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The role of accounting conservatism in executive compensation contracts

Abstract

To test the implication of Watts' (2003) argument that accounting conservatism increases the efficiency of executive compensation contracts, we investigate the relation between accounting conservatism and earnings-based executive compensation contracts in Japanese firms. We focus on Japanese executive compensation practices because the demand for accounting conservatism is likely to be greater for Japanese than for US firms given the predominance of earnings-based executive compensation contracts and relatively weak corporate governance of compensation contracts in Japan. We also investigate how the quality of the *ex-ante* information environment affects the relation between accounting conservatism and earnings-based executive compensation contracts. Consistent with our expectations, we find a positive relation between accounting conservatism and the compensation earnings coefficient. We also show that this positive relation is greater for firms with poor *ex-ante* information environment. These results suggest that the demand for accounting conservatism is greater for firms that use more earnings-based executive compensation contracts and have more serious *ex-post* settling-up problems.

Keywords: accounting conservatism; compensation contract; compensation earnings coefficient; information environment; *ex-post* settling-up problem

JEL classification: M 41

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

1 Introduction

Watts (2003) argues that accounting conservatism mitigates the agency problem between managers and stakeholders and reduces firms' agency costs. This study investigates the role of accounting conservatism in earnings-based executive compensation contracts among Japanese firms. Following Watts' (2003) argument, we first examine whether the demand for accounting conservatism is greater among firms that depend heavily on earnings-based executive compensation contracts. We then investigate how the quality of the *ex-ante* information environment affects the relation between accounting conservatism and earnings-based executive compensation contracts.

Managers usually have better information about their firm's prospects than other stakeholders do. In the absence of accounting conservatism, they may bias their estimates of future cash flows upwards using their superior information and inflate their net assets and earnings to receive greater payments under earnings-based compensation plans (Ball, 2001; Watts, 2003). Such opportunistic managerial behavior can create deadweight losses and reduce firm value. Agency theory suggests that attempts to recover any excess compensation *ex-post* can be costly since managers have limited liability and tenure. This is usually referred to as the "*ex-post* settling-up problem" (Leone et al., 2006).

Furthermore, we infer that the *ex-post* settling-up problem is more likely to occur in firms with a low-quality *ex-ante* information environment. Assuming that a poor *ex-ante* information environment implies severe information asymmetry between managers and external stakeholders, managers in a low-quality information environment are more likely to bias their future cash flow estimates upward to receive larger current bonuses. Managers also have incentives to manipulate earnings downwards to maximize multi-period compensation (e.g., Healy, 1985). However, this incentive is mitigated in Japan due to the absence of caps in bonus plans. The *ex-post* settling-up problem will thus be more serious for firms with a poor information environment.

Watts (2003) argues that accounting conservatism is a means of reducing the probability that managers will distribute their firms' net assets to themselves instead of investing in positive net present value projects. We hypothesize that (1) accounting conservatism is positively related to the use of earnings-based executive compensation contracts and that (2) this positive relation is greater for firms with poor *ex-ante* information environments.

Although Watts (2003) contends that executive compensation contracts are one of the factors behind the demand for accounting conservatism, few studies have examined the role of accounting conservatism in compensation contracts. One exception is O'Connell (2006). Assuming that accounting conservatism implies that earnings have a lower correlation with returns in good-news firm-years, O'Connell (2006) reveals that UK CEO cash compensation exhibits a stronger (weaker) sensitivity to accounting earnings in good- (bad-) news firm-years. He thus concludes that compensation committees are aware of the impact of conservatism when awarding earnings-based compensation (O'Connell, 2006, p. 643). However, this study does not measure accounting conservatism or examine the direct relation between executive compensation and accounting conservatism. Accordingly, it is unclear whether there is demand for accounting conservatism in earnings-based compensation contracts since his conclusion is drawn from composite assumptions. Our study addresses this gap in the literature.

We focus on Japanese executive compensation because its features are more likely to increase the demand for accounting conservatism. Studies have described two distinctive features of managerial compensation in Japan. First, Japanese managers receive compensation more on earnings-based performance than on stock-based performance (Kaplan, 1994; Kato and Kubo, 2006), which might increase the managerial incentive to engage in earnings management to obtain cash bonuses. Second, corporate governance over executive compensation is weaker in Japanese firms than in US firms. Specifically, the Japanese governance system features 1) fewer compensation committees and less efficient board monitoring (i.e., an inefficient monitoring system); 2) no systematic disclosure concerning individual compensation (i.e., an inefficient disclosure system); and 3) less explicit bonus plans and no clawback provisions for preventing managerial moral hazard (i.e., a less explicit compensation system). We conjecture that these features of corporate governance over executive compensation in Japan increase managers' opportunities to engage in opportunistic behavior designed to increase their bonuses. Consequently, we expect to see demand for accounting conservatism in Japanese firms since it can prevent managers from inflating their earnings and obtaining excess compensation.

We first examine the relation between accounting conservatism and the degree of dependence on earnings-based compensation plans. Following Basu's (1997) specification, we define accounting conservatism as an asymmetric verification requirement for gains and losses. We derive a proxy for the degree of dependence on earnings-based compensation plans by estimating the compensation earnings coefficient (CEC), reflecting pay-for-performance sensitivity, following Bushman et al. (2006), who use the coefficient of earnings estimated from a model that regresses executive compensation on earnings and returns. Firms with a relatively high CEC could have a more serious *ex-post* settling-up problem because their managers have a stronger incentive to manage their earnings and because the excess compensation based on temporarily inflated earnings is greater than that for firms with low CEC. Thus, the demand for accounting conservatism could be greater for firms with higher CEC. We therefore predict that accounting conservatism is positively related to CEC.

We test our hypothesis using a sample of 11,731 Japanese firm-year observations spread over 29 years, from 1987 to 2015. Our results indicate a significant and positive relation between the asymmetric timeliness of earnings and CEC, as hypothesized. This finding suggests that the demand for accounting conservatism is greater for firms with earnings-based executive compensation contracts, consistent with Watts' (2003) argument.

Furthermore, we predict that the information effectiveness of accounting conservatism in reducing excess compensation is stronger in settings with poor *ex-ante* information environments. We measure the environment using four related variables: (1) analyst following, (2) the probability of informed trading (PIN score) (3) number of segments, and (4) the standard deviation of stock returns. We construct a composite measure for the quality of the information environment through principal component analysis using these four variables. Consistent with our hypothesis, only firms with poor *ex-ante* information environments show a significant positive relation between accounting conservatism and CEC. This result suggests that the demand for accounting conservatism is greater for firms with higher information asymmetries and more serious *ex-post* settling-up problems. Finally, additional analysis indicates that large debtholders are the main drivers of the demand for accounting conservatism in Japan, suggesting that they consider accounting conservatism to be a useful governance tool in executive compensation contracts.

We contribute to the literature on accounting conservatism in two key ways. First, we add to accounting conservatism studies by providing evidence for the economic role of conservatism in earnings-based compensation contracts. Following Ball (2001) and Watts (2003), previous studies have investigated the demand for accounting conservatism in several contexts such as debt contracts (Ahmed et al., 2002; Ball et al., 2008; Beatty et al., 2008; Brockman et al., 2015; Zhang, 2008), the information environment (LaFond and Watts, 2008; Kim and Pevzner, 2010), corporate governance (Ahmed and Duellman, 2007; Garcia Lara et al., 2007, 2009; LaFond and Roychowdhury, 2008; Lim et al., 2014), corporate investment behavior (Bushman et al., 2011; Francis and Martin, 2010; Garcia Lara et al., 2016), and international differences (Ball et al., 2000; Ball et al., 2003; Bushman and Piotroski, 2006; Ndubizu and Sanchez, 2006). However, few studies have examined the effect of accounting conservatism on executive compensation contracts (O'Connell, 2006), despite its theoretical importance (Watts, 2003).[1] Consistent with Watts

[1] Iyengar and Zampelli (2010) reveal that the sensitivity of executive pay to earnings is higher for firms that report lower discretionary accruals. Based on the result, they argue that accounting conservatism allows firms to formulate contracts that tie executive compensation more closely to accounting performance. However, their research design limits the interpretability of their results. First, they use an earnings management measure (discretionary accruals) as the proxy for accounting conservatism, making it difficult to determine the effect of accounting conservatism on compensation contracts. Second, they estimate the sensitivity of executive pay to earnings for a cross-sectional sample and thus fail to capture the incentive intensity in

(2003), we provide evidence suggesting that accounting conservatism reduces the possibility that managers will receive unexpectedly high compensation.

Second, we focus on Japan's unique compensation practice. Although managers are generally highly rewarded for their earnings-based performance, corporate governance over executive compensation is relatively weak. Our results suggest that the importance of conditional conservatism in compensation contracts might depend on the efficiency of alternative monitoring systems and the information environment.

The rest of this paper is organized as follows. Section 2 reviews the literature and develops hypotheses. Section 3 describes the variables and explains the research design. Section 4 outlines the sample selection procedure and descriptive statistics. Section 5 presents the empirical results for the relation between accounting conservatism and earnings-based executive compensation contracts. Section 6 summarizes the results of additional analyses. Finally, Section 7 concludes the paper.

