

The Effects of IFRS Adoption on Earnings Predictability of Japanese Firms

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Abstract : This paper examines whether the earnings predictability of Japanese firms is higher following the adoption of International Financial Reporting Standards (IFRS) compared with firms that follow Japanese Generally Accepted Accounting Principles (JP GAAP). The latter are likely to be categorized in terms of code-law origin and stakeholder orientation along with the German GAAP, which are generally perceived to be of lower quality than IFRS. Tokuga (2011) points out that the Accounting Standards Board Japan (ASBJ) and the International Accounting Standards Board (IASB) have made substantive efforts towards convergence under the Tokyo Agreement. Although JP GAAP are said to have become almost indistinguishable from IFRS, the effect of IFRS on the financial information reported by Japanese companies has not been sufficiently clarified. It is questionable whether the accounting quality of financial reports prepared under JP GAAP is higher or lower than those prepared based on IFRS.

Given this context, this study examines whether the predictability of earnings under JP GAAP is higher than or equivalent to that under IFRS by focusing on the association between current earnings and future cash flows. Although the sample size is relatively small in the single-country setting adopted herein, this is arguably compensated for by the fact that the disparity between voluntary adoption and domestic GAAP application can be explicitly observed and earnings quality can be directly compared without concern for institutional differences.

要約 : 本稿では、国際財務報告基準 (IFRS) を採用した企業の利益の予測可能性が、日本の会計基準 (JP GAAP) に従った企業のそれに比して高いかどうかを検証している。日本の会計基準による利益は、情報提供機能の側面からIFRS下の利益より品質が低いと認識されている。徳賀 (2011) は、日本会計基準審議会 (ASBJ) と国際会計基準審議会 (IASB) が東京合意の下で収斂に向けて実質的な努力を払ってきたと指摘し、JP GAAPとIFRSとの間における相違はほぼ存在しないと主張している。他方、IFRSを採用している日本企業が報告する財務情報に対するIFRSの影響は十分に解明されていない。

以上の現状認識の下、本研究では、利益の予測可能性に焦点をあて、JP GAAP下の利益の質が、IFRS下の利益の質に比して高いか否かを明らかにしている。

JEL Classification : M40; M41

Keywords : Earnings predictability, International Financial Reporting Standards (IFRS), Japanese Generally Accepted Accounting Principles (JP GAAP)

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1. Introduction

The objective of this study is to investigate the relationship between the use of different accounting standards (or techniques) and earnings behavior. As (Lev 1983) points out, “current earnings changes often affect operating decisions by signaling a change in future cash flows. Thus, for example, an earnings decline might signal management a decrease in future cash flows, leading to a lower optimal level of capital investments, advertising and R&D outlays.”

This paper compares earnings computed under International Financial Reporting Standards (IFRS) with those computed under the Japanese Generally Accepted Accounting Principles (JP GAAP) to investigate the effect of IFRS adoption on the earnings and earnings predictability of Japanese firms.

Japan began allowing certain listed companies to use IFRS for their consolidated reporting for fiscal years ending on or after 31 March 2010 (BAC 2009)¹. In June 2013, the Japanese government called for the use of IFRS to increase to about 300 companies by the end of 2016². Furthermore, the government's 2015 ‘Japan Revitalization Plan’ encouraged the use of IFRS and the number of companies adopting IFRS has grown rapidly ever since. As of June 2019, 199 listed and 2 unlisted companies had adopted IFRS and 16 more companies had announced their intention to adopt IFRS (FSA 2019). According to the FSA (2019), this amounts to 35.6% (over 2 trillion USD) of Japan market capitalization as of June 2019 (Table 1).

The International Accounting Standard Board (IASB) states that the main purpose of its work is “to develop, in the public interest, a single set of high quality, understandable, enforceable and globally accepted financial reporting standards based on clearly articulated principles.” The IASB have argued that application of IFRS would improve the quality of information.

Skeptics of the use of IFRS under the one-size-fits-all principle suggest that adopting high quality standards might be a necessary action but not a sufficient one (Ball et al. 2003; Christensen et al. 2015).

Opponents of a single set of standards suggest that a system of multiple sets of standards would offer advantages in terms of competition among standards (Sunder 2001, 2007). Atwood et al. (2011) conclude that the direct effect of IFRS adoption on the quality of U.S. financial reporting is likely to be small because US GAAP are of high quality. They suggest that the difference in the ability to predict future cash flows supports calls for allowing competition between IFRS and US GAAP rather than requiring all U.S. firms to adopt IFRS or converging IFRS and US GAAP (Sunder 2001, 2007; Kothari et al. 2010).

JP GAAP are likely to be categorized in terms of code-law origin and stakeholder orientation along with the German GAAP (Mueller et al. 1999), which are generally perceived to be of lower quality than IFRS (e.g., Leuz and Verrecchia 2000). On the other hand, as Tokuga (2011, p. 99) points out, the Accounting Standard Board of Japan (ASBJ) and the IASB have made substantive efforts towards convergence under the Tokyo Agreement and JP GAAP are said to have become almost indistinguishable from IFRS. However, the effect of IFRS on the financial information of Japanese companies has not been sufficiently clarified yet. Thus, it is questionable whether the accounting quality of financial reports prepared under JP GAAP is higher or lower than that prepared according to IFRS.

Given this context, the objective of this study is to examine whether the predictability of earnings under JP GAAP is better or equivalent to that under IFRS by focusing on the association between current earnings and future cash flows. Although the sample size is relatively small in the single-country setting adopted herein, this is arguably compensated by the fact that the differences between voluntary adoption and domestic GAAP application can be explicitly observed and earnings quality can be directly compared without concern for institutional differences.

The remainder of the paper is organized as follows. Section 2 reviews the salient literature and develops the hypothesis. Section 3 discusses details of the Japanese accounting system and differences

Table1. Number of Japanese Firms Adopting IFRS*

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019/ 6
Number of firms	3	1	6	12	28	44	33	33	37	16
Total	3	4	10	24	52	96	129	162	199	215

Source: FSA (2019) p. 3. *Includes firms that have officially announced their intention to adopt IFRS.

between JP GAAP and IFRS. Section 4 delineates the methodology and describes the data before providing summary statistics. Section 5 focuses on exploring and interpreting the empirical results. Section 6 provides the results of robustness tests. Finally, conclusions are offered in Section 7.

