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Evidence from Japanese Pension Accounting

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Recognition versus Disclosure and Managerial Discretion: Evidence from Japanese Pension Accounting*

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Abstract: In Japan, the current pension accounting standard requires firms to recognize pension items—prior service costs and actuarial gains and losses—in consolidated financial statements; however, firms are still allowed to disclose them in the notes when preparing unconsolidated financial statements. Employing this unique pension accounting rule, I explore whether and how disclosed versus recognized pension liabilities influence managerial discretion regarding pension assumptions. Recognition firms, those that recognize the previously disclosed pension items on the balance sheet, choose higher discount rates than disclosure firms, those that still disclose them in their notes. In particular, in case of more debt-contracting incentives, recognition firms are more likely to exercise their discretion over discount rates than disclosure firms. Overall, my results suggest that firms underestimate pension liabilities by using pension assumptions when pension recognition rules are mandated.

JEL Classification: M41, M48

Keywords: Recognition versus Disclosure, Managerial Discretion, Pension Accounting, Discount Rate

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1. Introduction

In this research, I explore the impacts of mandating pension recognition on managerial discretion over pension assumptions. In particular, I use the unique Japanese pension accounting standard to examine whether the differences between recognition and disclosure of pension information affect the managerial choice of discount rates to measure pension liabilities. Furthermore, I investigate how firms' pension plan deficits and debt-contracting incentives influence the relationships between disclosed versus recognized pension liabilities and the choice of discount rates.

Several previous studies on recognition versus disclosure of pension liabilities investigate whether the differences between recognition and disclosure affect the decision-making of financial statement users in assessing firms' value and their risks. Most show that financial statement users process disclosed and recognized pension items differently when making their decisions (Basu and Naughton, 2020; Hsieh and Liu, 2021; Kim and Nam, 2021; Larcher, 2021; Yu, 2013).

One of the factors in financial statement users' differential treatments between recognition and disclosure is the reliability of accounting information (Schipper, 2007). Firm managers expend greater efforts to scrutinize recognized amounts in financial statements than disclosed financial information in the notes, which decreases managerial discretion in recognized items compared to disclosed items (Clor-Proell and Maines, 2014; Cotter and Zimmer, 2003). Contrarily, prior research reports that firm managers increase their discretion when accounting rules change from disclosure to recognition (Amir and Gordon, 1996; Amir and Ziv, 1997; Cheng and Smith, 2013; Choudhary et al., 2009; Kusano et al., 2016). Therefore, the influence of the differences between recognized and disclosed items on managerial discretion remains unclear.

Despite firm managers employing a greater discretion when recognition rules are mandated, it remains unclear how firm managers exercise their discretion over pension assumptions. Previous studies provide mixed evidence on the effects of recognized versus disclosed pension liabilities on the managerial choice of discount rates (Fried and Davis-Friday, 2013; Jones, 2013; Naughton, 2019). For instance, Jones (2013) found that firm managers opportunistically chose higher discount rates and underestimated pension liabilities in response to the change in the U.S. pension accounting standard from disclosure to recognition. In contrast, Naughton (2019) stated that after the recognition of previously unrecognized

pension items (i.e., prior service costs and actuarial gains and losses) in financial statements, firm managers decreased their use of discretion in discount rates.

Extant research provides substantial evidence regarding the associations between recognition versus disclosure of pension liabilities and managerial discretion; however, these associations have not been thoroughly explored. Prior studies may not have been able to sufficiently distinguish between the effects of recognized versus disclosed pension liabilities and those of other factors because they analyzed the economic consequences of disclosure versus recognition of pension information by comparing only before and after the pension recognition mandate.

The Japanese pension accounting standard can provide an ideal research setting to investigate the effects of recognized versus disclosed pension liabilities on managerial discretionary choices. Before the Accounting Standards Board of Japan (ASBJ) implemented Statement No. 26, *Accounting Standard for Retirement Benefits* (ASBJ, 2012), firms did not report their pension funding status on the balance sheet because prior service costs and actuarial gains and losses, as they occurred, were not recognized in financial statements. With Statement No. 26, the ASBJ eliminated the delayed recognition of pension liabilities. However, this elimination is required only for consolidated financial statements but not for unconsolidated (parent-only) financial statements. Even after Statement No. 26 was put into effect, Japanese firms that prepare only unconsolidated financial statements are allowed to continue the off-balance sheet treatment of the pension items. Accordingly, comparing firms preparing consolidated financial statements (hereinafter referred to as "recognition firms") and those preparing only unconsolidated financial statements (hereinafter referred to as "disclosure firms") before and after the adoption of Statement No. 26, I can explore the influence of recognized versus disclosed pension liabilities on managerial discretion over pension assumptions.

In addition, employing the Japanese setting facilitates examining the influence of the differences between recognized and disclosed pension liabilities on managerial discretionary behavior. Japanese firms employ defined benefit (DB) pension plans since the 1960s. The collapse of the bubble economy in the early 1990s resulted in the deterioration of the financial condition of several Japanese firms' DB pension plans. Under these circumstances, in the early 2000s, corporate pension plans were reformed, and Japanese firms could now also employ defined contribution (DC) pension plans. However, they are

required to resolve the underfunding of DB pension plans when converting them to DC pension plans. Unlike U.S. firms, a few Japanese firms have adopted DC pension plans only while many continue to employ DB pension plans (Goto and Yanase, 2021). Using Japanese firms as the sample, I can reduce the problem of sample selection bias when examining recognition versus disclosure of pension liabilities.

First, I examine the relationships between recognition versus disclosure of pension liabilities and the managerial choice of discount rates. Previous studies provide mixed evidence on how firm managers process recognized and disclosed pension liabilities differently when choosing discount rates (Fried and Davis-Friday, 2013; Jones, 2013; Naughton, 2019). Since the associations between disclosed versus recognized pension amounts and managerial discretion over pension assumptions are unclear, this study analyzes these associations by employing the unique Japanese pension accounting rule and finds that recognition firms choose higher discount rates than disclosure firms in the post-Statement No. 26 period.

Subsequently, I explore how firms' pension plan deficits and debt-contracting incentives influence the relationships between recognized versus disclosed pension liabilities and managerial discretion. Even though recognition versus disclosure of pension information impacts the managerial choice of discount rates, the impacts are not homogeneous but vary across firms. Recognizing the previously disclosed pension items in financial statements can have substantial impacts on firms with larger pension deficits and those with more debt-contracting incentives (Jones, 2013). I show that when firms have more debt-contracting incentives, recognition firms choose higher discount rates compared to disclosure firms in the post-Statement No. 26 period.

This study makes two important contributions to the accounting literature on recognition versus disclosure. The first contribution is the analysis of the effects of recognized versus disclosed pension liabilities on managerial discretion. Most prior literature on recognition versus disclosure of pension information examines whether financial statement users process recognized and disclosed items differently in making their decisions (Basu and Naughton, 2020; Beaudoin et al., 2011; Hsieh and Liu, 2021; Kim and Nam, 2021; Kusano, 2021; Larcher, 2021; Yu, 2013). However, only a few studies have investigated how the differences between recognized and disclosed pension liabilities influence managerial discretionary behavior (Fried and Davis-Friday, 2013; Jones, 2013; Naughton, 2019). One factor that leads market participants to process recognition and disclosure differently is that firm managers

scrutinize recognized amounts more closely than disclosed financial information, which increases the reliability of accounting information (Clor-Proell and Maines, 2014; Cotter and Zimmer, 2003; Schipper, 2007). When firm managers choose discount rates with relatively more discretion to underestimate pension liabilities in response to mandating pension recognition, it decreases the value and risk relevance of pension information. Thus, this study can complement and extend the research on how recognized versus disclosed pension liabilities affect market participants' decision-making.

Second, this study extends previous research on recognition versus disclosure of pension information by employing the unique Japanese pension accounting rule. Several previous studies have analyzed whether recognized versus disclosed pension liabilities have substantial impacts on managerial discretion on discount rates and provide mixed evidence regarding it (Fried and Davis-Friday, 2013; Jones, 2013; Naughton, 2019). However, these studies fail to distinguish the effects of pension accounting standard changes from other effects because they compare only before and after the accounting standard changes when examining recognition versus disclosure. Under Statement No. 26, there are two types of firms: firms that recognize the previously off-balance sheet pension items in financial statements (i.e., recognition firms) and firms that still disclose them in the notes (i.e., disclosure firms). Employing this setting, this study can thus explore how the differences in recognition and disclosure of pension liabilities influence the managerial choice of discount rates.

This study also has important implications for the setting of accounting standards. By eliminating the delayed recognition of pension liabilities to report firms' pension funding status on the balance sheet, the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) have facilitated the provision of useful accounting information to financial statement users (FASB, 2006; IASB, 2011). This study provides evidence on how a change in the accounting standard from disclosure to recognition allows firm managers to exercise more discretion over actuarial assumptions. The results suggest that accounting standard changes that emphasize recognition in financial statements rather than disclosure in the notes may increase managerial discretion, which could lead to a decrease in the usefulness of financial reporting.

The remainder of this paper is organized as follows. Section 2 summarizes Japanese pension accounting rules, reviews prior research, and develops my hypotheses. Section 3 describes the research

design for analyzing whether and how the differences between recognized and disclosed pension liabilities influence the managerial choice of discount rates. Section 4 summarizes the sample selection procedure and the descriptive statistics for the variables to test my hypotheses. Section 5 reports the effects of disclosed versus recognized pension liabilities on managerial discretionary behavior. Finally, Section 6 discusses the remaining research issues and concludes the study.

