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INCREMENTAL VERSUS RELATIVE INFORMATION CONTENT OF PENSION LIABILITY*

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Abstract

This paper examines two issues related to pension accounting information. The first issue is the value relevance of pension accounting information in Japanese capital market. The result clearly indicates that pension assets, pension liabilities, and pension expenses are value relevant. The second issue is the measurement alternatives related to pension liabilities. To empirically analyze this question, I compare ABO and PBO from viewpoint of "**incremental information content**" vs. "**relative information content**". I find evidence that PBO has incremental information content *beyond* ABO and also has *greater* relative information content than ABO. Japanese new pension accounting standard, *Accounting standard for employee benefits*, adopts PBO as pension liability measure. This study supports the new standard from viewpoint of investment decision usefulness.

Keywords: Pension accounting, Projected Benefit Obligation, Accumulated Benefit Obligation, Value relevance study.

I. *Introduction*

In Japan, a new pension accounting standard, "*Accounting Standard for Employee Benefit*," is effective from the fiscal year starting after 1st April 2000. The new standard is quite similar to IAS19 (*Employee benefits*) and SFAS87 of U.S.A. (*Employers' Accounting for Pensions*). However, there have been few empirical researches concerning pension accounting in Japan. From the decision usefulness perspective, it is important to investigate the value relevance of pension information in Japanese capital market so that we can evaluate the content of new accounting standard.

As generally known, there are three measurement alternatives of pension liabilities. Which liability measure is most useful, VBO (Vested Benefit Obligation), ABO (Accumulated

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TABLE 1. UNDER-FUNDED PENSION PLAN

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
number of under-funded plans	287	327	546	722	832	988	1238	1093	1299	329	1642
number of total plans	1474	1593	1735	1804	1842	1878	1883	1874	1858	1835	1801

Source: Basic Data of Private Pension, Pension Fund Association (in Japanese)

TABLE 2. PENSION FUND INVESTMENT PERFORMANCE IN JAPAN

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
6.85%	5.71%	4.15%	4.36%	3.21%	3.51%	2.64%	5.74%	2.49%	13.09%	−9.83%

Source: Annual Report of Pension Fund, Pension Fund Association (in Japanese)

Benefit Obligation) or PBO (Projected Benefit Obligation)? Business Accounting Deliberation Council (BADC), which used to be the Japanese accounting standard setting body, chose PBO as the best pension liability measure. But it seems that PBO was chosen without convincing discussion and objective evidence. Was PBO the best choice?

I will empirically analyze this question by comparing "**incremental information content**" vs. "**relative information content**" of ABO and PBO. Through these two tests, this paper compares information content of two liability measures. There has been no empirical study so far, to the best of my knowledge, which compares relative information content of ABO and PBO.

The reminder of this paper is organized in the following manner. Section II summarizes the controversy with respect to pension accounting and reviews relevant prior empirical researches directly related to this study. Section III describes the research design and presents the results of the value relevance analysis concerning pension information. In the section IV, "**incremental information content**" vs. "**relative information content**" of ABO and PBO will be compared, which is followed by summary and conclusion in Section V.

II. *Pension Accounting Controversy and Prior Research*

1. Background and Pension Accounting Controversy

Before analyzing pension liability measure in detail, we start from the value relevance of pension assets, liabilities, and also expenses. In recent years, Japan is coming to be one of the most aged societies in the world. Easily supposed, aging imposes a great burden on corporate management, which means increasing labor costs.[1] For this reason, investors and security analysts pay much more attention to pension assets, liabilities, and expenses when valuing corporations.[2] In recent years, most of the Japanese private pension funds are under-funded (See Table 1).

According to the estimation by Matsui and Suzuki [1998], under-funding in total amounts to

[1] Because of lifetime employment contract in Japan, it has not been easy to fire employee.

[2] For instance, see *Portfolio Strategy* (*October 16. 1998 Report*) of Goldman Sachs Japan (by Matsui and Suzuki).

