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THE VALUE AND CREDIT RELEVANCE OF IFRS VERSUS JGAAP ACCOUNTING INFORMATION*

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Abstract

This paper examines which accounting information -one is accounting information based on Japanese GAAP (JGAAP) and the other is those based on IFRS- better explains total market capitalizations of firms' common stock and credit ratings issued by credit-rating agencies. Our results are as follows. First, both the value and credit rating relevance of IFRS-based net income measures are significantly lower than those based on JGAAP. Second, IFRS-based net income measures incrementally lower the credit rating relevance of accounting information. These results suggest that both the value and credit rating relevance of net income information of Japanese firms could become impaired by the adoption of IFRS.

Keywords: IFRS, Voluntary Adoption, Japanese Firms, Value Relevance, Credit Relevance

I. *Introduction*

From the fiscal year ending March 31, 2010, publicly listed Japanese companies satisfying certain conditions have become eligible to voluntarily adopt the International Financial Reporting Standards (IFRS) for their consolidated financial statements. Japanese companies initially adopting the IFRS are required, under the parallel reporting system, to simultaneously disclose their financial results compiled in line with both Japanese accounting standards (JGAAP) and the IFRS in the first year of their IFRS adoption. This study focuses on the Japan-specific practice of the parallel reporting system and compares the value and credit rating relevance of the accounting figures based on the IFRS and JGAAP to examine how the adoption of the IFRS affects the value and credit rating relevance of accounting information.

Many studies have been conducted on the value relevance and credit rating relevance of accounting information under the IFRS and local accounting standards (Barth et al. [2008]; Bartov et al. [2005]; Florou et al. [2017]; Wu and Zhang [2014]). The findings of these prior studies have generally indicated that accounting information data based on the IFRS provided more value relevance and credit rating relevance. However, these findings may have been

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distorted by sample bias due to incentive effects on the sample companies that voluntarily adopted the IFRS (Daske et al. [2008]). This study, therefore, focuses on the parallel reporting system to find out whether the IFRS or JGAAP has had more value relevance and credit rating relevance after the voluntary adoption of the IFRS.

Focusing on the parallel reporting system enables us to simultaneously observe accounting information based on the IFRS and JGAAP. In this respect, this study differs from prior studies, enabling us to effectively control the impacts on our empirical findings arising from companies' intrinsic and/or fiscal-year-specific factors, which could be irrelevant to the adoption of the IFRS. Thus we can effectively control the potential impacts of companies' incentives to voluntarily adopt the IFRS (Daske et al. [2008]) because accounting information disclosed in the parallel reporting system is based on both the IFRS and JGAAP for an identical reporting period.

A relevant previous study is Hung and Subramanyam [2007]. They focused on the impact of disclosures in the initial transitioning year from German GAAP to the IFRS of 80 German companies that voluntarily adopted the IFRS between 1998 and 2002, and examine the value relevance of the accounting information in terms of both relative and incremental value relevance. Our study differs from Hung and Subramanyam [2007] in two ways.

First, Hung and Subramanyam [2007] compare the value relevance of the *t*-1 period accounting information (IFRS basis), which is disclosed for comparison to the first year of the IFRS adoption (*t*-period), with the actual performance in the same period (German GAAP basis). In other words, because Hung and Subramanyam's [2007] research approach compares the accounting information for the period *t*-1 based on a German GAAP and an IFRS basis, with the latter disclosed in period *t*, it has limitations in that it compares German GAAP-based accounting information with IFRS-based accounting information not in fact available to investors at period *t*-1. In contrast, this study uses Japan's unique parallel reporting system to compare IFRS and JGAAP-based accounting information, both reported together in the first year of the IFRS adoption (year *t*). Therefore, this study's analysis is able to overcome the research limitations of Hung and Subramanyam [2007], enabling a more precise comparison of accounting information under the two accounting regimes.

Second, Hung and Subramanyam [2007] focus solely on the value relevance of accounting information, while this study compares both the value relevance and credit rating relevance of accounting information based on both IFRS and JGAAP to investigate how accounting information could influence investors as well as creditors. Similar to our study, Masumura [2016] compared the earnings quality (value relevance and timeliness of profit/loss recognition) of IFRS- and JGAAP-based accounting information by using Japan's parallel reporting system. However, as with Hung and Subramanyam [2007], Masumura [2016] does not compare the credit rating relevance of accounting information. We also extend the sample data to IFRS adopters whose fiscal year ends in March 2018. In this sense, this study can be considered an extension of Masumura [2016].

Comparing the value and credit relevance of IFRS- and JGAAP- based accounting information, we find that IFRS-based balance sheet information is more relevant than JGAAP, while IFRS-based income statement information is less relevant. These results suggest that IFRS could improve the relevance of stock information, while deteriorate that of flow information.

The structure of this paper is as follows. Section II summarizes the parallel reporting

system currently applied to Japanese companies voluntarily adopting the IFRS. Section III reviews prior research and develops our hypotheses to be tested empirically. Section IV describes this study's research approach and presents our sample selection procedures and descriptive statistics for each variable used in our analysis. Section V reports this study's empirical results, and Section VI concludes the paper with a discussion of the study's limitations and future challenges.

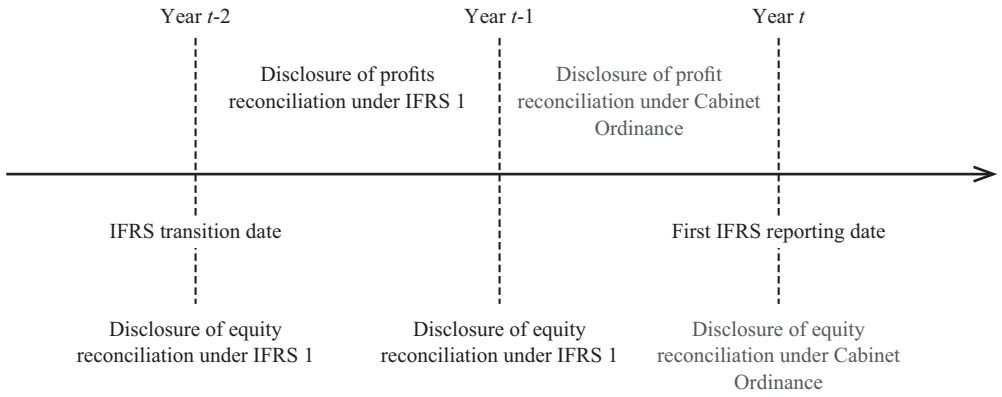
II. *The Parallel Reporting System Applied to Japanese Companies Voluntarily Adopting IFRS*

In June 2009, the Business Accounting Council released the "Opinion on the Application of the International Financial Reporting Standards in Japan (Interim Report)" (hereinafter, Interim Report). According to the Interim Report, voluntary adoption of the IFRS would be permitted starting in the fiscal year ending March 31, 2010. This triggered implementation of the IFRS in earnest in Japan. Companies that voluntarily apply the IFRS are required to disclose the differences in their financial statement figures between the IFRS and the previous accounting standards.

