressures from myopic demands from the market and forecast accuracy could be undermined by earnings manipulation. A firm's CSR awareness may encourage a managerial behavioral bias that avoids earnings manipulation in the short term. If so, CSP could be a relevant factor in improving forecast accuracy. Thus, hypothesis 2 is introduced.

Hypothesis 2: *The higher the CSP of the firm, the more accurate the management earnings forecast.*

CSR awareness could also contribute to restraining any optimistic bias in the management forecast. Responsible managers would be averse to providing biased information to the market from a long-term view, for such behavior could harm the trust in the firm's management in the market and its market valuation. Thus, hypothesis 3 is introduced.

Hypothesis 3: *The higher the CSP of the firm, the less optimistic its management earnings forecast.*

Restraining optimistic management forecasts, however, may link to discretional conservatism motivated by the desire to enhance the reputation of management or to avert criticism from not realizing the forecast. If managers provide optimistic forecasts, there is an upward bias in the earnings forecast. However, among less optimistic forms of forecast bias, there can be some with excess conservative forecast bias that reduce trust in management. Thus, it is necessary to identify the effects of CSP on forecast biases between upward-bias and downward-bias firms. Thus, hypothesis 4 is introduced.

Hypothesis 4: The higher the CSP of the firm, the less conservative the management earnings forecast.

**4. Empirical Analyses**

**4.1 Data and variables**

The sample period of this study is 2007-2015, which covers the longest period of available CSR data. The CSP data we use in this study were developed by Suto and Takehara (2016a) based on the annual CSR questionnaire survey data by Toyo Keizai Inc.[2] The first column of Table 1 shows all

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[2] Toyo Keizai has conducted nine annual CSR surveys since 2005. The questionnaire is sent to all public firms on the Tokyo Stock Exchange (TSE) and to the major listed companies on other exchanges in Japan. We exclude 2005 and 2006 from the analysis as the question format changed significantly after 2006.

listed firms on the stock exchanges with a fiscal year-ending in March and the second and third columns show the number of the listed firms which disclose management forecasts and their estimated implied cost of equity, respectively.

The firms which provide management forecasts include 90.6% of the all listed firms with a March fiscal year end for the observed period (=16,632/18,351). Therefore, a large number of the listed firms disclose management earnings forecasts in Japan. The fourth and fifth columns are the numbers of the non-respondents and respondents to the Toyo Keizai questionnaire. Of the listed firms, 33.5% responded to the CSR Survey. Among the 18,351 analyzed firms, 15,791 have both management forecasts and estimated implied cost of equity, including 6,156 respondents and 12,195 non-respondents to the CSR Survey. Finally, the last column shows the number of the sample firms for which both the implied cost of equity and CSR data are available. Thus, we select these 5,435 firms as the sample, which covers about 29.6% of all listed firms with a March fiscal year end (=5,435/18,351).

For most Japanese firms, the fiscal year is from April to March and management forecast of one year net income for the fiscal year is disclosed in the middle of May. The definitions of the study variables are summarized in Figure 1. The ICE is calculated per (4) in the residual income valuation model (1). As a measure of management forecast bias, the difference between the management forecast of net income and realized net income is calculated as follows. The difference between future net income forecast (FNI) and realized net income (RNI) divided by the market value of equity is the measure of management optimism (PNI). A higher PNI implies a more optimistic forecast. The absolute value of the gap between future net income and realized net income (ABPNI) represents the accuracy of the management forecast. Both of the two variables are standardized with market value MV. $PNI_t$ is a measure of earnings forecast optimism for fiscal year t and $ABSPNIt$ is a measure of earnings forecast accuracy for fiscal year $t$. We use these two variables to identify discretional manager forecast decision-making and irresponsibility for minimization of forecast errors. They are proxies for different types of management forecast biases.

As a proxy for CSR awareness, we use a composite measure of CSP, as designed by Suto and Takehara (2016a).[3] We introduce four control variables which influence management forecasts; return on total assets (ROA) as an accounting-based measure of financial performance; debt ratio

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[3] Suto and Takehara (2016a) use a stakeholder approach to define the dimensions of CSP and develop an original method to construct CSP indices with the Toyo Keizai questionnaire results. They calculate five CSP dimensional indices according to stakeholder relationships: employee relations (EMP), social contributions (SC), security of the firm and product safety (SS), internal governance and risk management (IG) and environmental preservation (ENV). Subsequently, they consolidate these CSP dimensional indices into a composite index.

(DR) (=total debt/total assets) as leverage; natural logarithm of market value of equity (lnMV) (in million JPY) as firm size; and book-to-market (B/M) value (in %) to identify differences in the market valuation of the firm.

