The Expected Rate of Return on Plan Assets and Plan Asset Allocation

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ABSTRACT

New accounting standards for retirement benefits, ASBJ Statement No.26: *Accounting Standard for Retirement Benefits* and ASBJ Guidance No.25: *Guidance on Accounting Standard for Retirement Benefits*, have been adopted since fiscal 2013 in Japan. One of the main changes they effected is the expansion of footnote disclosure of items related to retirement benefits, including those concerning the expected rate of return on plan assets (ERR) — namely, plan asset allocation and actual return on plan assets. Japanese stock exchanges allow firms to adopt J-GAAP, US GAAP or International Financial Reporting Standards to list on their exchanges. US GAAP has required firms to disclose plan asset allocation and actual return on plan assets since fiscal 2003. This study examines the effect of these disclosure items on the determination of ERR for firms under both J-GAAP and US GAAP. Our results demonstrate that coefficients for variables of the new disclosure items are both positive and significant for firms adopting J-GAAP. As for firms adopting US GAAP, the actual return on plan assets is positively related to ERR. Therefore, we conclude these items required under the new accounting standards do provide financial statement users more useful information for decision-making.

Keywords: Expected rate of return on plan assets, Plan asset allocation, Actual return on plan assets.

1. INTRODUCTION

The new accounting standards for retirement benefits, ASBJ Statement No.26: *Accounting Standard for Retirement Benefits* (ASBJ Statement 26) and ASBJ Guidance No.25: *Guidance on Accounting Standard for Retirement Benefits* (ASBJ Guidance 25), were issued in May 2012, and have been adopted since fiscal 2013. The main changes arising from these standards are (a) the recognition on the balance sheet of a defined benefit liability including unrecognized obligations, (b) a choice in the attribution method of estimated defined benefit obligations for each period, and (c) the expansion of footnote disclosures for retirement benefits.

To estimate defined benefit obligations, plan assets, and defined benefit cost, firms need to make many decisions about future conditions, because retirement benefits occur in the future. Actuarial assumptions thus have an important role in calculating pension components. These assumptions include discount rates, expected rates of return on plan assets (ERR), rates of future salary increases, mortality, rates of employees' turnover,

and others. Changes in these assumptions have a significant effect on the amounts of pension components. The discount rate is determined in reference to yields on safe and secure long bonds, including government bonds and high-grade corporate bonds (ASBJ Statement 26, par.20). Thus the discount rate can be set based on objective, publically available information. On the other hand, the ERR is determined on firm-specific information, including a firm's investment portfolio and the market conditions for plan assets that the firm holds (ASBJ Guidance 25, par.25). Therefore, it is important for firms to disclose information related to ERR, which will demonstrate that they are setting their ERRs appropriately.

The new accounting standards require firms to disclose more detailed information on defined benefit plans, which is intended to be useful for investor decision-making. The new items disclosed in the footnotes are the breakdown of changes in defined benefit obligations and plan assets in the period, and items regarding plan assets including the allocation of plan assets. The expansion of footnotes disclosures is made based on the harmonization with International Financial Reporting Standards (IFRS). Several items in footnotes are related to plan assets. The new disclosure items are especially important to predict the ERR, namely, plan asset allocation and the actual return on plan assets. As explained above, the ERR has a significant effect on defined benefit cost, and it is difficult to estimate in an objective way, because it is set based on firm-specific information. Therefore, this paper will examine whether the new information is useful for financial statement users to judge if the ERR is set properly.

2. DISCLOSURES ON RETIREMENT BENEFITS
2.1 J-GAAP

There are two accounting standards for retirement benefits, ASBJ Statement 26 and ASBJ Guidance 25, which have been adopted since fiscal 2013. They require firms to disclose additional information regarding a firm's defined benefit plans.

Under the prior accounting standard for retirement benefits, *Accounting Standard for Retirement Benefits,* firms disclosed the following information in footnotes (*Accounting Standard for Retirement Benefits*, par.6):

(a) Retirement benefit plans that a firm adopts;

(b) The breakdown of defined benefit obligations, plan assets, prepaid defined benefit cost, defined benefit liability, unrecognized past service cost, unrecognized actuarial gain or loss, and other information;

(c) The breakdown of defined benefit cost, including current service cost, interest cost, expected return on plan assets, past service cost, actuarial gains and losses, and other items; and

(d) The basis of calculation, including actuarial assumptions (discount rate and ERR), the attribution method of estimated defined benefit obligations to each period, the amortization period for past service cost, and actuarial

gains and losses.

Under ASBJ Statement 26, the following information is currently required to be disclosed in the footnotes (ASBJ Statement 26, par.30):

(a) Summary of retirement benefit plans that a firm adopts;

(b) The breakdown of changes in defined benefit obligations and plan assets in the period;

(c) The breakdown of defined benefit obligations, plan assets, and defined benefit liability;

(d) Profit or loss related to retirement benefits;

(e) The amount of actuarial gains and losses and past service cost recognized in other comprehensive income;

(f) The amount of unrecognized actuarial gain or loss and unrecognized past service cost recognized in accumulated other comprehensive income;

(g) Items regarding plan assets including the allocation of plan assets; and

(h) Actuarial assumptions (discount rate, ERR, and other important assumptions).

Both (b) and (g) are new disclosure items under ASBJ Statement 26. Items (b), (d), (e), (f), (g), and (h) are related to the ERR. Item (b) shows the actual return on plan assets which would be helpful for financial statement users to judge if a firm sets the ERR appropriately. Item (g) describes the asset allocation on plan assets and the method for setting the ERR. ASBJ Guidance 25 states that the ERR is determined based on the investment portfolio, management performance in the past, management policy, and the market for plan assets that a firm holds (ASBJ Guidance 25, par.25). This information varies depending on how a firm manages plan assets. The method that firms use to determine their ERRs is at their discretion. Therefore, these changes in Japanese accounting standards require firms to disclose information related to the determination of the ERR, which would provide financial statement users additional useful information.