IFRS No.1 (First-time Adoption of IFRS) stipulates disclosure of the differences in financial statement figures. Under IFRS No.1, firms initially adopting IFRS are required to disclose tables that reconcile equity and earnings from the previous accounting standards to the IFRS. In particular, companies must disclose the impacts of the transition from the previous GAAP to the IFRS on their financial positions, business performance, and cash flow (IFRS No.1, Paragraph 23), and are mandated to disclose the impacts to equity, comprehensive income, and cash flow. The period when these tables reconciling equity and profits must be disclosed is the most recent reporting period before the first reporting date under the IFRS.

In addition to the reconciliation tables the IFRS No.1 demands to disclose, additional information disclosures called parallel disclosures are required by the "Cabinet Office Ordinance Revising a Portion of the Regulations on the Terminology, Forms and Presentation Methods of Consolidated Financial Statements" (hereinafter, Cabinet Ordinance), which was released by the Financial Services Agency in December 2009. Disclosure items in the parallel reporting system are (1) for IFRS adopters in the first fiscal year of adoption, the disclosure of condensed consolidated financial statements according to JGAAP and information about changes in "significant items in the preparation of the consolidated financial statements" (for two reporting periods in both cases) and (2) information (for two reporting periods) about differences between major consolidated financial statement items reported under IFRS and JGAAP. Therefore, in Japan, under the Cabinet Ordinance, voluntary IFRS adopters are required to prepare financial statements and corresponding reconciliation tables based on both JGAAP and IFRS at the first IFRS adoption date.

FIGURE 1. SUMMARY OF DISCLOSURE REQUIREMENT OF IFRS NO.1 AND CABINET OFFICE ORDINANCE



Note: Figure 1 summarizes disclosures of the reconciliation tables required by IFRS No.1 and the Cabinet Ordinance. The parallel reporting system mandated by the Cabinet Ordinance requires voluntary IFRS adopters to prepare financial statements in compliance with JGAAP at the first IFRS reporting date. This differs from IFRS No.1, which only requires financial statements under the previous GAAP for the year prior to adoption (comparative period). In this sense, we can obtain the financial information for the both of JGAAP and IFRS in first IFRS reporting date. It allows us to compare the relevance of financial information between JGAAP and IFRS in first IFRS reporting date.

III. *Review of Prior Research and Hypotheses Development*

1. Value Relevance and Credit Relevance of IFRS-based Accounting Information

Most previous studies have focused on value relevance when investigating the impact of changes in accounting information upon the adoption of the IFRS. Major previous studies examining the impacts of IFRS adoption on the value relevance of accounting information are Bartov et al. [2005] and Barth et al. [2008]. Bartov et al. [2005] examined 915 firm/years in Germany in which the IFRS or USGAAP was voluntarily adopted between 1998 and 2000 to compare the value relevance of corporate accounting information for companies that had voluntarily adopted USGAAP or the IFRS and for those that were using German GAAP. They found that the value relevance of earnings of companies voluntarily adopting USGAAP or the IFRS was significantly higher than that of earnings of companies using German GAAP.

Barth et al. [2008] expanded upon Bartov et al. [2005] and surveyed the impacts of voluntary IFRS adoption on earnings quality using data from countries that had voluntarily adopted the IFRS. Specifically, Barth et al. [2008] took 1,986 company/years in 21 countries that had voluntarily adopted the IFRS between 1994 and 2003 and tested whether there were any statistically significant differences among the proxy variables for earnings quality of companies that had voluntarily adopted the IFRS and ex-US matching companies that had not voluntarily adopted the IFRS. Barth et al. [2008] used the value relevance of accounting information as a major variable for the quality of earnings and found that the value relevance of

accounting information is significantly higher for voluntary IFRS adopters than their control group.

In recent years, impacts of IFRS-based accounting information on creditors (i.e., impacts of IFRS adoption on credit relevance) have also been examined (Florou et al. [2017] and Wu and Zhang [2014]). Florou et al. [2017] examined 202 companies (1,664 companies/years) in countries that mandated the IFRS adoption in 2005 to study the changes in credit relevance between 2000 and 2009. Computing the pseudo-determination coefficient using Standard & Poor's issuer ratings as dependent variables on the IFRS-mandated companies, they found that the value of the pseudo- determination coefficient was higher after IFRS adoption (2005–2009) than before IFRS adoption (2000–2004). They suggest the adoption of IFRS strengthens credit relevance as there was little difference in the pseudo-determination coefficient after IFRS adoption for the company sample in non IFRS-mandatory countries.

Wu and Zhang [2014] examined 1,917 companies/years for mandatory adoption of IFRS and 883 companies/years for voluntary adoption of IFRS for 1990–2007 to ascertain whether default risk factors extracted from return on total assets, liability ratio, and interest coverage ratio added incremental information to their ratings after IFRS adoption. This study, using Moody's senior unsecured debt ratings, found that although default risk factors provided incremental information after IFRS adoption at companies adopting IFRS voluntarily, no incremental information was obtained for companies with mandatory IFRS adoption.

Given the findings of Daske et al. [2008], Wu and Zhang [2014] additionally examined whether the results differ for countries with strong enforcement and found that for IFRS-mandated companies in countries with strong enforcement, default risk factors provided incremental information post adoption of IFRS. Consistent with Daske et al. [2008], when IFRS adoption was mandatory, the impacts of accounting information on ratings proved most influential where enforcement is strong. This shows that the incentive effect of adopting the IFRS on accounting information has high credit relevance post-IFRS adoption.