Table 2 presents the descriptive statistics of the variables for the CSR respondents and non-respondents. Respondents are characterized by better performance (e.g., higher ROA), larger size, higher leverage, and higher market value than non-respondents. They also have lower implied cost of equity (ICE) and lower forecast biases in terms of both forecast optimism (PNI) and accuracy (ABSPNI) than non-respondents.

Table 3 presents the correlation matrix among the variables within respondent groups. CSP has a significantly negative correlation with ICE (-0.144) and a strongly positive one with firm size MV (0.634), as expected. CSP is also negatively correlated with PNI (-0.025) and ABPNI (-0.068), but not statistically significant. ICE has a significantly negative correlation with PNI (-0.208), ROA (-0.311), and firm size lnMV (-0.248), and market value B/M (-0.249). Firm size, lnMV, has a strong positive correlation with performance, ROA (0.227), and higher market valuation, B/M (-0.531), as expected, and a significantly negative correlation with PNI (-0.128) and an insignificant one with ABSPNI (-0.032).

PNI has a strongly negative correlation with ROA (-0.556), which suggests that a lower corporate performance tends to be linked to more management forecast optimism. On the other hand, the correlation of ABPNI with ROA (-0.154) is negative but less so than PNI. B/M is positively correlated to PNI (0.174), while it has a negative correlation with ABPNI (-0.139). Although investors are concerned with forecast accuracy, they seem to be more influenced by optimistic management forecasts.

## 4.2 Corporate social responsibility-ranked portfolios and awareness

Preliminarily, we categorize the sample firms based on their levels of CSR awareness and conduct analyses to identify the association of CSR awareness with other variables by the difference test of averages between our portfolios of firms. Table 4 summarizes the results.

First, we categorize the listed firms into respondents and non-respondents to the CSR survey, and run difference test averages for ICE between the two portfolios of respondents. The non-respondents are assumed to be less aware of CSR practices and related disclosure than respondents (Suto and Takehara, 2016b). The results for the average ICE are expectedly negative at 1% significance. Respondents have lower ICE, less forecast biases (lower PNI and ABPNI), higher performance (ROA, ROE), higher creditability, higher market valuation, and larger size than non-respondents. Second, we categorize respondents into five CSP ranked portfolios and compare the average of the variables between the lowest CSP portfolio (P1) and the highest CSP portfolio (P5). As shown in Table 4, the results are completely consistent with those between full sample respondents and

non-respondents. This suggests that higher CSP firms restrain management forecast optimism more, are more concerned with forecast accuracy, and have a lower implied cost of equity.

Next, we classify each CSP-ranked portfolio into five groups of forecast bias in terms of PNI and ABPNI, respectively, and compare the average ICE of the cross ranked portfolios. Table 5 presents 25 cross ranked portfolios in five CSP groups and five PNI or ABPNI groups, and calculates the average ICE in each of the cells. PNI1 is the highest (most optimistic bias) and PNI5 is lowest (least optimistic bias). ABSPNI1 is the highest (most inaccurate bias) and ABPNI5 the lowest (least inaccurate bias). CSP1 is the lowest (least responsible) and CSP5 is the highest (most responsible).

Panel A compares the ICE average in the PNI-CSP cross-portfolios and Panel B compares it in the ABSPNI-CSP portfolios. First, to identify the ICE and CSP levels by controlling PNI and ABSPNI, we conduct difference tests of the average ICE between the lowest CSP portfolio (CSP1) and highest CSP portfolio (CSP5). For both Panels A and B, from the results of the difference tests, we found that a higher CSP tends to link to a lower ICE for every PNI or ABSPNI portfolio. Further, the relation between the CSP level and PNI is systematic except for PNI4/CP2 (8.244). Based on the results, we confirm that a higher CSR awareness tends to link to a lower cost of equity.

Next, to identify the relation between ICE and forecast biases while controlling CSP, we conduct difference tests of average ICE between the highest PNI portfolio (PNI1) and the lowest PNI portfolio (PNI5) for each CSP level, and between the highest ABSPNI portfolio (ABSPNI1) and the lowest ABSPNI portfolio (ABSPNI5). In Panel A, if the CSP level is controlled, the relation between PNI and ICE is unexpectedly negative, demonstrating that higher optimistic bias links to a lower cost of equity. This suggests that there may be a high conservative bias link to a high-risk premium. To comingle this complicated result, it is necessary to identify the influence of optimism and conservatism in the management forecast on cost of equity, respectively. In Panel B, if CSP is controlled, ABSPNI has a positive correlation with ICE except for CSP2, however, in the CSP5 portfolio, the result of the difference test is not statistically significant. Based on these results, we comprehend that forecast accuracy could contribute to reducing the cost of equity, even at the same CSP level.