2. Background and hypotheses

2.1. Institutional setting

The Business Accounting Council (BAC) provided guidance on the recognition and measurement of pension liabilities and expenses before the effectiveness of Statement No. 26.[1] The BAC Statement, *Statement on Establishing Accounting Standard for Retirement Benefits* (BAC, 1998), permitted the delayed recognition of pension liabilities, which was similar to Statement of Financial Accounting Standards (SFAS) No. 87, *Employers' Accounting for Pensions* (FASB, 1985). The BAC Statement required Japanese firms not to recognize certain pension items (i.e., prior service costs and actuarial gains and losses) in financial statements, but to disclose them in the notes when they incurred, which were gradually recognized as pension expenses through amortization in the following years. Under the BAC Statement, Japanese firms did not recognize their pension funding status as pension liabilities in their financial statements.

The Japanese pension accounting treatments resemble those of the global accounting standards, such as SFAS No. 87, with some differences. For instance, the discount rate used to estimate retirement benefit obligations differs. Under the principal rule of the BAC Statement, the discount rate should be determined based on the interest rate of a long-term high-grade bond at the end of the fiscal year; however, it can also be determined by considering the changes in bond yields over a certain period (BAC, 1998). Thus, Japanese firms could determine their discount rates based on no more than five-year average yields of high-grade bonds (Japanese Institute of Certified Public Accountants [JICPA], 1999). However, from the

[1] In Japan, pension accounting standards were partially revised several times before the implementation of Statement No. 26. However, Statement No. 26 substantially revised the pension accounting rules, including abolishing the delayed recognition of pension liabilities.

perspective of accelerating the global convergence of accounting standards, in July 2008, the ASBJ issued Statement No. 19, *Partial Amendments to Accounting Standard for Retirement Benefits (Part 3)* (ASBJ, 2008), which repealed the exception rule regarding the discount rate. From the fiscal years ending in or after March 2010, Japanese firms choose their discount rates based on the interest rates of high-grade bonds at the end of the fiscal year.

The FASB revised its pension accounting treatments and issued SFAS No. 158, *Employers' Accounting for Defined Benefit Pension and Other Postretirement Plans—an amendment of FASB Statements No. 87, 88, 106, and 132(R)*, in September 2006. Owing to the delayed recognition of pension liabilities, firms did not report their pension funding status in their financial statements. However, there were substantial differences between firms' pension funding status disclosed in the notes and pension liabilities recognized in financial statements (Larcher, 2021, Figure 1). Therefore, there were strong concerns that the delayed recognition would fail to provide financial statement users with accounting information useful for decision-making. By issuing SFAS No. 158, the FASB repealed the delayed recognition of pension liabilities.[2]

In May 2012, the ASBJ also issued Statement No. 26 that abolished the delayed recognition of pension liabilities. Firms are now required to recognize the differences between retirement benefit obligations and plan assets as pension liabilities, thereby reporting their pension funding status on the balance sheet. At the same time, the previously off-balance sheet pension items are recognized as accumulated other comprehensive income and are gradually recognized as pension expenses in the following years. The provisions of Statement No. 26 are similar to those of SFAS No. 158.

However, the ASBJ decided to mandate this accounting treatment only for consolidated financial statements for the time being. There are strong concerns about the impacts of pension legislation and distributable net income under Japanese company law; thus, it was difficult to achieve sufficient consensus among market participants (ASBJ, 2012, pars. 87–88). Therefore, certain pension items (i.e., prior service costs and actuarial gains and losses) are still disclosed in the notes to unconsolidated financial statements.

Accordingly, the accounting treatment of pension liabilities differs between consolidated and

[2] In June 2011, the IASB also issued revisions to International Accounting Standard (IAS) No. 19, *Employee Benefits*, and required firms to report their pension funding status in financial statements.

unconsolidated financial statements since Statement No. 26 is effective. Firms that prepare consolidated financial statements recognize the previously disclosed pension items in their financial statements (i.e., recognition firms). In contrast, firms that prepare only unconsolidated financial statements continue to disclose the pension items in the notes (i.e., disclosure firms). Using this unique pension accounting rule facilitates exploring the influence of the differences between recognition and disclosure of pension liabilities on managerial discretion over pension assumptions.[3]

2.2. Prior research

2.2.1. Managerial discretion over actuarial assumptions

Firms employ various actuarial assumptions to measure their pension liabilities and expenses. To measure pension liabilities, the estimation of retirement benefit obligations is critical. Retirement benefit obligations are estimated by employing actuarial assumptions, such as the discount rate and the rate of salary increase. In addition, expected returns, determined based on the expected rates of return on plan assets under the U.S. and Japanese GAAP, are employed to measure pension expenses. Thus, pension assumptions, such as discount rates, expected rates of return on plan assets, and the rate of salary increase, are necessary to measure pension liabilities and expenses. A slight change in pension assumptions can significantly impact the accounting numbers reported in financial statements.

Previous studies have examined how firms choose their discount rates to manage reported accounting numbers. They found that firm managers chose higher discount rates to underestimate pension liabilities on the balance sheet (Billings et al., 2017; Blankley and Swanson, 1995; Godwin et al., 1996; Kwon, 1994). In addition, Japanese firms employ discount rates to manage their reported pension liabilities and earnings (Obinata, 2000). These findings indicate that firm managers opportunistically exercise discretion in choosing discount rates and manage reported accounting numbers.

[3] Japanese firms with consolidated subsidiaries prepare both consolidated and unconsolidated financial statements and disclose them in their annual securities report. Firms that prepare consolidated financial statements were required to disclose detailed note information in their unconsolidated financial statements as well. However, there were strong concerns regarding disclosure overload by preparing the note disclosures for unconsolidated as well as consolidated financial statements. Therefore, since the fiscal years ending in or after March 2014, Japanese firms that prepare consolidated financial statements have been exempted from disclosing the information in the notes to unconsolidated financial statements concerning information disclosed in consolidated financial statements.

Previous studies have also examined how firms use expected returns on plan assets to measure pension expenses. They found that firm managers discretionarily chose the expected rates of return on plan assets to manage earnings (Amir and Benartzi, 1998; An et al., 2014; Asthana, 2008; Bergstresser et al., 2006; Comprix and Muller, 2006; Li and Klumpes, 2013). Japanese firms also choose higher expected rates of return on plan assets and thus, manage earnings (Goto and Yanase, 2021; Qin et al., 2021). These results suggest that firms have considerable discretion over the expected rates of return when conducting earnings management.

Therefore, firm managers can manage reported accounting numbers recognized in financial statements by employing pension assumptions, including discount rates and expected rates of return. Such management of reported accounting numbers using actuarial assumptions is not homogenous but differs across firms. Notably, when firms have larger pension deficits, they use actuarial assumptions to conduct balance sheet and earnings management (Asthana, 1999; Billings et al., 2017; Godwin, 1999; Gopalakrishnan and Sugrue, 1995; Kisser et al., 2017; Kwon, 1994; Li and Klumpes, 2013). Managers have considerable discretion over the actuarial assumptions in managing reported accounting numbers.

2.2.2. Recognition versus disclosure and managerial discretion

Much of the prior literature shows that financial statement users process disclosed and recognized items differently when making their decisions (Aboody, 1996; Ahmed et al., 2006; Davis-Friday et al., 1999; Dhaliwal et al., 2011; Israeli, 2015; Kusano, 2019). One of the factors in the differential treatments between recognition and disclosure is the reliability of accounting information (Bratten et al., 2013; Callahan et al., 2013; Davis-Friday et al., 2004; Müller et al., 2015).[4] Firm managers and auditors scrutinize recognized amounts in financial statements more closely than disclosed financial information in the notes (Clor-Proell and Maines, 2014; Cotter and Zimmer, 2003; Goncharov et al., 2014; Kusano and Sakuma, 2020). For instance, Clor-Proell and Maines (2014) report that public firm managers expend their greater efforts for recognized liabilities than for disclosed liabilities, which leads to an increase in the

[4] Financial statement users experience higher information processing costs in understanding disclosed financial information in the notes rather than recognized amounts in financial statements (Barth et al., 2003). Thus, this information processing also induces the differential treatments between recognition and disclosure (Kusano, 2020; Michels, 2017; Müller et al., 2015; Schipper, 2007; Yu, 2013).

reliability of accounting information. Auditors also expend additional effort for recognized pension liabilities relative to disclosed pension liabilities to address an increase in business risk (Kusano and Sakuma, 2020).

However, when accounting rule changes from disclosure to recognition, firm managers exercise discretion over accounting estimates, which can reduce the reliability of accounting information (Amir and Gordon, 1996; Amir and Ziv, 1997; Balsam et al., 2008; Choudhary, 2011; Johnston, 2006). Amir and Gordon (1996) showed that when recognizing postretirement benefit obligations other than pensions in financial statements, firms with large liabilities chose parameters such as higher discount rates, to underestimate them. However, firms with large changes in postretirement benefits other than pensions and large reported earnings chose their parameters conservatively and overestimated postretirement benefit obligations other than pensions.

Managerial discretion over accounting estimates is also observed when pension recognition rules are mandated (Fried and Davis-Friday, 2013; Jones, 2013). For instance, Jones (2013) reported that firms with larger previously off-balance sheet pension items and larger liabilities changed their actuarial assumptions after the implementation of SFAS No. 158. In particular, when distinguishing actuarial assumptions into discount rate and salary increase rate, firms with larger liabilities (i.e., more debt-contracting incentives) were more likely to choose higher discount rates and lower salary increase rates to underestimate pension liabilities in financial statements. In addition, Fried and Davis-Friday (2013) found that firms with larger previously unrecognized pension items chose higher discount rates in the post-SFAS No. 158 period. These studies suggest that firm managers opportunistically use discount rates to underestimate pension liabilities in financial statements when pension recognition rules change.