2.2 US GAAP

In the US, FASB Accounting Standards Codification No.715: *Compensation-Retirement Benefits* (ASC715) regulates the recognition and measurement of defined benefit obligations and plan assets, and the disclosures. ASC715 includes the guidance in Statement of Financial Accounting Standards No.87: *Employers' Accounting for Pensions* (SFAS87), Statement of Financial Accounting Standards No.106: *Employers' Accounting for Postretirement Benefits Other Than Pensions* (SFAS106), Statement of Financial Accounting Standards No.132R: *Employers' Disclosures about Pensions and Other Postretirement Benefits* (SFAS132R), and Statement of Financial Accounting Standards No.158: *Employers' Accounting for Defined Benefit Pension and Other Postretirement Plans* (SFAS158).

SFAS132R, which became effective from December 2003, revises disclosure requirements stated in SFAS132, the previous statement on postretirement benefits that was issued in 1998[1] to satisfy financial statement users' needs for more information about economic resources and obligations related to pension plans (SFAS132R, Reasons for Issuing This Statement). SFAS132R addresses only disclosure issues. The additional disclosures it requires include types of plan assets, investment strategy, measurement dates, plan obligations, cash flows, and components of net periodic benefit cost recognized during interim periods. The information on types of plan assets and investment strategy form the basis for determining the ERR (SFAS132R, Differences between This Statement and Statement 132).

As mentioned above, currently ASC715 includes SFAS87, 106, 132R or 158, and prescribes accounting for compensation including pension plans. ASC715 states that the ERR shall be determined with consideration of the availability of all plan assets for investment throughout the year (ASC715, par.715-30-35-48). The difference between the expected return on plan assets and actual return on plan assets is recognized as actuarial gains and losses (ASC715, par.715-30-35-26). ASC715 requires firms to disclose information about postretirement benefit plan assets that is useful for financial statement users' understanding. The following information about plan assets should be disclosed (ASC715, par.715-20-50-1d):

(a) how investment allocation decisions are made, including factors that are pertinent to an understanding of investment policies and strategies;

(b) the classes of plan assets;

(c) the inputs and valuation techniques used to measure the fair value of plan assets;

(d) the effect of fair value measurements using significant unobservable inputs (Level 3) on changes in plan assets for the period; and

(e) significant concentrations of risk within plan assets.

These items form the underlying basis of a firm's determination of ERR. With regard to (b), under SFAS132R, firms tended to categorize their plan assets into fewer than four types, including equity securities, debt securities, and others. In December 2008, Financial Accounting Standards Board (FASB) issued FASB Staff Position No. FAS132(R)-1: *Employers' Disclosures about Postretirement Benefit Plan Assets* (FSP FAS132(R)-1). The position paper discusses the disclosures concerning categories of plan assets and those about fair value measurements of plan assets. It states that firms should disclose their pension plans and other postretirement benefit plans at fair value

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[1] SFAS87 required firms to disclose their ERRs and the types of assets held in the pension portfolio (SFAS87, par.54a). Amir and Benartzi (1998) mention that while most of firms disclosed their ERRs, only a few firms disclosed information about the composition of plan assets, and the information was often vague. When SFAS132 was issued, the requirement for the disclosure of plan asset allocation was eliminated, because FASB believed it "provides only limited useful information to users of financial statements" (SFAS132, par.53).

for each major category of plan assets. The major categories include cash and cash equivalents; equity securities (segregated by industry type, company size, or investment objective); debt securities issued by national, state, and local governments; corporate debt securities; asset-backed securities; structured debt; derivatives on a gross basis (segregated by type of underlying risk in the contract); investment funds (segregated by type of fund); and real estate (FSP FAS132(R)-1, par.9).[2]

The position paper also requires firms to disclose information that allows financial statement users to assess the inputs and valuation techniques used to develop fair value measurements of plan assets at the end of the period (FSP FAS132(R)-1, par.11). Firms have to categorize their plan assets into three different levels of the fair value hierarchy and provide disclosure.[3] For plan assets categorized in significant unobservable inputs (Level 3), a reconciliation of the beginning and ending balances during the period is separately presented (FSP FAS132(R)-1, par.12). These requirements are effective for fiscal years ending after December 15, 2009. They are included in ASC715 (ASC715, par.20-50-1d-5).

FASB issued Exposure Draft: *Compensation-Retirement Benefits-Defined Benefit Plans-General (Subtopic 715-20)* (ED715-20) in January 2016. This exposure draft is part of the disclosure framework project of the board, which aims to "improve the effectiveness of disclosures in the notes to financial statements by facilitating clear communication of the information required by generally accepted accounting principles (GAAP)" (ED715-20, Summary and Questions for Respondents). It amends some disclosure requirements and adds objectives for disclosure, as well as reorganizing content to list disclosure requirements under each related objective (ED715-20, par.1). Under ED715-20, the major categories on plan assets and the levels of the fair value hierarchy on plan assets are stated as the information useful in assessing "the entity-specific risks of the plan" (ED715-20, par.715-20-50-1F), and "the judgments and assumptions that most significantly affect the determination of the benefit obligation, net benefit cost, and fair value of plan assets" (ED715-20, par.715-20-50-1C).

2.3 IFRS

Japanese stock exchanges allow firms to adopt J-GAAP, US GAAP, or IFRS. Japanese firms have been allowed to adopt IFRS since fiscal 2009. International Accounting Standard No.19: *Employee Benefits* (IAS19) also requires firms to disclose detailed information on plan asset allocation from fiscal 2013. With regard to ERR, IAS19 states that it was eliminated for calculating the return on plan assets, because the International Accounting Standards Board (IASB) found it difficult to determine the

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[2] These examples are not meant to be all inclusive (FSP FAS132(R)-1, par.9).
[3] The three levels are described as fair value measurements using quoted prices in active markets for identical assets or liabilities (Level 1), significant other observable inputs (Level 2), and significant unobservable inputs (Level 3) (FSP FAS132(R)-1, par.11).

return in an objective way, and the possibility existed that the return would include some portion that occurred not simply from the passage of time (IAS19, par.BC78). Currently firms are required to recognize interest income on plan assets in the net interest on the net defined benefit liability (IAS19, par.124).[4] The interest income on plan assets is calculated by multiplying the fair value of plan assets at the beginning of the period by the discount rate, which is determined by reference to market yields at the end of the reporting period on high quality corporate bonds (IAS19, pars.83, 125).