TABLE 3. ASSET ALLOCATION OF PRIVATE PENSION FUND

	Domestic bond	CB	Domestic equity	Foreign bond	Foreign equity	Loan	Real estate	General account	others
1990	21.7	3.3	13.0	5.2	5.4	10.8	0.6	36.9	3.2
1991	23.1	3.4	10.1	4.9	5.1	10.5	0.5	39.2	3.2
1992	24.1	4.5	10.0	4.8	4.9	8.9	0.4	40.3	2.2
1993	22.2	4.4	11.8	4.1	4.9	8.7	0.4	40.8	2.8
1994	21.2	4.7	11.1	3.8	5.4	8.4	0.3	42.2	2.8
1995	22.4	5.1	13.6	4.7	6.6	5.5	0.3	39.9	1.9
1996	25.0	5.2	15.7	5.4	10.3	5.1	0.3	30.6	2.4
1997	24.1	3.5	21.5	6.1	15.6	2.4	0.1	24.4	2.2
1998	22.2	2.0	28.3	8.5	16.6	2.2	0.1	17.7	2.5
1999	21.5	1.6	36.5	7.4	18.0	1.4	0.0	11.1	2.5

Source: Annual Report of Pension Fund, Pension Fund Association (in Japanese)

TABLE 4. DEGREE OF MATURITY

1992	1993	1994	1995	1996	1997	1998	1999	2000
12.0%	13.0%	14.3%	16.1%	17.8%	19.4%	21.4%	23.6%	26.1%

degree of maturity = beneficiary/participant
Source: Annual Report of Pension Fund, Pension Fund Association (in Japanese)

as large as 80 trillion Yen. There are three major reasons. First, net income of Japanese companies is decreasing due to macro-economic recession. Sponsoring firms have less financial ability to contribute any cash to pension funds than before. Second, most pension funds earned only low rate of investment return on pension plan assets as shown in Table 2 because the performance of Tokyo Stock Exchange has been low in recent years. In addition, Japanese pension funds allocated more than 70% assets into domestic bond and domestic equity due to restriction by the Ministry of Health and Welfare (see Table 3). They could not take advantage of high return from foreign markets such as U.S. and Asia.[3]
The third reason is the increasing degree of maturity of the companies and thier pension funds (see Table 4). Pension liabilities are, therefore, coming to be larger and larger.

For the reasons mentioned above, many Japanese pension funds are under-funded. Nonetheless, funding status of pension fund was not on the balance sheet of the sponsoring firm before 2001. It is not all exaggeration to say that Japanese financial reporting as to employers' pension was 30 years behind that of the United States. Pension assets and liabilities were off-balance items. Pension expenses were recognized on cash basis under the old rule. In addition, pension information disclosure was not sufficient under the old GAAP in Japan. However, as the serious situation were unveiled and as financial risk concerning private pension came to be recognized, the Business Accounting Deliberation Council (BADC), which was the Japanese standard setting body, took initiative in setting a new standard in July 1996. And a new pension accounting standard is effective from the fiscal year starting after 1st. April 2000. The new standard is quite similar to IAS19 about employee benefits. It requires pension expenses to be recognized on the accrual basis. The difference between PBO and

[3] Until 1997, there used to be an asset allocation restriction. That requires all pension funds to invest more than 50% into bond or fixed income, less than 30% into equity, less than 30% into international assets, and less than 20% into real estates.

pension assets is recognized on balance sheet as net liabilities. And detailed information such as an outline of pension scheme, actuarial assumptions, some components of pension expenses are disclosed in the footnote.

BADC published a new standard, *Accounting standard for employee benefits*, in June 1998. At the introduction part, it states that "*pension information is said to be useful for investors*" (italics mine). But there have been few researches that are empirically supported. Therefore, value relevance of pension assets, liabilities, and expenses are still open questions in Japan. This is the first issue to analyze in this paper.