## 4.3 Regression analyses

### 4.3.1 Regression model

We employed the following regression model to analyze the effects of CSR awareness on the cost of equity.

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\begin{aligned}
Y_{j,t} = \ & \alpha + \beta_1 CSP_{j,t} + \beta_2 ROA_{j,t} + \beta_3 DR_{j,t} + \beta_4 \ln MV_{j,t} + \beta_5 BM_{j,t} \\
& + \sum_{i=1}^{28} \eta_j Industry_{i,j,t} + \sum_{i=1}^{8} \delta_i Year_{i,j,t} + \varepsilon_{j,t}
\end{aligned} \tag{6}
$$

In the above regression model (6), the dependent variable $Y_{j,t}$ is either the implied cost of equity

(ICE), forecast optimism (PNI), or forecast accuracy (ABSPNI). *Industry*$_{i,j,t}$ is the dummy variable, which equals 1 if firm $j$ belongs to the $i$-th industry, and 0 otherwise. We also include a year dummy variable, *Year*$_{i,j,t}$, in this model. Since there may be endogeneity between CSP and the dependent variable (ICE, PNI, or ABSPNI), we estimate the parameters in model (6) by a two-stage least squares method. We use as instrument variables a lagged one-year composite CSP score ($CSP_{j,t-1}$) and NOTSE1 dummy variable, which equals 1 if a firm is not listed on the Tokyo Stock Exchange First Section, and 0 otherwise.

The regression results are summarized in Table 6. The coefficient of CSP on ICE is negative but not statistically significant, while ICE looks to be influenced by other firm attributes. ICE has a significantly positive relation with the profitability measure ROA, DR, and B/M, while being strongly and negatively associated with firm size (lnMV), as expected. As for management forecast biases, the coefficient of CSP on PNI is significant and negative (-0.247) at 1% significance and on ABSPNI (-0.091) is significant at the 10% level. According to these estimated coefficients, we comprehend that CSR has more effect on mitigating inaccuracy than restraining optimistic forecasts. For the whole sample, hypothesis 1 is rejected, but hypotheses 2 and 3 are not rejected.

Among the firm attributes, ROA has a strongly negative relation with both PNI and ABSPNI, which suggests that higher performing firms have less incentive to pursue opportunistic earnings management. Regarding other firm attributes, the coefficients of DR, lnMV, and B/M on ABSPNI are all significantly negative, however, all variables except for ROA are insignificant for PNI.

### 4.3.2 Regressions by firm size groups

We confirmed, as presented in Table 3, that firm size is strongly correlated with CSP. Thus, we divide the sample firms into three size groups (large-cap, mid-cap, and small-cap) in each year ($t$=2007,…,2015) and, after excluding firm size (lnMV) from the control variables, conducted regressions again. The regression results are summarized in Table 7. All groups have negative coefficients of CSP on implied cost of equity (ICE) and the two bias variables PNI and ABSPNI. For large-cap and mid-cap groups, CSP has negative coefficients on ICE, significant at the 5% level, and for the small-cap group, negative and significant at the 10% level.

Regarding the forecast biases for the large-cap group, the coefficients of CSP on both variables are significant at less than 5%. For the mid-cap, the coefficient of CSP on PNI is statistical significant ($p$-value=0.62), but for ABSPNI it is not significant ($p$-value=0.108). For small-cap, in contrast, the coefficient of CSP on PNI is not significant ($p$-value=0.279) and that of ABPNI is significant ($p$-value=0.001). Thus, if the size effect on CSP is controlled, hypothesis 1 is no longer rejected. Hypothesis 2 and 3 are also again not rejected, but the results are not strong. These empirical results suggest that CSP reduces cost of equity and could contribute to mitigating management forecast biases.

Over all firm size groups, ROA and B/M have strong positive effects on ICE and negative effects on PNI and ABSPNI. At the same time, ROA and B/M have significantly negative effects on management forecast biases. Thus, among the firm attributes, except for firm size, corporate performance and market valuation are key determinants of cost of equity in the market as well as management forecast behavior.

### 4.3.3 Forecast optimism and conservatism

The regression results we obtained suggest that CSP could mitigate management forecast biases in terms of forecast accuracy and discretional behavioral bias. However, as suggested in 4.2, the influence of CSP on management forecast biases may not be symmetric with forecast optimism and conservatism. Even if more CSR aware firms provide less optimistic forecasts, it is possible that some of these firms may be doing so as they prefer conservative forecasts in order to avert negative assessments of any downside error of the forecast. Forecast conservatism could be motivated by the self-protection behavior of managers or by a desire to enhance management's reputation by providing a potential positive surprise effect in the market. If so, higher CSP may not contribute to encouraging management forecast decision-making.