2 Literature review and hypothesis development

2.1 Demand for accounting conservatism in compensation contracts in Japan

2.1.1 Relation between accounting earnings and executive compensation

We begin our examination of the demand for accounting conservatism in Japanese compensation contracts by describing current Japanese executive compensation practices.

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earnings-based compensation contracts for individual firms, leaving the causal relation between accounting conservatism and the sensitivity of executive pay to earnings unclear. Our study expands their research by estimating a conditional conservatism measure based on Basu (1997) and the CEC for individual firms. Further, to confirm the validity of Watts (2003)'s argument, we also examine the effect of the quality of the information environment on the relation between accounting conservatism and the CEC.

The Japanese executive compensation mechanism has two features that might increase the demand for accounting conservatism. First, the compensation payments of Japanese managers are more likely to be based on earnings-based performance. Prior studies have revealed that executive compensation has a significantly positive correlation with profitability in Japanese firms (Kaplan, 1994; Kato, 1997; Kato and Kubo, 2006; Mitsudome et al., 2008; Shuto, 2007; Xu, 1997) and that the relation is similar to that in the US (Kaplan, 1994; Mitsudome et al., 2008). Further, Kaplan (1994) and Kato and Kubo (2006) show that managerial compensation is more sensitive to accounting earnings than to stock-based performance in Japan, suggesting that Japanese managers receive compensation based on earnings-based performance.

Consistent with these empirical findings, recent survey studies show that Japanese managerial compensation is based on accounting earnings. Japan's Ministry of Economy, Trade and Industry (METI; 2015) conducted a survey that compared the compensation practices in Japan to those in Western countries (the US, the UK, Germany, and France). It indicates that accounting earnings predominate as a performance measure in Japanese executive compensation contracts, while US firms are more likely to use stock-based performance measures such as total shareholders return (TSR) (METI, 2015, p. 49). Specifically, it reveals that the performance measures used in Japanese executive compensation contracts are as follows, in order of frequency (METI, 2015, p. 13): net income or income before taxes (46%); operating income (43%); ordinary income (36%); and sales (35%). It also indicates that the use of stock-based performance measures such as stock price or market capitalization is ranked at only 5%, implying that accounting earnings are the dominant performance measure in the Japanese compensation system.[2] Furthermore, the Tokyo Stock Exchange (TSE; 2015) shows that stock option plans are present in 31.8% of listed companies in 2014, implying that Japanese compensation contracts do not depend heavily on equity-based incentive plans and that most Japanese executives are rewarded through cash bonuses that depend on earnings-based compensation plans.[3] These features create more earnings management incentives to increase managerial compensation in Japanese firms. Similar to the findings for US firms (Healy, 1985), Shuto (2007) shows that Japanese executives manage earnings to maximize their own cash compensation. Accounting conservatism can directly control such behavior and reduce managerial ability to inflate earnings.

2.1.2 Corporate governance system for executive compensation in Japan

Executive compensation contracts in Japan feature relatively weak corporate governance systems. Comparing Japanese compensation practice with that in US firms, the Japanese monitoring system for executive compensation contracts is likely to be less efficient. For

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[2] Another survey conducted by the Japan Association of Corporate Directors (2016) reveals a similar tendency, showing that accounting earnings such as operating income (57%), net income (34%), and sales (32%) are used in executive compensation contracts more frequently than are stock-based measures such as EVA (5%) or TSR (0%).

[3] One of the reasons why Japanese compensation contracts depend more on accounting earnings might be explained by providing some legal background. Japanese firms are required to set their director compensation via a resolution passed at a shareholders' meeting if compensation is not already prescribed in the articles of incorporation (Companies Act, Article 361). In addition, until 2006, the directors' total bonuses were disclosed along with divided payments as an appropriation of retained earnings in a profit and loss statement (Former Commercial Code, Article 283), meaning that director bonuses were distributed from accounting earnings. Japanese firms with compensation committees (i.e., with US-type governance) were not required to follow this provision but Japanese firms were not allowed to set up compensation committees until 2003, and firms with committees represent only about 2% of all listed companies in Japan (see also footnote 4). Thus, most firms had to follow the provision.

example, while US firms have independent compensation committees that determine executive compensation, most Japanese firms lack committees tasked with setting detailed policies for manager compensation or related matters.[4] The boards of Japanese firms have a strict internal hierarchy (Hoshi and Kashyap, 2001; Kubo and Saito, 2008).[5] Japanese directors are often full-time members of the board, and each non-titled director and some executive directors are responsible for a particular division of their firm (Kubo and Saito 2008, p. 403). Aoki (1990) and Milgrom and Roberts (1992) argue that unlike the US, the Japanese corporate governance system functions more through consensus than through CEO dominance and board members function as a group. This feature suggests that a Japanese board of directors is likely to act in line with its CEO, which may render the board ineffective.

Second, Japan lacks a detailed disclosure system for executive compensation contracts. In contrast to the US setting, Japanese *individual* managers are generally not required to disclose compensation information to shareholders. The common practice is to disclose only the total compensation paid to all directors in the annual report. Although a recent Financial Services Agency requirement obliges Japanese firms to disclose the details of executive compensation in their securities reports,[6] few firms actually provide this

[4] The "Company of Committees" Law of the Japanese Companies Act was introduced in 2005. A company of committees is defined as any stock company with a nominating committee, an audit committee, or a compensation committee (Companies Act, Article 2, item xii). This definition is generally consistent with that of US firms. The Tokyo Stock Exchange (2015) reports that the number of companies with committees (the percentage of companies with committees out of all listed companies) were only 59 (2.5%), 55 (2.3%), 51 (2.2%), 20 (2.2%), and 58 (1.7%) in 2007, 2009, 2011, 2013 and 2015, respectively.

[5] The directors are classified as chairperson, president (CEO), vice-president, *senmu* (senior executives), *joumu* (executives), and non-titled directors (Kubo and Saito, 2008).

[6] Specifically, *the Cabinet Office Ordinance on the Disclosure of Corporate Affairs* requires listed companies to disclose the following information on executive compensation: (1) for each of their directors/statutory

information.[7] The lack of detailed disclosure on executive compensation increases the information asymmetry between managers and stakeholders and exacerbates moral hazard. Stakeholders have no way to monitor the individual executive compensation policy, which may encourage managerial opportunism.

Finally, while most US firms enter into *explicit* earnings-based compensation contracts with their managers,[8] Japanese firms do not (Kay, 1997). Most US firms have a compensation committee that designs explicit compensation contracts, such as earnings-based bonus plans, stock options, and restricted stocks. As mentioned, however, most Japanese firms have no compensation committee to determine explicit formulae for calculating annual bonuses.[9]

We conjecture that the lack of explicit contract provisions to prevent managerial

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auditors whose remuneration for the relevant fiscal year is JPY 100 million or more, the total remuneration with his/her name and a breakdown by type of payment (e.g., salary, bonus, stock option, and retirement payment); (2) the total remuneration paid to inside directors, inside statutory auditors, and outside directors/outside statutory auditors, with a breakdown by type of payment for each class; and (3) an explanation of the company's remuneration policies for its directors/statutory auditors and how they are decided when put in place as of the date of filing the relevant securities report. This new rule came into effect on March 31, 2010.

[7] In the Tokyo Shoko Research (2010) reports, for firms listed on the first section of the Tokyo Stock Exchange whose fiscal years ended in March 2010 (i.e., 1,337 firms), only 113 firms provided detailed information on executive compensation pursuant to the new rules.

[8] According to Sloan (1993), 99% of large US manufacturing corporations in 1989 used an annual bonus plan tying executive compensation to accounting earnings. A more recent study, De Angelis and Grinstein (2015), reports that, on average, 79% of Standard and Poor 500 index firms set pre-specified accounting performance measures as their performance goals in executive compensation contracts. Furthermore, in the case of cash compensation, about 86% of CEOs received cash compensation based on the achievement of pre-specified performance goals (De Angelis and Grinstein, 2015, p. 624). These results suggest the wide diffusion of explicit compensation contracts in US firms.

[9] The positive relation between earnings and compensation in the absence of an explicit contract is often referred to as an "implicit compensation contract" (Murphy, 1999). According to Murphy (1999), an implicit compensation contract is defined as an unwritten agreement between contracting parties in which the CEO's pay is implicitly related to the firm's performance through year-to-year salary-level adjustments, target bonuses, options, and restricted stock grants, without explicit contractual provisions. On the contrary, an explicit compensation contract assumes that CEO pay is explicitly related to accounting returns through annual bonuses and stock-price appreciation based on stock options and restricted stock.

moral hazard increases the opportunity for and incentive of managers to engage in opportunistic behavior. For example, a general earnings-based bonus plan has an explicit formula for calculating annual bonuses and often has an upper bound (i.e., cap) beyond which earnings increases will not increase the bonus. This cap is expected to prevent managers from obtaining unrestricted excess compensation through earnings management and thus reduce opportunistic behavior. Because most Japanese firms have no compensation committee or explicit earnings-based bonus plan with a cap on compensation, managers might have more flexibility by which to acquire excess compensation through earnings-based compensation schemes.[10]

Second, recent studies show that the clawback provision included in compensation contracts is effective in mitigating the *ex-post* settling-up problem between the CEO and shareholders in the US (Chan et al., 2012, 2013, 2015). Explicit contracts have a stronger effect on the *ex-post* settling-up problem because they are legally binding and contract violations can be used as evidence in court. As far as we are aware, however, no Japanese firm includes a clawback provision in its compensation contracts.

