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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 value and credit rating relevance of IFRS-based net income measures are statically 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 value and credit rating relevance of net income information of Japanese firms could become impaired by the adoption of IFRS.

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

1. Introduction

Since 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 paper 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 the credit rating relevance of accounting information.

A lot of studies have been conducted on the value relevance and the 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 proved more value relevance and credit rating relevance. However, these findings could contain sample bias that distorted the results due to the incentive effects on the sample companies that voluntarily adopted the IFRS (Daske et al. [2008]). This paper, therefore, focuses on the parallel reporting system to find out which accounting information, 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 paper differs from prior researches, enabling us to effectively control the impacts on our empirical findings brought by companies’ intrinsic and/or fiscal-year-specific factors, which could be irrelevant to the adoption of the IFRS. The purpose of doing this is we can effectively control the potential impacts of companies’ incentives to voluntarily adopt the IFRS (Daske et al. [2008]) because information disclosed in the parallel reporting system give us accounting information of a given company based on both the IFRS and JGAAP for an identical reporting period.

A previous study most relevant to ours is that of Hung and Subramanyam [2007]. They focused on disclosures of the impacts in the initial transitioning year from German GAAP to the IFRS of 80 German companies that voluntarily adopted the IFRS between 1998 and 2002, examining the value relevance of the accounting information in the voluntary adoption of the IFRS in terms of both relative and incremental value relevance. Meanwhile, our paper differs from Hung and Subramanyam [2007] in two respects.

First, Hung and Subramanyam [2007] compares the value relevance of the \( t-1 \) period accounting information (IFRS basis), which is disclosed for comparison purpose 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 the Hung and Subramanyam’s [2007] research approach is comparing the accounting information for the period \( t-1 \) each based on a German GAAP and an IFRS basis, with the latter disclosed in the 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 the time of the period \( t-1 \). In contrast, this paper 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 paper’s analysis is able to overcome the research approach limitations of Hung and Subramanyam [2007], enabling a more precise comparison of accounting information under the two accounting regimes.

Second, Hung and Subramanyam [2007] focuses solely on the value relevance of accounting information, while this paper compares both the value relevance and the credit rating relevance of accounting information based on both IFRS and JGAAP to investigate how the accounting information could influence investors as well as creditors. Meanwhile, recently, Masumura [2016] has compared the earnings quality (value relevance and timeliness of profit/loss recognition) of IFRS- and JGAAP-based accounting information by using the Japan’s parallel reporting system as this paper does. However, similar to Hung and Subramanyam [2007], Masumura [2016] does not compare the credit rating relevance of accounting information. In this sense, this paper can be considered an extension of Masumura [2016].

The structure of this paper is as follows. Section 2 summarizes the parallel reporting system currently applied to Japanese companies voluntarily adopting the IFRS. Section 3 reviews prior researches and develops our hypotheses that would be tested empirically. Section 4 describes this paper’s research approaches, and presents our sample selection procedures and descriptive statistics for each variable used in our analysis. Section 5 reports and presents this paper’s empirical results. Finally, Section 6 concludes this paper with mentions of its limitations and future challenges.

2. 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 implementations 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, firm initially adopting IFRS are required to disclose tables that reconcile equity and earnings during the transition from the previous accounting standards to the
IFRS. Namely, 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 in regard 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) released by the Financial Services Agency in December 2009. Disclosure items in the parallel reporting system are (1) for IFRS adaptors in the first fiscal year of adoption, disclosure of condensed consolidated financial statements (for two reporting periods) according to JGAAP and information about changes in “significant items in the preparation of the consolidated financial statements” (for two reporting periods) 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 per IFRS No.1 and Cabinet Office Ordinance
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 say that the parallel reporting system per the Cabinet Ordinance, which is the main focus of this paper, is a Japan’s unique institutional characteristic mandated to voluntary IFRS adopters in the nation.