2. Institutional Background

2.1. Traits of the Japanese Accounting System

Since Japan is generally classified as a code-law country (e.g., Ball et al. 2000; La Porta et al. 1998), accounting standards predominantly originate at the governmental level. According to Ball et al. (2003), the traits of code-law countries can be summarized as follows. Governments establish and enforce national accounting standards typically with representation from major political groups such as labor unions, banks, and business associations. Since current-period income tends to be viewed as a pie to be divided among major groups, the demand for accounting income arises more from compliance with tax codes, dividends, and bonus payout policies, all of which affect preparers' choices and reduce the sensitivity of accounting income to changes of market value (Ball et al. 2003).

Japan does not exhibit all traits of the code-law model. First, the Japanese government is generally not directly involved in setting accounting standards. Labor unions have little influence on standard-setting and corporate governance. To some extent, Japan exhibits traits of the market-oriented common-law model because there is demand for high quality financial reporting, and disclosure is enforced in a primarily market system. Furthermore, when Japanese firms adopt IFRS, their earnings would exhibit more market-oriented traits that could induce higher earnings quality than before.

Second, the uniqueness of the Japanese accounting system is primarily a function of the integration of the traditional Japanese accounting system and its related infrastructures (Tsunogaya and Chand 2012). Japan has adopted a single-reporting regime in which accounting standards and the Corporation Tax Act (the Tax Act) are highly dependent. The principles of expense recognition and the Definite Settlement of Accounts approach (or *kakuteikessansyugi*, hereafter 'the Settlement approach') permeate accounting practices. BAC (2013, pp. 4-6) states that Japan continues to investigate the most appropriate method for its accounting system and the specific conditions of the Japanese economy, such as the use of the Settlement approach. To protect its relevant peripheral system, Japan takes a separation approach to the consolidation and non-consolidation of financial statements, called *rentanbunri*.

Third, the ASBJ issued the first two Japan Modified International Standards (JMIS). Following the publication of The Present Policy on the Application of IFRS (the Present Policy), the ASBJ established the "Working Group for the Endorsement of IFRS" in August 2013. Based on the discussions therein, the ASBJ issued the JMIS, which altered the IFRS to address two matters (goodwill and reclassification) in June 2015. The ASBJ posits that goodwill constitutes the cost of investment, should be amortized on a systematic basis³, and recognized as an expense so that it corresponds with the operating result after business combination.

Last, based on Yamaji (2016), when examining individual standards, the following 10 items are listed as accounting standards that differ between JP GAAP and IFRS: (1) other comprehensive income and reclassification, (2) fair value measurement, (3) development cost accounting, (4) goodwill accounting, (5) reversal of an impairment loss, (6) foreign

exchange accounting, (7) the presentation of non-controlling interest, (8) employee benefits accounting, (9) revenue recognition⁴, (10) deferred tax accounting. Yamaji (2016, p. 321) points out that among these items, fair value measurement, development cost accounting, goodwill accounting, and employee benefits accounting may have a significant impact on profit. These items will be scrutinized in what follows to inform model development.

2.2. Defining Earnings Quality

In recent years, earnings quality has been “in the limelight as a research subject in certain associations such as SEC, American Accounting Association (AAA), American Institute of Certified Public Accountants (AICPA), etc.” (Ichinomiya 2008, p. 1). Though the concept of earnings quality is fundamental in accounting (Dichev et al. 2013), “there is neither an agreed-upon meaning assigned to the phrase nor a generally accepted approach to measuring earnings quality” (Schipper and Vincent 2003, footnote 2).

For instance, Schipper and Vincent (2003) note that time-series constructs associated with earnings quality include persistence, predictive ability, and variability⁵. Furthermore, Dichev et al. (2013, p. 2) delineate the list of candidate measures of earnings quality as follows: earnings persistence, predictability, asymmetric loss recognition, various forms of benchmark beating, smooth earnings, magnitude of accruals, income-increasing accruals, absolute value of discretionary or abnormal accruals, and the extent to which accruals map into cash flows⁶. After extensively reviewing the literature on earnings quality vis-à-vis the current situation in Japan, Ichinomiya (2008) states that important properties of earnings quality are the persistency of earnings, the conservatism of accounting processes, and the predictability of future profits.

Given that the definition and measures of earnings quality are so broad, this paper focuses only on the property of predictive ability⁷ for analyzing the association between earnings and future cash flows. The reason for this is as follows. First, such predictability is linked to decision usefulness and is

therefore idiosyncratic to a given user’s particular prediction process and goal (Schipper and Vincent 2003, p.100). Second, since the subject of this paper is the earnings quality of Japanese listed companies around IFRS adoption, focus is duly placed on the IASB’s Conceptual Framework (the Framework). The Framework emphasizes that existing and potential investors, lenders, and other creditors need information to help them assess the prospects for future net cash inflows to an entity (IASB 2010, OB3). Third, accounting earnings reflect cash flow forecasts (Dechow et al. 1998) and financial reporting should provide information that is helpful to users for predicting future cash flows (Atwood et al. 2011; the pretext of the Frameworks⁸).

3. Review of Prior Research and Hypothesis Development

3.1. Review of Prior Research

This sub-section reviews the literature about earnings quality in the context of IFRS adoption in German and Japan, and the predictability of future cash flows.

3.1.1. Quality in the context of IFRS

One stream of literature compares IFRS accounting numbers to those under domestic GAAP in certain countries to identify changes and differences in accounting quality⁹. Some prior studies document accounting quality improvements (e.g., Barth et al. 2008; Hung & Subramanyam 2007) around voluntary IFRS adoption.

Hung & Subramanyam (2007) examine a sample of German firms that adopted International Accounting Standards (IAS) between 1998 and 2002. They compare accounting numbers reported under German GAAP with those under IAS for the same firm years and find that total assets and book value of equity, as well as variability of book value and income, are significantly higher under IAS than under German GAAP. In addition, they document that IAS adjustments to book value are generally value relevant. Furthermore, they compare the value relevance of the two accounting standards

by regressing stock prices on book values and net incomes. The results of that analysis suggest that book values of equity yield a higher coefficient under IAS and net incomes yield a higher coefficient under German GAAP.