In summary, the features of Japanese executive compensation practice are more likely to increase opportunities for managers to engage in earnings management to increase their compensation. Hence, we expect to find a demand for accounting conservatism in Japanese executive compensation practices.

[10] As mentioned, the ceiling on director compensation is set by the articles of incorporation or via a shareholder resolution. However, no regulation prescribes a ceiling on *individual* executive compensation.

2.1.3 Who demands accounting conservatism in executive compensation contracts?

In this section, we discuss who demands accounting conservatism. Japanese firms set their director compensation via a resolution passed at a shareholders' meeting if compensation is not already prescribed in the articles of incorporation (Companies Act, Article 361). Generally, such resolutions set a ceiling on director compensation, and the CEO decides the amount received by each director, subject to the total limit. If directors could set their pay without requiring approval at a shareholders' meeting, their pay might become excessive (Kubo and Saito, 2008). These requirements were introduced in corporate law to prevent directors, including the CEO, from setting their own pay (Kubo and Saito, 2008). The shareholders, as a principal in this contract, can monitor payments for *total* director compensation at the shareholders' meetings. Thus, we expect that shareholders in Japanese firms have a relatively strong incentive to monitor managers compensation contracts and demand accounting conservatism. If managers and directors do not supply conservatism, shareholders are likely to discount the stock price.

Further, managers themselves might also have an incentive to use accounting conservatism to respond to shareholders' demands. Shuto and Takada (2010) argue that firm managers can bond themselves to outside shareholders by employing accounting conservatism and suggest that the demand for accounting conservatism is greater when the agency problem between managers and shareholders is more pronounced.

Next, we expect that debtholders also demand accounting conservatism in executive compensation contracts. One typical form of moral hazard between owner-managers and debtholders is overpayment of executive compensation. In particular, owner-managers can receive large bonuses by reporting upwardly biased earnings, creating a serious agency problem between owner-managers and debtholders. Hence, we predict that debtholders are likely to demand accounting conservatism to reduce the likelihood of managers overstating net assets and cumulative earnings in order to distribute the firm's net assets to themselves and to shareholders via larger dividends.

Finally, unlike their US counterparts, Japanese boards of directors (including the CEO) have weak incentive to monitor the compensation payment process. It is thus argued that boards of directors in Japan fail to adequately monitor CEO since they face little pressure from outside directors (Kubo and Saito, 2008, p. 403).

2.2 Hypothesis development

Our first research objective is to investigate the relation between accounting conservatism and earnings-based executive compensation contracts. Watts (2003) expects that accounting conservatism can mitigate the agency problem between managers and shareholders. Because of the information asymmetry between managers and external stakeholders, executives have better information about current and expected firm performance than other stakeholders have. Furthermore, because of their limited tenure and liability, managers have an incentive to inflate expected firm cash flows to maximize their own interests, creating deadweight losses (Ball, 2001; Watts, 2003). From the perspective of compensation contracts, managers may bias reported earnings upward to receive larger current bonuses under earnings-based compensation contracts.

Recovering excess compensation paid to managers is difficult, especially when they leave the firm before the cash flows are realized. Shareholders often require a court ruling for such recovery, which involves time-consuming litigation and high costs. Dechow (2006) presents examples of this type of *ex-post* settling-up problem. Leone et al. (2006) examine the implications of such problems for the asymmetric timeliness of cash compensation relative to returns. They show that the board of directors has the discretion to reduce costly *ex-post* settling-up of excess cash compensation paid to CEOs. However, Shaw and Zhang (2010) criticize the research design of Leone et al. (2006) and argue that the board of directors cannot mitigate the *ex-post* settling-up problem. Watts (2003) argues that conservatism is a verifiable earnings measure that can prevent managers from receiving excess compensation or making inefficient investments. This argument supports our prediction that the demand for accounting conservatism will be greater for firms that depend heavily on earnings-based executive compensation plans.

To examine firms' dependence on earnings-based executive compensation contracts, we focus on the CEC (pay-for-performance sensitivity) based on Bushman et al.'s (2006) method. Managers of firms with high CEC are likely to have stronger incentives to favor external shareholders' interests: the incentive system encourages managers to increase accounting-based performance and thereby reduce the agency problem between managers and shareholders.

However, such a strong incentive system could induce managers to engage in earnings management in order to maximize their bonuses (Healy, 1985; Shuto, 2007). In addition, managers of firms with relatively high CEC could receive excess compensation by reporting temporarily inflated earnings. For example, if managers retiring from such firms inflate net assets and earnings temporarily in their final years, their excess compensation would be larger. The following hypothesis is therefore proposed:[11]

HYPOTHESIS 1: *Accounting conservatism is positively related to compensation earnings coefficients.*

Our second research objective is to examine how the *ex-ante* information environment affects the relation between accounting conservatism and executive compensation contracts. Since the information environment affects the opportunistic behavior of managers, it is also expected to affect the demand for accounting conservatism in compensation contracts. Assuming that a poor *ex-ante* information environment implies severe information asymmetry between managers and external stakeholders, managers of firms with low-quality information environments could have more opportunities to inflate their net assets and earnings and receive larger bonuses. Because serious information asymmetry render shareholders and external stakeholders unable to monitor managers closely, firms with poor *ex-ante* information environments have more *ex-post* settling-up problems. Thus, we hypothesize that the positive relation between accounting conservatism

[11] On the other hand, we should note that accounting conservatism might reduce the efficiency of executive compensation contracts. For example, the adoption of accounting conservatism might lower managerial incentives because rewards for current-period economic success are deferred until the results are realized in future earnings. Further, studies on the relation between accounting conservatism and investment efficiency argue that, while accounting conservatism is expected to increase investment efficiency, it can also cause an under-investment problem (Watts, 2003; Ball, 2001). If stakeholders place greater importance on this negative effect of accounting conservatism on contracting, the CEC will not be significantly associated with accounting conservatism as hypothesized. Thus, it is an empirical question whether the demand for increased accounting conservatism is positively related to compensation earnings coefficients.

and compensation earnings coefficients is stronger in firms with poor *ex-ante* information environments:

HYPOTHESIS 2: *The positive relation between accounting conservatism and compensation earnings coefficients is stronger in firms with poor ex-ante information environments.*

3 Research design

3.1 Variable measurement

3.1.1 Accounting conservatism measures

We capture the degree of accounting conservatism using a model specification based on Basu (1997):

$$E_{it} = \alpha_0 + \alpha_1 DR_{it} + \alpha_2 R_{it} + \alpha_3 DR_{it} * R_{it} + \varepsilon_{it} \qquad (1)$$

where

E = net income divided by market value of equity at the beginning of the fiscal year,

R = stock returns over the fiscal year,

DR = an indicator variable taking a value of 1 if the returns (R) are negative and zero otherwise.

The i and t subscripts indicate the firm and year, respectively. While the coefficient of R measures the timeliness of earnings with respect to positive returns (i.e., good news), that of $DR*R$ measures the incremental timeliness of earnings with respect to negative returns (i.e., bad news). The coefficient of $DR*R$ indicates the difference between the sensitivity of earnings to good news versus bad news (i.e., the asymmetric timeliness of earnings). This asymmetric timeliness of earnings is referred to as "conditional conservatism" (Ball and Shivakumar, 2005; Beaver and Ryan, 2005; Ryan, 2006). We focus on conditional conservatism in testing our hypotheses because Ball and Shivakumar (2005) argue that conditional conservatism can enhance contracting efficiency, whereas unconditional conservatism is inefficient for (or at best neutral in) contracting.[12]

3.1.2 Compensation Earnings Coefficients

To consider incentive intensity in earnings-based compensation contracts, we estimate CECs following the method of Bushman et al. (2006). We estimate firm-specific CECs through a time-series regression of compensation changes on changes in earnings and stock returns using the following regression model:

$$\Delta BONUS_{it} = \beta_0 + \beta_1 \Delta E_{it} + \beta_2 RET_{it} + \varepsilon_{it} \tag{2}$$

where

$\Delta BONUS$ = change in the natural log of the director's bonus at the end of the fiscal year,

[12] Ball and Shivakumar (2005, pp. 90–91) argue that unconditional conservatism can be easily observed and that stakeholders adjust for it *ex-ante*. In addition, it reduces opportunities to use conditional conservatism. Thus, unconditional conservatism is likely to reduce contracting efficiency.

ΔE = change in net income deflated by the market value of equity at the beginning of the fiscal year,

RET = cumulative stock returns over the 12-month period of the firm's fiscal year.