3. Reviewing Prior Research and Hypotheses Development

3.1 Value Relevance and Credit Relevance of IFRS-based Accounting Information

Most previous studies have focused on the 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]. First, 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 significantly higher than that of earnings of companies using German GAAP.

Barth et al. [2008] expanded upon Bartov et al. [2005], which looked at German companies only, 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 statistical significance 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 the credit relevance, have also been examined Florou et al. [2017] and Wu and Zhang [2014]. Florou et al. [2017] researched 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). In addition, the researchers perceive the adoption of IFRS strengthens the 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] looked at 1,917 companies/years for companies with mandatory adoption of IFRS and 883 companies/years for companies with voluntary adoption of IFRS over a test period 1990–2007 to find out 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 added to incremental information after IFRS adoption at companies adopting IFRS voluntarily, no incremental information was present at companies with mandatory IFRS adoption.

In addition, in light of the findings of Daske et al. [2008], Wu and Zhang [2014] additionally examined whether the results differed if countries with strong rules of law and those without were compared and found that for IFRS-mandated companies in countries with strong rules of law, default risk factors added 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 rules of law are 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, at least they agreed that accounting information after IFRS adoption may increase the credit relevance.

The findings of prior studies on whether the value relevance and the credit relevance increase after IFRS voluntary adoption show that both the value and the credit relevance rise after the voluntary IFRS adoption. However, incentives for adopting IFRS may cause bias into the sample of companies that voluntarily adopted IFRS, thereby confounding the research findings (Daske et al.
Therefore, this paper focuses on Japan’s parallel reporting system to examine which of IFRS- or JGAAP-based accounting information has better explanation power on market capitalization or 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 paper differs from aforementioned studies in that it enables us to effectively control the impacts of intrinsic corporate and/or time trend factors on our empirical findings that are irrelevant to IFRS adoption. The reason behind is we can effectively control influences of 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 previous, overseas study most relevant to ours is Hung and Subramanyam [2007]. Specifically, it could be seen as a ground-breaking study in this field in that it examined 80 companies/years in Germany that adopted IFRS voluntarily between 1998 and 2002 and investigates the impacts of IFRS adoption on the value relevance of accounting information in both the relative and the 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 10% levels, 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 1% levels, indicating that IFRS-based net income has less value relevance in a comparison of German GAAP based one.

Also, value relevance that combined net assets and net income on IFRS basis proved lower than those of German GAAP basis with 10% levels of statistical 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 this 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 assertions by Kusano (2012).

3.2 Hypothesis Development

When we base on 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 are an indicator of future earnings and 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 current 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 is merely ideal concepts, we actually 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- or 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 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, 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 (Tsuijyama [2014], p. 53). 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, the IFRS focuses more on stock than does JGAAP (Tokuga [2011, p. 99]).

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, we cannot necessarily clarify whether our analysis will also reach outcomes similar to those of Hung and Subramanyam [2007]. This is an issue that needs to be empirically studied.

In terms of 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 have not examined Japanese firms 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 paper presents four hypotheses for empirical examination as to whether the IFRS or JGAAP is better for explanation of market capitalization or 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.

4. Research Design

4.1 Empirical Models

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

First, this paper follows Hung and Subramanyam [2007] in comparing the differences in the
value relevance of IFRS-based and JGAAP-based accounting information through regressions from 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.

\[ P_t = a_0 + a_1 BV_{IFRS_t} + a_2 NI_{IFRS_t} + YearFixedEffect_t + \epsilon_t \]  
(1)

\[ P_t = a_0 + a_1 BV_{JGAAP_t} + a_2 NI_{JGAAP_t} + YearFixedEffect_t + \epsilon_t \]  
(2)

Where,

\( P_t \) = Market capitalization at 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 \( t \)

\( YearFixedEffect \) = Dummy variables to control for year fixed effects (year 2011 to year 2016).