To investigate the different forecast behaviors, we classify the sample firms into two groups; upward bias (PNI>0; forecasted income > realized income) and downward bias (PNI<0; forecasted income < realized income). We assume that upward biased firms have optimistic biases and downward biased firms have conservative biases.

We conduct regression analyses for each group. The regression results are demonstrated in Table 8. Panel A presents PNI>0 (upward forecast bias group; optimistic) and Panel B presents PNI<0 (downward forecast bias group: conservative). In the regressions, the explanatory variable is ABSPNI to identify the effect of CSP on degree of optimism and conservatism.

Regarding the upward bias group (optimistic forecast), the coefficient of CSP on ICE is negative but statistically insignificant. The coefficient of ABSPNI is also negative and statistical insignificant at less than 10% significance. We see no significant effect of CSP on degree of upward bias. Regarding the downward bias group, the coefficient of CSP on ICE is significantly positive and the coefficient of CSP on ABSPNI is also positive but insignificant. For the downward bias group, high CSP firms tend to have a high cost of equity, while CSP has no significant influence on forecast bias. Thus, hypothesis 4 is rejected.

When we classify the sample into the upward forecast bias and downward forecast bias firms, the relation between CSP and forecast bias within each group becomes less obvious. According to the results, the more conservative the forecast, the higher the cost of equity of the firm; this result suggests that some of the Japanese firms may provide excessive conservative forecasts, as it is found that CSP could increase their cost of equity while their CSR practices could contribute to improving

their management forecast opportunism as a whole. In terms of the downward bias, the fact that CSP has a significantly positive relation with ICE in the downward forecast bias group suggests that high CSP firms may bear high risk premiums in the market. We cannot deny the possibility of excess conservatism among downward bias management forecasts, which then links to the uncertainty of estimating the firm's future cash flow.

**5 Concluding remarks**

This is the first study to examine the influence of CSP on management earnings forecast biases in the context of Japanese firms for the period 2007-2015. The aim of this study is to investigate two types of forecast biases: forecast accuracy and forecast optimism (or conservatism). Based on empirical analyses, we find the following notable results. First, a high CSP links to lower managerial forecast biases. Second, controlling the size effect on CSP by segmenting the sample into three size groups, we find that a high CSP not only mitigates these two forecast biases but it also links to a lower implied cost of equity. These empirical results suggest that CSP as a proxy for firm CSR awareness may enhance forecast accuracy and mitigate opportunistic managerial forecasts. From these results, we comprehend that a CSR strategy for long-term success can contribute to encouraging managerial forecast behavior that increases transparency and business trust and ultimately, reduces the implied cost of equity. Third, considering possible excess conservative management forecast bias to avoid negative assessments of management, we investigate the influence of CSP on ICE among upward and downward bias groups. In the downward forecast bias group, we find that a high CSP may bear a high-risk premium in the market. This finding suggests that some firms may pursue excess conservatism in earnings forecasts, while CSP has no significant influence on mitigating conservatism.

In the management earnings forecast disclosure peculiar to Japan, listed firms are requested to disclose management forecasts for net income and sales, and, moreover, per Japan's Corporate Law, a certain level of forecast errors must be revised in the firm's next financial report. Therefore, the managers at Japanese listed firms seem to be under strong pressure to avoid forecast errors and thus, in general, choose conservative forecasting rather than optimistic forecasting as downward revisions of earnings forecasts can be perceived as management failures. High CSP aware firms may be more concerned with their reputations as good companies and may thereby tend to be more conservative. It is very interesting, in the context of the Japanese listed firms, that among firms with downward bias forecasts, there can be excess conservatism in order to protect managers from the risk of negative assessments. We also found, however, that such managerial behavior may induce information asymmetry between management and investors and thus link to a higher cost of equity in the market.

Possibly, such excess conservatism may be only a remarkable forecast bias in Japan. According

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to the empirical results of this study, in terms of the excess conservatism in management earnings forecasts, CSR practices may not contribute to improving the behavioral bias of managers,. More research is necessary to investigate excess conservatism in management earnings forecast bias among listed Japanese firms and its determinants. This could be an interesting research topic for future development.