We use the *total* cash bonus of all directors on the board as a proxy for executive compensation[13] because studies such as Aoki (1990) and Milgrom and Roberts (1992) argue that the Japanese corporate governance system functions more through consensus than through CEO dominance (as in the US) and that Japanese board members function as a group. Unlike the disclosure requirements of the US Securities and Exchange Commission, corporate proxy statements in Japan provide no information on the compensation of individual executives in our sample period. In Japan, only the total compensation paid to all directors is disclosed in the *Yuka Shoken Hokokusho*, the Japanese equivalent of the US 10-K filings. Data on executives, such as the number of executives, average ages, careers, total salaries, and the bonuses paid to all directors, can be obtained from this report.[14] Model (2) measures the CEC as the sensitivity of the annual cash bonus to earnings, the coefficients of ΔE, while controlling for other public performance information (Bushman et al., 2006, pp. 62–63). Stock returns are included to proxy for the additional public performance

[13] Most studies on Japanese executive compensation use the *total* cash compensation of the board of directors as the proxy variable for executive compensation (Joh, 1999; Kaplan, 1994; Otomasa, 2004; Shuto, 2007).

[14] Our estimation model for *CEC* might have a limitation in that our director bonus variable includes both executive and nonexecutive directors' bonuses. Because non-executive directors generally do not receive variable compensation, we should consider only the executive director's bonus. To address this problem, we consider the change in the director bonus as a dependent variable. Assuming that the non-executive director's bonus varies little from year to year, the above limitation is not a serious problem in our study.

information used in compensation contracts.[15]

To measure the *CEC* of period *t*, we estimate the time-series regression model for each firm for the period *t*-8 to *t*-1. We presume that firms with a higher *CEC* have explicit or implicit earnings-based compensation plans and that their managers thus have high incentive intensity. Therefore, as described in the hypothesis development, accounting conservatism will be greater for firms with higher *CEC* values.

3.2 Research models

3.2.1 Research model for testing hypothesis 1

To test hypothesis 1, we examine the relation between accounting conservatism and earnings-based compensation plans. Specifically, we use the following model to investigate the relation between the asymmetric timeliness of earnings and CECs:

$$
\begin{aligned}
E_{it} = {} & \gamma_0 + \gamma_1 DR_{it} + \gamma_2 R_{it} + \gamma_3 DR_{it}*R_{it} + \gamma_4 R_{it}*CEC_{it} + \gamma_5 DR_{it}*R_{it}*CEC_{it} + \gamma_6 CEC_{it} + \gamma_7 MTB_{it} \\
& + \gamma_8 SIZE_{it} + \gamma_9 DR_{it}*CEC_{it} + \gamma_{10} DR_{it}*MTB_{it} + \gamma_{11} DR_{it}*SIZE_{it} + \gamma_{12} R_{it}*MTB_{it} \\
& + \gamma_{13} R_{it}*SIZE_{it} + \gamma_{14} DR_{it}*R_{it}*MTB_{it} + \gamma_{15} DR_{it}*R_{it}*SIZE_{it} + Year\ dummy \\
& + Firm\ fixed\ effects + \varepsilon_{it} \qquad (3)
\end{aligned}
$$

where

[15] As discussed in Bushman et al. (2006, note 13), we do not assume that stock prices are directly used in compensation contracts in our model. The contracts reflect other available performance information. We use stock market returns as a proxy for other available information expected to capture the value impact of publicly available information. The inclusion of stock returns in our empirical models is important for two reasons. First, the actual compensation model can use stock returns; thus, omitting stock returns from the regression would result in a bias for CEC. Second, the omission of performance measures can lead to significant inference problems due to the interactions between the measures in optimal contracts (Demski and Sappington, 1999).

CEC = compensation earnings coefficient measured by coefficient (β_1) on ΔE from the estimation of model (2): $\Delta BONUS_{it} = \beta_0 + \beta_1 \Delta E_{it} + \beta_2 RET_{it} + \varepsilon_{it}$,

MTB = ratio of market value of equity to book value of equity at the beginning of the fiscal year,

SIZE = natural log of the market value of equity at the end of the fiscal year,

Year dummy = year dummy variables,

Firm fixed effects = a vector of firm fixed effects,

All other variables are as previously defined.

The coefficient on *DR*R*CEC* in model (3) measures the relation between the CEC and asymmetric timeliness with respect to bad news.[16] If the relation between the degree of dependence on earnings-based compensation plans and accounting conservatism is consistent with the prediction in hypothesis 1, the coefficient estimate on *DR*R*CEC* is expected to be positive.

We set the control variables for accounting conservatism based on prior research. These include the market-to-book ratio (*MTB*), firm size (*SIZE*), year dummy (*Year dummy*), and firm fixed effects (*Firm fixed effects*).[17] We use the market-to-book ratio to control for the effect of the opening composition of the equity value on future asymmetric

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[16] We estimate the regression model with the *CEC* variable divided by 10.

[17] Although prior studies tend to use leverage as a control variable (Khan and Watts, 2009), we do not include the variables for the following reasons. First, in an additional analysis section, we directly examine the effect of leverage on the relation between accounting conservatism and compensation contract. Second, Roychowdhury and Martin (2013, p.143) argue that because *MTB* provides a parsimonious and important control for conservatism, more extensive controls are unnecessary. Although we also examine the regression model including leverage as a control variable, the results are generally consistent with those of our study.

timeliness because it is determined considering the cumulative effect of past asymmetric timeliness (Roychowdhury and Martin, 2013; Roychowdhury and Watts, 2007).

We use a size variable because studies have indicated that firm size is negatively related to the asymmetric timeliness of earnings (Givoly et al., 2007; LaFond and Watts, 2008). Litigation may also be a source of accounting conservatism (Basu, 1997; Watts, 2003). Thus, several studies on US firms have controlled for the effect of litigation risk on accounting conservatism (LaFond and Roychowdhury, 2008; LaFond and Watts, 2008). However, we do not control for litigation risk because the Japanese litigation environment is different to that of the US, with Japanese firms facing a litigation risk considerably smaller than that faced by US firms (Shuto and Takada, 2010; Wingate, 1997, Table 2, pp. 138–139). We also include dummy variables to control for year effects. Finally, we use pooled regressions with firm fixed effects to mitigate the biases related to cross-sectional differences in the expected components of returns and earnings (Ball et al., 2013).[18]

3.2.2 Research model for testing hypothesis 2

To test hypothesis 2, we examine the effect of the *ex-ante* information environment on the relation between accounting conservatism and CEC. To measure the *ex-ante* information environment, we construct a composite measure for the quality of firm's information environment. Specifically, we reduce the following four information environment-related

[18] Ball et al. (2013) show both analytically and empirically that the Basu regression's incremental coefficient on negative returns is a biased estimator of the relation between the news components of returns and earnings when there is no control for cross-sectional variation in the expected components of returns and earnings. After implementing various analyses, they conclude that measuring conditional conservatism while simply controlling for firm-specific effects could be an effective way to avoid potentially spurious inferences (Ball et al., 2013, p. 757).

financial variables to a single index through principal component analysis: (1) analyst following; (2) PIN score; (3) number of segments; and (4) the standard deviation of stock returns.

Our primary objective in selecting these variables is to capture the quality of information environment from a *variety* of viewpoints based on prior studies. Analysts following is the most common proxy for information environment (Duchin et al., 2010; Lang and Lundholm, 1993 1996; Riedl and Serafeim, 2011).[19] We assume this indicates the degree of informativeness based on the firm's overall information environment and that outsiders have more information about a firm followed by more analysts (Duchin et al., 2010; Riedl and Serafeim, 2011).[20] Our second measure is the PIN presented by Duarte and Young (2009). The PIN was first proposed by Easley and O'Hara (1992) and was extended by Duarte and Young (2009) to capture the information asymmetry between informed and uninformed investors in equity markets.[21] We follow LaFond and Watts (2008) and use PIN as a proxy for the information asymmetry between managers and

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[19] The number of analysts following is calculated using the data on firms with at least one analyst following since the database used in this study does not distinguish between missing data and zero analyst following. The necessary analyst data are obtained from the Institutional Brokers Estimate System (I/B/E/S) on the Datestream.

[20] While some studies of US firms have used multiple analyst-based measures such as analyst coverage, dispersion of analysts' forecasts, and forecast errors in measuring information asymmetry (Riedl and Serafeim, 2011; Duchin et al., 2010), we do not depend heavily on the analyst variables because Japanese analysts are less active than US analysts are (Ota and Kang, 2011, pp. 39–40). The mean of analysts in our sample is 5.735, which is quite low compared to the 15.16 of US firms (Duchin et al., 2010). Because of this difference, the dispersion of analysts' forecasts significantly decreases our sample size. Thus, we use not only the analyst variables but also a wide variety of variables related to the *ex-ante* information environment.