IAS19 also states that a firm shall disclose a sensitivity analysis for each significant actuarial assumption as of the end of the reporting period. The methods and assumptions used in preparing the sensitivity analysis, as well as information about the amount, timing, and uncertainty of future cash flows, should also be disclosed (IAS19, par.145). Currently there are about 70 firms adopting IFRS in Japan. These firms are not treated in this paper, since IFRS requires firms to adopt discount rates to calculate the interest income on plan assets.

3. PLAN ASSET ALLOCATION OF JAPANESE LISTED FIRMS

The calculation of pension components relies on several future assumptions, including discount rates, ERRs, or rates of employees' turnover. Changes in these assumptions have a significant effect on the amounts of defined benefit obligations, plan assets, defined benefit liability, and defined benefit cost. Bauman and Shaw (2014) show the effect of the sensitivity of defined benefit cost on changes in the discount rate or ERR. They conclude that a 1% increase (decrease) in discount rates leads to an 8% to 9% increase (decrease) in operating income on average. As for ERRs, a 1% increase (decrease) in these rates provides about a 3% to 4% increase (decrease) in operating income. It can be assumed that all accounting standards require firms to disclose detailed information on defined benefit plans owing to the volatility and uncertainty in the calculation of these pension components. US GAAP and IAS19 require firms to disclose more detailed information, including assumptions, in the footnotes to the financial statements than J-GAAP.

3.1 Japanese Listed Firms Adopting J-GAAP

This section examines the effect of plan asset allocation and actual return on plan assets on the determination of ERRs by discussing disclosures by Japanese firms for each of these items. Japanese firms are required to disclose their plan asset allocations in their footnotes for fiscal years beginning on or after April 1, 2013. Therefore, the data is available for fiscal 2013 and 2014. Firms disclosing both ERRs and plan assets are selected. The number of firms included in our study in fiscal 2013 is below that in fiscal

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[4] The net interest on the net defined benefit liability (asset) consists of interest income on plan assets, interest cost on the defined benefit obligation, and interest on the effect of the asset ceiling (IAS19, par.124).

2014, because only firms issuing their financial statements in March 31, 2013 are selected, owing to the requirement of the effective date. Firms with less-than-12-month accounting periods, as well as banks and insurance firms, are excluded. Financial data used in this study were collected from Nikkei Economic Electronic Databank System (2015), provided by the Nikkei Digital Media, Inc., and each firm's financial statements.

Table 1 shows the average ERRs and actual rates of return on plan assets (ARR) of listed firms adopting J-GAAP. The ARR is the total amount of expected return on plan assets and actuarial gains and losses that occurred in the period divided by plan assets in the beginning of the period.[5] The ARR is much higher than ERR in both fiscal 2013 and 2014, because Japanese and foreign stock prices increased during these time-spans.

Table 1. ERR and ARR of Firms Adopting J-GAAP

(%)

	No. of Firms	ERR	ARR
2013	1,186	2.01	7.75
2014	1,480	2.04	9.63

Most Japanese listed firms adopting J-GAAP tend to classify their plan assets into four categories: equity securities, debt securities, general account of life insurance company, and others. The average rates of these four asset classes in fiscal 2013 and 2014 are shown in Table 2. Several firms disclose more detailed information. Their classification of plan assets includes cash and cash equivalents, domestic and foreign stocks, domestic and foreign bonds, general account of life insurance company, and others. Firms tend to invest more than 30% of plan assets in each of equities and bonds. The general account of life insurance company indicates holdings of life insurance products, which guarantee a certain amount of interest. When a firm purchases these financial products for their pension portfolios, investors are not informed of the amounts in the portfolio. It is difficult to see if the ERR is set appropriately based on the active market conditions. There are several firms that invest all their plan assets in life insurance companies' products.

The composition of the investment portfolio changes depending on conditions in the securities markets. For example, when domestic stock prices decrease, the proportion of foreign stocks or bonds in plan assets increases. The significant effect on plan assets from price action in the securities markets make a firm's plan asset allocation and ARR both highly volatile and uncertain.

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[5] The amount of actuarial gains and losses occurred in the period is disclosed in the breakdown of changes in plan assets for the period.

Table 2. **Plan Asset Allocation of Firms Adopting J-GAAP**

				(%)
	Equity Securities	Debt Securities	General Account of Life Insurance Company	Others
2013	32.00	31.80	23.20	13.00
2014	30.81	31.47	24.12	12.84

3.2 Japanese Firms Adopting US GAAP

There are about 30 Japanese firms adopting US GAAP for fiscal 2003 to 2014. Table 3 shows their average ERRs and ARRs for these periods. The ERRs are stable compared with the ARRs. The ARR is strongly affected by movements in stock and bond prices. For example, in 2007, sub-prime mortgage loans became a serious problem in the US, and prices for both domestic and foreign stocks and bonds fell. In 2008, the bankruptcy of the big investment bank, Lehman Brothers had a significant negative impact on the global economy. In both years ARRs, were negative. For the recent three years, an improvement in US economic indexes, positive expectations for Japanese economic policies, and yen depreciation increased domestic and foreign stock and bond prices.[6] The ARRs in these periods were highly positive.

Table 3. **ERR and ARR of Firms Adopting US GAAP**

	No. of Firms	ERR	ARR
2003	28	3.15	14.70
2004	30	2.96	3.28
2005	31	3.10	17.48
2006	30	3.33	4.28
2007	30	3.38	-8.31
2008	30	3.29	-17.12
2009	30	3.16	11.14
2010	30	3.13	0.59
2011	28	3.29	1.91
2012	28	3.24	10.39
2013	28	3.27	7.40
2014	20	3.34	10.71

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[6] Pension Fund Association, "The Survey and Comment on Pension Asset Management," http://www. pfa.or.jp/activity/tokei/shisanunyo/jittai/index.html.