Although Florou et al. [2017] and Wu and Zhang [2014] reached different results regarding the impacts of mandatory IFRS adoption on the credit relevance of accounting information, they agreed that accounting information after IFRS adoption may increase credit relevance.

Prior studies show that both value and credit relevance increase after voluntary IFRS adoption. However, incentives for adopting IFRS may cause sample bias for companies that voluntarily adopted IFRS, making these results less reliable. (Daske et al. [2008]). Therefore, this study focuses on Japan's parallel reporting system to examine whether IFRS- or JGAAP-based accounting information has better explanatory power for market capitalization and credit ratings after the voluntary IFRS adoption.

Focusing on the parallel reporting system enables us to simultaneously observe accounting information based on the IFRS and JGAAP. This study differs from aforementioned studies in that it enables us to effectively control the impacts of intrinsic corporate and/or time trend factors that are irrelevant to IFRS adoption. This includes adoption incentives possibly induced at companies voluntarily adopting IFRS, as we can simultaneously obtain both IFRS- and JGAAP-based accounting information released by a given company in an identical reporting period.

A study of particular relevance to our own is Hung and Subramanyam [2007]. It was a ground-breaking study in this field and it examined 80 companies in Germany that adopted IFRS voluntarily between 1998 and 2002 and investigated the impacts of IFRS adoption on the

value relevance of accounting information in both relative and incremental terms. First, its analysis of the relative value relevance found that the value relevance of IFRS-based current-period net income (net assets) was less (more) statistically significant at the 1% (5%) level than German GAAP-based current-period net income (net assets).

In addition, Hung and Subramanyam's [2007] analysis of the incremental value relevance showed that the coefficient of the difference between IFRS-based net assets and German GAAP-based net assets was positive and statistically significant at the 10% level, indicating that IFRS-based net assets have incremental value relevance relative to German GAAP-based net assets. In contrast, the coefficient of the difference between IFRS-based net income and German GAAP-based income is negative and statistically significant at the 1% level, indicating that IFRS-based net income has less value relevance than the German GAAP-based one.

Also, value relevance that combined net assets and net income on the IFRS basis proved lower than the German GAAP basis for a 10% level of significance. These findings are consistent with Hung and Subramanyam's [2007] assumptions, which held that while the IFRS is an accounting system that emphasizes balance sheet and fair market values (stock-based accounting), German GAAP is the one that emphasizes income statement and historical values (flow-based accounting). Further, Hung and Subramanyam [2007] interpret that the value relevance is much lower with IFRS-based accounting information (i.e., net income) than with the German GAAP-based counterpart because IFRS-based accounting information includes many fair value valuation-based measurement errors. This is consistent with the theoretical prediction of Kusano [2012].

2. Hypothesis Development

When we use the residual income model as a business valuation model, two accounting models are proposed: one for stock-based accounting and the other for flow-based accounting (Kusano [2012]).[1] Flow-based accounting emphasizes income determination to provide useful information for decision making. Highly persistent earnings have a high predictive ability for future earnings and cash flows; flow-based accounting demands historical cost as a measurement basis of assets and liabilities in order to determine net income.

On the other hand, stock-based accounting focuses on the book value of net assets in order to provide investors with useful information. A manager who has an information advantage reports the values of stocks on the balance sheet and narrows the gap between the book value of net assets and the market value of equity; stock-based accounting demands market value/value-in-use as a measurement basis of assets and liabilities (Kusano [2012, p.143]). However, as Kusano [2012, p.141] shows, because pure flow and stock-based accounting are merely ideal concepts, we need to use both net assets and net income to estimate equity value. In other words, when ideal accounting models based on flows and stocks are placed at either end of the spectrum, a real accounting models exist somewhere in between (Kusano [2012, p.141]). Given this, which accounting system, JGAAP or IFRS, is closer to flow-based accounting, and which is closer to stock-based accounting?

According to Iwasaki [2010, p.99], JGAAP is traditionally a flow-based type of accounting system, while the IFRS is stock-based. Therefore, drawing on Iwasaki [2010, p.99], our analysis

[1] See Kusano [2012] for details on flow- and stock-based accounting.

may result in similar findings to those of Hung and Subramanyam [2007]; that is, net assets under IFRS are more value relevant than those under JGAAP, and net income under IFRS is less value relevant than those under JGAAP. However, according to Tsujiyama [2014, p.53], JGAAP has been actively promoted to converge with the IFRS, so that its significant differences from IFRS are said to be virtually eliminated by 2008. Meanwhile, Tokuga [2011] points out that, because of convergence efforts under the Tokyo Agreement, although JGAAP is said to have become almost indistinguishable from IFRS, differences still persist in the basic ideas at the heart of the IFRS and JGAAP as well as in their overall accounting models. In other words, in its conceptual framework, there is a greater emphasis on stock with the IFRS than JGAAP (Tokuga [2011, p.99]).[2]

Therefore, when considering the impacts of both JGAAP's gradual convergence with IFRS, and the accounting models and overall frameworks that still exist between the IFRS and JGAAP, it is an empirical question whether our outcomes are similar to those of Hung and Subramanyam [2007].

Concerning credit relevance of accounting information, previous studies (Florou et al. [2017]; Wu and Zhang [2014]) have indicated that IFRS adoption increases the credit relevance of accounting information. However, they did not examine Japanese firm adopting IFRS. Therefore, it is uncertain whether our findings from Japanese firms will be similar to those of prior studies on credit relevance. Japanese rating agencies are dominant in the credit rating business in Japan, making the nation one of the few countries where the major global players—Standard & Poor's and Moody's—do not hold the leading market positions (Morita [2010]). This could also differentiate Japanese credit rating practices from those in other countries. Therefore, this study presents four hypotheses to examine whether the IFRS or JGAAP gives better explanations of market capitalization and credit ratings. These four are shown in the form of null hypotheses below.

Hypothesis 1-a. There are no statistically significant differences between the value relevance of IFRS-based and JGAAP-based accounting information.

Hypothesis 1-b. The differences between IFRS-based and JGAAP-based accounting information have no incremental value relevance relative to JGAAP-based accounting information.

Hypothesis 2-a. There are no statistically significant differences between the credit relevance of IFRS-based and JGAAP-based accounting information.