In contrast, Bartov et al. (2005) find that German GAAP earnings exhibit a higher coefficient in a regression of price on book value and earnings. The inconsistency between the findings of Bartov et al. (2005) and those of Hung and Subramanyam (2007) can be caused by either omission of the book value of equity in the regression model employed by Bartov et al. (2005) or simply be reflective of empirical differences embodied in the data used in each study¹⁰.

Christensen et al. (2015) reexamine the evidence provided by Barth et al. (2008)¹¹ with German voluntary adopters between 1998 and 2005. Following the methodology of Barth et al. (2008), they find that voluntary adopters exhibit significantly lower earnings management, more timely loss recognition, and greater value relevance, while mandatory adopters exhibit little improvement in accounting quality. They conclude that adoption of IFRS does not necessarily lead to higher quality accounting, at least not when the preparers have no incentive to become more transparent in their reporting (Christensen et al. 2015, p. 33)¹².

Atwood et al. (2011) and Palea & Scagnelli (2017) assess the earnings predictability of future cash flows. Atwood et al. (2011) examine whether earnings persistence and the association between current accounting earnings and future cash flows differ for firms reporting under IFRS versus domestic GAAP and US GAAP. There is no discernable difference in the persistence of positive earnings across firms reporting under IFRS and US GAAP. With their results, they suggest that the quality of U.S. financial reporting may decline with IFRS adoption, and users of financial statements should consider the lower association between current earnings and future cash flows under IFRS as compared with US GAAP in their prediction models (Atwood et al. 2011)¹³.

Palea & Scagnelli (2017) investigate the role of earnings computed under IFRS in predicting future cash flow and compare IFRS and domestic GAAP

based on European Directives. They focus on how effectively net income, comprehensive income, and its related components predict future cash flows under IFRS within the banking industry. Their results suggest that net income and comprehensive income reported under IFRS are superior at predicting future cash flows compared with domestic GAAP.

Findings from prior research comparing accounting quality are mixed, depending on matched samples applying US GAAP or non-US domestic GAAP. In the same manner, earnings reported under IFRS may differ from those reported under JP GAAP in terms of current earnings predict ability of future cash flows. If JP GAAP have become indistinguishable from IFRS as Tokuga (2011) asserts, there would be no difference between the predictability of earnings reported under JP GAAP and that under IFRS.

3.1.2. Literature about IFRS-based accounting quality in Japan¹⁴

Yamaji (2016) examines the value relevance of net income information for 47 Japanese voluntary adopters as of March 2015 based on the return model of Harris & Mueller (1999). His analysis yields three key findings: (1) net income under IFRS is larger than that under JP GAAP, (2) information on net income under IFRS is positively relevant with return, and (3) when net income under IFRS is greater than that under JP GAAP, net income under IFRS is highly relevant with return. But he couldn't find that change in net income under IFRS is relevant with return.

Masumura (2016) examines financial statement numbers and their quality under both IFRS and JP GAAP for the year of adoption and the year before. Based on a sample of 84 firms that voluntarily adopted IFRS from 2010 to 2015, she investigates the effects of the adoption on the relative and incremental value relevance of book values and net income. The key results of the analysis can be summarized as follows: (1) there is no significant difference in value relevance between IFRS and JP GAAP; and (2) there is no significant difference in timeliness of net income between IFRS and JP GAAP.

Kim & Koga (2017) examine which accounting information reported under either IFRS or JP GAAP

Table2. Comparison of previous research

	Masumura (2016)	Kim & Koga (2017)	Yamaji (2016)
Time periods	December 2015	December 2016	March 2015
Firm's number	84 firms	67 firms	47 firms
Dependent variable	Change in market capitalization	Market capitalization	Change in return
Proxies	BPS, EPS	Book value, Net income	EPS (JP GAAP, IFRS)

Source: compiled by the author based on each document.

better explains total market capitalizations of firms' common stock and credit ratings. They find both value and credit rating relevance of net income measures under IFRS were significantly lower than those under JP GAAP. However, no significant difference in the relative value relevance and relative credit rating relevance of accounting information¹⁵ based on either IFRS or JP GAAP are discerned. With these findings, they conclude that IFRS adoption could impair both value relevance and credit rating relevance of net income information.

This sub-section reviews the previous research on voluntary application of IFRS in Japan. Studies that comparatively analyze the value relevance of JP GAAP and IFRS reported different results. While Yamaji (2016) finds IFRS-based net income information is positively relevant with return in general, Masumura (2016) finds no significant difference in value relevance. Furthermore, Kim & Koga (2017) find that value and credit rating relevance of net income under IFRS is significantly lower than those under JP GAAP.

Most of literatures in Japan are focus on relevance, and only few literatures analyze the ability of IFRS-based earnings information to predict future cash flows. Although some literatures examine the predictability of net income or comprehensive income (e.g., Wakabayasi 2009; Moriwaki 2016), the data based on IFRS are excluded.

3.2. Summary and Hypothesis Development

A number of studies have sought to explore the premise that changing accounting standards from domestic GAAP to IFRS leads to more informative or more comparable financial reporting. Although it is not a completely consistent result, the following can

be pointed out. While there is no significant difference in the quality of accounting information between US GAAP and IFRS, the accounting quality between domestic GAAP and IFRS shows that that of IFRS is more dominant. However, focusing on studies on the accounting quality of Japanese firms, the effects of IFRS adoption are equivocal.

For example, while Masumura (2016) finds no significant differences between the regimes in terms of value relevance or timeliness, Kim & Koga (2017) provide results that are against IFRS adoption. Based on their results, Kim & Koga (2017) assert that IFRS adoption can impair both value relevance and credit rating relevance of net income information of Japanese firms. In contrast, Yamaji (2016) provide results in favor of IFRS adoption.

One plausible reason is that studies use different proxies, time periods, and variables which may compromise their inter-comparability (Barth et al. 2008)¹⁶. Table 2 shows the comparison with Masumura (2016), Kim & Koga (2017), and Yamaji (2016). Since all of them examine the value relevance, there are only insignificant differences such as total amount or balance amount, total amount or scaled amount. In the case of Yamaji (2016), since the analysis year is early, the sample is small, and the return is used as the dependent variable, which may induce the different result. While there is little that can be said clearly about the impact of IFRS adoption, it is obvious that more research on the accounting quality of Japanese IFRS adopters is needed from different perspective.