Table 4. **Plan Asset Allocation of Firms Adopting US GAAP**

(%)

	Equity Securities	Debt Securities	Genreal Account of Life Insurance Company	Others
2003	43.89	24.46	12.39	19.25
2004	43.10	30.37	10.30	16.23
2005	48.13	30.74	10.45	10.68
2006	46.70	32.70	10.87	9.73
2007	41.40	35.87	11.53	11.20
2008	33.37	38.63	14.07	13.93
2009	37.52	36.07	14.40	12.02
2010	34.99	36.88	15.59	12.54
2011	31.97	37.98	16.29	13.76
2012	31.94	36.92	14.65	16.49
2013	31.84	37.28	14.74	16.14
2014	31.72	35.62	15.26	17.40

As mentioned in Section 2.2, SFAS132R was issued and became effective from December 2003. SFAS132R requires firms to disclose new information related to plan assets: types of plan assets and investment strategy (SFAS132R, Differences between This Statement and Statement 132). Under SFAS132R, firms tend to disclose their plan asset allocation segregated into four types which are the same as those under ASBJ Statement 26. Table 4 indicates the plan asset allocation of firms adopting US GAAP from fiscal 2003 to 2014. It shows that each year firms invest 31% to 48% of plan assets in equity securities, and 25% to 38% in debt securities.

With the issuance of FSP FAS132(R)-1 in December 2008, firms are required to disclose the plan asset allocation in more detailed classifications, but they are not prescribed explicitly. Thus different firms will use different classifications. In this study, eleven asset types are used, which are common in the sample firms of this study. Table 5 shows the plan asset allocation of firms adopting US GAAP after FSP FAS132(R)-1 was adopted.

Table 5. **Plan Asset Allocation of Firms Adopting US GAAP from Fiscal 2009 to 2014**

(%)

	2009	2010	2011	2012	2013	2014
Cash & Cash Equivalent	2.80	3.71	2.93	4.62	2.77	2.45
Stocks	37.02	34.99	31.97	31.94	31.84	31.72
Bonds	36.14	36.88	37.98	36.92	37.28	35.62
Hedge Funds	1.75	1.69	2.02	1.90	2.17	2.66
General Account of Life Insurance Company	14.89	15.59	16.29	14.65	14.74	15.26
Private Equity	0.15	0.14	0.16	0.16	0.11	0.16
Real Estate	0.35	0.39	0.35	0.43	0.53	0.86
Mortgages	0.17	0.07	0.23	0.21	0.23	0.08
Investment Funds	2.79	2.62	2.56	2.57	2.63	2.52
Others	3.94	3.92	5.51	6.60	7.70	8.67

The allocations in firms' investment portfolios do not change significantly each year. Firms tend to invest around 70% of plan assets in stocks and bonds, 15% in the general account of life insurance company, and 2% in each of hedge funds and investment funds. Most firms categorize their equity securities as either domestic or foreign stocks. However, when firms manage their stocks in pooled funds, the proportions of domestic and foreign stocks in equity securities are not disclosed in their footnotes and therefore unknown. In this study, about 80% of firms disclose the proportion of domestic and foreign stocks in plan assets. Table 6 shows the proportions related to domestic and foreign stocks.

Excluding fiscal 2009, in each year the average proportion of domestic stocks in total stocks is around 50%. As explained above, in 2008 stock prices declined significantly. The rate of return on foreign stocks was more negatively affected by the recession than that for domestic stocks. The market benchmark rate of return on foreign stocks was much less than that on domestic stocks. Therefore, in fiscal 2009 firms had more of their plan assets in domestic stocks than in foreign stocks. As a general rule, the rate of return on domestic stocks moves in conjunction with foreign stocks, and firms tend to invest almost the same amounts in domestic and foreign stocks.

Table 6. **Proportions Related to Domestic and Foreign Stocks**

(%)

	No. of Firms	DS/PA	FS/PA	DS/(DS+FS)
2009	23	23.51	13.91	61.75
2010	23	19.68	15.52	55.26
2011	24	17.74	14.36	54.42
2012	24	16.52	15.62	50.73
2013	22	15.83	15.74	48.73
2014	17	15.04	15.98	46.81

DS=Domestic Stocks, FS=Foreign Stocks, PA=Plan Assets

4. PRIOR RESEARCH

There are several researches which study the effect on the ERR of disclosures of plan asset allocation and actual return for the period. With regard to plan asset allocation, Amir and Benartzi (1998) show that firms tend to invest 50% of their plan assets in domestic stocks, 30% in domestic bonds, 7% in cash equivalent, and about only 1% in high-risk assets including venture capital, LBOs (high risk equity investments in highly leveraged firms), and private placements. They conclude that, while the ERR and the percentage of plan assets invested in stocks are related, the relationship is rather weak. Bergstresser et al. (2006) examine if managers increase the proportion of equity in plan assets to justify higher ERRs. They employ ordinary least squares regressions to test the effect of the proportion of equity in plan assets on the ERR. Their results show that when the percentage of equity in plan assets is higher, the ERR is also higher. They

conclude that the ERR might be affected by plan asset allocation, and also that executives' forecasts (both optimistic and pessimistic) used in plan asset management drive both ERRs and plan asset allocations.

Chuk (2013) reports that the t-tests and the cross-sectional model employed in this analysis show that firms with a higher percentage of equity in plan assets set their ERRs higher, which results in plan asset allocation being an important factor for ERR determination. Other point of views describes how plan asset allocation is affected by additional factors. Friedman (1983) discusses how firms with more volatile earnings and highly leveraged balance sheets tend to invest in more debt securities to offset ordinary business risk. Amir et al. (2010) find that the shift of plan assets from equity to debt securities is positively related to increases in funding levels, effective tax rates, and financial leverage, and is negatively associated with the investment horizon.

Turning to the effect of ARR on ERR, Blankley and Swanson (1995) compare them and find that, year to year, the ARR is volatile. However, the average ARR and ERR tend toward nine percent during the sample period of 1987 to 1993. They therefore conclude the ERR becomes more closely linked to the ARR as time passes. Blankley et al. (2010) analyze the ERR compared with two firm-specific benchmarks, unadjusted actual return and an internal rate of return earned on plan assets. They also find that annual actual returns are volatile; however, the mean of these actual returns for the 13-year-period of the analysis is consistent with the reported ERRs. Lew (2009) examines whether financially distressed firms use their actuarial assumptions for earnings management. The model in the study includes the change in ARR to explain the change in ERR. He finds that the ARR is statistically significant. Amir and Benartzi (1998) employ a model that includes ARR to explain if this information is useful for predicting ERR. They conclude that the ARR is not related to the ERR.