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$$MV_{j,May} = BV_{j,t-1} + \frac{FNI_{j,t} - k_{j,May}BV_{j,t-1}}{k_{j,May}} \Rightarrow k_{j,May} = \frac{FNI_{j,t}}{MV_{j,May}} = \text{EPR}$$

$$ICE_{j,t} = k_{j,May}$$

$$PNI_t = \frac{FNI_t - NI_t}{MV_{j,May}}$$

Fiscal Year $t$ (April –March)

Fiscal Year End

$$DR_t = \frac{TD_t}{TA_t}$$

Fiscal Year End

Management
Forecast
(Middle of May)

$$ROA_t = \frac{NI_t}{(TA_t + TA_{t-1})/2}$$

Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec  Jan  Feb  Mar Apr  May

$TA_{t-1}$  $FNI_t$

$TD_{t-1}$  (Prompt Report)

$NI_{t-1}$

(Financial Report)

$TA_t$

$TD_t$

$NI_t$

(Financial Report)
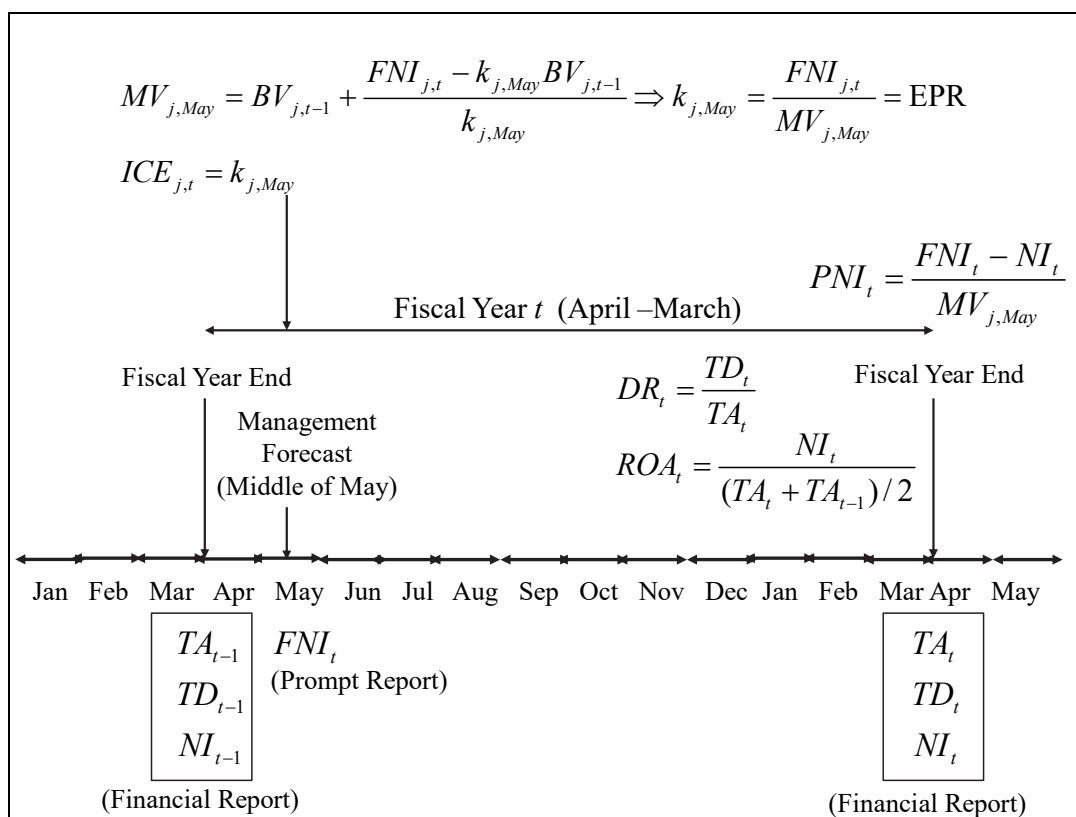
**Figure 1. Definition of Variables**

**Table 1. Number of Observations**

| Year | March Fiscal Year End | Management Forecast Exists | Implied Cost is Estimated | Non-respondents to CSR Survey | Respondents to CSR Survey | Implied Cost & CSR Survey |
|------|------|------|------|------|------|------|
| 2007 | 2,138 | 1,750 | 1,712 | 1,513 | 625 | 518 |
| 2008 | 2,123 | 1,785 | 1,739 | 1,477 | 646 | 556 |
| 2009 | 2,071 | 1,801 | 1,543 | 1,437 | 634 | 482 |
| 2010 | 2,023 | 1,809 | 1,731 | 1,372 | 651 | 574 |
| 2011 | 1,986 | 1,820 | 1,603 | 1,335 | 651 | 535 |
| 2012 | 2,105 | 1,979 | 1,918 | 1,388 | 717 | 658 |
| 2013 | 1,976 | 1,880 | 1,819 | 1,267 | 709 | 657 |
| 2014 | 1,974 | 1,896 | 1,856 | 1,222 | 752 | 711 |
| 2015 | 1,955 | 1,912 | 1,870 | 1,184 | 771 | 744 |
| All | 18,351 | 16,632 | 15,791 | 12,195 | 6,156 | 5,435 |

**Table 2. Descriptive Statistics**

CSP: Composite measure of Corporate Social Performance, ICE: Implied Cost of Equity, PNI: Measure of management forecast optimism. ROA: Return on Total Assets, DR: Debt ratio (=total debt/total assets), lnMV: Natural logarithm of market value of equity8 (in million JPY), B/M: Book-to-market (in %).