However, Naughton (2019) reported that firm managers were less likely to discretionarily employ discount rates to manage pension liabilities when changing the pension accounting standard from disclosure to recognition. He indicated that the average discount rate was higher after the implementation of SFAS No. 158 because of the shift in the underlying yield curb. This suggests that managers reduce their discretion in the discount rates to measure pension liabilities on the balance sheet after the change in accounting rule.

Previous studies have provided mixed evidence on whether and how firm managers exercise their

discretion when accounting standards change from disclosure to recognition. In particular, they report mixed findings on how firm managers discretionarily choose discount rates to estimate pension liabilities when pension recognition rules are mandated (Fried and Davis-Friday, 2013; Jones, 2013; Naughton, 2019). The effects of recognized versus disclosed pension liabilities on the choice of discount rates have not been extensively explored and remain an empirical research issue. Therefore, by comparing disclosure and recognition firms, this study explores whether and how firm managers exercise their discretion over pension assumptions in response to change in the Japanese pension accounting standard from disclosure to recognition.

2.3. Hypothesis development

When firms sponsor DB pension plans, they have obligations to pay retirement benefits to their employees at the time of their retirement. DB pension plans significantly influence firms' business risk. In particular, when firms have larger pension deficits, the effects of DB pension plans on firms' business risk are substantial because they affect firms' cash flows. To mitigate these negative impacts, firm managers discretionarily use actuarial assumptions such as discount rates and expected rates of return on plan assets (Billings et al., 2017; Godwin, 1999; Kisser et al., 2017; Kwon, 1994; Li and Klumpes, 2013).

The pension accounting standard change from disclosure in the notes to recognition in financial statements significantly impacts managerial discretion. Prior studies report that capital market participants fail to adequately consider off-balance sheet pension information (Franzoni and Marín, 2006; Goto and Yanase, 2016; Landsman and Ohlson, 1990; Nakajima and Sasaki, 2010). Even sophisticated market participants, such as equity analysts and credit rating agencies, cannot properly reflect the note information and do not make appropriate decisions (Beaudoin et al., 2011; Picconi, 2006; Sengupta and Wang, 2011; Wang and Zhang, 2014). As pension accounting rules change from disclosure to recognition, financial statement users may place more emphasis on pension liabilities recognized in financial statements than on pension information disclosed in the notes to assess firms' value and risks (Basu and Naughton, 2020; Larcher, 2021; Yu, 2013). Firm managers would exercise their discretion over actuarial assumptions to mitigate the impacts of the mandated pension recognition.

When prior service costs and actuarial gains and losses are recognized in financial statements rather

than disclosed in the notes, firm managers would choose higher discount rates to underestimate their pension liabilities in the current period (Fried and Davis-Friday, 2013; Jones, 2013). Additionally, they would choose higher discount rates to reduce the volatility of other comprehensive income. When the previously off-balance sheet pension items are recognized as pension liabilities, they are also recognized in accumulated other comprehensive income due to the delayed recognition on the income statement. If financial statement users assess the volatility of other comprehensive income as high risk (Bao et al., 2020), firm managers may not lower the discount rates, even if the interest rates on high-grade bonds decline.

Furthermore, firm managers would also discretionarily use their pension assumptions, considering not only the impacts on capital market participants, but also the impacts on contracts between managers and stakeholders. For instance, in debt contracts, the maintenance of net assets is often used as an accounting-based covenant (Christensen and Nikolaev, 2012; Demerjian, 2011; Kochiyama and Nakamura, 2021; Li, 2010). When the maintenance of net assets is used as an accounting-based covenant, changes in other comprehensive income or accumulated other comprehensive income may result in the violation of the accounting-based covenant in debt contracts. Firm managers, seeking to discretionarily manage reported accounting numbers to avoid violating accounting-based covenants, would choose higher discount rates and underestimate pension liabilities (Jones, 2013).

Accordingly, changes in pension accounting rules that require firms to report their pension funding status in financial statements would lead to managerial discretionary behavior. Under Statement No. 26, recognition firms recognize the previously off-balance sheet pension items in financial statements, while disclosure firms still disclose them in the notes to financial statements. Therefore, I propose the first hypothesis as:

Hypothesis 1: Recognition firms choose higher discount rates than disclosure firms after Statement No. 26 is implemented.

The differences between recognition and disclosure of pension liabilities have significant impacts on the choice of discount rates, but the extent would vary among firms. Firms' pension funding status was not reported on the balance sheet earlier. After mandating pension recognition, the differences between retirement benefit obligations and plan assets are now reported on the consolidated balance sheet. In Japan,

most firms with DB pension plans have pension plan deficits, and their pension funding ratio—plan assets divided by retirement benefit obligations—is extremely low (Goto and Yanase, 2016; Kusano and Sakuma, 2020). Thus, when firms have larger pension deficits, the change from disclosure to recognition can have substantial impacts on the decision-making of market participants and accounting-based covenants in debt contracts. Therefore, to mitigate the impact of the mandated pension recognition, recognition firms with larger pension deficits would rather employ their discretion over pension assumptions more than disclosure firms in the same pension deficit situation.

Accounting-based covenants are often employed in debt contracts. When accounting-based covenants are violated, debtors lose the benefit of time and are required to repay their obligations even before the due date, or they are required to raise interest rates through renegotiation with creditors or the modification of debt contracts. Thus, firms with a higher probability of violating accounting-based covenants (i.e., firms with more debt-contracting incentives) would choose higher discount rates to mitigate the impacts of the rule changes from disclosure to recognition (Jones, 2013). That is, recognition firms with more debt-contracting incentives are more likely than disclosure firms to exercise their discretion over discount rates.

Accordingly, mandating pension recognition is more likely to have negative impacts on firms with larger pension deficits and debt-contracting incentives. To mitigate such negative impacts, managers are more likely to choose higher discount rates and underestimate their pension liabilities. Therefore, I propose the following hypotheses.

Hypothesis 2: Among firms with larger pension deficits, recognition firms choose higher discount rates than disclosure firms after Statement No. 26 is implemented.

Hypothesis 3: Among firms with more debt-contracting incentives, recognition firms choose higher discount rates than disclosure firms after Statement No. 26 is implemented.

3. Research design

In this study, I explore whether and how the differences between recognized and disclosed pension liabilities influence managerial discretionary behavior. However, factors other than recognition versus disclosure of pension information may affect firm managers' choice of discount rates. To control for these

effects, I employ the unique Japanese pension accounting rule and use the difference-in-differences (DID) method.[5] I analyze the associations between recognized versus disclosed pension liabilities and the choice of discount rates before and after the adoption of Statement No. 26 for disclosure and recognition firms. Using the following regression model, I examine the effects of recognition versus disclosure of pension liabilities on managerial discretionary behavior:

$$\begin{aligned} DR_{it} = {} & \alpha_0 + \alpha_1 RF_{it} + \alpha_2 RF_{it} \times Post_{it} + \alpha_3 PFS_{it} + \alpha_4 Debt_{it} \\ & + \alpha_5 Size_{it} + \alpha_6 ROA_{it} + \alpha_7 MTB_{it} + \alpha_8 Age_{it} \\ & + \sum_j \alpha_j Industry\ Dummy + \sum_k \alpha_k Year\ Dummy + \varepsilon \end{aligned} \quad (1)$$

where *DR* is the dependent variable, which is the discount rate reported by firms minus the interest rate on high-grade bonds on the balance sheet date.[6] The independent variable of interest in this study is $RF \times Post$, which is an interaction term between *RF* and *Post*. *RF* is an indicator variable that equals 1 if firms prepare consolidated financial statements (i.e., recognition firms), and 0 otherwise (i.e., disclosure firms). *Post* is an indicator variable that equals 1 if firms adopt Statement No. 26, and 0 otherwise.[7] The other independent variables are defined in the Appendix. I estimate regression model (1) using the ordinary least squares (OLS) method, with robust standard errors clustered by firm.

Comparing the discount rates of disclosure and recognition firms before and after the adoption of Statement No. 26 is necessary to test my hypotheses. Recognition and disclosure firms are distinguished by whether they prepare consolidated financial statements or only unconsolidated financial statements based on the presence of consolidated subsidiaries. As firms can choose whether to establish a

[5] Statement No. 26 changes the pension rules regarding the discount rate and increment in future salary. For instance, the BAC Statement stated that, in principle, firms have to determine the discount rate based on the average period up to the estimated timing of benefit payment. However, under the BAC Statement, firms were permitted to use the period approximate to the expected average remaining working lives of employees in practice; Statement No. 26 abolishes this exception (ASBJ, 2012, par. 66). Employing the DID method can control these effects when testing my hypotheses.

[6] The interest rates of high-grade bonds at the end of the fiscal year are obtained from the Japan Securities Dealers Association (https://market.jsda.or.jp/shijyo/saiken/baibai/baisanchi/index.html). I calculate the interest rates of high-grade bonds by weighted averaging the interest rates for AA (Aa) bonds with a remaining life of 10 years rated by the following credit rating agencies: Rating and Investment Information, Japan Credit Rating Agency, Moody's Japan, and Standard & Poor's Japan.