The financial reporting objective noted in the Conceptual Framework of the IASB seeks to provide users with decision-relevant information. Based on the IASB's assertion, the information should

contribute to evaluating a firm's ability to generate cash and cash equivalents and should therefore be useful for predicting the timing and changes in its financial positions (IASB 2010, paras. 12-14). The IASB issue principles-based standards and take steps to remove allowable accounting alternatives, requiring accounting measurements that better reflect a firm's economic position and performance. After such implementation, it states that IFRS adoption should lead to enhanced earnings quality.

The literatures provide evidence in support of the IASB's position. For instance, Barth et al. (2008, p. 468) point out that accounting quality could increase if these actions by the standard setter limit management's opportunistic discretion in determining accounting amounts by, for example, managing earnings. Earnings quality could also increase because of changes in the financial reporting system contemporaneous with IFRS adoption through more rigorous enforcement. Limiting alternatives can also increase accounting quality by virtue of constraining management's opportunistic discretion in determining accounting amounts (Ashbaugh and Pincus 2001).

Since a goal of the IASB is to develop an internationally acceptable set of high quality financial reporting standards, an assumption of those studies is that the level of IFRS might be higher than that of domestic GAAP including JP GAAP. Since the decision usefulness approach that underpins IFRS is cash flow oriented (Hujii 2019, p. 89), the ability of companies to create cash is emphasized and useful information for investors is the ability to forecast cash flows. From these perspectives, earnings of Japanese companies computed under IFRS would exhibit more predictable future cash flows comparing to those computed under JP GAAP.

On the other hand, as the results of that Japanese prior efforts towards convergence have increased the quality of JP GAAP and its international comparators, JP GAAP have achieved the equivalent level to IFRS as the European Commission (EC) has concluded (Tokuga 2011; BAC 2013). As we reviewed above, in terms of value relevance some research reports there is no significant difference between companies

applying JP GAAP and IFRS. Besides, as Kvaal & Nobes (2012) assert, despite adoption of IFRS, domestic GAAP patterns of practice still tend to continue.

From these perspectives, I premise there would be no substantive differences in earnings predictability of future cash flows reported under these two standards, therefore formulate a null hypothesis as follows.

H0: There is no statistically significant difference between IFRS-based earnings and JP GAAP-based earnings in terms of the predictability of future cash flows.

4. Research design

4.1. Empirical models

This paper investigates the ability of earnings under IFRS to provide useful information to predict future cash flows. Associations between current earnings and future cash flows are quantified following Atwood et al. (2011) and Palea and Scagnelli (2017). Atwood et al. (2011) examined the ability of current earnings to explain future cash flows up to one lag of time, while Palea and Scagnelli (2017) used up to three lags of earnings. This paper investigates the predictability of earnings for one-year forward cash flows due to data constraints.

Model (1) is used to test for differences in earnings predictability of future cash flows.

Model (1)

$$\begin{aligned}
 CF_{t+1} = & \alpha_0 + \alpha_1 IFRS_t + \alpha_2 EARN_t + \alpha_3 LOSS_t \\
 & + \alpha_4 IFRS_t \times EARN_t \\
 & + \alpha_5 IFRS_t \times EARN_t \times LOSS_t \\
 & + \alpha_6 GW_t + \alpha_7 IMPA_t + \alpha_8 DEP_t \\
 & + \alpha_9 FSALE_t + \alpha_{10} BTDT_t \\
 & + \alpha_{11} LogTA_t + \alpha_{12} LEV_t + Year\ Dummy \\
 & + Ind. Dummy + \varepsilon_t
 \end{aligned}$$

Where,

CF = cash flows from operation scaled by initial total assets;

$IFRS$ = indicator set to one for firms in the IFRS

sample, zero otherwise;

EARN = operating income scaled by initial total assets;

LOSS = indicator set to one if *EARN* is negative in year *t*, zero otherwise;

GW = goodwill scaled by initial total assets;

IMPA = impairment loss scaled by initial total assets;

DEP = depreciation cost scaled by initial total assets;

FSALE = foreign sales scaled by gross sales;

BTD = net income before extraordinary items – (tax expense 30%)

LogTA = natural logarithm of total assets;

LEV = total liabilities divided by the book value of equity;

Year Dummy = year fixed effects (year 2015 to year 2017).

Ind. Dummy = industry fixed effects (TOPIX Sector Indices)

The control variables in model (1) are justified as follows:

Goodwill. Goodwill accounting is a major difference between IFRS and JP GAAP. Goodwill under IASB is capitalized and impaired unlike the amortization under JP GAAP. From that perspective, firms that have more business combinations appear more likely to adopt IFRS than those that have less business combinations (Inoue & Ishikawa 2014; Kikuta et al. 2018). Notably, Inoue (2017) reveals that significant reductions in SG&A led to an increase in net income because non-amortization of goodwill and actuarial differences related to retirement benefit expenses are unrecognized as expenses in IFRS, SG&A is reduced, and net income increases.

Impairment loss. Under JP GAAP, Japanese firms amortize goodwill regularly and recognize an impairment loss if the impairment test shows a decrease in value. On the other hand, managers have discretion to delay the recognition of impairment losses and increase short-term profits under IFRS (Amano 2018, p. 85).

Depreciation cost. Depreciation of long-lived tangible assets and amortization of intangible assets are

significant predictors of future cash flows (Barth et al. 2001, p. 57).

Foreign Sales. Firms with a higher ratio of overseas sales are more likely to adopt IFRS because of the need to improve management efficiency through integration with overseas subsidiaries (Gassen & Sellhorn 2006; Amano 2018).

Book-tax differences (BTD). Tax regulations affect accounting choices (Dechow et al. 2010 p. 385). Since Japan has applied the Definite Settlement of Accounting Approach, the differences between book-income and tax-income (hereafter, 'BTD') could be affected to a considerable extent following adoption (Kang 2012).

Total assets (LogTA) and *Leverage (Lev)* are added to control for size and capital structure (Inoue & Ishikawa 2014; Christensen et al. 2015; Masumura 2016).

The principal coefficients of interest are generated with respect to $IFRS_t \times EARN_t$. If α_4 is significant, this suggests that the predictability of earnings for future cash flows under IFRS is higher than that under JP GAAP.