Mean, S.D., 1st Qu., Median and 3rd Qu. denote sample mean, standard deviation, 1st quintile, median and 3rd quintile, respectively. Sample period is from fiscal year 2007 to 2015.

| | | Mean | S.D. | 1st Qu. | Median | 3rd. Qu. |
|---|---|---|---|---|---|---|
| CSP | Respondents | 0.256 | 1.684 | -1.069 | 0.420 | 1.682 |
| | Non-reppondents | ----- | ----- | ----- | ----- | ----- |
| ICE | Respondents | 7.004 | 3.879 | 4.348 | 6.362 | 8.913 |
| | Non-reppondents | 7.602 | 4.514 | 4.471 | 6.877 | 9.970 |
| PNI | Respondents | 2.532 | 8.074 | -1.233 | 0.126 | 3.006 |
| | Non-reppondents | 3.140 | 9.191 | -1.553 | 0.267 | 3.991 |
| ABSPNI | Respondents | 1.496 | 1.864 | 0.313 | 0.808 | 1.922 |
| | Non-reppondents | 1.744 | 2.092 | 0.374 | 0.946 | 2.296 |
| ROA | Respondents | 2.249 | 4.906 | 0.903 | 2.375 | 4.277 |
| | Non-reppondents | 1.697 | 6.525 | 0.679 | 2.228 | 4.323 |
| DR | Respondents | 52.085 | 18.994 | 37.943 | 52.697 | 66.714 |
| | Non-reppondents | 50.236 | 20.833 | 34.030 | 50.571 | 66.071 |
| lnMV | Respondents | 10.684 | 1.924 | 9.216 | 10.634 | 12.121 |
| | Non-reppondents | 9.401 | 1.474 | 8.359 | 9.271 | 10.314 |
| B/M | Respondents | 1.238 | 0.751 | 0.739 | 1.075 | 1.554 |
| | Non-reppondents | 1.422 | 0.914 | 0.780 | 1.254 | 1.870 |

**Table 3. Correlations among Variables**

CSP: Composite measure of Corporate Social Performance, ICE: Implied Cost of Equity, PNI: Measure of management forecast optimism. ROA: Return on Total Assets, DR: Debt ratio (=total debt/total assets), lnMV: Natural logarithm of market value of equity8 (in million JPY), B/M: Book-to-market (in %).

|  | CSP | ICE | PNI | ABSPNI | ROA | DR | lnMV | B/M |
|---|---|---|---|---|---|---|---|---|
| CSP | 1.000 | -0.144 | -0.025 | -0.068 | 0.048 | 0.033 | 0.634 | -0.249 |
| ICE |  | 1.000 | -0.208 | -0.008 | 0.311 | 0.132 | -0.248 | 0.227 |
| PNI |  |  | 1.000 | 0.264 | -0.556 | 0.062 | -0.128 | 0.174 |
| ABSPNI |  |  |  | 1.000 | -0.154 | -0.188 | -0.028 | -0.139 |
| ROA |  |  |  |  | 1.000 | -0.377 | 0.227 | -0.397 |
| DR |  |  |  |  |  | 1.000 | -0.032 | -0.080 |
| lnMV |  |  |  |  |  |  | 1.000 | -0.531 |
| B/M |  |  |  |  |  |  |  | 1.000 |

**Table 4. Characteristics of CSP ranked 6 Portfolios**

CSP: Composite measure of Corporate Social Performance, ICE: Implied Cost of Equity, PNI: Measure of management forecast optimism. ROA: Return on Total Assets, DR: Debt ratio (=total debt/total assets), lnMV: Natural logarithm of market value of equity (in million JPY), B/M: Book-to-market (in %).