The second issue is measurement alternatives related to pension liabilities. In pension accounting, there are three pension liability measures: VBO (Vested Benefit Obligation), ABO (Accumulated Benefit Obligation), and PBO (Projected Benefit Obligation). VBO is the actuarial present value of vested benefits for which a service is no longer required. This is a legal liability for a firm. Nobody disagrees with the notion that VBO is included in the accounting liability. ABO is the actuarial present value of benefits (whether vested or non-vested) attributed by the pension benefit formula to employee service rendered before a specified date. That is based on employee service and compensation prior to that date. PBO is the actuarial present value of a date of all benefits attributed by the pension benefit formula to employee service rendered prior to that date.

PBO is measured by using assumptions as to future compensation levels if the pension benefit formula is based on those future compensation. PBO differs from ABO in that it includes effects of future salary increases. Generally, PBO is greater than ABO because PBO includes future salary increases part. ABO is greater than VBO because ABO includes non-vested obligation. In short, PBO$\geqq$ABO$\geqq$VBO.

Japanese new pension accounting standard introduced PBO to measure pension liabilities and expenses (service cost and interest cost component). But there is no empirical support to rationalize it. This study empirically investigates which measure is perceived as more relevant to stock market participants through an analysis of "incremental information content" and "relative information content" of ABO and PBO.[4]

2. Prior Research

Several studies examined the information content of pension assets and liabilities. For example, Landsman [1986] examined how securities markets in U.S.A. valued pension assets and liabilities information disclosed under SFAS 36 by using cross-sectional regressions. He found evidence to support the notion that pension fund property rights lay fully with the firm. Barth [1991] also investigated pension assets and liabilities question by using cross-sectional regression models. The question raised in her study was which measures of pension assets and liabilities most closely reflected in the stock value. According to Barth [1991], the fair value of plan assets and all three liability measures were used when investors value a firm. With respect to liabilities, she found that ABO had significantly less measurement error than others.

Gopalakrishnan and Sugrue [1993] studied the value relevance of PBO by decomposing

[4] In addition to the major differences discussed here, there are other measurement-specific issues such as determination of interest rates, specification of actuarial cost methods, and recognition of gains and losses. They are not considered further here, as they are applied to all measures; this study focuses on fundamental differences among the measures.

it into three components. Those are VBO, non-vested part (ABO-VBO), and salary increases part (PBO-ABO). They found that all parts were perceived as corporate liabilities by investors in the context of determining market value of stockholders' equity.

All of these three researches used American companies as samples analyzed. Nakano [1998] investigated the value relevance of pension assets and liabilities using Japanese samples based on stock model (B/S model) like Barth [1991]. He found that the pension assets (fair value) and VBO, ABO, and PBO were all perceived as value increasing and decreasing factors, which means value-relevant. The evidence is consistent with the notion that pension fund property rights lie with the firm in Japan. In other words, investors regard that pension funds are integrated with sponsoring firms, not separated from them. His research, however, did not make it clear which liability measure was the most relevant. This paper will deal with that issue more in detail.

III. *Value Relevance of Pension Information*

1. Data

In Japan, before 2001, the Securities and Exchange Law required corporations under its jurisdiction to disclose only "either pension assets or past service liabilities" in the footnotes. In my view, this disclosure provision was quite insufficient for two reasons. First, this disclosure provision required information on only either pension assets or past pension liabilities. Investors were unable to accurately value a company without information on both assets and liabilities. Second, pension liabilities are not limited to "past service" liabilities. Therefore, we could not collect enough pension information available to do empirical research on Japanese firms before the new standard.

Fortunately, however, some leading Japanese firms prepare for financial statements complying with the U.S.GAAP, in the case of pension, SFAS87 (*Employers' Accounting for Pensions*). I chose all of those firms as our samples, which have continuously disclosed pension information under SFAS 87 from 1991 to 1997. This resulted in 23 firms in each year and 160 firms in the pooled data.[5]

At this point of time, July 2003, under the new standard, it is no longer possible to compare information content of ABO and PBO. Because ABO was rejected through the process of standard setting and only PBO is disclosed now. Hence, our sample firms provide us a precious experimental opportunity to compare ABO and PBO. This is the reason why I use rather old data from 1991 to 1997 instead of more recent data.