[7] I do not include the *Post* coefficient in regression model (1) because I have included year dummies in the model.

consolidated subsidiary, there is a self-selection problem when comparing pension liabilities between disclosure and recognition firms. The attributes of firms that choose disclosure or recognition firms might affect the choice of actuarial assumptions. Following McMullin and Schonberger (2020), this study employs entropy balancing to control for the self-selection bias. I estimate entropy balancing weights for each year and assign the weights to recognition firms rather than disclosure firms (McMullin and Schonberger, 2022). Using the control variables, I balance the first three moments—mean, variance, and skewness—of the covariates when estimating the entropy balancing weights.

Hypothesis 1 states that recognition firms choose higher discount rates than disclosure firms in response to the adoption of Statement No. 26. Since the differences in recognized and disclosed pension liabilities have substantial impacts on the decision-making of market participants and accounting-based covenants in debt contracts (Basu and Naughton, 2020; Jones, 2013; Yu, 2013), firm managers would discretionarily choose their discount rates to mitigate the negative impacts. Thus, recognition firms that must recognize the previously off-balance sheet pension items on the balance sheet owing to the mandating of pension recognition, would choose higher discount rates than disclosure firms that are still allowed to disclose the pension items in the notes. Therefore, I predict that the sign of the $RF \times Post$ coefficient would be positive.[8]

Hypotheses 2 and 3 state that firms with larger pension deficits and more debt-contracting incentives choose higher discount rates in the period after Statement No. 26. The effects of pension accounting rule changes on managerial discretionary behavior are not homogeneous but vary among firms. In particular, when firms have larger pension deficits and more debt-contracting incentives, recognizing the previously disclosed pension liabilities in financial statements is expected to have greater impacts on reported accounting numbers. I construct a subsample of firms based on the median of their pension funding status (*PFS*) and leverage (*Debt*) each year, where firms with smaller *PFS* are those with larger pension deficits, and firms with larger *Debt* are those with more debt-contracting incentives. I predict that the sign of the $RF \times Post$ coefficients would be positive for the subsample of firms with larger pension deficits and

[8] Prior to the adoption of Statement No. 26, delayed recognition of pension liabilities was permitted in both consolidated and unconsolidated financial statements. Since I cannot predict the effects of the differences in disclosure and recognition firms on the choice of discount rates in the pre-Statement No. 26 period, I do not predict the sign of the *RF* coefficient.

those with more debt-contracting incentives.

Following previous studies, I include firms' pension funding status (*PFS*), leverage (*Debt*), size (*Size*), profitability (*ROA*), growth opportunity *(MTB*), and firm age (*Age*) as control variables in the regression model (Fried and Davis-Friday, 2013; Jones, 2013). Firms with larger pension deficits and more debt-contracting incentives are expected to choose higher discount rates to underestimate their pension liabilities. Accordingly, I predict that the sign of the *PFS* coefficient would be negative but that the sign of the *Debt* coefficient would be positive. Moreover, firms with larger size, higher profitability, and greater growth opportunity are less likely to violate accounting-based covenants in debt contracts, and thus, these managers are less likely to employ actuarial assumptions to manage reported accounting numbers opportunistically. I expect the sign of the *Size*, *ROA*, and *MTB* coefficients to be negative. Furthermore, firms with a higher firm age also have larger pension liabilities, and the impacts of DB pension plans on firms' business risk would be larger. Therefore, firms with a higher firm age choose higher discount rates to underestimate pension liabilities. Thus, I predict that the sign of the *Age* coefficient would be positive. Finally, I include industry and year indicators in regression model (1) to control for the fixed effects of industry and year.

4. Sample selection and descriptive statistics

Data regarding financial statement and stocks are collected from the *Nikkei NEEDS Financial QUEST* database and the *Nikkei NEEDS Daily Stock Return* database, respectively. Statement No. 26 is effective from the fiscal years ending in or after March 2014. The discount rates used to estimate retirement benefit obligations are determined based on the interest rates of high-grade bonds on the balance sheet date from the fiscal years ending in or after March 2010 (ASBJ, 2008). Thus, the study sample period begins in March 2010. To test my hypotheses, I employ the same period before and after the implementation of Statement No. 26, ending the sample period in March 2017.[9] I analyze whether and how the differences between recognition and disclosure of pension liabilities influence managerial discretion on discount rates

[9] My sample period includes the Great East Japan Earthquake that occurred on March 11, 2011. It had significant impacts on Japanese supply chains and firms' operations (Carvaljo et al., 2021). Thus, I exclude the year 2011 from my sample and retest my hypotheses. This reinvestigation does not change the main results (the table is not included here).

over four years each before and after the adoption of Statement No. 26, that is, the periods covering 2010–2013 and 2014–2017.

My initial sample starts with listed firms adopting Japanese GAAP, and does not include firms engaged in the banking, securities, and insurance industries or firms ending their fiscal years other than on March 31. I obtain 19,324 firm-year observations from 2010 to 2017. I exclude 50 firm-year observations that change their accounting periods during the fiscal year, delete 2,440 firm-year observations without sponsoring DB pension plans, and exclude another 3,979 firm-year observations from my sample because I could not obtain the necessary data for my analyses. Thus, the final sample used to test my hypotheses comes to 12,855 firm-year observations, which are divided into 6,645 and 6,210 firm-year observations for pre- and post-Statement No. 26 periods, respectively. I winsorize the continuous variables at both 1 and 99 percentiles for each year to mitigate the effects of outliers.

Table 1 presents the descriptive statistics for the variables used to test the hypotheses. Panel A reports them for all the firms in this study. The mean and median of *DR* are 0.0054 and 0.0037, respectively. On average, firm managers choose a discount rate of 54 basis points higher than the interest rate on high-grade bonds. Panel B presents the descriptive statistics for the variables by dividing the sample into the pre- and post-Statement No. 26 periods. When comparing *DR* between the two periods, the mean and median differences of the variable are negative and statistically significant. The findings indicate that the discount rate is smaller after the implementation of Statement No. 26 than before its implementation. Panel C presents the results of the balancing test. The standardized differences in *PFS*, *Debt*, *Size*, and *Age* between recognition and disclosure firms before conducting entropy balancing are outside the bounds. Furthermore, the variance ratios of *Size*, *ROA*, and *Age* between both firms are substantially different. However, after entropy balancing, all covariates are well balanced in both the standardized differences and variance ratios (McMullin and Schonberger, 2020, 2022).

Table 2 reports the correlation matrix for the variables to analyze the effects of mandating pension recognition on the choice of discount rates. The lower left and upper right of the table present the Pearson and the Spearman rank-order correlations, respectively. In both correlation analyses, correlations between

my independent variables are small, and thus, multicollinearity is not a concern in this study.[10]

5. Results

5.1. Main results

This study employs the DID method to examine the effects of the pension accounting standard change from disclosure to recognition on the choice of discount rates. The DID method requires the parallel trends assumption to ensure unbiased estimators. To assess the parallel trends assumption, it is necessary to check whether the treatment and control groups follow common trends before implementing a policy. Therefore, before testing the hypotheses, I check the trends in the mean of discount rates during the sample period.

Figure 1 shows the trends of the discount rates for recognition firms (treatment group) and disclosure firms (control group). In the period prior to Statement No. 26 (2010–2013), the discount rates fluctuate substantially; however, recognition and disclosure firms are expected to have common trends in the discount rates. In addition, I regress *DR* on *RF*, year dummies, and the interaction terms between *RF* and year dummies in the pre-Statement No. 26 period to examine whether the recognition and disclosure firms have common trends. An unreported result indicates that the interaction terms are not statistically significant, which suggests that the parallel trends assumption is not violated.

Table 3 presents the results for Hypothesis 1. First, I examine whether the differences between recognized and disclosed pension liabilities influence the choice of discount rate without control variables. Column (1) reports that the $RF \times Post$ coefficient (0.0008) is positive and statistically significant. This result indicates that recognition firms that recognize prior service costs and actuarial gains and losses in financial statements choose discount rates 8 basis points higher after the adoption of Statement No. 26 when compared to disclosure firms. Subsequently, I explore how recognition versus disclosure of pension liabilities affects managerial discretionary behavior when including control variables. Column (2) shows that the $RF \times Post$ coefficient is still positive and statistically significant at the 5% level. This result indicates that recognition firms choose higher discount rates in the post-Statement No. 26 period than disclosure firms. The evidence of this study supports Hypothesis 1.

[10] This study calculates the variance inflation factor (VIF) in estimating the regression model using OLS. All the VIF values are less than 10, which indicates there is no concern about multicollinearity.

Changes in the pension accounting standard have significant impacts on the choice of discount rates, but the extent of the impacts is not homogeneous across firms. I explore how firms' pension funding status and debt-contracting incentives influence the relationships between recognized versus disclosed pension liabilities and the managerial choice of discount rates. Table 4 shows the results for Hypotheses 2 and 3.

First, I analyze whether the effects of recognized versus disclosed pension liabilities on the choice of discount rates differ depending on firms' pension plan deficits. Column (1) shows that for firms with smaller pension deficits, the $RF \times Post$ coefficient has the expected sign and is marginally statistically significant. This result indicates that when firms have smaller pension deficits, recognition firms are more likely to choose higher discount rates than disclosure firms after the implementation of Statement No. 26. However, as shown in Column (2), for firms with larger pension deficits, the $RF \times Post$ coefficient is positive but not statistically significant. This result shows that when firms have larger pension deficits, recognition firms do not choose higher discount rates compared to disclosure firms after the adoption of Statement No. 26. The results suggest that in case of larger pension deficits, firm managers do not employ pension assumptions to underestimate pension liabilities when the previously off-balance sheet pension items are recognized on the balance sheet. This evidence does not support Hypothesis 2.