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.

\[ P_t = a_0 + a_1 BV_{JGAAP_t} + a_2 BV_{DIF_t} + a_3 NI_{JGAAP_t} + a_4 NI_{DIF_t} + YearFixedEffect_t + \epsilon_t \]  
(3)

Where,

\( P_t \) = Market capitalization at 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 \( NI_{JGAAP,t} \)

\( YearFixedEffect = \) Dummy variables to control for year fixed effects (year 2011 to year 2016).

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

Second, this paper 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.

\[
\begin{align*}
\text{Rating}_t &= a_0 + a_1 \text{LEV}_{IFRS,t} + a_2 \text{ROA}_{IFRS,t} + YearFixedEffect_t + \epsilon_t \\
\text{Rating}_t &= a_0 + a_1 \text{LEV}_{JGAAP,t} + a_2 \text{ROA}_{JGAAP,t} + YearFixedEffect_t + \epsilon_t
\end{align*}
\]

Where,

\( \text{Rating}_t = \) issuer credit ratings released by Rating and Investment Information, Japan Credit Rating Agency, Standard & Poor’s, Moody’s, and Fitch. Ratings range from D (1) to AAA (21) in period \( t \)

\( \text{LEV}_{IFRS,t} = \) IFRS-based long-term liabilities divided by total assets both in period \( t \)

\( \text{ROA}_{IFRS,t} = \) IFRS-based net income attributable to the parent company divided by total assets both in period \( t \)

\( \text{LEV}_{JGAAP,t} = \) JGAAP based long-term liabilities divided by total assets both in period \( t \)

\( \text{ROA}_{JGAAP,t} = \) JGAAP based net income attributable to the parent company divided by total assets both in period \( t \)

\( YearFixedEffect = \) Dummy variables to control for year fixed effects (year 2011 to year 2016).

In addition, equation (6) below is the model for testing whether incremental credit relevance exists.
\[ Rating_t = a_0 + a_1 LEV\_JGAAP_t + a_2 LEV\_DIF_t + a_3 ROA\_JGAAP_t + a_4 ROA\_DIF_t + YearFixedEffect_t + \varepsilon_t \]  

Where,

- \( Rating_t \) = issuer credit ratings released by Rating and Investment Information, Japan Credit Rating Agency, Standard & Poor’s, Moody’s, and Fitch. 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 \( LEV\_IFRS \) 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 \( ROA\_IFRS \) and \( ROA\_JGAAP_t \)
- \( YearFixedEffect \) = Dummy variables to control for year fixed effects (year 2011 to year 2016).

### 4.2 Sample Selection

Let us now discuss the sample selection process of this study. To begin with, the IFRS voluntary adopters analyzed in this paper consist of 67 of the total 101 companies that had voluntarily adopted IFRS as of December 2016.

Excluded are (1) companies that adopted IFRS when they were listed on the stock exchange for the first time (7 companies); (2) companies that had not yet released their Financial Statements for the first year of IFRS adoption as of the time of the data collection (Feb. 11, 2017; 14 companies); (3) companies that implemented the parallel reporting system only in their first quarter earnings report (companies that did not include parallel reporting system in their Financial Statements) (3 companies); and (4) companies that switched from USGAAP to IFRS (10 companies).

These 67 companies comprised 66.34% of the companies that had voluntarily adopted IFRS as of December 2016. Further, for testing the differences between the credit relevance of accounting information based on IFRS and JGAAP, data on issuer ratings for 34 companies were unavailable. Therefore, note that our sample for testing the differences in credit relevance was 33 companies, or only about half of the 67 companies in our testing of differences in the value relevance.

### 4.3. Descriptive Statistics

Table 1 presents descriptive statistics for the variables used in this study. First, the mean of
$BV_{IFRS_t}$ is 439,990, while the mean of $BV_{JGAAP_t}$ is 426,757, showing that the book value of net assets is higher when calculated based on IFRS than on JGAAP. In addition, the mean of $NI_{IFRS_t}$ is 48,096, while the mean of $NI_{JGAAP_t}$ is 40,860, indicating that net income attributable to the parent company is higher on an IFRS basis than on a JGAAP basis.