4.2. Sample Selection

The sample consists of 210 firm-years of data for Japanese industrial firms that adopted IFRS before fiscal year (FY) 2015, with data spanning from FY 2014 to FY 2018. The following procedures are used to identify the sample and collect the necessary data. Excluded are (1) companies for which there are missing data in terms of firm-year observations in Nikkei Needs; (2) companies that adopted IFRS when they were listed on the stock exchange for the first time; (3) companies that switched from US GAAP to IFRS¹⁷; (4) observations for any variables which lie outside the 0.5-99.5 percent range of the relevant variable's sample distribution. Through the selection process, 210 IFRS-applied firm-years data are obtained representing the treatment group along with 4069 JP GAAP-applied firm-years data representing the control group.

Table 3 categorizes firm-years based on the industry group classification by the Tokyo Stock Exchange. The industry with the largest number

Table3. Distribution of sample firms by year, industry group (n=210firm-years)

Number of firm-years switching from JP GAAP to IFRS, by industry group			
Industry Group		Industry Group	
Foods	8	Chemicals	16
Oil Products	1	Rubber Products	5
Glass & Ceramics Products	6	Nonferrous Metals	6
Iron & Steel	3	Retail Trade	15
Machinery	14	Real Estate	3
Electric Appliances	27	Land Transportation	3
Transportation Equipment	23	Information & Communication	5
Precision Instruments	12	Services	37
Pharmaceutical	26	-	-
Total	120	Total	90

*: The industry sectors are in accordance with the classification by the Tokyo Stock Exchange, which consists of 33 industry sectors (TOPIX Sector Indices).

of firm-years is services at 37, while that with the fewest is the oil products industry at 1.

Model (2)

$$IFRS_t = \text{logit} (\beta_0 + \beta_1 EARN_t + \beta_2 GW_t + \beta_3 IMPA_t + \beta_4 DEP_t + \beta_5 FSALE_t + \beta_6 BTD_t + \text{Year Dummy} + \text{Ind. Dummy})$$

Next, I construct a matched sample through the propensity score matching process (nearest-neighbor approach) which involves choosing a sample from the control group that matches the treatment group using model (2). The following six variables are considered for estimating IFRS adoption factors. The main reasons for these choices are described above and additional explanation is as follows.

First, *Operating income*. As Inoue (2017) provides results to suggest that significant reductions in SG&A led to an increase in net income, operating income under IFRS would be larger than that under JP GAAP. Ishikawa (2015) also provides evidence indicating that adoption has a profit boosting effect. Second, *Goodwill*. Firms that have more business combinations appear to be more likely to adopt IFRS (Inoue & Ishikawa 2014; Kikuta et al. 2018). *Impairment loss*. Managers have discretion to delay the recognition of impairment losses and increase short-term profits under IFRS (Ishikawa 2015; Amano 2018). *Depreciation cost*. The number of Korean companies changing depreciation method increases around the adoption (Kang 2012).

4.3. Descriptive statistics

Panels A, B, and C of Table 4 report descriptive statistics for variables when the entire sample is considered for propensity score matching, followed by the IFRS sample, and then the JP GAAP sample, respectively. In all panels, cash flows (CF) and earnings (EARN) are positive, in mean and median terms. Comparing panels B and C, means and medians of CF and EARN calculated under IFRS are larger than those under JP GAAP. These differences are statistically significant according to the results of univariate comparisons (mean CF t-statistic = -3.541 and $p < 0.01$, mean EARN t-statistic = -4.285 and $p < 0.01$).

In the same manner, means and medians of other variables, except LOSS and book-tax differences (BTD), under IFRS are larger than those under JP GAAP. This is generally consistent with the evidence of Masumura (2016). The SD of EARN under IFRS is higher than that under JP GAAP, whereas the SD of negative EARN under JP GAAP is higher than that under IFRS, suggesting higher variability in EARN among IFRS firms and in negative EARN among JP GAAP firms.

Table 5 presents the results of Pearson (below the diagonal) and Spearman (above the diagonal) bivariate correlation analyses. Cash flows are significantly and positively correlated with EARN, goodwill (GW), impairment loss (IMP), and depreciation cost (DEP). Earnings are significantly and positively (negatively) correlated with GW (total assets (LogTA)) in the Pearson correlation

Table4. Descriptive statistics for propensity score matching

Panel A: All Sample 4279 firm-years										
	CF_{t+1}	EARN	LOSS	GW	IMP	DEP	FSALE	BTD	LogTA	LEV
Mean	0.071	0.068	0.019	0.016	0.003	0.032	0.196	-0.003	11.556	1.171
SD	0.054	0.052	0.137	0.049	0.008	0.021	0.256	0.025	1.432	0.968
Min.	-0.162	-0.081	0	0	0	0.000	0	-0.227	7.954	0.098
Med.	0.068	0.058	0	0	0.000	0.029	0	-0.002	11.426	0.885
Max.	0.310	0.450	1	0.527	0.101	0.303	0.908	0.116	15.769	7.573
Panel B: IFRS Adopted 210 firm-years										
Mean	0.084	0.084	0.005	0.101	0.005	0.043	0.391	-0.002	13.213	1.218
SD	0.053	0.058	0.069	0.133	0.011	0.033	0.315	0.037	1.416	1.077
Min.	-0.157	-0.017	0	0	0	0.002	0	-0.205	8.129	0.121
Med.	0.084	0.072	0	0.040	0.001	0.039	0.396	0.001	13.338	0.925
Max.	0.237	0.340	1	0.527	0.075	0.292	0.908	0.077	15.731	6.250
Panel C: JP GAAP applied 4069 firm-years										
Mean	0.071	0.068	0.020	0.012	0.003	0.031	0.186	-0.003	11.471	1.169
SD	0.054	0.052	0.140	0.036	0.008	0.021	0.248	0.025	1.380	0.963
Min.	-0.162	-0.081	0	0	0	0.000	0	-0.227	7.954	0.098
Med.	0.068	0.057	0	0	0.000	0.028	0	-0.003	11.361	0.882
Max.	0.311	0.450	1	0.409	0.101	0.303	0.908	0.116	15.769	7.573

Table5. Pearson (below the diagonal) and Spearman (above the diagonal) correlations (n=4279 firm-years)