| | Non-respondents | Respondent | Diff. (R-NR) | p-value | P1 Low CSP | P2 | P3 | P4 | P5 High CSP | Diff. (P5-P1) | p-value |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP | ---- | 0.256 | ---- | ---- | -2.252 | -0.761 | 0.413 | 1.426 | 2.449 | 4.701 | 0.000 |
| ICE | 7.602 | 7.004 | -0.598 | 0.000 | 7.913 | 7.540 | 7.142 | 6.498 | 6.004 | -1.909 | 0.000 |
| PNI | 0.777 | 0.617 | -0.160 | 0.000 | 0.833 | 0.699 | 0.592 | 0.403 | 0.575 | -0.258 | 0.013 |
| ABSPNI | 1.744 | 1.496 | -0.248 | 0.000 | 1.789 | 1.521 | 1.508 | 1.282 | 1.398 | -0.391 | 0.000 |
| ROA | 1.697 | 2.249 | 0.552 | 0.000 | 1.700 | 2.049 | 2.293 | 2.752 | 2.453 | 0.754 | 0.001 |
| ROE | 2.765 | 4.364 | 1.600 | 0.000 | 2.792 | 4.094 | 4.434 | 5.780 | 4.723 | 1.931 | 0.006 |
| DR | 50.236 | 52.085 | 1.850 | 0.000 | 51.079 | 52.125 | 51.801 | 52.052 | 53.365 | 2.286 | 0.003 |
| lnMV | 9.401 | 10.684 | 1.283 | 0.000 | 9.157 | 9.708 | 10.531 | 11.646 | 12.372 | 3.216 | 0.000 |
| B/M | 1.422 | 1.238 | -0.184 | 0.000 | 1.471 | 1.437 | 1.287 | 1.045 | 0.951 | -0.520 | 0.000 |

## Table 5. Implied Cost of Equity of 25 Portfolios

CSP: Composite measure of Corporate Social Performance, PNI: Measure of management forecast optimism.

| Panel A: CSP and Management Forecast Optimism (PNI) ranked 25 Portfolios | | | | | | | |
|---|---|---|---|---|---|---|---|
| | PNI1(high) | PNI2 | PNI3 | PNI4 | PNI5(low) | Diff. | *p*-value |
| CSP1 (low) | 7.450 | 7.366 | 7.316 | 7.887 | 9.096 | -1.646 | 0.001 |
| CSP2 | 6.517 | 6.731 | 7.178 | 8.244 | 9.064 | -2.547 | 0.000 |
| CSP3 | 6.471 | 6.685 | 6.892 | 7.085 | 8.295 | -1.824 | 0.000 |
| CSP4 | 6.370 | 6.304 | 5.910 | 6.484 | 7.576 | -1.206 | 0.000 |
| CSP5(high) | 5.469 | 5.872 | 5.898 | 5.953 | 6.724 | -1.255 | 0.000 |
| Diff. | 1.981 | 1.494 | 1.418 | 1.933 | 2.372 | | |
| *p*-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | |
| Panel B: CSP and Management Forecast Accuracy (ABSPNI) ranked 25 Portfolios | | | | | | | |
| | ABSPNI1 (high) | ABSPNI2 | ABSPNI3 | ABSPNI4 | ABSPNI5 (low) | Diff. | *p*-value |
| CSP1(low) | 8.373 | 8.043 | 7.746 | 7.520 | 7.509 | 0.864 | 0.084 |
| CSP2 | 7.123 | 7.575 | 7.927 | 7.553 | 7.626 | -0.504 | 0.237 |
| CSP3 | 7.466 | 7.325 | 7.332 | 6.700 | 6.691 | 0.776 | 0.052 |
| CSP4 | 6.950 | 6.961 | 6.452 | 6.146 | 6.200 | 0.750 | 0.022 |
| CSP5(high) | 6.080 | 6.126 | 5.892 | 6.008 | 5.861 | 0.218 | 0.435 |
| Diff. | 2.293 | 1.917 | 1.854 | 1.512 | 1.647 | | |
| *p*-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | |

## Table 6. Results of Two-Stage Regression Analyses

[Independent Variables] CSP: Composite measure of Corporate Social Performance, ROA: Return on Total Assets, DR: Debt ratio (=total debt/total assets), lnMV: Natural logarithm of market value of equity8 (in million JPY), B/M: Book-to-market (in %).

[Dependent Variables] ICE: Implied Cost of Equity, PNI: Measure of management forecast optimism.

| Dependent Variable | ICE | | PNI | | ABSPNI | |
|---|---|---|---|---|---|---|
| | Coef. | $p$-value | Coef. | $p$-value | Coef. | $p$-value |
| Intercept | 7.868 | 0.000 | 8.651 | 0.001 | 3.959 | 0.000 |
| CSP | -0.004 | 0.939 | -0.247 | 0.075 | -0.091 | 0.002 |
| ROA | 0.385 | 0.000 | -1.178 | 0.000 | -0.218 | 0.000 |
| DR | 0.061 | 0.000 | 0.000 | 0.989 | -0.010 | 0.000 |
| lnMV | -0.513 | 0.000 | 0.090 | 0.473 | -0.063 | 0.011 |
| B/M | 0.929 | 0.000 | 0.124 | 0.849 | -0.455 | 0.000 |
| Industry Dummy | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Dummy | Yes | Yes | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.319 | | 0.501 | | 0.338 | |