Thereafter, I investigate how firms' debt-contracting incentives influence the associations between recognition versus disclosure of pension liabilities and managerial discretionary behavior. Column (3) reports the results for firms with less debt-contracting incentives; the $RF \times Post$ coefficient is consistent with the expected sign but is not statistically significant. When firms have less debt-contracting incentives, I find no evidence to support that recognition firms choose higher discount rates compared to disclosure firms in the period subsequent to Statement No. 26. Column (4) reports that for firms with more debt-contracting incentives, the $RF \times Post$ coefficient (0.0012) is positive and statistically significant at the 5% level. This result reveals that when firms have more debt-contracting incentives, recognition firms choose higher discount rates than disclosure firms after the adoption of Statement No. 26. These results further suggest that when firms have more debt-contracting incentives, firm managers choose higher discount rates to underestimate pension liabilities in response to the pension accounting standard change from disclosure to recognition, thus supporting Hypothesis 3.

5.2. Robustness tests

Mandating pension recognition influences discretionary managerial behavior. In particular, when firms have more debt-contracting incentives, their managers are more likely to choose higher discount rates in response to changes in pension accounting standards. This subsection presents several analyses to confirm the robustness of the main findings.

First, I reexamine my hypotheses by changing the definition of discount rates. In the main analysis, I employ the discount rate disclosed by firms minus the interest rates on high-grade bonds as the dependent variable in regression model (1). Japanese firms may determine their discount rates by referring to the industry-average discount rates. Accordingly, in this robustness test, I use the discount rates disclosed by firms minus the industry-average discount rates for each year to explore whether and how the differences between recognition and disclosure of pension liabilities affect managerial discretion over pension assumptions. Unreported results indicate that recognition firms choose higher discount rates than disclosure firms after the adoption of Statement No. 26. In addition, for firms with more debt-contracting incentives, recognition firms exercise their discretion over pension assumptions when compared with disclosure firms. These results are consistent with the main findings.

Subsequently, I retest my hypotheses by assigning balancing weights to disclosure firms rather than recognition firms when employing entropy balancing. Following McMullin and Schonberger (2022), my main analyses assign the entropy weights to recognition firms rather than disclosure firms, which promotes the efficiency of the observational weights; however, this approach estimates the average treatment effect for the control. Thus, to estimate the average treatment effect for the treated, I assign the entropy weights to disclosure firms rather than recognition firms. When estimating the entropy balancing weights, I balance the first two moments (i.e., mean and variance) of the covariates. Unreported balancing tests reflect that imbalance in both means and variances is eliminated after entropy balancing.

Table 5 reports the results of the analyses. Columns (1) and (2) present that the $RF \times Post$ coefficients are positive and statistically significant at the 5% level. These results indicate that recognition firms choose higher discount rates than disclosure firms after the adoption of Statement No. 26, which is consistent with Hypothesis 1. Columns (3) and (4) present the impacts of firms' pension funding status, and Columns (5) and (6) present the impacts of their debt-contracting incentives. The $RF \times Post$

coefficients are not statistically significant for firms with smaller pension deficits and less debt-contracting incentives. However, for firms with larger pension deficits and more debt-contracting incentives, the $RF \times Post$ coefficients are positive and statistically significant. These results are consistent with Hypotheses 2 and 3, which indicate that when firms have larger pension deficits and more debt-contracting incentives, recognition firms choose higher discount rates than disclosure firms in the post-Statement No. 26 period. The results indicate that, unlike the main findings, firms with larger pension deficits are more likely to exercise their discretion over pension assumptions than disclosure firms when pension recognition rules are mandated.

Further, I reinvestigate my hypotheses by using propensity score matching. I estimate the propensity score annually using the following logit model:

$$DF_{it} = Logit\left(\beta_0 + \beta_1 Size_{it} + \beta_2 ROA_{it} + \beta_3 MTB_{it} + \beta_4 Debt_{it} + \beta_5 PFS_{it} + \beta_6 Age_{it} + \sum_j \beta_j Industry\ Dummy + \varepsilon\right) \quad (2)$$

where *DF* is the dependent variable, which is an indicator variable that equals 1 for disclosure firms and 0 for recognition firms. I employ one-to-one nearest neighbor propensity score matching without replacement and set a caliper distance of 0.02 to match disclosure and recognition firms.[11] Unreported balancing tests show that except for variance ratios of *Debt* and *Age*, standardized differences and variance ratios of the covariates are within the bounds, which suggests that all covariates are generally properly balanced and that the propensity score matching is appropriate. Table 6 reports the results of propensity score matching, which utilizes 787 firm-year observations each for recognition and disclosure firms. Columns (1) and (2) present that recognition firms exercise their discretion over pension assumptions more than disclosure firms in the period subsequent to Statement No. 26. Moreover, as shown in Columns (3)–(6), when firms have larger pension deficits and more debt-contracting incentives, recognition firms are more likely to choose higher discount rates than disclosure firms after the adoption of Statement No.

[11] The choice of propensity score matching can have significant impacts on the results of my analyses (Shipman et al., 2017). Therefore, I retest my hypotheses using one-to-one nearest neighbor propensity score matching without replacement and with caliper distances of 0.01 and 0.005, respectively. Unreported results are consistent with the results using the caliper distance of 0.02.

26. Except for the investigation of Hypothesis 2, my results are consistent with my main results.

Furthermore, I employ a firm fixed effects model to consider unobserved time-invariant firm characteristics. I employ the following regression model to retest my main findings:

$$DR_{it} = \gamma_0 + \gamma_1 RF_{it} \times Post_{it} + \gamma_2 PFS_{it} + \gamma_3 Debt_{it} + \gamma_4 Size_{it} + \gamma_5 ROA_{it} + \gamma_6 MTB_{it} + \gamma_7 Age_{it} + \sum_j \gamma_j Firm\ Dummy + \sum_k \gamma_k Year\ Dummy + \varepsilon \quad (3)$$

where all the variables are already defined. When using the firm fixed effects model, I exclude firms that change their firm types (i.e., disclosure and recognition firms) during the sample period and the singleton observations from my sample. Table 7 presents the results using the firm fixed effects model. Columns (1) and (2) report that recognition firms choose higher discount rates than disclosure firms after the adoption of Statement No. 26. Regardless of firms' pension funding status, as shown in Columns (3) and (4), recognition firms are more likely to choose higher discount rates than disclosure firms. Columns (5) and (6) show that when firms have more debt-contracting incentives, recognition firms choose higher discount rates than disclosure firms in the post-Statement No. 26 period. Therefore, the results are, except for the analysis of Hypothesis 2, consistent with the main findings.

I have conducted several robustness tests to confirm my main findings. When the pension recognition rules are changed, recognition firms are more likely to choose higher discount rates than disclosure firms. Some analyses show that, unlike the main results, recognition firms with larger pension deficits exercise their discretion over pension assumptions compared to disclosure firms after the implementation of Statement No. 26. Furthermore, all robustness tests reveal that when firms have more debt-contracting incentives, recognition firms choose higher discount rates than disclosure firms in the post-Statement No. 26 period to underestimate pension liabilities. Thus, the evidence suggests that my inferences are robust.

5.3. Additional analyses

5.3.1. Effects of managerial discretion on the value relevance of pension liabilities

This study reveals that on average, mandating pension recognition leads to an increase in managerial discretion in discount rates to underestimate pension liabilities. However, as shown in the main findings,

the managerial choice of discount rates has varied across firms. It is unclear whether managerial discretion influences how market participants process recognized and disclosed pension liabilities differently when making their decisions.

Previous studies have provided mixed evidence on the effects of the differences in recognition and disclosure of pension liabilities on financial statement users' decision-making (Beaudoin et al., 2011; Mitra and Hossain, 2009; Larcher, 2021; Yu, 2013). For instance, Beaudoin et al. (2011) report that equity investors treat recognized pension liabilities in financial statements and disclosed pension liabilities in the notes similarly. On the contrary, Mitra and Hossain (2009) show that market participants process disclosed and recognized pension information differently when assessing firms' value. In addition, Yu (2013) analyzes how financial statement users treat disclosed and recognized pension liabilities differently and observes that their sophistication levels influence their decision-making. However, Larcher (2021) reports that sophistication of market participants fails to comprehensively explain their differential treatments between recognition and disclosure of pension liabilities.

Previous studies have investigated whether managerial discretion over pension assumptions impairs the value relevance of pension liabilities (Fahad et al., 2020; Hann et al., 2007; Obinata, 2000); however, they have not explored whether and how it influences market participants' differential treatments between disclosure and recognition of pension liabilities. Thus, with a focus on recognition firms, my study investigates the effects of the managerial choice of discount rates on the value relevance of recognized versus disclosed pension liabilities, by employing the following regression equation based on Ohlson's (1995) model:

$$MVE_{it} = \delta_0 + \delta_1 PL_{it} + \delta_2 BVE^*_{it} + \delta_3 NI_{it} + \delta_4 Neg_{it} \times NI_{it} + \delta_5 Over_{it} + \sum_j \delta_j Industry\ Duumy + \sum_k \delta_k Year\ Dummy + \varepsilon \quad (4)$$

where the dependent variable *MVE* is the market value of equity three months after the end of the fiscal year. *PL*, pension liability of the firm, is the independent variable of interest. Firms' pension liabilities, which are retirement benefit obligations minus plan assets, are disclosed in the notes in the pre-Statement No. 26 period and recognized on the balance sheet in the post-Statement No. 26 period. Other independent

variables are defined in detail in the Appendix.[12] My study divides the sample based on the median of firms' discount rates in the periods prior and subsequent to Statement No. 26.[13] I predict that the sign of the *PL* coefficients is negative since pension liabilities have negative impacts on firms' value. Table 8 presents the results of this value relevance test.