	CF_{t+1}	EARN	LOSS	GW	IMP	DEP	FSALE	BTD	LogTA	LEV
CF_{t+1}		0.476	-0.142	0.106	0.052	0.340	0.036	0.066	-0.038	-0.206
EARN	0.478		-0.238	0.111	-0.079	-0.001	0.006	0.028	-0.061	-0.316
LOSS	-0.145	-0.249		-0.050	0.087	-0.021	0.012	-0.180	-0.069	0.030
GW	0.085	0.142	-0.017		0.176	0.097	0.055	-0.157	0.177	0.076
IMP	0.066	-0.043	0.158	0.086		0.184	-0.019	-0.045	0.174	0.125
DEP	0.312	0.059	-0.023	0.061	0.158		0.208	0.071	0.137	0.034
FSALE	0.027	-0.011	0.023	0.012	-0.003	0.190		0.212	0.239	-0.102
BTD	0.085	0.018	-0.261	-0.101	-0.094	0.038	0.155		0.204	0.019
LogTA	-0.074	-0.157	-0.068	0.078	-0.018	0.093	0.248	0.191		0.177
LEV	-0.185	-0.276	0.048	0.048	0.082	-0.001	-0.094	0.014	0.186	

Notes: Bolded text indicates that the correlation is significant at $p < 0.01$.

analysis. Furthermore, GW and IMP are significantly correlated with cash flows, earnings, and negative earnings in the Spearman correlation analysis. Finally, BTD is significantly correlated with all variables except earnings according to the Spearman results.

5. Empirical Results

Table 6 shows the results of the logit IFRS adoption model in model (2). I find that the coefficients of GW, DEP, and FSALE are highly significant, with a positive sign, suggesting that the demand for adopting IFRS is greater for firms with more

goodwill, higher depreciation costs, and greater exposure to foreign markets. The pseudo- R^2 of the model is moderate (29.6%), suggesting that the logit model explains a reasonable portion of a firm's decision to voluntarily adopt IFRS.

Table 7 shows descriptive statistics for matched data constructed for 210 firm-years under IFRS and JP GAAP, after nearest neighbor matching. While mean CF of IFRS is smaller than that of JP GAAP, median CF of IFRS is larger than that of JP GAAP. Furthermore, mean and median EARN of IFRS are larger than those of JP GAAP. In terms of EARN, these results are consistent with Inoue (2017) who shows that net income reported under IFRS tends to

Table6. Results of the Logit Regression

$$IFRS_t = \text{logit} (\beta_0 + \beta_1 EARN_t + \beta_2 GW_t + \beta_3 IMPA_t + \beta_4 DEP_t + \beta_5 FSALE_t + \beta_6 BTD_t + \text{Year dummy} + \text{Industry dummy})$$

IFRS	Coefficient (z-statistics)
EARN	1.168 (0.68)
GW	15.880 (13.57) ***
IMPA	9.138 (1.10)
DEP	12.351 (3.61) ***
FSALE	2.255 (5.67) ***
BTD	-0.360 (-0.43)
Intercept	-4.149 (-3.94) ***
Year Dummies	Included
Industry Dummies	Included
Observations	3,480
Pseudo-R ²	0.296

Notes: All variables are defined as in 4.1.

*** p<0.01, ** p<0.05, * p<0.1. Z-statistics for coefficients are in ().

Table7. Descriptive statistics of matched samples for regression analysis

Panel A-1: IFRS Adopted 210 firm-years										
Mean	CF _{t+1}	EARN	LOSS	GW	IMP	DEP	FSALE	BTD	LogTA	LEV
Mean	0.084	0.084	0.005	0.101	0.005	0.043	0.391	-0.002	13.213	1.213
SD	0.053	0.058	0.069	0.133	0.011	0.033	0.315	0.037	1.416	1.077
Min.	-0.157	-0.017	0	0	0	0.002	0	-0.205	8.129	0.121
Med.	0.084	0.072	0	0.040	0.001	0.039	0.396	0.001	13.338	0.925
Max.	0.237	0.340	1	0.527	0.075	0.292	0.908	0.077	15.731	6.250
Panel A-2: JP GAAP Applied 210 firm-years										
Mean	0.088	0.069	0.038	0.087	0.007	0.147	0.415	-0.005	11.806	1.067
SD	0.132	0.059	0.192	0.128	0.017	0.035	0.285	0.036	1.381	0.716
Min.	-0.074	-0.023	0	0	0	0.004	0	-0.100	9.050	0.111
Med.	0.075	0.057	0	0.014	0.001	0.036	0.433	-0.005	11.647	0.878
Max.	1.488	0.358	1	0.395	0.082	0.225	0.897	0.082	15.520	3.797
Panel B: Pearson correlation matrix (420 firm-years)										
Mean	CF _{t+1}	EARN	IFRS	LOSS	GW	IMP	DEP	FSALE	BTD	LogTA
EARN	0.273									
IFRS	-0.070	-0.021								
LOSS	-0.093	-0.190	-0.080							
GW	-0.012	0.341	0.018	-0.053						
IMP	0.051	0.340	-0.090	0.077	0.249					
DEP	0.096	0.419	-0.085	-0.039	0.094	0.359				
FSALE	0.120	-0.200	-0.074	0.055	-0.332	-0.106	0.058			
BTD	0.097	0.073	0.041	-0.148	-0.176	-0.125	-0.082	0.218		
LogTA	-0.046	-0.025	0.486	-0.094	-0.133	0.009	-0.010	0.162	0.282	
LEV	-0.189	-0.257	0.080	-0.034	0.104	0.055	0.003	-0.161	-0.147	0.062

Notes: Bolded text indicates that the correlation is significant at $p < 0.01$.

be higher due to the reduction of SG&A. While the mean and median of LOSS, IMP, DEP, and foreign sales (FSALE) are smaller under IFRS than those under JP GAAP, the mean and median of GW, total assets (LogTA), leverage (LEV) are higher where IFRS is applied compared with where JP GAAP is applied.

Moreover, SDs of EARN, LOSS, IMP, and DEP are higher with JP GAAP compared with IFRS; but SDs of GW, FSALE, BTD, LogTA, and LEV are higher under IFRS compared with JP GAAP. Although SDs of FSALE in both IFRS and JP GAAP are higher than those of other variables, Mean and Median of FSALE are close to each other.