Hypothesis 2-b. The differences between IFRS-based and JGAAP-based accounting information have no incremental credit relevance relative to JGAAP-based accounting information.

IV. *Research Design*

1. Empirical Models

Empirical Models to Test Relative and Incremental Value Relevance of Accounting Information

First, this study follows Hung and Subramanyam [2007] in comparing the differences in the value relevance of IFRS-based and JGAAP-based accounting information via regressions as

[2] Note that Tokuga [2011] uses the term "book value of net assets model."

equations (1) to (3) below. Equations (1) and (2) are models testing the differences in the relative value relevance of IFRS-based and JGAAP-based accounting information, while equation (3) is a model testing whether the differences between IFRS-based and JGAAP-based accounting information have incremental value relevance relative to JGAAP-based accounting information.

$$P_t = a_0 + a_1 BV\_IFRS_t + a_2 NI\_IFRS_t + IndustryFixedEffect_i + YearFixedEffect_t + \varepsilon_t \quad (1)$$

$$P_t = a_0 + a_1 BV\_JGAAP_t + a_2 NI\_JGAAP_t + IndustryFixedEffect_i + YearFixedEffect_t + \varepsilon_t \quad (2)$$

Where:

P_t = Market capitalization three months after the end of period *t,*
BV_IFRS_t = IFRS-based book value of net assets (excluding shares held by non-controlling shareholders) in period *t,*
NI_IFRS_t = IFRS-based net income attributable to the parent company in period *t,*
BV_JGAAP_t = JGAAP-based book value of net assets (excluding shares held by non-controlling shareholders) in period *t,*
NI_JGAAP_t = JGAAP-based net income attributable to the parent company in period *t,*
$IndustryFixedEffect_i$ = Dummy variables to control for industry fixed effects,
$YearFixedEffect_t$ = Dummy variables to control for year fixed effects (year 2012 to year 2018).

In addition, equation (3) below tests whether the differences between IFRS-based and JGAAP-based accounting information have incremental value relevance relative to JGAAP-based accounting information:

$$P_t = a_0 + a_1 BV\_JGAAP_t + a_2 BV\_DIF_t + a_3 NI\_JGAAP_t + a_4 NI\_DIF_t + IndustryFixedEffect_i + YearFixedEffect_t + \varepsilon_t \quad (3)$$

Where:

P_t = Market capitalization three months after the end of period *t,*
BV_JGAAP_t = JGAAP-based book value of net assets (excluding shares held by non-controlling shareholders) in period *t,*
BV_DIF_t = the differences between BV_IFRS_t and BV_JGAAP_t,
NI_JGAAP_t = JGAAP-based net income attributable to the parent company in period *t,*
NI_DIF_t = the differences between NI_IFRS_t and NI_JGAAP_t,
$IndustryFixedEffect_i$ = Dummy variables to control for industry fixed effects,
$YearFixedEffect_t$ = Dummy variables to control for year fixed effects (year 2012 to year 2018).

Empirical Models to Test Relative and Incremental Credit Relevance of Accounting Information

Second, this study compares the differences in the credit relevance of accounting information based on IFRS and JGAAP by adjusting the Hann et al. [2007] model used to test credit relevance and utilizing the empirical models of Hung and Subramanyam [2007]. These are shown in equations (4) through (6) below. Equations (4) and (5) are models testing the differences in the relative credit relevance of IFRS-based and JGAAP-based accounting

information, while equation (6) is a model testing whether the differences between IFRS-based and JGAAP-based accounting information have incremental credit relevance relative to JGAAP-based accounting information.

$$Rating_t = a_0 + a_1\, LEV\_IFRS_t + a_2\, ROA\_IFRS_t + CRA\_Dummy_i + IndustryFixedEffect_i + YearFixedEffect_t + \varepsilon_t \quad (4)$$

$$Rating_t = a_0 + a_1\, LEV\_JGAAP_t + a_2\, ROA\_JGAAP_t + CRA\_Dummy_i + IndustryFixedEffect_i + YearFixedEffect_t + \varepsilon_t \quad (5)$$

Where:

$Rating_t$ = Issuer credit ratings released by Rating and Investment Information (R&I), Japan Credit Rating Agency (JCR), Standard & Poor's (S&P), and Moody's. Ratings range from D (1) to AAA (21)[3] in period *t,*

LEV_IFRS_t = IFRS-based long-term liabilities divided by total assets, both in period *t,*

ROA_IFRS_t = IFRS-based net income attributable to the parent company divided by total assets, both in period *t,*

LEV_JGAAP_t = JGAAP-based long-term liabilities divided by total assets both in period *t,*

ROA_JGAAP_t = JGAAP-based net income attributable to the parent company divided by total assets both in period *t,*

$IndustryFixedEffect_i$ = Dummy variables to control for industry fixed effects,

$YearFixedEffect_t$ = Dummy variables to control for year fixed effects (year 2012 to year 2018),

CRA_Dummy_i = Dummy variables to control characteristics of credit rating agencies (S&P, JCR, Moody's).

In addition, equation (6) below tests whether incremental credit relevance exists.

$$Rating_t = a_0 + a_1\, LEV\_JGAAP_t + a_2\, LEV\_DIF_t + a_3\, ROA\_JGAAP_t + a_4\, ROA\_DIF_t + CRA\_Dumny_i + IndustryFixedEffect_i + YearFixedEffect_t + \varepsilon_t \quad (6)$$

Where:

$Rating_t$ = Issuer credit ratings released by R&I, JCR, S&P, and Moody's. Ratings range from D (1) to AAA (21) in period *t*,

LEV_JGAAP_t = JGAAP-based long-term liabilities divided by total assets both in period *t,*

LEV_DIF_t = the differences between LEV_IFRS_t and LEV_JGAAP_t,

ROA_JGAAP_t = JGAAP-based net income divided by total assets both in period *t,*

ROA_DIF_t = the differences between ROA_IFRS_t and ROA_JGAAP_t,

CRA_Dummy_i = Dummy variables to control characteristics of credit rating agencies (S&P, JCR, Moody's),

$IndustryFixedEffect_i$ = Dummy variables to control for industry fixed effects,

$YearFixedEffect_t$ = Dummy variables to control for year fixed effects (year 2012 to year 2018).