Adams et al. (2011), and Li and Klumpes (2013) utilize a model including both percentage of equity in plan assets and ARR to examine if firms have an opportunity to inflate earnings through the ERR determination. Adams et al. (2011) find that the percentage of equity and the ARR provide financial statement users helpful information to predict ERR. Li and Klumpes (2013) also find that there is a relationship between the ARR and ERR. However, percentage of equity has no effect on the determination of the ERR.

Most papers find that plan asset allocation and the actual return on plan assets are related to the determination of the ERR. However, there are several papers which show the opposite result. Therefore, this paper will examine if the new disclosure items required under the current accounting standards provide additional useful information for financial statement users to judge whether a firm sets an appropriate ERR.

5. HYPOTHESIS DEVELOPMENT

As stated, the new accounting standards require firms to disclose additional

accounting items related to plan assets, including plan asset allocation and the actual return on plan assets. Preparing this information requires man-hours and costs for firms. If it's not helping financial statement users, it is not worthwhile to prepare it. Therefore, it is useful to analyze if the new disclosure items will provide more useful information for financial statement users.

Section 2.1 described the disclosure items related to plan assets under prior and current Japanese accounting standards on retirement benefits. The expected return on plan assets is stated as a calculated return reasonably expected to result from the management of plan assets (ASBJ Statement 26, par.10). As mentioned above, the ERR is determined based on investment portfolio, management performance in the past, management policy, and security market conditions for the plan assets that a firm holds (ASBJ Guidance 25, par.25). The disclosures on plan assets in footnotes should provide useful information for predicting the ERR.

Under prior standards, the breakdown of plan assets, unrecognized actuarial gain or loss, defined benefit cost, and actuarial assumptions are disclosed as items related to plan assets. Under current standards, the breakdown of changes in plan assets in the period, and items regarding plan assets including the allocation of plan assets, are added to prior disclosure requirements. To examine the usefulness of these two new items, the following hypotheses are developed:

H1: Firms with higher proportions of equity securities in their plan assets set higher ERRs.

H2: Firms that have higher ARRs are more likely to adopt higher ERRs.

Regarding the first hypothesis, Japanese firms adopting J-GAAP tend to categorize their plan assets into four types, including equity securities, debt securities, general account of life insurance company, and others. Japanese firms adopting US GAAP have the same classifications for fiscal 2003 to 2008. It is assumed that investing in assets with higher risk yields higher returns. Therefore, firms investing in equity securities rather than debt securities should be expected to adopt higher ERRs. Amir and Benartzi (1998), Bergstresser et al. (2006), Adams et al. (2011), and Chuk (2013) recognize a positive relationship between the percentage of equity in plan assets and the ERR.

As for the second hypothesis, most prior researches discussed in Section 4 conclude there is a positive relationship between ARR and ERR — which indicates that efficient management of plan assets yields higher returns. The ARR is highly volatile, because it is determined by stock and bond prices that are strongly influenced by security market conditions. As described in Section 3, the average ARRs and ERRs of both firms adopting J-GAAP and those employing US GAAP indicate that ERRs are stable, whereas the ARRs fluctuate significantly. Other papers discussed in Section 4 (Blankley and Swanson (1995) and Blankley et al. (2010)) indicate that, year to year, the ARR is

volatile, and the mean of the ARRs for several years of the analysis is consistent with reported ERRs. Therefore, discerning the relationship between the ARR and ERR for Japanese firms adopting J-GAAP might require a longer period of study. If firms that do not manage their plan assets efficiently adopt higher ERRs, they might be using ERRs to manage earnings. If these new two disclosure items provide useful information for financial statement users, they both would be positively related to the ERR.

6. RESEARCH DESIGN

As noted, the new standards require plan asset allocation and actual return on plan assets to be disclosed, and yields on stocks are higher than those on bonds. It would therefore be expected that firms investing more plan assets in stocks will adopt higher ERRs. As for actual return on plan assets, management performance in the past is a significant part of the information firms use when they decide their ERRs. So the two new disclosure items are important for determining ERRs. The new standards state that the ERR should be determined based on information related to plan assets, including the investment portfolio and management results in the past. Therefore, our models include only pension components and market benchmarks. The following two models are employed:

$$ERR_{it} = \alpha_0 + \alpha_1 FUND_{it} + \alpha_2 DBSIZE_{it} + \alpha_3 HORIZON_{it} + \alpha_4 DR_{it} + \alpha_5 SIZE_{it} + \alpha_6 JSTOCK_{it} + e_{it} \tag{1}$$

$$ERR_{it} = \beta_0 + \beta_1 \%EQUITY_{it} + \beta_2 ARR_{it} + \beta_3 FUND_{it} + \beta_4 DBSIZE_{it} + \beta_5 HORIZON_{it} + \beta_6 DR_{it} + \beta_7 SIZE_{it} + \beta_8 JSTOCK_{it} + e_{it} \tag{2}$$

A comparison of these models can show whether the new disclosure requirements provide useful information for financial statement users. Multiple regression analysis and the Vuong (1989) test for nested models are used for our models.[7]

(1) Pension Funding Status (FUND)

Pension funding status, which can indicate whether a firm manages its plan assets efficiently, is the amount of plan assets at the end of the period divided by projected benefit obligations (PBO). An increase in the ERR decreases the amount of defined benefit cost. The difference between the ERR and the ARR is recognized as actuarial gains and losses over several years. Newell et al. (2002), Lew (2009), and Li and Klumpes (2013) include a variable for pension funding status in their models and

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[7] Vuong (1989) comments that a pair of competing models can each be further categorized as non-nested, overlapping, or nested. The nested model determines if there is any additional information that can be provided to the competing model. Model (2) includes all independent variables in Model (1), and adds two other components. Therefore, the nested model is adopted for this analysis.

examine its effect on the ERR. Newell et al. (2002) find that firms whose pension plans are better funded set their ERRs higher. However, two other researches conclude that firms with lower funding adopt higher ERRs to smooth their reported amounts of defined benefit cost. If firms do not use ERRs for earnings management, it can be assumed there is a positive relationship between the ERR and pension funding status.