For Rating, the mean was 13.758 while the median was 14. This means that more than half of the sample had issuer ratings of “A” or higher. In addition, the mean of $ROA_{IFRS_t}$ was 0.045, while the mean of $ROA_{JGAAP_t}$ was 0.039, showing that return on assets is higher when based on IFRS. Similarly, the mean of $LEV_{IFRS_t}$ is 0.260, while the mean of $LEV_{JGAAP_t}$ is 0.255, so leverage comes out higher on an IFRS basis.

Table 1: Summary Statistics

<table>
<thead>
<tr>
<th>Panel A: Value Relevance</th>
<th>Mean</th>
<th>Std.dev.</th>
<th>Min</th>
<th>25%ile</th>
<th>Med</th>
<th>75%ile</th>
<th>Max</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_t$</td>
<td>934,953</td>
<td>1,732,668</td>
<td>9,837</td>
<td>78,609</td>
<td>206,497</td>
<td>796,698</td>
<td>8,157,599</td>
<td>67</td>
</tr>
<tr>
<td>$BV_{IFRS_t}$</td>
<td>439,990</td>
<td>691,343</td>
<td>1,461</td>
<td>52,574</td>
<td>168,877</td>
<td>524,806</td>
<td>3,308,228</td>
<td>67</td>
</tr>
<tr>
<td>$NI_{IFRS_t}$</td>
<td>48,096</td>
<td>96,634</td>
<td>-3,161</td>
<td>3,455</td>
<td>13,896</td>
<td>50,895</td>
<td>494,465</td>
<td>67</td>
</tr>
<tr>
<td>$BV_{JGAAP_t}$</td>
<td>426,757</td>
<td>662,042</td>
<td>1,635</td>
<td>50,783</td>
<td>174,214</td>
<td>500,613</td>
<td>3,196,214</td>
<td>67</td>
</tr>
<tr>
<td>$NI_{JGAAP_t}$</td>
<td>40,860</td>
<td>80,956</td>
<td>-15,183</td>
<td>2,533</td>
<td>11,651</td>
<td>45,818</td>
<td>398,418</td>
<td>67</td>
</tr>
<tr>
<td>$BV_{DIF_t}$</td>
<td>13.759</td>
<td>32.797</td>
<td>-23.000</td>
<td>-298</td>
<td>2.039</td>
<td>12.794</td>
<td>131,724</td>
<td>67</td>
</tr>
<tr>
<td>$NI_{DIF_t}$</td>
<td>6.124</td>
<td>17.153</td>
<td>-6.941</td>
<td>52</td>
<td>1.486</td>
<td>4.038</td>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>Panel B: Credit Relevance</th>
<th>Mean</th>
<th>Std.dev.</th>
<th>Min</th>
<th>25%ile</th>
<th>Med</th>
<th>75%ile</th>
<th>Max</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td>13.758</td>
<td>1.969</td>
<td>9.000</td>
<td>13.000</td>
<td>14.000</td>
<td>15.000</td>
<td>18.000</td>
<td>33</td>
</tr>
<tr>
<td>$LEV_{IFRS_t}$</td>
<td>0.260</td>
<td>0.222</td>
<td>0.027</td>
<td>0.170</td>
<td>0.208</td>
<td>0.252</td>
<td>0.886</td>
<td>33</td>
</tr>
<tr>
<td>$ROA_{IFRS_t}$</td>
<td>0.045</td>
<td>0.040</td>
<td>-0.012</td>
<td>0.008</td>
<td>0.042</td>
<td>0.072</td>
<td>0.147</td>
<td>33</td>
</tr>
<tr>
<td>$LEV_{JGAAP_t}$</td>
<td>0.255</td>
<td>0.213</td>
<td>0.011</td>
<td>0.169</td>
<td>0.202</td>
<td>0.258</td>
<td>0.885</td>
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<tr>
<td>$ROA_{JGAAP_t}$</td>
<td>0.039</td>
<td>0.035</td>
<td>-0.019</td>
<td>0.009</td>
<td>0.034</td>
<td>0.065</td>
<td>0.101</td>
<td>33</td>
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<tr>
<td>$LEV_{DIF_t}$</td>
<td>0.005</td>
<td>0.019</td>
<td>-0.027</td>
<td>-0.005</td>
<td>0.002</td>
<td>0.008</td>
<td>0.092</td>
<td>33</td>
</tr>
<tr>
<td>$ROA_{DIF_t}$</td>
<td>0.006</td>
<td>0.013</td>
<td>-0.009</td>
<td>-0.001</td>
<td>0.003</td>
<td>0.010</td>
<td>0.051</td>
<td>33</td>
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</tbody>
</table>