Panel B of Table 7 presents the results of Pearson correlation analyses for matched samples. CF is significantly and positively (negatively) correlated with EARN (LEV). Furthermore, EARN is significantly and positively (negatively) correlated with GW, IMP, and DEP (LOSS, FSALE, and LEV). GW is significantly and positively correlated with IMP. Finally, BTD is significantly and positively correlated with total assets (LogTA).

Table 8 shows the results of associations between current earnings and future cash flows reported under IFRS and JP GAAP. In general, results suggest that earnings and negative earnings under IFRS are better able to predict future cash flows. Although the Adjusted R^2 of the model is slightly lower (11.8%), the regression model has explanatory power the association between earnings and future cash flows.

In detail, the coefficient for $IFRS \times EARN$ on one-year-ahead cash flows is significant at the 5% level (coefficient = 0.177 and t-statistic = 2.07), indicating that earnings under IFRS are significantly positively associated with future cash flows. Moreover, the association between current-year losses ($IFRS \times EARN \times LOSS$) and future cash flows is significant at the 10% level (coefficient = -6.230 and t-statistic =

-1.96).

The results are generally consistent with Atwood et al. (2011) and Palea and Scagnelli (2017), suggesting that earnings reporting under IFRS have higher predictability for next-period cash flows than earnings under JP GAAP. Taken as a whole, the null hypothesis for the research is rejected.

6. Robustness analysis

I perform two robustness tests to examine whether the results are sensitive to alternative variables. First, I use profit before tax (NIBT) instead of operating income. Table 9 shows the results from regression model (3). The coefficient of $IFRS \times NIBT_t$ is positive and statistically significant at the 5% level (coefficient = 0.166 and t-statistic = 2.07). This suggests that profit before tax calculated under IFRS exhibits higher predictability than that under JP GAAP.

Second, I test model (4) with 2-year average future cash flows to examine the ability of operating income to predict long-term future cash flows. The coefficient of $IFRS \times EARN_t$ is positive and statistically significant at the 10% level (coefficient = 0.622 and

Table8. Results of Regression with matched samples

$$CF_{t+1} = \alpha_0 + \alpha_1 IFRS + \alpha_2 EARN_t + \alpha_3 LOSS + \alpha_4 IFRS \times EARN_t + \alpha_5 IFRS \times EARN_t \times LOSS + \alpha_6 GW_t + \alpha_7 IMPA_t + \alpha_8 DEP_t + \alpha_9 FSALE_t + \alpha_{10} BTD_t + \alpha_{11} LogTA_t + \alpha_{12} LEV_t + Year\ dummy + \varepsilon_t$$

CF_{t+1}	Coefficient (t-statistics)
IFRS	-0.019 (-2.010) **
EARN	0.157 (2.39) **
LOSS	-0.047 (-1.99) **
IFRS×EARN	0.177 (2.07) **
IFRS×EARN×LOSS	-6.230 (-1.96) *-
GW	-0.007 (-0.34)
IMPA	0.077 (0.42)
DEP	-0.047 (-0.63)
FSALE	0.056 (2.81) ***
BTD	0.073 (0.92)
LogTA	-0.001 (-0.72)
LEV	-0.004 (-1.22)
Constant	0.094 (4.08) ***
Year Dummies	Included
Observations	420
Adj. R-squared	0.118
Highest (Mean) VIF	4.29 (1.90)

Notes: All variables are defined as in 4.1.

*** p<0.01, ** p<0.05, * p<0.1. T-statistics for coefficients are in ().

Table 9. Results of Robust Test

	Model (3): CF_{t+1}	Model (4): CF_AV
Model (3) $CF_{t+1} = \alpha_0 + \alpha_1 IFRS + \alpha_2 NIBT_t + \alpha_3 LOSS + \alpha_4 IFRS \times NIBT_t + \alpha_5 IFRS \times NIBT_t \times LOSS + controls + Year\ dummy + \varepsilon_t$		
Model (4) $CF_AV = \beta_0 + \beta_1 IFRS + \beta_2 EARN_t + \beta_3 LOSS + \beta_4 IFRS \times EARN_t + \beta_5 IFRS \times EARN_t \times LOSS + controls + Year\ dummy + \varepsilon_t$		
	Model (3): CF_{t+1}	Model (4): CF_AV
IFRS	-0.007 (-0.77)	0.028 (0.74)
NIBT	0.174 (3.14) ***	
EARN		-0.352 (-1.16)
LOSS	0.031 (1.86) *	-0.052 (-0.45)
IFRS × NIBT	0.166 (2.07) **	
IFRS × NIBT × LOSS	-1.046 (-0.82)	
IFRS × EARN		0.622 (1.69) *
IFRS × EARN × LOSS		-3.015 (-0.25)
GW	0.015 (0.80)	-0.223 (-2.29) **
IMPA	-0.705 (-3.13) ***	0.951 (0.361)
DEP	0.372 (5.13) ***	1.413 (4.09) ***
FSALE	0.024 (2.74) ***	-0.079 (-1.97) *
BTD	0.220 (2.91) ***	-0.015 (-0.05)
LogTA	-0.004 (-2.43) **	0.013 (1.64)
LEV	-0.004 (-1.30)	0.026 (2.05) **
Constant	0.102 (4.67) ***	-0.100 (-1.00)
Year Dummies	Included	
Observations	416	262
Adj. R-squared	0.196	0.162
Highest (Mean) VIF	4.14 (1.88)	4.32 (2.05)

Notes: All variables are defined as in 4.1 except NIBT, and CF_AV .

NIBT = profit before tax scaled by beginning total assets;

$CF_AV = (CF_{t+1} + CF_{t+2}) \div 2$ scaled by beginning total assets.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. T-statistics for coefficients are in ().

t-statistic = 1.69). This shows that the predictability of earnings reported under IFRS is higher than that under JP GAAP.

These results are similar to those in the previous section, which would seem to confirm their robustness.

7. Conclusions

This study investigates the implication of adopting IFRS in Japan, a country with a stakeholder-oriented and tax-driven accounting system. The results provide timely and pertinent insights into the potential consequences of IFRS adoption by listed companies in Japan. Focusing on a particular country removes the need to control for potentially confounding effects of country-specific factors unrelated to the financial reporting system (Barth et al. 2008) and thus leads to more robust inferences.

This study adds to the literature on international accounting differences by comparing stakeholder-oriented and shareholder-oriented accounting models in the same institutional setting.