2. Model

Valuation model in this study is based on that of Barth-Beaver-Landsman [1998].

$$MVE = BVE + UNA \tag{1}$$

[5] One company changes its way of preparing for financial statements from U.S. GAAP to Japanese GAAP in 1997.

MVE＝Market Value of Equity
BVE＝Book Value of Equity
UNA＝Unrecognized Net Assets

When it is possible to prepare for a perfect balance sheet reflecting all corporate resources to state firm value, market value of equity will be equal to book value of equity on balance sheet. In this setting, price to book value ratio (P/B ratio) would be equal to one. As generally known, however, balance sheet can not reflect all corporate resources. Unrecognized resources include technology, customer loyalty, brand equity, and human resource, which have potential to increase corporate performance in the future period. Therefore, in many cases, market value of equity will be larger than book value of equity (PBR$\geqq$1). Barth-Beaver-Landsman [1998] assumes that fair price of future abnormal earnings power would be reflected in this unrecognized net assets part. Since future abnormal earnings power is not directly observable, they assume that current net income reflects future abnormal earnings. Following their reasoning, in this paper, empirical tests are based on a regression of market value of equity on the two primary summary measures from the balance sheet and income statements, book value of equity and net income.

$$\text{MVE}=\text{BVE}+\text{Net Income} \tag{2}$$

Since this paper focuses on pension accounting information, independent variables (BVE and Net Income) should be decomposed into two parts, the pension-factor and non-pension factor as in the empirical models below.

$$\text{MVE}_i=\beta_o+\beta_1(\text{BVA}_i-\text{BVL}_i)+\beta_2(\text{PA}_i-\text{PL}_i)+\beta_3\text{NONPEN}_i+\beta_4\text{PENX}_i+\varepsilon_i \tag{3}$$

BVA: (Book value of Assets other than pension)
BVL: (Book value of Liabilities other than pension)
PA: (Fair value of Pension Assets)
PL: (Present value of Pension Liabilities)
NONPEN: (Non-pension flow＝Net income＋PENX)
PENX: (Pension expenses)
i denotes firms

With respect to PL, in order to compare the information content of VBO, ABO and PBO respectively, each measure is put into equation (3) as an independent variable. Therefore, three econometric models are used to test value relevance as follows.

$$\text{MVE}_i=\beta_o+\beta_1(\text{BVA}_i-\text{BVL}_i)+\beta_2(\text{PA}_i-\text{VBO}_i)+\beta_3\text{NONPEN}_i+\beta_4\text{PENX}_i+\varepsilon_i \tag{4}$$

$$\text{MVE}_i=\beta_o+\beta_1(\text{BVA}_i-\text{BVL}_i)+\beta_2(\text{PA}_i-\text{ABO}_i)+\beta_3\text{NONPEN}_i+\beta_4\text{PENX}_i+\varepsilon_i \tag{5}$$

$$\text{MVE}_i=\beta_o+\beta_1(\text{BVA}_i-\text{BVL}_i)+\beta_2(\text{PA}_i-\text{PBO}_i)+\beta_3\text{NONPEN}_i+\beta_4\text{PENX}_i+\varepsilon_i \tag{6}$$

Descriptive firm statistics are shown in Table 5. All dependent and independent variables are divided by the number of shares outstanding to exclude the heteroscedasticity problem in estimation. MVE is the stock price three months after the fiscal year end.