[21] The PIN used in this study, as proposed by Duarte and Young (2009), is sometimes referred to as the "adjusted PIN." Duarte and Young (2009) extended the original PIN model by including an order–flow shock component in the original model. Please see Kubota et al. (2010), Ebihara et al. (2014) and Kubota and Takehara (2015) for detailed information on the calculation method for PIN used in this study.

outside equity investors.[22]

Our third measure is the number of segments expected to capture the complexity of sample firms. Some studies argue that the complexity of firms such as those with numerous segments requires outsiders to incur additional costs to gain information about the firms. Studies suggest that the information gathering costs of outsiders such as investors, analysts, and outside directors increase along with number of business lines (Bhushan, 1989; Boone et al., 2007; Coles et al., 2008; Duchin et al., 2010; Frankel et al., 2006; Greenstein and Sami, 1994). Finally, we use the standard deviation of stock returns over the 12-month fiscal year to capture fundamental firm uncertainty. In particular, studies have used share price volatility as a proxy for information asymmetry (Duchin et al., 2010; Healy et al., 1999; Lang and Lundholm, 1993; Leuz and Verrecchia, 2000). To the extent that past performance volatility suggests performance unpredictability, volatility indicates the potential information asymmetries between the firm and shareholders or among investors (Lang and Lundholm, 1993; Leuz and Verrecchia, 2000).

Focusing on a single variable might not completely capture the *ex-ante* information environment. Therefore, to comprehensively estimate this feature, we construct a composite measure of the degree of the *ex-ante* information environment with principal component analysis and reduce the above four variables into a single index (*INFO*). To test hypothesis 2, we partition our sample firms into two sub-samples based on *INFO* and re-estimate regression model (3).

[22] LaFond and Watts (2008) provide evidence suggesting that the information asymmetry between firm insiders and outside equity investors generates conservatism after controlling for other demands for conservatism.

4 Sample selection and descriptive statistics

4.1 Sample selection

Table 1 summarizes our sample selection procedure. We obtain our initial sample of 41,152 observations from listed non-financial companies for years 1987 to 2015. The necessary financial statement and share price data are obtained from the *Nikkei NEEDS Financial QUEST* database. We first delete 2,675 firm-year observations because the accounting period was changed during the analysis timeframe. We also exclude 26,740 observations with insufficient data required to calculate the CEC. We require this criterion to estimate the CEC involving time-series data covering the past eight years. Further, after deleting observations with missing data to calculate the other variables, the sample reduces to 11,731 observations to test hypothesis 1. We also exclude 6,591 observations with insufficient data needed to calculate the *INFO* for the test of hypothesis 2. For example, the PIN data are only available from 1997 to 2012. Hence, the sample used in the analysis of hypothesis 2 includes 5,140 observations. To ensure that the results are not sensitive to extreme values, we winsorize the variables at their 1st and 99th percentiles by year.

【Insert Table 1 about here】

4.2 Descriptive statistics

Table 2 summarizes the descriptive statistics for the variables used in this study. The mean (median) of net income (*E*) and fiscal stock returns (*R*) are 0.030 (0.040) and 0.076 (0.016), respectively; this is generally consistent with the results of previous studies (Ball et al., 2000; Shuto and Takada, 2010). The median net income exceeds its mean value, indicating that the net income is negatively skewed. However, as Table 2 shows, stock returns are positively skewed (i.e., the mean value exceeds the median value). This differential skew of earnings relative to returns is consistent with asymmetric accounting conservatism.

【Insert Table 2 about here】

We report the estimation results of model (2) in Table 3. The table shows that the mean adjusted R-squared of the model is 0.180 and the average value of the coefficients on accounting earnings (ΔE), 12.507, is positive, suggesting that managerial bonuses in Japan are generally associated with accounting earnings. Further, we divide the sample into two sub-samples according to the sign of CEC (i.e., the coefficient on ΔE). We can posit that firms with a positive *CEC* have an earnings-based bonus plan, while firms with a negative *CEC* do not. Given that assumption, the table shows that about 75% of our sample firms has a sort of bonus plan based on accounting earnings. We also find that, for the sub-sample with a positive *CEC*, the coefficient on ΔE is positive and has a relatively high *t*-value. Moreover, the mean adjusted R-squared of the model, 0.236, is higher than is that of the model of the sub-sample with a negative CEC, -0.001. The above results suggest that accounting earnings have a high explanatory power for managerial bonuses and that most Japanese firms have earnings-based bonus plans.

【Insert Table 3 about here】

Table 4 summarizes the correlation matrix of the variables used in this analysis. The upper right-hand side of the table reports the Spearman rank-order correlations, and the lower left-hand side reports the Pearson correlations. For both correlations, *E* is positively correlated with *R* and negatively correlated with *DR*. This suggests that reported earnings reflect at least a portion of the information in the returns, consistent with the results of previous studies (Ball et al., 2000; Basu, 1997; Shuto and Takada, 2010).

【Insert Table 4 about here】

5 Results

5.1 Result for hypothesis 1

Hypothesis 1 predicts that a relatively high CEC is positively associated with greater asymmetric earnings timeliness. To test the hypothesis, we estimate model (3) and summarize the results in Table 5. We use pooled regressions and reported *t*-statistics based on standard errors clustered at the firm level, following Petersen's (2009) analysis.[23,24]

【Insert Table 5 about here】

The results in Table 5 are consistent with our hypothesis. First, Table 5 indicates that the coefficient of *DR*R*CEC* is 0.007; this is significantly positive at the 5% level in a one-tailed test, as expected. Thus, the demand for accounting conservatism is greater for

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[23] Petersen (2009) indicates that researchers can address cross-sectional dependence and time-series dependence by including time dummies in the model, and then by estimating standard errors clustered by firms. We use this estimation method to simultaneously control for time-series dependence and cross-sectional dependence. If clustering standard errors at firm level does not allow for the estimation of standard errors of all our year dummy variables, we combine at least two years' dummy variables into a one-year dummy variable to estimate the regression.

[24] We also estimate the regression model based on the weighted least squares (WLS). We use the mean of the CECs as weights in the regressions. The results based on the WLS are generally consistent with our initial results.

firms with an earnings-based incentive compensation plan. As for the control variables, the coefficients of *DR*R*MTB* and *DR*R*SIZE* have the expected signs, although *DR*R*MTB* is not significant at conventional levels.

Furthermore, following the method of LaFond and Roychowdhury (2008), we assess the economic significance of the effect of *CEC* on asymmetric timeliness. The table indicates that the coefficient on *DR*R*CEC* is 0.007. Although *MTB* is another widely acknowledged factor that affects asymmetric timeliness (LaFond and Roychowdhury, 2008), the result indicates that the coefficient on *DR*R*CEC* is similar to the absolute value of *DR*R*MTB*, -0.009. More importantly, the marginal effects of *CEC* on accounting conservatism show that the asymmetric timeliness coefficient increases from 0.048 in the first quartile of *CEC*, to 0.059 in the third quartile of *CEC*.[25] The results signify 24% increase in the asymmetric timelines coefficient across *CEC*, which appears to be an economically significant increase.

5.2 Result on hypothesis 2

Next, we test hypothesis 2, which predicts the effect of the *ex-ante* information asymmetry on the relation between accounting conservatism and CEC. Using the composite quality of information environment measure (*INFO*), we first partition our sample firms into two sub-

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[25] We have calculated the marginal effects of CEC on accounting conservatism in Table 5. To estimate the degree of accounting conservatism (*CON*), we partially differentiate *E* with respect to *DR*R*: $CON = \partial (E) / \partial(DR*R) = 0.255 + 0.007CEC - 0.009MTB - 0.018SIZE$. We use mean values for *MTB* (1.348) and *SIZE* (10.855) in Table 2.

samples: *INFOlow* and *INFOhigh*. The *INFOlow* (*INFOhigh*) sub-sample contains observations whose *INFO* values are less (more) than the sample median. We then re-estimate regression model (3) for each sub-sample and summarize the results in Table 6.

【Insert Table 6 about here】

The table shows that, for the *INFOlow subsample*, the coefficient on *DR*R*CEC*, 0.022, is significantly positive at the 1% level whereas the coefficient on *DR*R*CEC* for *INFOhigh* is not significant. We conduct a formal test of the difference in estimated coefficients on *DR*R*CEC* across the two sub-samples. The untabulated results based on the seemingly unrelated estimation (SUE) procedure show that the magnitude of the coefficients are significantly different (χ^2-statistics = 5.15, *p*-value = 0.023).These results suggest that the significantly positive relation between accounting conservatism and CEC is due to a poor *ex-ante* information environment. These results are consistent with hypothesis 2.

In summary, the results of this section suggest that accounting conservatism has a positive relation with the use of earnings-based compensation contracts and that the demand for accounting conservatism is greater for firms with a low-quality information environment.

6 Additional analysis: Demand of external stakeholders for conservatism

Our main analyses indicate that the demand for accounting conservatism is greater for firms with earnings-based executive compensation contracts, suggesting that accounting conservatism could reduce the agency problem between managers and stakeholders by increasing the efficiency of the compensation contracts. In this section, we examine the effect of the external stakeholders, including institutional investors and large debtholders, on the use of accounting conservatism in compensation contracts to reduce agency problems. Because external stakeholders are aware of the possibility of opportunistic managerial behavior, they will punish the firm for inflating earnings by discounting the firm's value or restricting access to borrowings or increasing the cost. Thus, firms with institutional investors or large debtholders might require more conservatism if it is useful for governance.