First, I analyze whether equity investors process recognition and disclosure of pension liabilities differently when making their decisions. Columns (1) and (2) present the results in the periods prior and subsequent to Statement No. 26, respectively. Both columns report that the *PL* coefficients are negative and statistically significant at the 1% level. The results indicate that disclosed and recognized pension liabilities convey value-relevant information to equity investors in the pre- and post-Statement No. 26 periods. Employing the Wald test, I examine how recognition versus disclosure of pension liabilities affects the decision-making of financial statement users. The Wald test indicates that the *PL* coefficients before and after the adoption of Statement No. 26 are marginally statistically different. This result suggests that equity investors process disclosed and recognized pension liabilities differently.

Thereafter, I investigate how managerial discretion in the choice of discount rates influences the value relevance of recognized versus disclosed pension liabilities. Columns (3) and (4) present the results of firms with lower discount rates, and Columns (5) and (6) present the results of firms with higher discount rates. Except for Column (6), the results show that pension liabilities convey value-relevant information to equity investors; however, recognized pension liabilities do not have associations with stock prices when firms choose higher discount rates, which indicates that managerial discretion can decrease the value relevance of pension information. When firms choose lower discount rates, the Wald test indicates a statistically significant difference between the *PL* coefficients in the pre- and post-Statement No. 26 periods. However, the Wald test reveals no statistically significant difference between them when firms choose higher discount rates. These results indicate that only when firms choose lower

[12] Following prior literature (Hann et al., 2007; Yu, 2013), I deflate dependent and independent variables except for indicator variables by sales. I also employ total assets as a deflator to analyze the effects of managerial discretion on the value relevance of recognized versus disclosed pension liabilities. Using total assets as the denominator does not change my inferences (unreported table).

[13] Following Obinata (2000), I estimate the mean of the discount rates (*DR*) for each firm in the pre- and post-Statement No. 26 periods and divide the sample into two groups based on the median. I also divide the sample into lower and higher discount rates based on median of the discount rates (*DR*) for each year. Unreported results are consistent with the results reported in Table 8.

discount rates, financial statement users place more emphasis on recognized pension liabilities than disclosed pension liabilities in making their decisions. This evidence suggests that managerial discretion over pension assumptions has substantial impacts on the usefulness of pension information.

5.3.2. Managerial discretion over the expected rates of return

Statement No. 26 abolishes the delayed recognition of pension liabilities to recognize prior service costs and actuarial gains and losses on the balance sheet in consolidated financial statements. On the contrary, the delayed recognition in the income statement is still allowed, regardless of whether firms prepare consolidated or unconsolidated financial statements. Thus, certain changes in pension liabilities are not immediately recognized as pension expenses in the income statement when incurred; they are gradually recognized as pension expenses in subsequent periods. The change in pension accounting standard affects the measurement of pension liabilities but does not affect the recognition and measurement of pension expenses. Therefore, firm managers can employ their discount rates to manage pension liabilities recognized on the balance sheet; however, it is not clear whether firm managers will use the expected rates of return on plan assets to manage pension expenses. Notably, prior studies analyzing recognition versus disclosure of pension liabilities have focused on discount rates but not on the expected rates of return on plan assets to analyze managerial discretionary behavior (Fried and Davis-Friday, 2013; Jones, 2013). Since the effects of mandating pension recognition on the managerial choice of expected rates of return are unclear, this study analyzes how the differences between recognized and disclosed pension liabilities influence the choice of expected rates of return.

The dependent variable in regression model (1) is changed to the expected rates of return (*ERR*), where *ERR* is the expected rate of return disclosed by firms minus the industry-average expected rates of return for each year. Statement No. 26 requires Japanese firms to report the allocation of plan assets among the investment categories in the notes, regardless of whether they prepare consolidated or unconsolidated financial statements. Previous studies report that with the disclosure of the allocation of plan assets, firms reduce the expected return on plan assets to be consistent with the actual return on plan assets (Chuk, 2013; Naughton, 2019). However, since I cannot predict how recognition firms manage the expected rates of return on plan assets compared to disclosure firms in the period subsequent to Statement No. 26, I do

not predict the sign of the $RF \times Post$ coefficient.

Table 9 reports the results of this additional analysis. Columns (1) and (2) present the effects of the differences in recognized and disclosed pension liabilities on the choice of the expected rates of return on plan assets. As shown in both columns, the $RF \times Post$ coefficients are positive and marginally statistically significant. Columns (3) and (4) present the effects of firms' pension funding status, and Columns (5) and (6) present the effects of their debt-contracting incentives. When firms have larger pension deficits and more debt-contracting incentives, the $RF \times Post$ coefficients are positive and statistically significant. These results indicate that recognition firms with larger pension deficits and more debt-contracting incentives choose higher expected rates of return than disclosure firms after the adoption of Statement No. 26. As shown in the main findings, recognition firms choose higher discount rates to mitigate the impacts of mandating pension recognition since they are required to recognize the previously off-balance sheet pension items on the balance sheet in the post-Statement No. 26 period. The results of this additional analysis suggest that, in addition to the discount rates, recognition firms choose higher expected rates of return on plan assets to manage their pension expenses.[14] However, since information on the allocation of plan assets among investment categories in the pre-Statement No. 26 period is not publicly disclosed, exploring managerial discretionary behavior regarding the choice of expected rates of return remains a future research issue.

6. Concluding remarks

This study investigated the impacts of recognition versus disclosure of pension liabilities on managerial discretion over pension assumptions. Using the unique Japanese pension accounting rule, I explored how firm managers employ their discretion in choosing discount rates when certain pension items—prior service costs and actuarial gains and losses—are recognized on their balance sheets. The study provides valuable evidence on how differences in recognized and disclosed pension liabilities influence managerial discretionary behavior.

[14] This study investigates whether recognition and disclosure firms employ different investment strategies for plan assets after the adoption of Statement No. 26, by focusing on bonds and equities. Unreported results indicate no difference in the investment strategies for plan assets between recognition and disclosure firms.

The differences between recognition and disclosure of pension liabilities have significant impacts on the managerial choice of discount rates. Recognition firms that are required to recognize the previously off-balance sheet pension items on the balance sheet choose higher discount rates than disclosure firms that are allowed to disclose them in the notes in the post-Statement No. 26 period. Moreover, when firms have more debt-contracting incentives, recognition firms are more likely to choose higher discount rates than disclosure firms in response to the adoption of Statement No. 26. Overall, my results suggest that firm managers discretionarily employ discount rates and underestimate pension liabilities to mitigate the impacts of changes in pension accounting standards from disclosure to recognition.

Despite valuable insights into the effects of mandating pension recognition on managerial discretionary behavior, this study has several limitations. My research indicates that when firms have more debt-contracting incentives, managers employ pension assumptions and manage pension liabilities in response to pension accounting rule changes from disclosure to recognition. Although the effects of the differences in recognition and disclosure of pension liabilities on managerial discretion are not homogeneous across firms, this study does not fully explore the heterogeneity of the effects of recognition versus disclosure. For instance, when firms have strong corporate governance, managers might discourage their discretionary behavior associated with the changes in accounting rules from disclosure to recognition. Thus, it is necessary to investigate the factors that inhibit managerial discretionary behavior. These examinations can advance our understanding of how managers exercise their discretion over pension assumptions in response to the differences between recognition and disclosure of pension information.

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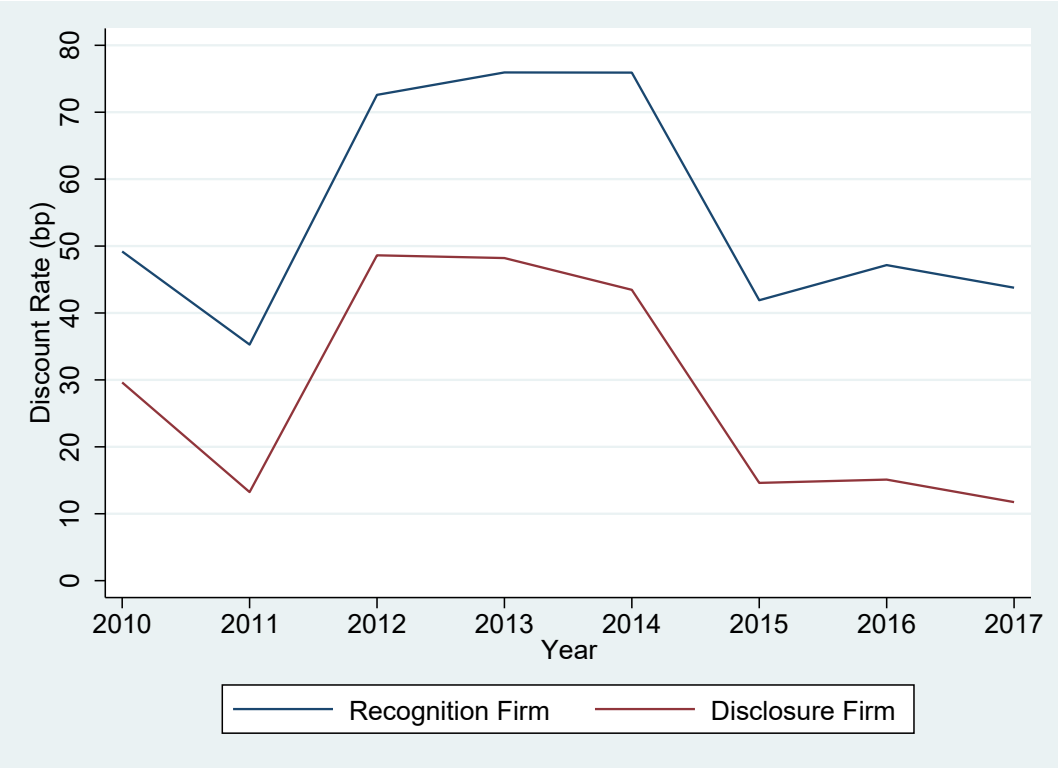
Appendix: Variable Definition