TABLE 5. DESCRIPTIVE FIRM STATISTICS

Yen in millions

	MVE	BVA	BVL	PA	VBO	ABO	PBO	NONPEN	PENX
Mean	1,162,943	2,698,004	1,986,472	158,041	189,889	219,261	266,352	48,754	19,384
Median	992,314	1,644,558	912,355	112,755	114,578	133,349	157,212	33,778	10,214
S.D	850,121	2,578,573	2,380,167	155,950	208,642	251,186	302,138	58,861	22,134

S.D: standard deviation

TABLE 6. VALUE RELEVANCE CHECK RESULT

	Adj.R^2	β_0	β_1	β_2	β_3	β_4
VBO model(4)	0.87	−171	1.35	2.51	4.99	−10.77
		[−1.65]	[12.28]**	[2.12]*	[7.03]**	[−2.67]**
ABO model(5)	0.87	−158	1.32	2.67	5.15	−14.45
		[−1.53]	[11.95]**	[2.56]*	[7.22]**	[−3.12]**
PBO model(6)	0.88	−70	1.28	4.31	5.68	−26.03
		[−0.67]	[11.80]**	[3.96]**	[7.93]**	[−4.37]**

[ ]: t-statistics
* statistically siginificant at 5% level
** statistically siginificant at 1% level

3. Empirical Results[6]

Table 6 presents the regression results. In all three models, the signs of coefficient values are as expected. β_1 are positive, β_2 are positive, β_3 are positive, and β_4 are negative respectively. In addition, t-values are high enough and all variables are statistically significant at the 1% or 5% level. Adjusted R^2 are stable and high. The result clearly shows that non-pension stock, pension stock, non-pension flow, and pension-flow are all statistically significant. It follows from what has been said thus far that the pension stock factor and pension flow factor have value relevance.[7]

IV. *PBO versus ABO*

1. Incremental Information Content Test

With respect to pension liabilities, future salary increase is a controversial issue. From normative viewpoint, some argue this issue by citing definition of "liability" in *Statements of Financial Accounting Concepts*, by U.S. FASB. FASB concepts Statements No.6 defines, "Liabilities are probable future sacrifices of economic benefits arising from present obligation of a particular entity to transfer assets or provide services to other entities in the future *as a result of past transactions or events*." ABO is consistent with this definition because it is reasonable to hold that a duty of payment accrued at the point employee service was offered. VBO is, needless to say, the legal liability concept and is consistent with the definition.

Then, is future salary increase part consistent with that definition, or purely future event

[6] F-values are statistically significant at the 1% level for all models in this paper.
[7] See Barth-Beaver-Landsman [1992], which empirically analyze pension costs.

TABLE 7. INCREMENTAL INFORMATION CONTENT TEST

	Adj.R^2	β_0	β_1	β_2	β_3	β_4	β_5
Model(8)	0.88	−20	1.29	4.08	−7.59	5.88	−30.58
		[−0.19]	[11.95]**	[3.74]**	[−3.44]**	[8.15]**	[−4.71]**
Model(9)	0.88	−182	1.37	1.21	−5.73	4.96	−12.06
		[−1.58]	[12.60]**	[1.60]	[−2.54]*	[6.87]**	[−2.39]*
Model(10)	0.87	−117	1.42	−4.49	5.1	−13.96	
		[−1.08]	[13.32]**	[−2.11]*	[7.09]**	[−2.83]**	

[ ]: t-statistics
* statistically siginificant at 5% level
** statistically siginificant at 1% level

and not liability at present? No definitive conclusion has yet been reached. So there still seems to be room for analyze this point further more.

To compare the ABO and PBO, this study uses "decomposition model" as in Gopalakrishnan and Sugrue [1993]. PBO can be decomposed into two parts; ABO and future salary increase part.

$$\begin{aligned} \text{PBO} &= \text{ABO} + \text{future salary increase part} \\ &= \text{ABO} + (\text{PBO-ABO}) \end{aligned} \tag{7}$$

Future salary increase part will be used as an independent variable in the multiple regression model. "Incremental information content" of PBO beyond ABO can be tested by the decomposition model as follows (8). Since future salary increase part is correlated with some variables, there would be multicollinearity problem. To mitigate this kind of problem, similar derivative models are also employed ((9) and (10)).