The arguments of prior studies lead to two alternative predictions. On the one hand, as stated above, we predict that external stakeholders closely related to firms will demand more accounting conservatism. In general, institutional investors are more sophisticated than individual investors and are thus important price-setters in capital markets (Hand, 1990; Chan and Lakonishok, 1995; Ramalingegowda and Yu, 2012; Sias et al., 2006; Walther, 1997). If conservative financial reporting provides governance benefits, then institutional investors are more likely to understand and value such benefits and consequently demand conservative accounting from managers (Ramalingegowda and Yu, 2012). If managers report less conservative earnings, contrary to the external stakeholders' demands, then the external stakeholders will discount the firm's value. Thus, we expect that the optimal action for a manager is to apply accounting conservatism. Consistent with this prediction, Ramalingegowda and Yu (2012) show that higher ownership by institutions that are likely to monitor managers is associated with more conservative financial reporting.

On the other hand, it is possible that external stakeholders closely related to firms do not drive the demand for accounting conservatism. Because these external stakeholders, such as institutional investors and large debtholders are likely to have privileged access to inside information (Carleton et al., 1998), they may rely more on direct monitoring and less on monitoring through accounting numbers (Holmström, 1979; Ke et al., 1999; Prendergast, 2002; Ramalingegowda and Yu, 2012). Especially in Japan, large debtholders such as main banks are capable of monitoring the inefficient behavior of firm managers because they have better access to inside firm information through monitoring activities such as checking accounts, holding shares, and having board representation (Aoki and Patrick, 1994).[26] Consistent with this inference, Erkens et al. (2014) provide evidence suggesting that lender monitoring through board representation, known as "affiliated banker on board," reduces lenders' demand for accounting conservatism.

Thus, whether external stakeholders in Japan demand conservative financial reports is an empirical question. To test the alternative predictions, we alternatively partition the sample at the median of the following variables: 1) residual institutional ownership (*RFIN*) and 2) leverage (*LEV*). Prior research finds that institutional ownership is endogenously determined by firm characteristics such as firm size, information environment, investment opportunity sets, and firm age (Gompers and Metrick, 2001; Ramalingegowda and Yu, 2012). To mitigate this problem, we estimate the residual ownership that is the residual from estimating an expected ownership model that expresses ownership as a function of

[26] The main bank system is usually defined as the close relation between a firm and a specific bank, characterized by bank borrowing, shareholdings of the client firms, and board members' exchanges (Aoki and Patrick, 1994; Hoshi and Kashyap, 2001).

economic determinants, following prior research (Gompers and Metrick, 2001; Ramalingegowda and Yu, 2012).[27] The regression results for the model using the *FIN* variable are summarized in Table 7. The table shows that the coefficients on *DR*R*CEC* for the *RFINlow* and *RFINhigh sub-sample*s are not significant. This suggests that institutional ownership does not demand more conditional conservatism in compensation contracts.

Table 8 reports the regression results for the model using the *LEV* variable. The table reveals that, while the coefficient on *DR*R*CEC* for the *LEV* high sub-sample, 0.014, is significantly positive, the coefficient on *DR*R*CEC* for the *LEV* low sub-sample is not significant[28]. These results suggest that large debtholders consider accounting conservatism as a useful governance tool and require managers to use it.

【Insert Table 7 about here】

【Insert Table 8 about here】

In summary, our results suggest that the use of accounting conservatism to reduce the agency problem in executive compensation contracts depends on the governance structure. The strong effect of large debtholders on the use of conservatism might be explained by the specific institutional features in Japan, the tight relation between firms, and their related banks.

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[27] Please see the details on the estimation method provided in the appendix.

[28] We conduct a formal test of the difference in estimated coefficients on *DR*R*CEC* across the two sub-samples, using the SUE procedure. The result provides evidence that the coefficients are insignificantly different (χ^2-statistics = 2.46, p-value = 0.117).

7 Conclusion

Following the argument in Watts (2003), we investigate the relation between accounting conservatism and earnings-based executive compensation contracts in Japanese firms. Watts (2003) argues that accounting conservatism reduces the likelihood that managers will inflate their firm's net assets and cumulative earnings in order to allocate the firm's net assets to themselves rather than invest in positive net present value projects. Furthermore, the demand for accounting conservatism tends to be greater for firms with low-quality information environments because the managers of such firms have more opportunities to engage in opportunistic behavior. Thus, we hypothesize that accounting conservatism is positively related to the degree of dependence on earnings-based executive compensation contracts and that this positive relation is greater for firms with poor *ex-ante* information environments.

We focus on Japanese firms because their managers have stronger incentives to supply accounting conservatism in executive compensation contracts. First, Japanese managers have a stronger incentive to manage their earnings and increase their bonuses because earnings-based compensation plans are predominant in their compensation packages. Second, due to relatively weak corporate governance, the stakeholders of Japanese firms have less power to control managerial opportunistic behavior. Thus, we expect stakeholder to demand more accounting conservatism to reduce excessive managerial compensation.

Consistent with these arguments, we find a positive relation between accounting conservatism and CEC, suggesting that the demand for accounting conservatism is greater for firms with higher earnings-based incentives. We also find a greater positive relation for firms with poor *ex-ante* information environments. Overall, our results illustrate the economic role of accounting conservatism in executive compensation contracts, supporting the argument of Watts (2003).

Finally, it must be noted that this study has some limitations. First, our entire analysis depends on the validity of the proxies for the pay–performance relation (i.e., *CEC*). Second, although we assume that the use of an earnings-based executive compensation contract encourages managers to use accounting conservatism, the possibility that there is an inverse causal relation between accounting conservatism and *CEC* cannot be excluded. Future research should address these issues.

APPENDIX: Estimation of residual ownership by financial institutions

This appendix describes how we estimate the measure of residual financial ownership (*RFIN*), defined as the residual from an expected financial ownership model that expresses financial ownership as a function of its economic determinants. Our model is based on Gompers and Metrick (2001) and Ramalingegowda and Yu (2012). The model is described below:

$$FIN_{it} = \beta_0 + \beta_1 BM_{it\text{-}1} + \beta_2 MV_{it} + \beta_3 Volatility_{it} + \beta_4 Turnover_{it} + \beta_5 Price_{it} + \beta_6 Momentum1_{it} + \beta_7 Momentum2_{it} + \beta_8 Age_{it} + \beta_9 Yield_{it\text{-}1} + \varepsilon_{it} \quad \text{(A1)}$$

where

FIN = ratio of the number of shares owned by financial institutions divided by the number of total shares,

BM = book-to-market ratio at the end of year *t*-1,

MV = market value of equity at the end of year *t*,

Volatility = variance of monthly returns from year *t*-2 to *t*,

Turnover = monthly volume divided by shares outstanding, measured three months prior to the end of year *t*,

Price = share price measured at the end of year *t*,

Momentum1 = firm's three months' gross return prior to the end of year *t*,

Momentum2 = firm's nine months' gross return ending three months prior to the end of year *t*,

Age = age of firm at the end of year *t* measured as number of years the firm is incorporated,

Yield = dividends of year *t*-1, scaled by market value of equity at the end of year *t*-1.

Following Gompers and Metrick (2001), we set nine independent variables for economic determinants, which are expected to be systematically related to financial ownership. We use *Age*, *Yield*, and *Volatility* as proxies for prudence motive.[29] If prudence considerations are important for financial institutions, then we expect financial ownership to be positively related to *Age* and *Yield* and negatively related to *Volatility*. We use *MV*, *Price*, and *Turnover* as proxies for liquidity and transaction-cost motives. If financial institutions demand liquid stocks, then we expect financial ownership to be positively related to *MV*, *Price*, and *Turnover*. We use *BM*, *Momentum1*, and *Momentum2* as proxies for historical return patterns. If financial institutions prefer to invest in firms based on historical return patterns, then we expect financial ownership to be positively related to *BM*, *Momentum1*, and *Momentum2*.

We estimate model A1 using a cross-sectional regression for every year. We then extract regression residuals for financial ownership variables (*FIN*) as our residual ownership measure (denoted *RFIN*). Therefore, our residual ownership measure captures the component of ownership unexplained by the economic determinants included in model

[29] Gompers and Metrick (2001) use S&P 500 membership as a proxy for the prudence motive. We omit S&P 500 membership, which includes large companies on the US stock market, from this proxy because our sample is composed only of Japanese companies.

A1. Further, prior studies reveal that transient shareholders do not have strong incentive to monitor managers (Bushee, 1998; Shuto and Iwasaki, 2014). In un-tabulated results, we find similar results when we use stable financial ownership, instead of *FIN*.[30]

[30] Specifically, we use the stable shareholdings owned by financial institutions from the database, *the Data Package of Cross-Shareholdings and Stable Shareholding*s (*Kabushiki mochiai joukyou chousa no kiso data*).