[3] We use the rating agencies' issuer credit ratings nearest to their financial statement closing date. Data on issuer ratings are for long-term local-currency ratings.

TABLE 1. SUMMARY STATISTICS

Panel A: Value Relevance

	Mean	Std.dev.	Min	25%ile	Med	75%ile	Max	*n*
P_t	904,267	1,480,922	6,656	82,309	366,000	1,191,400	9,056,581	123
BV_IFRS_t	436,013	606,535	74	49,832	181,350	571,692	3,327,938	123
NI_IFRS_t	46,486	81,201	-25,605	2,901	16,139	57,064	520,250	123
BV_JGAAP_t	424,396	582,106	109	50,208	176,714	547,806	3,237,200	123
NI_JGAAP_t	39,806	70,356	-18,664	1,890	16,982	49,937	479,130	123
BV_DIF_t	11,617	34,190	-99,620	-879	1,338	12,126	151,560	123
NI_DIF_t	6,680	19,047	-34,717	52	1,902	5,864	121,832	123

Panel B: Credit Relevance

	Mean	Std.dev.	Min	25%ile	Med	75%ile	Max	*n*
$Rating_t$	16.220	1.895	11.000	15.000	16.000	17.000	20.000	118
LEV_IFRS_t	0.227	0.112	0.020	0.173	0.233	0.295	0.605	118
ROA_IFRS_t	0.046	0.032	-0.012	0.024	0.041	0.064	0.146	118
LEV_JGAAP_t	0.228	0.110	0.011	0.169	0.234	0.293	0.599	118
ROA_JGAAP_t	0.039	0.028	-0.019	0.024	0.036	0.059	0.132	118
LEV_DIF_t	-0.001	0.013	-0.039	-0.006	-0.001	0.005	0.041	118
ROA_DIF_t	0.006	0.011	-0.009	-0.001	0.003	0.010	0.050	118

Note: This table presents summary statistics of each variable used in our value relevance and credit relevance analysis.

Where, P_t = Market capitalization three months after the end of period *t*, BV_IFRS_t = IFRS-based book value of net assets (excluding shares held by non-controlling shareholders) in period *t*, NI_IFRS_t = IFRS-based net income attributable to the parent company in period *t*, BV_JGAAP_t = JGAAP based book value of net assets (excluding shares held by non-controlling shareholders) in period *t*, NI_JGAAP_t = JGAAP based net income attributable to the parent company in period *t*, BV_DIF_t = the differences between BV_IFRS_t and BV_JGAAP_t, NI_DIF_t = the differences between NI_IFRS_t and NI_JGAAP_t, $Rating_t$ = issuer credit ratings released by Rating and Investment Information, Japan Credit Rating Agency, Standard & Poor's, and Moody's. Ratings range from D (1) to AAA (21) in period *t*, LEV_IFRS_t = IFRS-based long-term liabilities divided by total assets both in period *t*, ROA_IFRS_t = IFRS-based net income attributable to the parent company divided by total assets both in period *t*, LEV_JGAAP_t = JGAAP based long-term liabilities divided by total assets both in period *t*, ROA_JGAAP_t = JGAAP based net income attributable to the parent company divided by total assets both in period *t*, LEV_DIF_t = the differences between LEV_IFRS_t and LEV_JGAAP_t, ROA_DIF_t = the differences between ROA_IFRS_t and ROA_JGAAP_t. The subscript *t* denotes the calendar year (2011-2018). The unit of P_t, BV_IFRS_t, NI_IFRS_t, BV_JGAAP_t, NI_JGAAP_t, BV_DIF_t, NI_DIF_t is million yen.

2. Sample Selection

For sample selection, the IFRS voluntary adopters analyzed in this study consist of firms that adopted IFRS between the fiscal years ending April 2010 and March 2018[4]. Excluded are (1) companies that adopted IFRS when they were listed on the stock exchange for the first time; (2) companies that implemented the parallel reporting system only in their first quarter earnings report (and not in their annual reports); and (3) companies that switched from

[4] Our sample period ends with fiscal year ending March 2018 because we could not obtain issuer credit ratings after that period. To construct our sample period for 8 fiscal years (that is, the fiscal years ending April 2010 to March 2018) we excluded the fiscal year ending March 2010.

USGAAP to IFRS.

We obtained 123 firm/year for testing value relevance. Further, for testing the differences between the credit relevance of accounting information based on IFRS and JGAAP, we collect long-term issuer credit rating data of Japanese firms from R&I, JCR, S&P, and Moody's. As a result, we obtained 118 credit rating/year for testing credit relevance[5]. We obtained firms' financial and stock price data from the Nikkei NEEDS Financial QUEST2.0 database. The data of long-term issuer ratings are collected from the QUICK Workstation provided by QUICK corporation.

3. Descriptive Statistics

Table 1 presents descriptive statistics for the variables used in this study. First, the mean of BV_IFRS_t is 436,013, while the mean of BV_JGAAP_t is 424,396, showing that the book value of net assets is higher when calculated based on the IFRS than on JGAAP. In addition, the mean of NI_IFRS_t is 46,486, while the mean of NI_JGAAP_t is 39,806, indicating that net income attributable to the parent company is higher on an IFRS basis than on a JGAAP basis.

The mean of $Rating_t$ is 16.220, and the median is 16.000. This means that more than half of the sample had issuer ratings of "A" or higher. In addition, the mean of ROA_IFRS_t is 0.046, while the mean of ROA_JGAAP_t is 0.039, showing that return on assets is higher when based on the IFRS. Similarly, the mean of LEV_IFRS_t is 0.227, and the mean of LEV_JGAAP_t is 0.228, so there is little difference between the IFRS and JGAAP regarding the level of leverage.

V. *Empirical Results*

Table 2 shows the results for the relative value relevance and the relative credit relevance, while Table 3 shows the results for the incremental value relevance and the incremental credit relevance. In Table 2, the results for the relative value relevance are presented under Panel A, while the results for the relative credit relevance are presented under Panel B. In addition, the value relevance and the credit relevance of the IFRS-based accounting information are given on the left-hand column for each panel, while those for JGAAP-based accounting information are given in the right-hand column for each panel.