(2) Defined Benefit Plan Size (DBSIZE)

Defined benefit plan size is defined as the natural logarithm of PBO. It is expected that firms with larger defined benefit plans would have higher returns from their plan assets, because they can achieve economies of scale. Therefore, the coefficient sign for this variable would be positive.

(3) Investment Horizon (HORIZON)

Investment horizon is defined in a study of Amir et al. (2010) and is measured as the natural logarithm of the ratio of PBO to current service cost. Amir et al. (2010) explain that firms with longer investment horizons should invest in stocks, because PBO for young workforces are relatively long-term and primarily influenced by salary increases which are related to stocks. On the other hand, firms with shorter investment horizon should invest in bonds, because PBO for mature workforces are relatively short-term and primarily influenced by interest rates which are related to bonds. Amir et al. (2010) and Chuk (2013) include a variable for changes in investment horizon in their model to examine the effect on the changes in percentage of equity in plan assets. Amir et al. (2010) show a significant effect of changes in investment horizon on plan asset allocation. Therefore, it is assumed that firms with longer investment horizons would invest more in stocks, and there would be a positive relationship between ERR and investment horizon.

(4) Discount Rate (DR)

J-GAAP states that the discount rate is determined based on yields on safe and secure long bonds. These include government bonds, government agency securities, and high-grade corporate bonds (ASBJ Statement 26, par.20). The FASB also requires firms to estimate their discount rates based on the available information about rates implicit in current prices of annuity contracts and rates of return on high-quality fixed-income investments (ASC715, par.715-30-35-43). Kasaoka (2015) shows that Japanese listed firms adopting J-GAAP tend to adopt discount rates similar to those for 10- to 20-year government bonds.

Tables 2 and 4 indicate that Japanese listed firms tend to invest 30% to 40% of plan assets in debt securities. The IASB uses discount rates instead of ERRs to calculate interest income on plan assets, demonstrating that discount rates can be an indicator for estimating the ERR. Firms might refer to yields on bonds to estimate both discount rates

and ERRs. It is assumed that firms with higher discount rates set their ERRs higher.

(5) Plan Asset Allocation (%EQUITY)

ASBJ Guidance 25 states that the percentage and amount of plan assets categorized by asset type, including stocks and bonds, should be disclosed in footnotes. With regard to defined benefit plans that are managed by a retirement benefits trust (i.e., by a trust bank), when the proportion of retirement benefits trust in the total amount of plan assets is significant, the percentage and the amount of these assets are disclosed separately (ASBJ Guidance 25, par.59(1)). In general, firms disclose four categories of plan assets in footnotes: equity securities, debt securities, general account of life insurance company, and others. As explained in Section 4, there are several papers examining the effect of plan asset allocation on setting ERRs. Most papers show that the plan asset allocation is correlated to the ERR. When a firm invests a high percentage of plan assets in stocks, the ERR is also high, because investment in riskier categories is expected to earn higher returns.

(6) Actual Rate of Return on Plan Assets (ARR)

Actual return on plan assets is a key factor in determining the ERR. Klumpes and Whittington (2004), Lew (2009), Chuk (2013), and Li and Klumpes (2013) show the relationship between ERR and ARR.[8] Chuk (2013) uses the ARR over three years, because ERR is likely affected by ARRs of the previous few years. Japanese firms have been required to disclose the actual return only since fiscal 2013, so there are available data only for fiscal 2013 and 2014. Therefore, the ARR for the period is used as a variable in this analysis. The ARR is calculated as actual return for plan assets divided by plan assets at the beginning of the period. A positive relationship between ERR and ARR is assumed.

(7) Other Variables

Firms size (SIZE) and market benchmarks of Japanese stocks (JSTOCK) are added to our models. The ERR is determined based on investment portfolio, management performance in the past, management policy, and the market for plan assets that a firm holds (ASBJ Guidance 25, par.25). Market benchmarks can be an important factor for financial statement users when judging whether a firm sets the ERR appropriately. If a firm's ARR and the market benchmark rates of return on securities decrease while the firm increases ERR, it might be using ERR for earnings management to decrease the amount of defined benefit cost. In practice, firms tend to refer to past 3- to 5-year rates of return on plan assets to determine their ERRs. Therefore, 5-year average market benchmark rate of return on Japanese stocks is employed for this model.

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[8] Li and Klumpes (2013) expect that the coefficient on ARR would have a negative sign owing to the mean reversion in ARR over time.

7. EMPIRICAL RESULTS

7.1 Japanese Firms Adopting J-GAAP

This empirical analysis is based on the two latest years for which annual report data is available — fiscal 2013 (when the new accounting standards were required to be adopted) and fiscal 2014. A sample of 2,666 firms for the two years is identified.

Table 7. **Descriptive Statistics for the Effect of Plan Asset Allocation and ARR on ERR for Japanese Firms Adopting J-GAAP**

	ERR	%EQUITY	ARR	FUND	DBSIZE	HORIZON	DR	SIZE	JSTOCK
Mean	2.021	0.309	3.443	0.717	-1.112	1.320	1.291	4.992	6.014
Median	2.000	0.310	0.154	0.725	-1.081	1.314	1.200	4.910	3.746
Min.	0.000	0.000	-5.345	0.002	-2.779	0.275	0.200	3.336	3.746
Max.	8.900	1.000	37.282	2.095	-0.137	2.572	7.700	7.232	8.846
Std. Dev.	1.063	0.190	4.958	0.300	0.325	0.171	0.656	0.627	2.535

ERR=expected rate of return on plan assets, %EQUITY=proportion of stocks in plan assets, ARR=actual return on plan assets/plan assets at the beginning of the period, FUND=plan assets/PBO, DBSIZE=natural logarithm of PBO, HORIZON=natural logarithm of (PBO/current service cost), DR=discount rate, SIZE=natural logarithm of total assets, JSTOCK=5-year average market benchmark rate of return on Japanese stocks.