$$\text{MVE}_i = \beta_o + \beta_1(\text{BVA}_i - \text{BVL}_i) + \beta_2(\text{PA}_i - \text{ABO}_i) + \beta_3(\text{PBO}_i - \text{ABO}_i) + \beta_4\text{NONPEN}_i + \beta_5\text{PENX}_i + \varepsilon_i \tag{8}$$

$$\text{MVE}_i = \beta_o + \beta_1(\text{BVA}_i - \text{BVL}_i) + \beta_2(\text{PA}_i) + \beta_3(\text{PBO}_i - \text{ABO}_i) + \beta_4\text{NONPEN}_i + \beta_5\text{PENX}_i + \varepsilon_i \tag{9}$$

$$\text{MVE}_i = \beta_o + \beta_1(\text{BVA}_i - \text{BVL}_i) + \beta_2(\text{PBO}_i - \text{ABO}_i) + \beta_3\text{NONPEN}_i + \beta_4\text{PENX}_i + \varepsilon_i \tag{10}$$

The empirical results are shown in Table 7. In all models, the signs of future salary increases part are negative as expected and statistically significant. Therefore, it seems reasonable to conclude that future salary increases part have "incremental information content".
Judging from the results above, PBO seems to be more useful measure of pension liability than ABO for the purpose of investment decision making.

2. Relative Information Content Test

Empirical results in the previous section were obtained by decomposing PBO into two parts. However, it should be noted that PBO includes much uncertainty because it includes future event. It is not always the case that more information means more useful for investors. It is quite likely that information value itself may decrease as a degree of uncertainty increases. Hence, I will directly compare two measures by "relative information content test" in this

section.

As Biddle-Seow-Siegel [1995] states, there are two different ways to analyze information content of accounting numbers. One is "incremental information content test," the other is "relative information content test". The latter is subtly different from the former.

According to Biddle-Seow-Siegel [1995], "incremental information content comparisons asses whether one accounting measure (or set of measures) provides information content *beyond* that provided by another. Relative information content comparisons ask a subtly different question, which is whether one measure provides greater information content than another." In short, relative information content approach directly tests which measure conveys more information than another.

According to Biddle-Seow-Siegel [1995] again, when comparing relative information content between two accounting measures, X and Y, the relation can be described as follows.

◆ *Incremental information content comparisons*
Information content (X, Y) $\geqq$ Information content (Y)
Information content (X, Y) $\geqq$ Information content (X)

When the total information content of X and Y is greater than either that of only Y or only X, X or Y has incremental information content.

◆ *Relative information content comparisons*
Information content (X) $\geqq$ Information content (Y)
Information content (X) $\leqq$ Information content (Y)

In contrast, relative information approach directly tests which individual measure has *greater* information than another.

Chan and Seow [1996] compared two kinds of accounting earnings, following this approach. They examined the association between stock returns and two types of accounting earnings: foreign GAAP earnings versus earnings adjusted to U.S. GAAP. Empirical results based on the J_A test indicated that earnings based on foreign GAAP were more closely associated with stock returns than earnings reconciled to U.S. GAAP.

There has been no study that applies this idea to the field of pension accounting. In this study, I will expand this idea to compare the relative information content of ABO and PBO. J_A test is used to examine relative information content. When two hypotheses (H0 and H1) are independent (i.e., H0 is not the special case of H1 and vice versa, and an independent variable in one of these hypotheses is not that of the other), these two hypotheses are called a non-nested hypothesis.[8]

$$\text{H0: } MVE_i=\beta_o+\beta_1(BVA_i - BVL_i)+\beta_2(PA_i - ABO_i)+\beta_3 NONPEN_i+\beta_4 PENX_i+\varepsilon_i \quad (5)$$

$$\text{H1: } MVE_i=\beta_o+\beta_1(BVA_i - BVL_i)+\beta_2(PA_i - PBO_i)+\beta_3 NONPEN_i+\beta_4 PENX_i+\varepsilon_i \quad (6)$$

H0 and H1 is considered to be a non-nested hypothesis. The reason is that one is not the special case of the other, and an independent variable (for example, ABO) in one of these hypotheses is not that of the other (H1). While ABO is not the independent variable of H1, PBO is not

[8] See Davidson and MacKinnon [1981] about non-nested hypothesis and J test.