Let us first explain the results for the relative value relevance. In the left-hand column under Panel A, which shows the value relevance of IFRS-based accounting information, the coefficients for BV_IFRS_t and NI_IFRS_t are 0.4755 and 13.9514, respectively, and are both positive and statistically significant at the 1% level (p-value$=<0.001$, <0.001). In addition, in the right-hand column under Panel A, which shows the value relevance of JGAAP-based accounting information, the coefficients for BV_JGAAP_t and NI_JGAAP_t are 0.2277 and 17.4795, respectively, and are both positive and statistically significant at the 5% and 1% levels, respectively (p-value$=0.046$, <0.001).

These findings thus show that although value relevance is higher for the book value of net assets for IFRS-based (BV_IFRS_t) than for JGAAP-based (BV_JGAAP_t) by 0.2478, value relevance may be lower for net income for IFRS-based (NI_IFRS_t) than for JGAAP-based ($NI\_$

[5] We could not obtain Fitch ratings because IFRS firm did not receive credit ratings from Fitch at the adoption year.

TABLE 2. RELATIVE VALUE AND CREDIT RELEVANCE OF IFRS AND JGAAP

Panel A: Relative Value Relevance[a]

	(a) IFRS-based		(b) JGAAP-based	
Variables	coefficient	*p*-values	coefficient	*p*-values
BV_IFRS_t	0.4755	<0.001***		
NI_IFRS_t	13.9514	<0.001***		
BV_JGAAP_t			0.2277	0.046**
NI_JGAAP_t			17.4795	<0.001***
$IndustryFixedEffect_i$	Included		Included	
$YearFixedEffect_t$	Included		Included	
constant	Included		Included	
$Adj.R^2$	0.8688		0.8558	
N	123		123	
$BV\_IFRS_t - BV\_JGAAP_t$	0.2478	0.150	Tests of Coefficients	
$NI\_IFRS_t - NI\_JGAAP_t$	-3.5281	0.036**	Tests of Coefficients	
$Adj.R^2$ (a) – (b)	0.0130	0.430	Vuong (1989)'s tests	

Panel B: Relative Credit Relevance[b]

	(a) IFRS-based		(b) JGAAP-based	
Variables	coefficient	*p*-values	coefficient	*p*-values
LEV_IFRS_t	-3.8580	0.322		
ROA_IFRS_t	5.6647	0.301		
LEV_JGAAP_t			-0.5406	0.861
ROA_JGAAP_t			25.0337	<0.001***
$IndustryFixedEffect_i$	Included		Included	
$YearFixedEffect_t$	Included		Included	
CRA_Dummy_i	Included		Included	
constant	Included		Included	
$Adj.R^2$	0.3500		0.3978	
N	118		118	
$LEV\_IFRS_t - LEV\_JGAAP_t$	-3.3174	<0.001***	Tests of Coefficients	
$ROA\_IFRS_t - ROA\_JGAAP_t$	-19.3690	<0.001***	Tests of Coefficients	
$Adj.R^2$ (a)−(b)	-0.0478	0.040**	Vuong (1989)'s tests	

Note: This table presents the results of estimating the following OLS regressions. *t*-statistics are calculated using Petersen [2009]'s robust standard errors clustered by firm and year. ***, ** and * represent two-tailed significance at the 0.01, 0.05, and 0.1 levels.

[a] Relative Value Relevance Model

IFRS-based : $P_t = a_0 + a_1 BV\_IFRS_t + a_2 NI\_IFRS_t + IndustryFixedEffect_i + YearFixedEffect_t + \varepsilon_t$ (a)

JGAAP-based : $P_t = a_0 + a_1 BV\_JGAAP_t + a_2 NI\_JGAAP_t + IndustryFixedEffect_i + YearFixedEffect_t + \varepsilon_t$ (b)

Where, P_t = Market capitalization three months after the end of period *t*, BV_IFRS_t = IFRS-based book value of net assets (excluding shares held by non-controlling shareholders) in period *t*, NI_IFRS_t = IFRS-based net income attributable to the parent company in period *t*, BV_JGAAP_t = JGAAP based book value of net assets (excluding shares held by non-controlling shareholders) in period *t*, NI_JGAAP_t = JGAAP based net income attributable to the parent company in period *t*, $IndustryFixedEffect_i$ = Dummy variables to control for industry fixed effects, $YearFixedEffect_t$ = Dummy variables to control for year fixed effects.

[b] Relative Credit Relevance Model

IFRS-based : $Rating_t = a_0 + a_1 LEV\_IFRS_t + a_2 ROA\_IFRS_t + IndustryFixedEffect_i + YearFixedEffect_t + CRA\_Dummy_i + \varepsilon_t$ (a)

JGAAP-based : $Rating_t = a_0 + a_1 LEV\_JGAAP_t + a_2 ROA\_JGAAP_t + IndustryFixedEffect_i + YearFixedEffect_t + CRA\_Dummy_i + \varepsilon_t$ (b)

Where, $Rating_t$ = issuer credit ratings released by Rating and Investment Information, Japan Credit Rating Agency, Standard & Poor's, and Moody's. Ratings range from D (1) to AAA (21) in period t, LEV_IFRS_t = IFRS-based long-term liabilities divided by total assets both in period t, ROA_IFRS_t = IFRS-based net income attributable to the parent company divided by total assets both in period t, LEV_JGAAP_t = JGAAP based long-term liabilities divided by total assets both in period t, ROA_JGAAP_t = JGAAP based net income attributable to the parent company divided by total assets both in period t, $IndustryFixedEffect_i$ = Dummy variables to control for industry fixed effects, $YearFixedEffect_t$ = Dummy variables to control for year fixed effects.
CRA_Dummy_i = Dummy variables to control characteristics of credit rating agencies (S&P, JCR, Moody's).

$JGAAP_t$) by 3.5281. However, when we examine the differences between the coefficients, only the differences between NI_IFRS_t and NI_JGAAP_t were statistically significant (at the 5% level, p-value = 0.036). Although the adjusted R-squared was 86.88% for the IFRS model and 85.58% for the JGAAP model, when we applied Vuong's test, the difference between the adjusted R-squared for both models were not statistically significant (p-value = 0.430).

This suggests that there exists no statistically significant difference in the relative value relevance of IFRS-based and JGAAP-based accounting information as a whole (income statement plus balance sheet). However, with respect to net income information, our results suggest that the value relevance of the IFRS-based figures is lower than that of JGAAP.