Variable	Definition
Main Analysis	
DR	Discount rate reported by firms minus the interest rate on high-grade bonds at the end of fiscal year t.
RF	Indicator variable that equals 1 if a firm prepare consolidated financial statements, and 0 otherwise.
Post	Indicator variable that equals 1 if a firm adopts Statement No. 26, and 0 otherwise.
PFS	Plan assets minus retirement benefit obligations divided by retirement benefit obligations at the end of fiscal year t.
Debt	Debt divided by total assets at the end of fiscal year t.
Size	Natural logarithm of total assets at the end of fiscal year t.
ROA	Business income—operating income and financial income—divided by total assets at the end of fiscal year t.
MTB	Market value of equity divided by the book value of equity at the end of fiscal year t.
Age	Natural logarithm of one plus the year since a firm was established.
Additional Analysis	
MVE	Market value of equity three months after the end of fiscal year divided by sales in fiscal year t.
PL	Retirement benefit obligations minus plan assets divided by sales in fiscal year t.
BVE*	Book value of equity after adjustment of recognized pension liabilities (excluding prior service costs and actuarial gains and losses in the post-Statement No. 26 period) divided by sales in fiscal year t.
NI	Net income divided by sales in fiscal year t.
Neg	Indicator variable that equals 1 if a firm reports net loss during fiscal year t, and 0 otherwise.
Over	Indicator variable that equals 1 if a firm's pension plan is overfunded at the end of fiscal year t, and 0 otherwise.

Notes: This appendix describes the variable definitions.

Figure 1: Trend of the Discount Rate over Time



Notes: This figure presents the trend of the mean of discount rates over the sample period. The pre- and post-Statement No. 26 periods cover 2010–2013 and 2014–2017, respectively.

Table 1: Descriptive Statistics

Panel A: Full Sample

	N	Mean	SD	Min	p25	Median	p75	Max
DR	12,855	0.0054	0.0097	-0.0076	0.0014	0.0037	0.0069	0.0799
RF	12,855	0.9347	0.2471	0.0000	1.0000	1.0000	1.0000	1.0000
Post	12,855	0.4831	0.4997	0.0000	0.0000	0.0000	1.0000	1.0000
PFS	12,855	-0.4824	0.3505	-1.0010	-0.7674	-0.4537	-0.2259	0.6376
Debt	12,855	0.1872	0.1662	0.0000	0.0421	0.1499	0.2947	0.6932
Size	12,855	11.1740	1.4766	8.2620	10.1257	10.9598	12.0430	15.3579
ROA	12,855	0.0477	0.0387	-0.1027	0.0245	0.0434	0.0688	0.1721
MTB	12,855	1.0414	0.7157	0.2138	0.5850	0.8431	1.2500	5.6521
Age	12,855	4.0332	0.5365	1.3863	3.9120	4.1589	4.3175	4.8040

Panel B: Pre- versus Post-Statement No. 26

	Pre-Statement No. 26 (N=6,645)			Post-Statement No. 26 (N=6,210)			Mean Difference	Median Difference
	Mean	SD	Median	Mean	SD	Median		
DR	0.0056	0.0080	0.0037	0.0050	0.0113	0.0026	-0.0006***	-0.0012***
PFS	-0.5322	0.3008	-0.4984	-0.4290	0.3898	-0.3840	0.1032***	0.1143***
Debt	0.1980	0.1712	0.1614	0.1758	0.1599	0.1383	-0.0222***	-0.0230***
Size	11.1152	1.4772	10.8912	11.2369	1.4735	11.0116	0.1216***	0.1203***
ROA	0.0428	0.0395	0.0390	0.0531	0.0371	0.0480	0.0103***	0.0090***
MTB	0.9149	0.5742	0.7643	1.1767	0.8199	0.9328	0.2618***	0.1685***
Age	4.0082	0.5415	4.1431	4.0599	0.5299	4.2047	0.0517***	0.0616***

Table 1: Descriptive Statistics (Cont.)

Panel C: Balancing Test

Before Entropy Balancing

	Recognition Firm (N=12,015)			Disclosure Firm (N=840)			Std. Diff.	Var. Ratio
	Mean	Variance	Skewness	Mean	Variance	Skewness		
PFS	-0.4769	0.1208	0.0412	-0.5609	0.1449	0.3779	0.2397 †	0.8342
Debt	0.1906	0.0276	0.8154	0.1391	0.0254	1.2805	0.3099 †	1.0888
Size	11.2744	2.1157	0.6127	9.7379	0.8988	0.8414	1.0406 †	2.3540 †
ROA	0.0478	0.0015	0.2804	0.0474	0.0020	0.2598	0.0103	0.7192 †
MTB	1.0419	0.5079	2.3668	1.0342	0.5750	2.1263	0.0108	0.8834
Age	4.0397	0.2955	-2.3820	3.9401	0.1686	-1.0303	0.1856 †	1.7527 †

After Entropy Balancing

	Recognition Firm (N=12,015)			Disclosure Firm (N=840)			Std. Diff.	Var. Ratio
	Mean	Variance	Skewness	Mean	Variance	Skewness		
PFS	-0.5609	0.1460	0.3778	-0.5609	0.1449	0.3779	0.0000	1.0077
Debt	0.1391	0.0256	1.2804	0.1391	0.0254	1.2805	0.0001	1.0079
Size	9.7381	0.9068	0.8451	9.7379	0.8988	0.8414	0.0002	1.0089
ROA	0.0474	0.0020	0.2602	0.0474	0.0020	0.2598	0.0000	1.0049
MTB	1.0342	0.5794	2.1273	1.0342	0.5750	2.1263	0.0001	1.0077
Age	3.9401	0.1700	-1.0306	3.9401	0.1686	-1.0303	-0.0001	1.0080

Notes: This table provides the descriptive statistics for the variables used to test my hypotheses. All the variables are defined in the Appendix. ***, **, and * denote statistically significance for the mean and median differences at the 1%, 5%, and 10% levels, respectively. † denotes that standardized differences (variance ratios) are outside the plus or minus 0.1 (0.8 and 1.25) bounds.

Table 2: Correlation Matrix

	DR	RF	Post	PFS	Debt	Size	ROA	MTB	Age
DR	1.0000	0.0656	-0.1829	0.0842	0.0669	0.2125	-0.0501	0.0139	0.0792
	.	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.1159)	(0.0000)
RF	0.0685	1.0000	0.0024	0.0534	0.0997	0.2738	0.0081	0.0206	0.0969
	(0.0000)	.	(0.7868)	(0.0000)	(0.0000)	(0.0000)	(0.3599)	(0.0193)	(0.0000)
Post	-0.0311	0.0024	1.0000	0.1413	-0.0600	0.0451	0.1379	0.1842	0.0928
	(0.0004)	(0.7868)	.	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
PFS	0.0447	0.0593	0.1471	1.0000	-0.0556	0.2534	0.0588	0.0154	0.1141
	(0.0000)	(0.0000)	(0.0000)	.	(0.0000)	(0.0000)	(0.0000)	(0.0801)	(0.0000)
Debt	0.0675	0.0766	-0.0667	-0.0522	1.0000	0.1800	-0.2879	0.1026	0.0896
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	.	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Size	0.1710	0.2572	0.0412	0.2408	0.2219	1.0000	0.1042	0.2744	0.2255
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	.	(0.0000)	(0.0000)	(0.0000)
ROA	-0.0176	0.0025	0.1329	0.0375	-0.2920	0.0688	1.0000	0.4118	-0.1061
	(0.0460)	(0.7759)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	.	(0.0000)	(0.0000)
MTB	0.0148	0.0027	0.1828	-0.0012	0.1294	0.1610	0.3585	1.0000	-0.0227
	(0.0943)	(0.7630)	(0.0000)	(0.8877)	(0.0000)	(0.0000)	(0.0000)	.	(0.0100)
Age	0.0427	0.0459	0.0482	0.1051	0.0026	0.0697	-0.0962	-0.0967	1.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.7658)	(0.0000)	(0.0000)	(0.0000)	.

Notes: This table provides the correlation matrix for the variables used to test my hypotheses. Pearson and Spearman correlations are below and above the diagonal, respectively. All the variables are defined in the Appendix. *p*-values for correlation coefficients are reported in parentheses.