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

Where, $P_t$ = Market capitalization at 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 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 $BV_{JGAAP_t}$, $NI_{DIF_t}$ = the differences between $NI_{IFRS_t}$ and $NI_{JGAAP_t}$, $ROA_{IFRS_t}$ = IFRS-based return on assets in period $t$, $ROA_{JGAAP_t}$ = JGAAP-based return on assets in period $t$, $LEV_{IFRS_t}$ = IFRS-based leverage in period $t$, $LEV_{JGAAP_t}$ = JGAAP-based leverage in period $t$. 
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, Moody’s, and Fitch. 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 fiscal year (2010-2016). The unit of $Pt, BV_{IFRS_t}, NI_{IFRS_t}, BV_{JGAAP_t}, NI_{JGAAP_t}, BV_{DIF_t}, NI_{DIF_t}$ is million yen.

5. Empirical Results

This section provides our 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 shown under Panel A, while the results for the relative credit relevance are shown under Panel B. In addition, the value relevance and the credit relevance of the IFRS-based accounting information for each panel 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 empirical 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 0.6705 and 12.2673, respectively, both positive and statistically significant at the 1% level (p-value = 0.000, 0.000). 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 0.5075 and 15.8094, respectively, positive and statistically significant at the 5% and 1% levels, respectively (p-value = 0.013, 0.000).

These findings thus show that although value relevance is higher for book value of net assets for IFRS-based ($BV_{IFRS_t}$) than for JGAAP based ($BV_{JGAAP_t}$) by 0.1630, value relevance may be lower for net income for IFRS-based ($NI_{IFRS_t}$) than for JGAAP based ($NI_{JGAAP_t}$) by 3.5421. However, when we look at the differences between the coefficients, only the differences between $NI_{IFRS_t}$ and $NI_{JGAAP_t}$ was statistically significant (at the 1% level, p-value = 0.000). Although the adjusted R-squared was 93.00% for the IFRS model and 92.90% 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 = 0.870). 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 J-GAAP.

Next, let us examine the empirical results for the relative credit rating relevance. In the left-hand column under Panel B, showing the credit rating relevance of IFRS-based accounting information, the coefficients of \( LEV_{IFRS} \) and \( ROA_{IFRS} \) are -2.7440 and 9.4163, respectively; these results