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Table 1 Sample selection procedures

Criteria	Firm-years
Firm-years with data on consolidated financial statements during 1987-2015[1]	41,152
Less:	
Changing in accounting month within firm-years necessary for our analyses	(2,675)
Missing data to calculate compensation earnings coefficients	(26,740)
Missing data to calculate variables	(6)
Sample for hypothesis 1	11,731
Less:	
Missing data to calculate information environment variables	(6,591)
Sample for hypothesis 2	5,140

Note: This table presents the sample selection procedures of our sample. The sample is based on *the Nikkei NEEDS Financial QUEST* over the period 1987-2015.The industry is based on the Nikkei industry classification code (Nikkei gyousyu chu-bunrui). The code classifies the listed companies in Japan into 36 industries. The financial statements data is based on consolidated financial statements.

[1] We require sample firms to have past 10 years consolidated financial statements data, excluding financial institutions (banks, securities companies, and insurance companies) and other financial institutions (credit and leasing).

Table 2 Descriptive statistics

	Mean	Min	p25	Median	p75	Max	SD	Skewness	Kurtosis	*N*
E	0.030	-1.012	0.014	0.040	0.070	0.446	0.106	-3.191	22.953	11,731
R	0.076	-0.705	-0.172	0.016	0.238	2.927	0.391	1.803	9.768	11,731
DR	0.479	0.000	0.000	0.000	1.000	1.000	0.500	0.085	1.007	11,731
CEC	1.266	-34.538	0.022	0.489	1.653	50.717	3.053	2.879	35.829	11,731
INFO	0.000	-3.817	-0.821	-0.111	0.769	3.816	1.173	0.263	2.907	5,140
MTB	1.348	0.202	0.691	1.067	1.662	11.189	1.031	2.847	16.381	11,731
SIZE	10.855	7.007	9.682	10.697	11.899	15.448	1.597	0.366	2.615	11,731

Note: This table presents the descriptive statistics of our sample. *E* = net income divided by the market value of equity at the beginning of the fiscal year. *R* = stock return over the fiscal year. *DR* = an indicator variable taking the value of 1 if the returns (*R*) are negative and zero otherwise. *CEC* = compensation earnings coefficient measured by coefficient (β_1) on ΔE from the estimation of model: $\Delta BONUS_{it} = \beta_0 + \beta_1 \Delta E_{it} + \beta_2 RET_{it} + \varepsilon_{it}$. $\Delta BONUS$ = change in the natural log of director's bonus at the end of the fiscal year. ΔE = change in net income deflated by the market value of equity at the beginning of the fiscal year. *RET* = cumulative stock market return over the 12-month period of the firm's fiscal year. *INFO* = *ex-ante* information environment of the firm, computed using principal component analysis of the four variables (analysts following, the probability of informed trading (PIN score), the number of segments, and standard deviation of monthly stock returns). *MTB* = ratio of market value of equity to book value of equity at the beginning of fiscal year. *SIZE* = natural log of the market value of equity at the end of fiscal year.

Table 3 Regression result of managerial compensation on earnings

Independent Variable	Full sample Coefficient (t-value)	$CEC > 0$ Coefficient (t-value)	$CEC < 0$ Coefficient (t-value)
Constant	-0.145	-0.140	-0.163
	(-0.253)	(-0.240)	(-0.299)
ΔE	12.507	18.969	-9.246
	(1.743)	(2.546)	(-0.961)
RET	0.313	0.091	1.061
	(0.278)	(0.131)	(0.775)
Adj. R^2	0.180	0.236	-0.001
N	12,096	9,329	2,767

Note: This table reports the estimated parameters in the regression model (2): $\Delta BONUS_{it} = \beta_0 + \beta_1 \Delta E_{it} + \beta_2 RET_{it} + \varepsilon_{it}$. $\Delta BONUS$ = change in the natural log of director's bonus at the end of the fiscal year. ΔE = change in net income deflated by the market value of equity at the beginning of the fiscal year. *RET* = the cumulative stock market return over the 12-month period of the firm's fiscal year. The regressions are estimated for every firm-year. The table reports the mean coefficient across all firm-years and t-statistics calculated. The table also reports the mean adjusted R^2 (across firm-years) for each of these regressions. t-statistics are corrected for time-series correlation using a one-way cluster at the firm level.

Table 4 Correlations matrix

	E	*R*	*DR*	*CEC*	*INFO*	*MTB*	*SIZE*
E	1.00	0.46***	-0.41***	-0.11***	0.11***	-0.05***	0.09***
R	0.29***	1.00	-0.86***	-0.04***	0.11***	-0.26***	0.20***
DR	-0.27***	-0.71***	1.00	0.03**	-0.11***	0.21***	-0.17***
CEC	-0.05***	-0.04***	0.03**	1.00	0.08***	0.03**	0.07***
INFO	0.13***	0.05***	-0.10***	0.04***	1.00	0.30***	0.75***
MTB	0.00	-0.19***	0.18***	0.02*	0.17***	1.00	0.44***
SIZE	0.14***	0.16***	-0.17***	0.06***	0.75***	0.29***	1.00

Note: This table presents the correlations matrix (Pearson correlations are shown below the main diagonal, and Spearman correlations are shown above. *E* = net income divided by the market value of equity at the beginning of the fiscal year. *R* = stock return over the fiscal year. *DR* = an indicator variable taking the value of 1 if the returns (*R*) are negative and zero otherwise. *CEC* = compensation earnings coefficient measured by coefficient (β_1) on ΔE from the estimation of model: $\Delta BONUS_{it} = \beta_0 + \beta_1 \Delta E_{it} + \beta_2 RET_{it} + \varepsilon_{it}$. $\Delta BONUS$ = change in the natural log of director's bonus at the end of the fiscal year. ΔE = change in net income deflated by the market value of equity at the beginning of the fiscal year. *RET* = the cumulative stock market return over the 12-month period of the firm's fiscal year. *INFO* = *ex-ante* information environment of the firm, computed using principal component analysis of the four variables (analysts following, the probability of informed trading (PIN score), the number of segments, and standard deviation of monthly stock returns). *MTB* = ratio of market value of equity to book value of equity at the beginning of fiscal year. *SIZE* = natural log of the market value of equity at the end of fiscal year. ***, **, and * indicate statistically significance at the 0.01, 0.05 and 0.1 levels using a two-tailed *t*-test, respectively.

Table 5 Regression result on the relation between compensation earnings coefficient and accounting conservatism

Independent Variable	Expected Sign	Coefficient (t-value)
Constant		-0.447***
		(-7.284)
DR		-0.010
		(-0.442)
R	+	0.112***
		(2.462)
*DR*R*	+	0.255***
		(2.846)
*R*CEC*	−	-0.002*
		(-1.291)
*DR*R*CEC*	+	0.007**
		(1.735)
CEC		-0.000
		(-0.849)
MTB		0.002
		(0.572)
SIZE		0.047***
		(7.376)
*DR*CEC*		0.001
		(1.462)
*DR*MTB*		0.004
		(1.213)
*DR*SIZE*		-0.000
		(-0.192)
*R*MTB*	+	-0.004
		(-0.540)
*R*SIZE*	+/−	-0.007*
		(-1.490)
*DR*R*MTB*	−	-0.009
		(-0.760)
*DR*R*SIZE*	+/−	-0.018**
		(-2.177)
Year fixed effects		Yes
Firm fixed effects		Yes
Adj. R^2		0.174
N		11,731

Note: This table presents the regression results of the relation between compensation earnings coefficient and accounting conservatism. E = net income divided by the market value of equity at the beginning of the fiscal year. R = stock return over the fiscal year. DR = an indicator variable taking the value of 1 if the returns (R) are negative and zero otherwise. CEC = compensation earnings coefficient measured by coefficient (β_1) on ΔE from the estimation of model: $\Delta BONUS_{it} = \beta_0 + \beta_1 \Delta E_{it} + \beta_2 RET_{it} + \varepsilon_{it}$. $\Delta BONUS$ = change in the natural log of director's bonus at the end of the fiscal year. ΔE = change in net income deflated by the market value of equity at the beginning of the fiscal year. RET = the cumulative stock market return over the 12-month period of the firm's fiscal year. MTB = ratio of market value of equity to book value of equity at the beginning of fiscal year. $SIZE$ = natural log of the market value of equity at the end of fiscal year. t-statistics are corrected for time-series correlation using a one-way cluster at the firm level. ***, **, and * indicate statistically significance at the 0.01, 0.05 and 0.1 levels, respectively. p-values are one tailed when the sign of the coefficient is predicted, two tailed otherwise.