Next, let us examine the results for the relative credit rating relevance. The left-hand column under Panel B shows the credit rating relevance of IFRS-based accounting information. The coefficients of LEV_IFRS_t and ROA_IFRS_t are-3.8580 and 5.6647, respectively. LEV_IFRS_t and ROA_IFRS_t are not statistically significant at the (p-value = 0.322, 0.301). The right-hand column under Panel B shows the credit rating relevance of JGAAP-based accounting information. The coefficients for LEV_JGAAP_t and ROA_JGAAP_t are -0.5406 and 25.0337, respectively. LEV_JGAAP_t is not statistically significant (p-value = 0.861), whereas ROA_JGAAP_t is statistically significant (p-value = < 0.001).

The higher leverage ratio has a negative impact on credit ratings in the IFRS and JGAAP models. In other words, there is a tendency whereby higher leverage ratios corresponded to worse issuer credit ratings. The higher ROA also tend to have a positive impact on credit ratings.

We additionally test the difference between the impacts of accounting ratio calculated by IFRS and JGAAP on credit rating. For the leverage ratio, the difference between the coefficient of LEV_IFRS_t and LEV_JGAAP_t is -3.3174, and there are significant differences between the two models (p-value = < 0.001). For the return on total assets, the difference between the coefficient of ROA_IFRS_t and ROA_JGAAP_t is -19.3690, and there is a significant difference (p-value = < 0.001). This possibly indicates that while the credit rating relevance of the leverage ratio is higher for the IFRS-based than for the JGAAP-based, whereas credit rating relevance of return on total assets is lower for the IFRS-based than for the JGAAP-based. The adjusted R-squared was 35.00% for the IFRS model and 39.78% for the JGAAP model (a difference of 0.40%), while the difference between the adjusted R-squared for both models has a statistical significance at the 5% level (p-value = 0.040).

In summary, although the credit rating relevance of the leverage ratio based on IFRS is higher than that of JGAAP-based, we found that both the value relevance and the credit rating relevance of net income (return on assets) are less statistically significant for the IFRS-based

TABLE 3. INCREMENTAL VALUE AND CREDIT RELEVANCE OF IFRS AND JGAAP

Incremental Value and Credit Relevance

	(a) Incremental Value Relevance		(b) Incremental Credit Relevance	
Variables	coefficient	*p*-values	coefficient	*p*-values
BV_JGAAP_t	0.3831	0.004***		
BV_DIF_t	0.3553	0.920		
NI_JGAAP_t	15.1437	<0.001***		
NI_DIF_t	11.3402	0.144		
LEV_JGAAP_t			-0.1903	0.936
LEV_DIF_t			-35.7694	0.070*
ROA_JGAAP_t			33.3600	<0.001***
ROA_DIF_t			-64.2365	<0.001***
CRA_Dummy_i	Excluded		Included	
$IndustryFixedEffect_i$	Included		Included	
$YearFixedEffect_t$	Included		Included	
constant	Included		Included	
$Adj.R^2$	0.8668		0.5345	
N	123		118	

Note: This table presents the results of estimating the following OLS regressions. *t*-statistics are calculated using Petersen [2009]'s robust standard errors clustered by firm and year. ***, ** and * represent two-tailed significance at the 0.01, 0.05, and 0.1 levels.

$P_t=a_0+a_1BV\_JGAAP_t+a_2BV\_DIF_t+a_3NI\_JGAAP_t+a_4NI\_DIF_t+IndustryFixedEffect_i+YearFixedEffect_t+\varepsilon_t$ (a)

$Rating_t=a_0+a_1LEV\_JGAAP_t+a_2LEV\_DIF_t+a_3ROA\_JGAAP_t+a_4ROA\_DIF_t+IndustryFixedEffect_i+YearFixed\ Effect_t+CRA\_Dummy_i+\varepsilon_t$ (b)

Where, P_t=Market capitalization three months after the end of period *t*, BV_JGAAP_t=JGAAP based book value of net assets (excluding shares held by non-controlling shareholders) in period *t*, BV_DIF_t=the differences between BV_IFRS_t and BV_JGAAP_t, NI_JGAAP_t=JGAAP based net income attributable to the parent company in period *t*, NI_DIF_t=the differences between NI_IFRS_t and NI_JGAAP_t, $Rating_t$=issuer credit ratings released by Rating and Investment Information, Japan Credit Rating Agency, Standard & Poor's, and Moody's. Ratings range from D (1) to AAA (21) in period *t*, LEV_JGAAP_t=JGAAP based long-term liabilities divided by total assets both in period *t*, LEV_DIF_t=the differences between LEV_IFRS_t and LEV_JGAAP_t, ROA_JGAAP_t=JGAAP based net income attributable to the parent company divided by total assets both in period *t*, ROA_DIF_t=the differences between ROA_IFRS_t and ROA_JGAAP_t, $IndustryFixedEffect_i$=Dummy variables to control for industry fixed effects, $YearFixedEffect_t$=Dummy variables to control for year fixed effects.

CRA_Dummy_i=Dummy variables to control characteristics of credit rating agencies (S&P, JCR, Moody's).

than for the JGAAP-based, suggesting JGAAP income information is both more value- and credit- relevant than IFRS. In addition, although we could not find any statistically significant differences in the relative value relevance of accounting information between the IFRS-based and JGAAP-based as a whole (that is, income statement plus balance sheet), our result suggests that the relative credit rating relevance of accounting information based on JGAAP is superior to that of IFRS as a whole.

Table 3 shows the incremental value relevance and incremental credit relevance of IFRS-based and JGAAP-based accounting information. First, in Panel (a) of Table 3, which gives the results for incremental value relevance, both BV_JGAAP_t and NI_JGAAP_t are statistically significant and positive at the 1% level (p-value=0.004, <0.001), indicating that JGAAP-based book value of net assets and net income are significant in explaining share prices in the market.

However, the coefficients of BV_DIF_t and NI_DIF_t, which show the differences in reported numbers for the IFRS-based and JGAAP-based, indicate no statistical significance (p-value＝0.920, 0.144). This suggests that IFRS-based book value of net assets and net income may not provide as much incremental information for share price evaluation as the JGAAP-based metrics.