Table 3: Results for Hypothesis 1

	Predicted Sign	(1) Coefficient (t-value)	(2) Coefficient (t-value)
Constant		0.0028***	0.0029
		(9.7696)	(0.9723)
RF	?	0.0008*	0.0006
		(1.8756)	(1.4591)
RF×Post	+	0.0008**	0.0008**
		(2.2200)	(2.2682)
PFS	−		0.0010**
			(2.4903)
Debt	+		-0.0015
			(-0.8870)
Size	−		0.0003*
			(1.8840)
ROA	−		-0.0087
			(-1.4752)
MTB	−		0.0002
			(0.7116)
Age	+		-0.0006
			(-1.0963)
Industry FE		No	Yes
Year FE		Yes	Yes
N		12,855	12,855
Adj. R^2		0.0630	0.0902

Notes: This table presents the relationships between recognized versus disclosed pension liabilities and the choice of discount rates. All the variables are defined in the Appendix. t-statistics (in parentheses) are estimated by using robust standard errors clustered by firm. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4: Results for Hypotheses 2 and 3

		(1)	(2)	(3)	(4)
		Pension Deficits		Debt-contracting Incentives	
		Smaller	Larger	Less	More
	Predicted	Coefficient	Coefficient	Coefficient	Coefficient
	Sign	(t-value)	(t-value)	(t-value)	(t-value)
Constant		0.0012	0.0057	0.0074*	-0.0021
		(0.3889)	(1.3854)	(1.8182)	(-0.5605)
RF	?	-0.0001	0.0012*	0.0000	0.0013
		(-0.2458)	(1.7520)	(0.0475)	(1.4602)
RF×Post	+	0.0009*	0.0007	0.0006	0.0012**
		(1.7529)	(1.3757)	(1.3679)	(2.1664)
PFS	−	0.0002	0.0018	0.0012***	0.0010
		(0.1928)	(1.6295)	(2.6747)	(1.3158)
Debt	+	0.0004	-0.0026	0.0008	-0.0027
		(0.2052)	(-1.0722)	(0.1993)	(-1.4775)
Size	−	0.0005**	0.0001	0.0001	0.0005*
		(2.4606)	(0.4910)	(0.5314)	(1.7582)
ROA	−	0.0015	-0.0155*	-0.0143*	-0.0013
		(0.2813)	(-1.8159)	(-1.7071)	(-0.1904)
MTB	−	-0.0002	0.0004	0.0007	-0.0001
		(-0.7748)	(1.0373)	(1.5357)	(-0.4752)
Age	+	-0.0007	-0.0008	-0.0012	0.0004
		(-1.4104)	(-0.9564)	(-1.5039)	(0.6148)
Industry FE		Yes	Yes	Yes	Yes
Year FE		Yes	Yes	Yes	Yes
N		6,454	6,401	6,395	6,460
Adj. R^2		0.1028	0.0988	0.1002	0.1186

Notes: This table presents how firms' pension deficits and debt-contracting incentives influence the relationships between recognized versus disclosed pension liabilities and the choice of discount rates. All the variables are defined in the Appendix. t-statistics (in parentheses) are estimated by using robust standard errors clustered by firm. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5: Results of Robustness Test Using Entropy Balancing that Assigns the Entropy Balances to Disclosure Firms

		(1)	(2)	(3)	(4)	(5)	(6)
				Pension Deficits		Debt-contracting Incentives	
		All	All	Smaller	Larger	Less	More
	Predicted Sign	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
RF×Post	+	0.0008**	0.0008**	0.0002	0.0016**	-0.0008	0.0016***
		(2.0463)	(2.3364)	(0.5551)	(2.5080)	(-1.2086)	(3.1061)
Controls		No	Yes	Yes	Yes	Yes	Yes
Industry FE		No	Yes	Yes	Yes	Yes	Yes
Year FE		Yes	Yes	Yes	Yes	Yes	Yes
N		12,855	12,855	6,454	6,401	6,395	6,460
Adj. R^2		0.0816	0.1384	0.1465	0.1817	0.1008	0.1762

Notes: This table presents the results of the robustness test on how the differences between recognized versus disclosed pension liabilities influence the choice of discount rates using the entropy balancing that assigns the entropy balances to disclosure firms rather than recognition firms. All the variables are defined in the Appendix. The coefficients of control variables are not presented in this table for parsimony. t-statistics (in parentheses) are estimated by using robust standard errors clustered by firm. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6: Results of Robustness Test Using Propensity Score Matching

		(1)	(2)	(3)	(4)	(5)	(6)
				Pension Deficits		Debt-contracting Incentives	
		All	All	Smaller	Larger	Less	More
	Predicted Sign	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
RF×Post	+	0.0012**	0.0013**	0.0013	0.0013*	0.0009	0.0019**
		(2.1416)	(2.3083)	(1.5515)	(1.7041)	(1.0868)	(2.3092)
Controls		No	Yes	Yes	Yes	Yes	Yes
Industry FE		No	Yes	Yes	Yes	Yes	Yes
Year FE		Yes	Yes	Yes	Yes	Yes	Yes
N		1,574	1,574	784	790	784	790
Adj. R^2		0.0695	0.1084	0.0869	0.1323	0.1467	0.0949

Notes: This table presents the results of the robustness test on how the differences between recognized versus disclosed pension liabilities influence the choice of discount rates using one-to-one nearest neighbor propensity score matching without replacement and with a caliper distance of 0.02. All the variables are defined in the Appendix. The coefficients of control variables are not presented in this table for parsimony. t-statistics (in parentheses) are estimated by using robust standard errors clustered by firm. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7: Results of Robustness Test Using the Firm Fixed Effects Model

		(1)	(2)	(3)	(4)	(5)	(6)
				Pension Deficits		Debt-contracting Incentives	
		All	All	Smaller	Larger	Less	More
	Predicted Sign	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
RF×Post	+	0.0009**	0.0011***	0.0011*	0.0008*	0.0007	0.0013***
		(2.5087)	(2.8227)	(1.6845)	(1.7411)	(1.2207)	(2.5953)
Controls		No	Yes	Yes	Yes	Yes	Yes
Firm FE		Yes	Yes	Yes	Yes	Yes	Yes
Year FE		Yes	Yes	Yes	Yes	Yes	Yes
N		12,257	12,257	6,113	6,048	6,036	6,095
Adj. R^2		0.6746	0.6763	0.5856	0.7613	0.5727	0.7751

Notes: This table presents the results of the robustness test on how the differences between recognized versus disclosed pension liabilities influence the choice of discount rates using the firm fixed effects model. All the variables are defined in the Appendix. The coefficients of control variables are not presented in this table for parsimony. t-statistics (in parentheses) are estimated by using robust standard errors clustered by firm. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8: Results of Additional Test for Managerial Discretion on Value Relevance

		(1)	(2)	(3)	(4)	(5)	(6)
		All Firms		Low Discount Rates		High Discount Rates	
		Pre-Statement No. 26	Post-Statement No. 26	Pre-Statement No. 26	Post-Statement No. 26	Pre-Statement No. 26	Post-Statement No. 26
	Predicted Sign	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Constant		0.0858***	0.2006***	0.0475	0.0697	0.1276***	0.0966
		(2.9358)	(3.1081)	(1.1351)	(1.0410)	(3.2180)	(0.7627)
PL	−	-0.6378***	-1.1255***	-0.5722**	-1.7186***	-0.7149***	-0.4783
		(-4.1444)	(-3.7615)	(-2.3894)	(-4.7939)	(-3.6764)	(-1.0429)
BVE*	+	0.5061***	0.5599***	0.4931***	0.5690***	0.5206***	0.5492***
		(19.9775)	(9.9822)	(13.4592)	(8.8820)	(15.4740)	(6.0535)
NI	+	6.6508***	11.1356***	6.8599***	9.6726***	6.2989***	13.1032***
		(15.3385)	(13.0862)	(10.4031)	(10.8740)	(11.3631)	(9.8705)
Neg×NI	−	-6.8264***	-13.5840***	-6.9033***	-11.3595***	-6.6635***	-15.9074***
		(-14.0821)	(-8.1601)	(-9.2911)	(-9.6147)	(-11.0956)	(-5.8330)
Neg	?	0.0742***	0.2048***	0.0812***	0.1732***	0.0713***	0.2560***
		(5.2481)	(4.0267)	(3.8684)	(4.4157)	(3.8466)	(2.8575)
Over	?	-0.0382	-0.0194	-0.0178	-0.0028	-0.0743	-0.0450
		(-0.9069)	(-0.5745)	(-0.2958)	(-0.0681)	(-1.2319)	(-0.8667)
Industry FE		Yes	Yes	Yes	Yes	Yes	Yes
Year FE		Yes	Yes	Yes	Yes	Yes	Yes
N		6,175	5,804	3,089	2,914	3,086	2,890

Adj. R^2	0.6515	0.6295	0.6705	0.6455	0.6484	0.6380
Wald Test		3.5693		10.6724		0.2895
		[0.0589]		[0.0011]		[0.5906]

Notes: This table presents the results of the additional test on how the choice of discount rates influences the value relevance of recognition versus disclosure of pension liabilities. All the variables are defined in the Appendix. t-statistics (in parentheses) are estimated by using robust standard errors clustered by firm. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The Wald test, which investigates the equality between the *PL* coefficients before and after Statement No. 26 adoption, provides chi-square values. *p*-values are reported in square brackets.

Table 9: Results of Additional Test for Expected Rate of Returns

		(1)	(2)	(3)	(4)	(5)	(6)
				Pension Deficits		Debt-contracting Incentives	
		All	All	Smaller	Larger	Less	More
	Predicted Sign	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
RF×Post	?	0.0020*	0.0018*	0.0002	0.0026**	0.0012	0.0027*
		(1.8133)	(1.7242)	(0.1313)	(2.2035)	(0.8547)	(1.7779)
Controls		No	Yes	Yes	Yes	Yes	Yes
Industry FE		No	Yes	Yes	Yes	Yes	Yes
Year FE		Yes	Yes	Yes	Yes	Yes	Yes
N		10,451	10,451	5,246	5,205	5,199	5,252
Adj. R^2		0.0025	0.0955	0.1258	0.1198	0.1042	0.1110

Notes: This table presents the results of the additional test on how the differences between recognized versus disclosed pension liabilities influence the choice of expected rates of return on plan assets. All the variables are defined in the Appendix. The coefficients of control variables are not presented in this table for parsimony. t-statistics (in parentheses) are estimated by using robust standard errors clustered by firm. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.