Table 6 Regression results on the effect of *ex-ante* information environment on the relation between accounting conservatism and compensation earnings coefficient

Independent Variable	Expected Sign	*INFOlow sub-sample* Coefficient (*t*-value)	*INFOhigh sub-sample* Coefficient (*t*-value)
Constant		-0.434***	-0.378***
		(-2.870)	(-2.996)
DR		-0.024	-0.011
		(-0.260)	(-0.188)
R	+	0.003	0.002
		(0.028)	(0.026)
*DR*R*	+	0.535**	0.226
		(2.050)	(1.013)
*R*CEC*	−	-0.005**	-0.000
		(-1.981)	(-0.051)
*DR*R*CEC*	+	0.022***	-0.001
		(2.575)	(-0.215)
CEC		0.002	-0.000
		(1.481)	(-0.537)
MTB		0.001	-0.000
		(0.303)	(-0.283)
SIZE		0.021**	-0.003
		(2.125)	(-0.539)
*DR*CEC*		0.040***	0.034***
		(2.709)	(3.138)
*DR*MTB*		-0.003	0.002
		(-0.282)	(0.239)
*DR*SIZE*		0.001	0.000
		(0.117)	(0.018)
*R*MTB*	+	-0.007	-0.006
		(-0.479)	(-0.937)
*R*SIZE*	+/−	0.004	0.002
		(0.434)	(0.365)
*DR*R*MTB*	−	0.017	-0.006
		(0.737)	(-0.308)
*DR*R*SIZE*	+/−	-0.053**	-0.016
		(-2.255)	(-0.869)
Year fixed effects		Yes	Yes
Firm fixed effects		Yes	Yes
Adj. R^2		0.222	0.216
N		2,565	2,575

Note: This table presents the regression results on the effect of ex-ante information environment on the relation between accounting conservatism and compensation earnings coefficient. *INFOlow* (*INFOhigh*) sub-sample contains observations whose *INFO* values are less (more) than the sample median. *INFO* is *ex-ante* information environment of the firm, computed using principal component analysis of the four variables (analysts following, the probability of informed trading (PIN score), the number of segments, and standard deviation of monthly stock returns). *E* = net income divided by the market value of equity at the beginning of the fiscal year. *R* = stock return over the fiscal year. *DR* = an indicator variable taking the value of 1 if the returns (*R*) are negative and zero otherwise. *CEC* = compensation earnings coefficient measured by coefficient (β_1) on ΔE from the estimation of model (2): $\Delta BONUS_{it} = \beta_0 + \beta_1 \Delta E_{it} + \beta_2 RET_{it} + \varepsilon_{it}$. $\Delta BONUS$ = change in the natural log of director's bonus at the end of the fiscal year. ΔE = change in net income deflated by the market value of equity at the beginning of the fiscal year. *RET* = the cumulative stock market return over the 12-month period of the firm's fiscal year. *MTB* = ratio of market value of equity to book value of equity at the beginning of fiscal year. *SIZE* = natural log of the market value of equity at the end of fiscal year. *t*-statistics are corrected for time-series correlation using a one-way cluster at the firm level. ***, **, and * indicate statistically significance at the 0.01, 0.05 and 0.1 levels, respectively. One-tailed *p*-values are used when the sign of the coefficient is predicted, two-tailed *p*-values are used otherwise.

Table 7 Regression results on the effect of residual institutional ownership on the relation between accounting conservatism and compensation earnings coefficient

Independent Variable	Expected Sign	*RFIN low sub-sample* Coefficient (*t*-value)	*RFIN high sub-sample* Coefficient (*t*-value)
Constant		-0.463***	-0.572***
		(-3.295)	(-5.523)
DR		0.021	-0.029
		(0.543)	(-0.788)
R	+	0.081	0.179***
		(0.994)	(2.428)
*DR*R*	+	0.358***	-0.038
		(2.342)	(-0.287)
*R*CEC*	−	0.003	-0.005*
		(0.810)	(-1.376)
*DR*R*CEC*	+	-0.008	0.006
		(-0.873)	(0.960)
CEC		-0.000	0.000
		(-0.173)	(0.120)
MTB		0.004	0.018**
		(0.363)	(2.313)
SIZE		0.048***	0.053***
		(3.429)	(5.161)
*DR*CEC*		0.001	-0.000
		(0.584)	(-0.064)
*DR*MTB*		0.023***	0.001
		(3.110)	(0.147)
*DR*SIZE*		-0.005	0.002
		(-1.256)	(0.478)
*R*MTB*	+	0.037**	-0.031**
		(1.864)	(-1.903)
*R*SIZE*	+/−	-0.008	-0.008
		(-1.057)	(-0.986)
*DR*R*MTB*	−	-0.036*	0.039**
		(-1.301)	(1.700)
*DR*R*SIZE*	+/−	-0.020*	-0.001
		(-1.354)	(-0.056)
Year fixed effects		Yes	Yes
Firm fixed effects		Yes	Yes
Adj. R^2		0.178	0.201
N		4,111	4,118

Note: This table presents the regression results on the effect of residual institutional ownership on the relation between accounting conservatism and compensation earnings coefficient. *RFIN low* (*RFIN high*) sub-sample contains observations whose *RFIN* values are less (more) than the sample median. *RFIN* is the ratio of ownership of abnormal financial institution. *RFIN* is computed based on the results estimating the model: $FIN_{it} = \beta_0 + \beta_1 BM_{it-1} + \beta_2 MV_{it} + \beta_3 Volatility_{it} + \beta_4 Turnover_{it} + \beta_5 Price_{it} + \beta_6 Momentum1_{it} + \beta_7 Momentum2_{it} + \beta_8 Age_{it} + \beta_9 Yield_{it-1} + \varepsilon_{it}$. *E* = net income divided by the market value of equity at the beginning of the fiscal year. *R* = stock return over the fiscal year, *DR* = an indicator variable taking the value of 1 if the returns (*R*) are negative and zero otherwise. *CEC* = compensation earnings coefficient measured by coefficient (β_1) on ΔE from the estimation of model: $\Delta BONUS_{it} = \beta_0 + \beta_1 \Delta E_{it} + \beta_2 RET_{it} + \varepsilon_{it}$. $\Delta BONUS$ = change in the natural log of director's bonus at the end of the fiscal year. ΔE = change in net income deflated by the market value of equity at the beginning of the fiscal year. *RET* = the cumulative stock market return over the 12-month period of the firm's fiscal year. *MTB* = ratio of market value of equity to book value of equity at the beginning of fiscal year. *SIZE* = natural log of the market value of equity at the end of fiscal year. *t*-statistics are corrected for time-series correlation using a one-way cluster at the firm level. ***, **, and * indicate statistically significance at the 0.01, 0.05 and 0.1 levels, respectively. One-tailed *p*-values are used when the sign of the coefficient is predicted, two-tailed *p*-values are used otherwise.

Table 8 Regression results on the effect of debtholders on the relation between accounting conservatism and compensation earnings coefficient

Independent Variable	Expected Sign	*LEV low sub-sample* Coefficient (*t*-value)	*LEV high sub-sample* Coefficient (*t*-value)
Constant		-0.066	-0.751***
		(-1.546)	(-6.917)
DR		0.006	-0.036
		(0.329)	(-1.008)
R	+	0.125***	0.028
		(2.593)	(0.352)
*DR**R*	+	0.015	0.374***
		(0.163)	(2.737)
*R**CEC*	−	-0.003**	-0.005
		(-2.159)	(-1.212)
*DR**R**CEC*	+	0.002	0.014**
		(0.678)	(1.914)
CEC		0.000	-0.001
		(0.994)	(-1.106)
MTB		0.006***	0.013*
		(2.769)	(1.904)
SIZE		0.009**	0.076***
		(2.031)	(6.776)
*DR**CEC*		-0.000	0.002
		(-0.582)	(1.468)
*DR**MTB*		0.002	0.002
		(1.599)	(0.329)
*DR**SIZE*		-0.001	0.002
		(-0.653)	(0.475)
*R**MTB*	+	-0.004	-0.003
		(-1.167)	(-0.175)
*R**SIZE*	+/−	-0.007**	0.002
		(-1.730)	(0.287)
*DR**R**MTB*	−	0.001	-0.006
		(0.088)	(-0.248)
*DR**R**SIZE*	+/−	0.001	-0.030***
		(0.071)	(-2.351)
Year fixed effects		Yes	Yes
Firm fixed effects		Yes	Yes
Adj. R^2		0.193	0.183
N		5,858	5,873

Note: This table presents the regression results on the effect of debtholders on the relation between accounting conservatism and compensation earnings coefficient. *LEV low* (*LEV high*) sub-sample contains observations whose *LEV* values are less (more) than the sample median. *LEV* is total debt divided by market value of equity at the end of fiscal year. *E* = net income divided by the market value of equity at the beginning of the fiscal year. *R* = stock return over the fiscal year. *DR* = an indicator variable taking the value of 1 if the returns (*R*) are negative and zero otherwise. *CEC* = compensation earnings coefficient measured by coefficient (β_1) on ΔE from the estimation of model: $\Delta BONUS_{it} = \beta_0 + \beta_1 \Delta E_{it} + \beta_2 RET_{it} + \varepsilon_{it}$. $\Delta BONUS$ = change in the natural log of director's bonus at the end of the fiscal year. ΔE = change in net income deflated by the market value of equity at the beginning of the fiscal year. *RET* = the cumulative stock market return over the 12-month period of the firm's fiscal year. *MTB* = ratio of market value of equity to book value of equity at the beginning of fiscal year. *SIZE* = natural log of the market value of equity at the end of fiscal year. *t*-statistics are corrected for time-series correlation using a one-way cluster at the firm level. ***, **, and * indicate statistically significance at the 0.01, 0.05 and 0.1 levels, respectively. One-tailed *p*-values are used when the sign of the coefficient is predicted, two-tailed *p*-values are used otherwise.