| Table 2: Relative Value and Credit Relevance of IFRS and JGAAP Accounting Information |
|---------------------------------|-----------------|-----------------|
| **Panel A: Relative Value Relevance**<sup>a</sup> | **(a) IFRS-based** | **(b) JGAAP-based** |
| Variables | coefficient | \( p \)-values | coefficient | \( p \)-values |
| \( BV_{IFRS_t} \) | 0.6705 | 0.000*** | | |
| \( NI_{IFRS_t} \) | 12.2673 | 0.000*** | | |
| \( BV_{JGAAP_t} \) | | | 0.5075 | 0.013** |
| \( NI_{JGAAP_t} \) | | | 15.8094 | 0.000*** |
| YearFixedEffect, | Included | Included | Included | Included |
| constant | | | | |
| \( Adj.R^2 \) | 0.9300 | 0.9290 | |
| \( N \) | 67 | 67 | |
| \( BV_{IFRS_t} - BV_{JGAAP_t} \) | 0.1630 | 0.310 | Tests of Coefficients |
| \( NI_{IFRS_t} - NI_{JGAAP_t} \) | -3.5421 | 0.000*** | Tests of Coefficients |
| \( Adj.R^2 \) (a) – (b) | 0.0010 | 0.870 | Vuong (1989)’s tests |

<table>
<thead>
<tr>
<th><strong>Panel B: Relative Credit Relevance</strong>&lt;sup&gt;b&lt;/sup&gt;</th>
<th><strong>(a) IFRS-based</strong></th>
<th><strong>(b) JGAAP-based</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
<td>coefficient</td>
<td>( p )-values</td>
</tr>
<tr>
<td>( LEV_{IFRS_t} )</td>
<td>-2.7440</td>
<td>0.043**</td>
</tr>
<tr>
<td>( ROA_{IFRS_t} )</td>
<td>9.4163</td>
<td>0.320</td>
</tr>
<tr>
<td>( LEV_{JGAAP_t} )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( ROA_{JGAAP_t} )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YearFixedEffect,</td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td>constant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( Adj.R^2 )</td>
<td>0.3060</td>
<td>0.3830</td>
</tr>
<tr>
<td>( N )</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>( LEV_{IFRS_t} - LEV_{JGAAP_t} )</td>
<td>-0.8856</td>
<td>0.084*</td>
</tr>
<tr>
<td>( ROA_{IFRS_t} - ROA_{JGAAP_t} )</td>
<td>-11.5126</td>
<td>0.019**</td>
</tr>
<tr>
<td>( Adj.R^2 ) (a) – (b)</td>
<td>-0.0770</td>
<td>0.168</td>
</tr>
</tbody>
</table>
Note: This table presents the results of estimating the following OLS regressions. t-statistics are calculated using White [1980] heteroscedasticity-consistent standard errors. ***, ** and * represent two-tailed significance at the 0.01, 0.05, and 0.1 levels.

a Relative Value Relevance Model

IFRS-based: \[ P_t = a_0 + a_1 BV_{IFRS_t} + a_2 NI_{IFRS_t} + YearFixedEffect_t + \varepsilon_t \]  
JGAAP-based: \[ P_t = a_0 + a_1 BV_{JGAAP_t} + a_2 NI_{JGAAP_t} + YearFixedEffect_t + \varepsilon_t \]

Where, \( P_t \) = Market capitalization at 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 \( t \), \( YearFixedEffect_t \) = Dummy variables to control for year fixed effects (year 2011 to year 2016). The subscript \( t \) denotes the fiscal year (2010 to 2016).

b Relative Credit Relevance Model

IFRS-based: \[ Rating_t = a_0 + a_1 LEV_{IFRS_t} + a_2 ROA_{IFRS_t} + YearFixedEffect_t + \varepsilon_t \]  
JGAAP-based: \[ Rating_t = a_0 + a_1 LEV_{JGAAP_t} + a_2 ROA_{JGAAP_t} + YearFixedEffect_t + \varepsilon_t \]

Where, \( Rating_t \) = issuer credit ratings released by Rating and Investment Information, Japan Credit Rating Agency, Standard & Poor’s, Moody’s, and Fitch. 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 \( t \). \( YearFixedEffect_t \) = Dummy variables to control for year fixed effects. The subscript \( t \) denotes the fiscal year.

show that only \( LEV_{IFRS_t} \) has a statistically significant value at the 5% level (p-value = 0.043). Also, in the right-hand column under Panel B, which shows the credit rating relevance of JGAAP based accounting information, the coefficients for \( LEV_{JGAAP_t} \) and \( ROA_{JGAAP_t} \) are -1.8584 and 20.9290, respectively; this indicates that only \( ROA_{JGAAP_t} \) is statistically significant and positive at the 10% level (p-value = 0.068).