The contribution of the study is that it clarifies the effect of IFRS adoption on the earnings quality of Japanese companies. This paper investigates the ability of earnings reported under IFRS to predict future cash flows, compared with cases where earnings are reported under JP GAAP. The results show that the predictability of IFRS-based earnings is higher than that of JP GAAP-based earnings. These findings could be helpful to standard-setters and practitioners since cash flow prediction is a predominant element of accounting measurements and valuation processes (Palea & Scagnelli 2017).

Japanese firms voluntarily adopt IFRS, thus self-selection biases must be considered. Accordingly, the control group constructed by using propensity

score matching to eliminate self-selection bias to the extent possible. Through the matching process, more accurate and compelling results can be obtained, which is the second contribution.

There are several limitations of the study which must be acknowledged. First, since the focus is exclusively on Japan, the results may not be generalizable to other countries. Second, most of the analyses herein have low power because of the relatively small sample size. Third, for the sake of parsimony, I limited the accounting period to be analyzed, which could render the results suggestive and subject to specific macroeconomic-related factors.

¹ The conditions set out by the FSA are that the company: (1) is listed in Japan; (2) has staff experienced in IFRS; and (3) conducts its financial or business activities internationally (BAC 2009, p.14).

² In 2013, the first and last conditions for companies to be permitted to use IFRS were removed, leaving only the second condition (BAC 2013).

³ A systematic basis means the system using the straight-line method or other reasonable method, over its useful life. The useful life of goodwill is the period for which goodwill is expected to have an effect, which shall not exceed 20 years. The amortization charge shall be recognized in profit or loss.

⁴ ASBJ issued statement No. 29 Accounting Standard for Revenue Recognition at the 30th March 2018, which will be applied as of the 1st April 2021 and early application is permitted as of the 1st April 2018.

⁵ Schipper and Vincent (2003) also consider selected qualitative characteristics in the FASB's Conceptual Framework, the relations among income, cash, and accruals, and implementation decisions.

⁶ There are studies whose subjects are accounting quality (e.g., Barth et al. 2008) or earnings quality (e.g., Atwood et al. 2011). However, Dichev et al. (2013)'s list of measures of earnings quality includes both measures of accounting quality and earnings

quality. Henceforth, this paper adopts a similar meaning of earnings quality.

⁷ The difference between predictability and persistence is that the predictability of earnings is a function of the average absolute magnitude of the annual earnings shocks, whereas the time-series persistence of earnings reflects the autocorrelation in earnings (Lipe 1990, p. 50).

⁸ The FASB's Concepts Statement (para.53) states that predictive value is the valuable information about the existing financial state of a company and observed changes in that state from which predictions of success, failure, growth, or stagnation may be inferred. Users can be expected to favor those sources of information and analytical methods that have the greatest predictive value in achieving their specific objectives.

⁹ Barth et al. (2008) define accounting quality along three dimensions: the extent of earnings management, timely loss recognition, and value relevance.

¹⁰ While the sample in Hung and Subramanyam (2007) is limited to firms that changed accounting standards to IAS, with the availability of financial statements one year before IAS adoption (when both IAS and German GAAP financial statements were available), the sample in Bartov et al. (2005) is larger and includes all firms traded at German stock exchanges from 1990 to 2000 (Soderstrom and Sun 2007, p.681).

¹¹ Barth et al. (2008) analyze changes in the properties of reported earnings around the voluntary adoption of IFRS through comparisons with matched samples of 327 IAS adopters and non-adopters across 21 countries for 1994 through 2003. Based on univariate analysis, they find little difference in accounting quality between adopters and non-adopters in the pre-adoption period. However, they find evidence that the accounting quality of voluntary adopters increase in the post-adoption period with lower earnings management, more timely loss recognition, and more value relevance.

¹² With regard to manager's intention, Ball et al. (2003) also stress the importance of managers' incentives. They examine timely loss recognition for a sample

of firms in Hong Kong, Malaysia, Singapore, and Thailand where accounting standards are largely derived from common law and are therefore likely to be similar to IFRS. They find that timely loss recognition for firms in these countries is no better than it is for firms in code-law countries. They conclude that managers' incentives are important for accounting quality.

¹³ Hail et al. (2010) assess the potential impact of IFRS adoption on the quality and comparability of U.S. reporting practices. They suggest that the direct effect of IFRS adoption on the quality of U.S. financial reporting is likely to be small because the quality of US GAAP is high.

¹⁴ Although the subsection focuses on only IFRS-based accounting quality literature, some literatures examine the association between adopting IFRS announcement and market responses or the change of financial statements. For example, Inoue (2016) analyzes whether there is a push-up effect of IFRS adoption on net income and the response of the stock market to the announcement of IFRS voluntary adoption, based on 54 firms that voluntarily adopted IFRS from 2010 to 2014. He concludes the market recognizes that the positive impact on net profits resulting from IFRS adoption does not affect firms' long-term performance, which are almost consistent with Hirai (2017). Masumura (2016) examines financial statements numbers and their quality for the year of adoption and the year before, replicating the methodology of Hung and Subramanyam (2007). Based on a sample of 84 Japanese firm adopting IFRS from 2010 to 2015, she finds evidence to suggest that total assets, total liabilities, book values and net income under IFRS are larger than those under JP GAAP.

¹⁵ Kim and Koga (2017) use two variables for accounting information. One is long-term liabilities divided by total assets (LEV_IFRS/JGAAP), and the other is net income attributable to the parent company divided by total assets (ROA_IFRS/JGAAP).

¹⁶ Another potential reason for the mixed results over the adoption is that the lack of reporting incentives

in management effects to the qualitative impact of IFRS, as Ball et al. (2003) point out. However, unlike the analyzed countries by them, such as Hong Kong, Malaysia, Singapore and Thailand, Japan have already earned their reputation for high quality of accounting standards, and Japanese firms must have their own incentives to adopt IFRS as voluntary adopters. Therefore, incentive matter will not be considered here.

¹⁷ Soderstrom and Sun (2007, p.685) point out that US GAAP is closer to IFRS than are most European domestic GAAPs, which are similar to JP GAAP. Furthermore, Amano (2018) excludes US GAAP firms since goodwill is not amortized under US GAAP in the same way as IFRS.

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