Table 7 shows the descriptive statistics for the effect of new disclosure items on the determination of ERR, namely, plan asset allocation and ARR. The correlation coefficients for the variables are shown in Table 8. There is no strong relationship between any variables.

Table 8. **Correlation for the Effect of Plan Asset Allocation and ARR on ERR for Japanese Firms Adopting J-GAAP**

	ERR	%EQUITY	ARR	FUND	DBSIZE	HORIZON	DR	SIZE	JSTOCK
ERR	1.000								
%EQUITY	0.154	1.000							
ARR	0.068	0.290	1.000						
FUND	0.058	0.191	0.004	1.000					
DBSIZE	0.141	0.076	0.082	0.007	1.000				
HORIZON	0.274	0.119	0.081	0.009	0.414	1.000			
DR	0.296	0.020	0.234	-0.056	0.024	0.187	1.000		
SIZE	0.153	0.088	0.050	0.047	-0.074	0.268	0.146	1.000	
JSTOCK	-0.015	0.019	0.754	-0.110	0.055	0.057	0.302	0.021	1.000

Table 9 indicates the result of the effect of new disclosure items, %EQUITY and ARR, on the determination of ERR. As explained in Section 6, all coefficient signs are expected to be positive. The result shows that the coefficients of all variables except JSTOCK have positive signs. As for FUND, when a firm manages the plan assets efficiently, the ERR tends to be high. Regarding DBSIZE, when a firm has larger PBO, it achieves economies of scale. For HORIZON, when the employees of a firm have a

longer service life, it would refer to rates of return on stocks rather than on bonds. Only JSTOCK has an opposite coefficient sign from that expected. The 5-year average market benchmark rate of return on Japanese stocks in fiscal 2013 and 2014 are 12.522 and 12.492, respectively, whereas the average ERR in fiscal 2013 and 2014 were 2.01 and 2.04 in Table 1. Therefore, the coefficient for JSTOCK has a negative sign. Industry classification is not included, because the dummy does not have a significant effect on ERR in this analysis.

The new disclosure items, %EQUITY and ARR are positive and significant. The LR statistic for Vuong (1989) test is significant at the 0.1% level. The result also shows that Model (2) provides additional information to the determination of ERR than Model (1). These results from the multiple regression analysis and the Vuong (1989) test indicate that pension components are important factors for determining ERR, and investors can use the information to judge if a firm sets the ERR appropriately.

However, there are two problems in the accounting disclosures. As explained above, Japanese firms tend to categorize their plan assets by four factors. If a firm delegates plan asset management to insurance companies or other financial institutions, the information disclosed in the firm's footnotes is insufficient to permit financial statement users to know the amounts the pension plan invests in stocks and bonds. The second problem in disclosures is that the categories are not divided into domestic and foreign securities. In general, the rates of return on foreign stocks are much higher than those on domestic stocks, and rates on foreign bonds are also much higher than those on domestic bonds. More granular categories would be helpful for judging the appropriateness of ERR.

Table 9. **The Effect of Plan Asset Allocation and ARR on ERR for Japanese Firms Adopting J-GAAP**

Variables	Expected Signs	Model(1)		Model(2)	
		Coefficient	t-value	Coefficient	t-value
Intercept		-0.231	-0.994	-0.117	-0.493
%EQUITY	+			0.484	4.304 **
ARR	+			0.017	2.621 *
FUND	+	0.211	3.269 *	0.130	1.990 †
DBSIZE	+	0.229	3.443 *	0.207	3.125 *
HORIZON	+	1.112	8.382 ***	1.061	8.038 ***
DR	+	0.469	14.898 ***	0.470	15.032 ***
SIZE	+	0.114	3.483 *	0.101	3.108 *
JSTOCK	+	-0.048	-5.979 **	-0.074	-6.005 ***
Vuong Test			41.098***		
Adjusted R^2		0.158		0.170	
N			2,666		

***, **, *, † indicate statistical significance at 0.1, 1, 5, 10% levels respectively.

7.2 Japanese Firms Adopting US GAAP

This empirical analysis is for firms adopting US GAAP and based on 12 years of annual report data. The time period of this study is from fiscal 2003, when SFAS132R became effective, through the latest year, 2014, for which data are available. The sample identified for this analysis is 343 firms.

Table 10. **Descriptive Statistics for the Effect of Plan Asset Allocation and ARR on ERR for Japanese Firms Adopting US GAAP**

	ERR	%EQUITY	ARR	FUND	DBSIZE	HORIZON	DR	JSTOCK
Mean	3.149	0.382	4.671	0.731	5.332	1.373	2.408	4.356
Median	3.000	0.370	5.200	0.710	5.390	1.430	2.400	3.270
Min.	1.500	0.150	-26.130	0.320	3.060	0.140	0.600	-8.400
Max.	6.000	0.680	37.080	1.300	6.660	2.150	4.450	15.480
Std. Dev.	0.962	0.124	10.506	0.194	0.781	0.237	0.725	8.536

Table 10 shows the descriptive statistics for the effect of plan asset allocation and ARR on ERR for firms adopting US GAAP. Firm size is eliminated in this analysis, because the correlation coefficient with DBSIZE indicates 0.855, i.e., there is a strong relationship between firm size and DBSIZE. Japanese firms can choose among a few pension plans, including defined benefit plans and defined contribution plan, to provide to their employees. When a firm chooses a defined contribution plan, only the contribution amount to the plan for the period is recognized as defined benefit cost on the income statement. If firms have defined contribution plans as a part or all of their pension plans, defined benefit plan size would not be positively related to firm size. Therefore, the high correlation between firm size and DBSIZE shows that firms adopting US GAAP have defined benefit plans for most or all of their pension plans.