TABLE 8. RESLUTS OF RELATIVE INFORMATION CONTENT TEST

PanelA

Variable	intercept	BVA-BVL	PA-ABO	NONPEN	PENX	estimate 6
Coefficient	103	−0.96	−3.51	−4.12	15.24	1.76
t-statistics	[0.82]	[−1.42]	[−1.70]	[−1.48]	[1.57]	[3.44]**

PanelB

Variable	intercept	BVA-BVL	PA-ABO	NONPEN	PENX	estimate 5
Coefficient	−228	3.03	7.59	12.66	−49.58	−1.31
t-statistics	[−1.64]	[2.93]**	[3.44]**	[3.04]**	[−3.29]**	[−1.70]

* statistically siginificant at 5% level
** statistically siginificant at 1% level

that of H0.

The more concrete econometric procedure is as follows. First, I test H0 to H1, then test H1 to H0. This test is characterized as a mutual test of two hypotheses.

◆ Test of H0 to H1:

First, I run OLS regression on H1 and get predicted metric (theoretical metric). Then, I add that metric into H0 as the fifth independent variable after PENX and run regression once again on model (11).

$$MVE_i = \beta_o + \beta_1 (BVA_i - BVL_i) + \beta_2 (PA_i - ABO_i) + \beta_3 NONPEN_i + \beta_4 PENX_i + \beta_5 [\text{Predicted Metric from H1}] + \varepsilon_i \quad (11)$$

I test the null hypothesis that the fifth coefficient value (β_5) is equal to zero. When this hypothesis is not rejected, H0 is not rejected by H1. In contrast, when this hypothesis is rejected, H0 is rejected by H1.

◆ Test of H1 to H0:

Interchange H1 and H0. Then H1 is tested to H0 in a similar fashion.

The results are shown in Table 8. First, H0 is tested against H1. The hypothesis, "the fifth coefficient value=0", is rejected at the 1% level (see Panel A). It means that H0 is rejected by H1. It must be noted that only the coefficient of the fifth variable (β_5) does matter in this test. Next, H1 is tested against H0. The hypothesis, "the fifth coefficient=0", is not rejected (see Panel B). As a consequence, H1 is not rejected by H0, and H1 is finally accepted.

The results lead me to conclude that I can accept explaining MVE only by H1 but not only by H0. Because H1 is accepted and H0 is not acceptable. In other words, explaining only by PBO is acceptable, but explaining only by ABO is not acceptable. From what has been analyzed above, I can conclude that PBO has a greater "relative information content" than ABO.

V. *Summary and Conclusion*

This paper examines two issues related to pension accounting information. The first issue is the value relevance of pension accounting information in Japanese capital market. The result clearly indicates that pension assets, pension liabilities, and pension expenses are value

relevant.

The second issue is the measurement alternatives related to pension liabilities. To empirically analyze this question, I compare ABO and PBO from viewpoint of "**incremental information content**" vs. "**relative information content**". I find evidence that PBO has incremental information content *beyond* ABO and also has *greater* relative information content than ABO. Japanese new pension accounting standard, *Accounting standard for employee benefits*, adopts PBO as pension liability measure. This study supports the new standard from viewpoint of investment decision usefulness. Japanese new pension accounting standard does not require firms to disclose ABO information. In that context, this would be the first and also the last research to analyze information content of ABO.

This study, of course, has limitations. The sample size is quite limited because pension accounting disclosure in Japan has been insufficient. But it should be noted that even if we want to expand sample size, we can not compare PBO and ABO any more under the new standard.

There has been no study that tried to compare relative information content of pension accounting information using J_A test. This would be the contribution of this paper. J_A test is a powerful econometric test when directly comparing relative information content of two accounting numbers. This technique would be useful for other accounting information research area, such as cash flow versus earnings, earnings of different countries (like Chan and Seow [1996]), IAS earnings versus each country's earnings, consolidated earnings versus parent only earnings. This paper has presented one application among these possibilities. There still remains fruitful research area for the future.

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