In both models, LEV is negative although the JGAAP based model shows no statistical significance. In other words, there is a tendency where higher leverage ratios corresponded to worse issuer credit ratings. In addition, although return on total assets was not statistically significant in the IFRS-based model, it has a statistically significant positive value in either case. In other words, the lower the return on total assets, the lower the issuer credit ratings.

Meanwhile, the differences between the coefficients in the two models were -0.8856 for the leverage ratio and -11.5126 for the return on total assets. This possibly indicates that while the credit rating relevance of leverage ratio is higher for the IFRS-based (\( LEV_{IFRS_t} \)) than for the JGAAP-based (\( LEV_{JGAAP_t} \)) by 0.8856, credit rating relevance of return on total assets is lower for the IFRS-based (\( ROA_{IFRS_t} \)) than for the JGAAP-based (\( ROA_{JGAAP_t} \)) by 11.5126.
However, an examination of the differences between the coefficients showed both differences to be statistically significant ($p$-value = 0.084, 0.019). This suggests that the link to credit rating relevance is stronger for the IFRS-based leverage ratios than for those based on JGAAP; however, the link to the credit rating relevance is weaker for the IFRS-based return on total assets than JGAAP-based ones. The adjusted $R$-squared was 30.60% for the IFRS model and 38.30% for the JGAAP model (a difference of 7.70%), but when we applied the Vuong test, the difference between the adjusted $R$-squared for both models had no statistical significance ($p$-value = 0.0168).

In summary, we did not find any statistically significant differences in the relative value relevance and relative credit rating relevance of accounting information based on either the IFRS or JGAAP as a whole (income statement plus balance sheet), suggesting that there exist no differences in the information content of the two models. However, 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 than for the JGAAP based, and that the credit relevance of leverage ratios are more statistically significant for the IFRS-based leverage ratios than for the JGAAP based leverage ratios.

<table>
<thead>
<tr>
<th>Variables</th>
<th>(a) Incremental Value Relevance</th>
<th>(b) Incremental Credit Relevance</th>
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</thead>
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<tr>
<td></td>
<td>coefficient</td>
<td>$p$-values</td>
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<tr>
<td>$BV_{JGAAP,t}$</td>
<td>0.6243</td>
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<tr>
<td>$BV_{DIF,t}$</td>
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<td>$NI_{JGAAP,t}$</td>
<td>15.0471</td>
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<td>$NI_{DIF,t}$</td>
<td>3.4264</td>
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<td>$LEV_{JGAAP,t}$</td>
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<td></td>
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<tr>
<td>$LEV_{DIF,t}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ROA_{JGAAP,t}$</td>
<td></td>
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<tr>
<td>$ROA_{DIF,t}$</td>
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<td>$YearFixedEffect_t$</td>
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<td>$Adj.R^2$</td>
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<td>0.4820</td>
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<tr>
<td>$N$</td>
<td>67</td>
<td>33</td>
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</table>

*Note: This table presents the results of estimating the following OLS regressions. $t$-statistics are calculated using White [1980] heteroscedasticity-consistent standard errors. *** , ** and * represent two-tailed significance at the 0.01, 0.05, and 0.1 levels.*
\[ P_t = a_0 + a_1 BV_{JGAAP_t} + a_2 BV_{DIF_t} + a_3 NI_{JGAAP_t} + a_4 NI_{DIF_t} + \text{YearFixedEffect}_t + \varepsilon_t \] 
(a)

\[ \text{Rating}_t = a_0 + a_1 LEV_{JGAAP_t} + a_2 LEV_{DIF_t} + a_3 ROA_{JGAAP_t} + a_4 ROA_{DIF_t} + \text{YearFixedEffect}_t + \varepsilon_t \] 
(b)