Table 11. **Correlation for the Effect of Plan Asset Allocation and ARR on ERR for Japanese Firms Adopting US GAAP**

	ERR	%EQUITY	ARR	FUND	DBSIZE	HORIZON	DR	JSTOCK
ERR	1.000							
%EQUITY	0.023	1.000						
ARR	0.071	0.162	1.000					
FUND	0.131	0.172	-0.045	1.000				
DBSIZE	0.312	0.221	0.139	-0.030	1.000			
HORIZON	0.085	0.225	0.102	0.151	0.562	1.000		
DR	0.694	0.152	-0.039	0.046	0.245	0.004	1.000	
JSTOCK	0.057	0.198	0.227	0.235	0.091	0.330	-0.108	1.000

Table 11 indicates the correlation coefficients for the variables under discussion.

The correlations between DR and ERR, and HORIZON and DBSIZE, are 0.694 and 0.562, respectively. However, to test the variance inflation factors on all independent variables in this model, there is no multicollinearity recognized.

Table 12. **The Effect of Plan Asset Allocation and ARR on ERR for Japanese Firms Adopting US GAAP**

Variables	Expected Signs	Model(1)		Model(2)	
		Coefficient	t-value	Coefficient	t-value
Intercept		-0.139	-0.443	-0.026	-0.086
%EQUITY	+			-1.312	-4.200 **
ARR	+			0.008	2.097 †
FUND	+	0.449	2.239 †	0.589	2.980 *
DBSIZE	+	0.228	3.738 *	0.240	3.992 **
HORIZON	+	-0.299	-1.455	-0.223	-1.113
DR	+	0.871	16.103 ***	0.906	17.028 ***
JSTOCK	+	0.013	2.708 *	0.013	2.786 *
Vuong Test			20.023***		
Adjusted R^2		0.518		0.544	
N			343		

***, **, *, † indicate statistical significance at 0.1, 1, 5, 10% levels respectively.

Table 12 shows the result of the effect of plan asset allocation and ARR on ERR for Japanese firms adopting US GAAP. As expected, the variables for FUND, DBSIZE, DR, and JSTOCK are positively related to ERR. The coefficient for %EQUITY has an opposite sign from that expected for Model (2). As shown in Table 3, the average ARRs go up and down every year, because stock prices fluctuate significantly. The time period of this study includes the financial crisis of the late 2000s, when investments in stocks produced negative returns. Therefore, %EQUITY had a negative impact on the determination of ERR. In this analysis, for firms adopting US GAAP, the sample firms are almost the same every year and their number is limited. Therefore, the effect of firms with higher proportions of stocks in plan assets and lower ERRs on all firms might be significant. As for HORIZON, the coefficients are insignificant for both Models (1) and (2). Regardless of the investment horizon, firms with higher ARRs and larger pension funds tend to set their ERRs higher when securities prices are high. As for the Vuong (1989) test, it shows Model (2) explains ERRs more precisely than Model (1).

We also performed two additional analyses. Li and Klumpes (2013) include rates of future salary increases to explain the determination of ERR. As explained in Section 6(3), firms with young workforces are relatively long-term, and PBO are primarily influenced by salary increases which are related to stocks. Therefore, HORIZON and JSTOCK should be positively related to ERR, and rates of future salary increases also

have a positive effect on the ERR. There are several firms that do not disclose their rates of future salary increases, because they adopt point system pension plans. These firms include Kyocera Corporation, NH Foods Ltd., and Sony Corporation. The result shows that the variable for rates of future salary increases is insignificant. The determination of ERR is more likely to be linked to DR for Japanese firms.

Our other analysis examined if the detailed information on plan asset allocation required under FSP FAS132(R)-1 explains the determination of ERR more appropriately. The proportion of domestic stocks, foreign stocks, and high risk investments (hedge fund and mortgages) are included in the model instead of %EQUITY. The result indicates that the proportions of foreign stocks, hedge funds, and mortgages are positively related to the ERR. However, the variables for ARR, DBSIZE, and HORIZON become insignificant. The time-span for this analysis is from fiscal 2009 to 2014. The decrease in stock prices in 2008 might have produced the results on these variables. This analysis should be used for reference purposes only, because the sample is limited to 133 firms.

8. SUMMARY AND CONCLUSION

This paper examined if the new disclosure items required under ASBJ Statement 26 and ASBJ Guidance 25 provide additional useful information for financial statement users to judge whether firms determine their ERRs appropriately. The ERR is determined based on firm-specific information. The possibility exists that firms — by adopting higher ERRs and decreasing the amount of defined benefit cost — will use the ERR determination to manage earnings. The disclosure of plan asset allocation and ARR in footnotes may help investors understand why a firm's ERR has been set higher or lower than the previous year.

Japanese firms tend to invest 30% to 48% of plan assets in equity securities, 25% to 40% in debt securities. The proportions change based on stock market conditions and the ups and downs of equity prices. Similarly, the ARR also changes significantly every year, strongly affected by market price action. Therefore, information on plan asset allocation and ARR — which have an important role in estimating ERR — provide indications of market volatility and uncertainty.

With regard to firms adopting J-GAAP, the coefficients for all pension components except JSTOCK are positive and significant, i.e., the additional information under the new accounting standards is useful to predict the ERR. The Vuong (1989) test also supports the result. However, as explained in Section 7.1, there are two problems in the disclosure of plan asset allocation. The category of general account of life insurance company can obscure the proportions of plan assets in different types of securities. A further breakdown of stocks into domestic and foreign is needed, because yields on foreign stocks are much higher than those on domestic stocks.

The analysis for firms adopting US GAAP also shows the correlation between ERR

and ARR is positive and significant. However, the coefficient sign on %EQUITY is negative. When stock prices increase, firms invest more plan assets in stocks and make higher returns. However, when stock prices decrease, bonds offer better returns. Thus, in bear markets, plans with high percentages of assets in equities might produce negative than positive returns. Our analysis period from fiscal 2003 to 2014 includes the 2008 recession stemming from the bankruptcy of the big investment company Lehman Brothers. During this period, the coefficient sign for %EQUITY became negative.

Our analyses show that information on plan asset allocation and ARR should provide helpful information for financial statement users to judge the appropriateness of ERR. As IASB stated, the ERR cannot be determined in an objective way. Therefore, it is important for firms to disclose the detailed information on plan assets to explain how their ERRs are determined.

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