Panel (b) in Table 3 presents the results for incremental credit rating relevance. The coefficient for LEV_JGAAP_t is negative, but not significant (coefficient＝-0.1903; p-value＝0.936). The coefficient for ROA_JGAAP_t is positive and statistically significant at the 1% level (coefficient＝33.3600; p-value＝＜0.001). However, the coefficient for LEV_DIF_t, the difference in leverage ratio between the JGAAP and the IFRS-based, is negative and statistically significant at the 10% level (coefficient＝-35.7694; p-value＝0.070). This result suggests that the IFRS-based leverage ratio gives more incremental information to issuer ratings than JGAAP-based.

On the other hand, the difference in net income between the JGAAP-based and the IFRS-based (ROA_DIF_t) is significantly negative at the 1% level (coefficient＝-64.2365; p-value＝＜0.001). This result suggests that although the JGAAP-based return on assets may provide more incremental information to issuer credit ratings than the IFRS-based ones, the IFRS-based return on total assets may cause credit rating relevance to deteriorate more significantly.

Overall, although we could not find any incrementally value-relevant information regarding IFRS-based information, we find that IFRS-based balance sheet information is more credit relevant (10% level), whereas IFRS-based income statement information is less credit relevant (1% level).

These findings suggest that although IFRS-based balance sheet information provides some incremental credit rating relevance compared to equivalent JGAAP-based information, IFRS adoption may cause the value relevance and credit rating relevance of income statement related information, that is net income and return on assets, to significantly diminish.

As Hung and Subramanyam [2007] indicated, the decline in the relevance of income statement information could be significantly affected by increased measurement errors caused by enhanced fair value evaluation under the IFRS. As a result, the observed decrease in credit relevance of accounting information as a whole could mainly be driven by the decreased credit relevance of income statement related information. The different results between value and credit relevance could be caused by differences in information interpretation between sell-side equity analysts and credit analysts. Credit rating agencies interpret reported performance more conservatively than equity analysts (Batta and Muslu, 2017). The credit relevance of IFRS-based net income could be diminished because IFRS-based net income is more volatile than JGAAP-based, and credit analysts adjust reported IFRS-based income more conservatively than JGAAP-based income.

VI. *Conclusion*

This study utilizes Japan's parallel reporting system to analyze which accounting regime—IFRS or JGAAP—better explains market capitalization and credit ratings after voluntary adoption of IFRS. Our findings are as follows.

First, although the credit rating relevance of the leverage ratio based on IFRS is higher than that of JGAAP-based, both the value relevance and the credit rating relevance of net income (return on assets) are less statistically significant for the IFRS-based than for the JGAAP-based, suggesting JGAAP income information is both more value relevant, and credit relevant, than IFRS.

Second, although we could not find any statistically significant differences in the relative value relevance of accounting information between the IFRS-based and JGAAP-based as a whole (that is, income statement plus balance sheet), our result suggests that relative credit rating relevance of accounting information based on JGAAP is superior to that of IFRS as a whole.

Third, although we could not find any incrementally value-relevant information regarding IFRS-based information, we find that IFRS-based balance sheet information is more credit relevant (10% level), whereas IFRS-based income statement information has less credit relevant (1% level). Overall, we find IFRS adoption may cause the value relevance and credit rating relevance of income statement related accounting information, that is net income and return on assets, to significantly diminish.

This study extends the literature by documenting the effect of accounting standards on value- and credit relevance more precisely. Specifically, focusing on Japan's parallel reporting system enables us to disentangle the effect of accounting differences between IFRS and JGAAP *per se* from confounding factors such as firms' reporting incentives and/or fiscal-year-specific effects.

The findings of this study have implications toward standard setting in Japan in that despite the gradual process of convergence between IFRS and JGAAP, there still exist significant differences between the two standards. Our study has implications for future research. Specifically, the different results between value and credit relevance could be caused by differences in the interpretation of information between sell-side equity analysts and credit analysts. This complements the extant literature. However, as our findings are still preliminary, they should be interpreted carefully. In future studies, we plan to enhance reliability and possibilities of generalization of our findings through increasing sample size as well as refining our theoretical suppositions and research designs.

Specifically, because this study relies on data on the first year of IFRS adoption, future studies should establish whether the documented results of this study are also observed using long-term times series data. The documented differences between value and credit relevance of IFRS and JGAAP accounting information could be driven by the fact that it is impossible to compare IFRS-based accounting information with other periods, except t-1.

Furthermore, because IFRS No.1 (First-time Adoption of IFRS) allows firms to select some exemption rules when they first prepare IFRS-based financial statements, the effect of firms' incentives on the selection of exemption rules could bias our results. In that case, the documented results of our study may be explained by a joint effect between the firms' incentives on the selection of the exemption rules, and the differences between IFRS and JGAAP. Finally, because this study only compares the condensed figures of accounting differences between IFRS and JGAAP, namely the net income information and the net assets information, we could not identify the differences contributing to the documented value and credit relevance between IFRS-based and JGAAP-based accounting information. These issues exceed the scope of this study and are future research topics.

Appendix

Accounting Standards Differencees Between ifrs and Jgaap

Topic	*IFRS*	*JGAAP*
PPE and Investment Property	Fair Value allowed	Historical Cost basis
Borrowing costs on construction	Capitalized	Generally Expensed
Development costs	Some must be capitalized	Expensed (except software)
Pre-opening costs	Must be expensed	Can be capitalized
Intangible amortization	Indefinite-life not amortized	All amortized
Goodwill	Annually impaired	Amortized up to 20 years
Impairment test	No test: measured using discounted cash flow	Based on undiscounted
Impairment reversals	Required when appropriate	Not required
Inventory write-downs	Reversed when appropriate	Can be treated as permanent
Unlisted shares	At fair value	At cost
Provisions	Only when obligation: discounted	Can be made when no obligation; Generally not discounted
Proposed Dividends	Not accrued	Can be accrued
Convertible Debentures	Split into equity and debt	Generally treated as debt
Extraordinary Items	Not allowed	Wide definition
Discontinued Operation	Disclosed in detail	Not disclosed
Temporarily-Held Subsidiaries	Consolidated	Excluded
Recycling of Items of Other Comprehensive Income	Some of Other Comprehensive Incomes are not recycled	Other Comprehensive Incomes are all recycled

Source: Nobes and Parker [2017] pp.319 adjusted based on ASBJ [2015]

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