## Table 7. Size Category-wise Two-Stage Regression Results

Panel A. Large-Cap Samples     (*n*=1,583)

| Dependent Variable | ICE | | PNI | | ABSPNI | |
|---|---|---|---|---|---|---|
| | Coef. | *p*-value | Coef. | *p*-value | Coef. | *p*-value |
| Intercept | 2.876 | 0.026 | 4.521 | 0.000 | 3.881 | 0.000 |
| CSP | -0.202 | 0.011 | -0.059 | 0.034 | -0.102 | 0.004 |
| ROA | 0.339 | 0.000 | -0.446 | 0.000 | -0.257 | 0.000 |
| DR | 0.055 | 0.000 | -0.027 | 0.000 | -0.020 | 0.000 |
| B/M | 1.167 | 0.000 | -0.602 | 0.004 | -0.655 | 0.000 |
| Industry Dummy | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Dummy | Yes | Yes | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.336 | | 0.566 | | 0.364 | |

Panel B. Mid-Cap Samples     (n=1,499)

| Dependent Variable | ICE | | PNI | | ABSPNI | |
|---|---|---|---|---|---|---|
| | Coef. | *p*-value | Coef. | *p*-value | Coef. | *p*-value |
| Intercept | -1.395 | 0.148 | 4.835 | 0.000 | 3.930 | 0.001 |
| CSP | -0.218 | 0.000 | -0.083 | 0.062 | -0.019 | 0.108 |
| ROA | 0.483 | 0.000 | -0.397 | 0.000 | -0.200 | 0.000 |
| DR | 0.079 | 0.000 | -0.017 | 0.000 | -0.009 | 0.073 |
| B/M | 1.268 | 0.000 | -0.312 | 0.001 | -0.269 | 0.001 |
| Industry Dummy | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Dummy | Yes | Yes | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.373 | | 0.513 | | 0.297 | |

Panel C. Small-Cap Samples     (*n*=1,417)

| Dependent Variable | ICE | | PNI | | ABSPNI | |
|---|---|---|---|---|---|---|
| | Coef. | *p*-value | Coef. | *p*-value | Coef. | *p*-value |
| Intercept | 2.433 | 0.065 | 1.718 | 0.000 | 2.237 | 0.000 |
| CSP | -0.131 | 0.084 | -0.084 | 0.279 | -0.200 | 0.001 |
| ROA | 0.317 | 0.000 | -0.358 | 0.000 | -0.214 | 0.000 |
| DR | 0.078 | 0.000 | -0.006 | 0.173 | -0.004 | 0.125 |
| B/M | 1.101 | 0.000 | -0.309 | 0.007 | -0.440 | 0.000 |
| Industry Dummy | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Dummy | Yes | Yes | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.272 | | 0.541 | | 0.367 | |

**Table 8. Regression Results of Upward Forecast Bias and Downward Forecast Bias**

Panel A. PNI>0 Samples: Upward Forecast Bias Group (Optimistic)    (*n*=2,350)

| Dependent Variable | ICE | | ABSPNI | |
|---|---|---|---|---|
| | Coef. | *p*-value | Coef. | *p*-value |
| Intercept | 7.820 | 0.000 | 3.658 | 0.000 |
| CSP | -0.084 | 0.335 | -0.083 | 0.113 |
| ROA | 0.252 | 0.000 | -0.336 | 0.000 |
| DR | 0.050 | 0.000 | -0.012 | 0.000 |
| lnMV | -0.386 | 0.000 | -0.001 | 0.972 |
| B/M | 0.543 | 0.011 | -0.378 | 0.010 |
| Industry Dummy | Yes | Yes | Yes | Yes |
| Year Dummy | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.259 | | 0.503 | |

Panel B. PNI<=0 Samples: Downward Forecast Bias Group (Conservative)    (*n*=2,149)

| Dependent Variable | ICE | | ABSPNI | |
|---|---|---|---|---|
| | Coef. | *p*-value | Coef. | *p*-value |
| Intercept | 4.293 | 0.067 | 0.665 | 0.009 |
| CSP | 0.173 | 0.000 | 0.001 | 0.973 |
| ROA | 0.704 | 0.000 | 0.150 | 0.000 |
| DR | 0.087 | 0.000 | 0.003 | 0.128 |
| lnMV | -0.509 | 0.000 | -0.070 | 0.000 |
| B/M | 2.229 | 0.000 | -0.011 | 0.887 |
| Industry Dummy | Yes | Yes | Yes | Yes |
| Year Dummy | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.422 | | 0.315 | |