Where, \( P_t \) = Market capitalization at 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 \( NI_{JGAAP_t} \), \( \text{Rating}_t \) = issuer credit ratings released by Rating and Investment Information, Japan Credit Rating Agency, Standard & Poor’s, Moody’s, and Fitch. 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 \( ROA_{JGAAP_t} \), \( \text{YearFixedEffect}_t \) = Dummy variables to control for year fixed effects. The subscript \( t \) denotes the fiscal year.

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 empirical results for incremental value relevance, both \( BV_{JGAAP_t} \) and \( NI_{JGAAP_t} \) are statistically significant and positive at the 1% level (p-value = 0.001, 0.000), 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 for the JGAAP-based, indicate no statistical significance (p-value = 0.640, 0.630). This suggests that IFRS-based book value of net assets and net income may not provide as much incremental information to share price evaluation as the JGAAP based metrics.

Now, let us examine Panel (b) in Table 3, displaying the empirical results regarding incremental credit rating relevance. The coefficient for \( LEV_{JGAAP_t} \) is negative and significant at the 5% level (p-value = 0.029). Meanwhile, the coefficient for \( ROA_{JGAAP_t} \) is positive and statistically significant at the 5% level (p-value = 0.019). This means that on a JGAAP basis, the credit rating relevance of both return on total assets and leverage ratio is statistically significant.

However, the coefficient for \( LEV_{DIF_t} \), the difference in leverage ratio between the JGAAP-based and the IFRS-based, is positive at 9.84290 but not statistically significant (p-value = 0.320). On the other hand, the difference in net income between the JGAAP-based and the IFRS-based (\( ROA_{DIF_t} \)) is -58.5404, which is statistically significant at the 1% level (p-value = 0.008). This result suggests that the JGAAP-based return on assets may provide more incremental information to issuer credit ratings than that of the IFRS-based ones. In other words, this result suggests that the IFRS-based return on total assets may cause credit rating relevance to deteriorate.
6. Conclusion

This paper focused on 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, statistically significant differences were not observed in the relative value relevance and credit relevance between IFRS-based and JGAAP-based accounting information as a whole (income statement plus balance sheet).

Second, as for net income (return on assets), the IFRS-based numbers have less statistical significance in terms of value relevance (credit relevance) compared to the JGAAP-based numbers. Third, we observed no incremental value relevance for IFRS-based book value of net assets and net income compared with those based on JGAAP. In terms of credit rating relevance, we saw that IFRS-based net income may have less credit rating relevance than JGAAP-based income.

These findings suggest that IFRS adoption may be causing the value relevance and credit rating relevance of information on net income and return on assets to significantly diminish. As Hung and Subramanyam [2007] indicated, the decline in value relevance of information on net income could be significantly affected by increased measurement errors caused by enhanced fair value evaluation under the IFRS. Meanwhile, we found no evidence that accounting information based on IFRS-based balance sheet provides any incremental value relevance or credit rating relevance.

Nevertheless, this study was unable to observe any substantial differences in value relevance or credit rating relevance from accounting information as a whole (that is, income statement plus balance sheet) based either on the IFRS or JGAAP. This suggests that when looking at only partial aspects of income statement information, IFRS adoption may negatively influence or even impair the value relevance and credit rating relevance of reported figures. However, as our empirical findings are still preliminary, these findings should be interpreted carefully. In future studies, we plan to enhance reliability and possibilities of generalization of our empirical findings through increasing sample size as well as fine-tuning our theoretical suppositions and research designs.

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2 Note that Tokuga [2011] uses the term, “net asset book value model.”

3 In cases where more than one rating agencies assign each issuer credit rating, we used the most conservative credit rating. Also, 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.