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Voluntary IFRS adoption and accounting quality: Evidence from Japan

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ABSTRACT

Accounting scholars have discussed the determinants of International Financial Reporting Standards (IFRS) adoption and its outcomes. However, little research focuses on the Asian countries that voluntarily adopted IFRS on a limited basis. In this study, we focus on a specific country, Japan, the largest nation worldwide that allows voluntary IFRS adoption. According to expectancy theory, we predict that voluntary IFRS adoption with motivation similar to that of the International Accounting Standards Board can improve accounting quality by enhancing motivation to adhere to the IFRS guidelines, which increases financial reporting comparability. We find that voluntary IFRS adoption by Japanese firms with positive motivation reduces income smoothing and enhances the extent of conditional conservatism. Additionally, we find that these associations primarily exist in firms with higher leverage, banker investors, a higher degree of tax avoidance and in regions with strong outside investor rights. Our main findings are robust to several sensitivity tests. This study fills a gap in the existing literature on IFRS adoption by investigating the effect of voluntary IFRS adoption on accounting quality from an adoption motivation perspective.

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1. Introduction

Accounting standards are designed to improve comparability, enforce transparency, provide relevant information and deliver financial statements to external users. Currently, 144 countries and areas have adopted International Financial Reporting Standards (IFRS) on a mandatory basis.[1] Accounting scholars have discussed the determinants of IFRS adoption (Christensen et al., 2007; Fitó et al., 2012; Francis et al., 2008; Van Tendeloo & Vanstraelen, 2005) and its economic consequences (André et al., 2015; Ball et al., 2015; Bova & Pereira, 2012; Brüggemann et al., 2013). However, little research focuses on voluntary IFRS adoption in the context of a single country setting (i.e. one that permits or requires IFRS for at least some domestic publicly accountable entities).[2] Although studies of large samples have shown that voluntary

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IFRS adoption can improve accounting quality (De George et al., 2016), the mechanism through which voluntary IFRS adoption achieves this improvement remains unclear.

Voluntary IFRS adoption has implications for certain large economies like those of the U.S., India and China. In this study, we focus on a specific country, Japan, the largest nation that presently allows voluntary IFRS adoption. To fill the gap in prior literature, we investigate from the motivation perspective whether voluntary IFRS adoption can improve accounting quality using a sample of Japanese listed firms for the fiscal years 2010 to 2014.

The review of the literature on the economic consequences of IFRS adoption shows that results are mixed. Several studies from the EU and Australia show that IFRS adoption can improve profitability ratios (Lantto & Sahlström, 2009), enhance value relevance (Aharony et al., 2010) and lead to capital market benefits (Brochet et al., 2013) through enhanced comparability. Other studies argue that IFRS adoption may not be conducive to accounting quality due to its looser standards (Barth et al., 2008). Ahmed et al. (2013) use a global sample to investigate the effects of IFRS adoption and show that accounting quality decreased (through a significant increase in aggressive reporting of accruals and a significant reduction in the timeliness of loss recognition) after mandatory IFRS adoption.

Voluntary IFRS adoption by Japanese listed firms may lead to higher accounting quality as a result of greater financial reporting comparability or to lower accounting quality due to its greater complexity and vague judgments. More importantly, considering the different approaches of mandatory and voluntary adoption, we assume that the motivation behind voluntary IFRS adoption should be different from that of mandatory adoption (Christensen et al., 2015). Based on the Financial Services Agency's (FSA, 2015) survey report, the motivation for Japanese listed firms to voluntarily adopt IFRS is to enhance management transparency and improve comparability, which is highly consistent with the purposes of the International Accounting Standards Board (IASB). Expectancy theory predicts that firms have incentives to improve performance to attain the rewards they expect (Vroom, 1964). Accordingly, we expect that voluntary IFRS adoption by Japanese listed firms may lead to higher accounting quality.

We conduct a multivariate regression analysis that examines the association between voluntary IFRS adoption by Japanese firms and accounting quality. Specifically, we investigate two empirical measures of accounting quality: (1) income smoothing and (2) conditional conservatism. In this analysis, we control for known determinants that have been identified in previous accounting quality studies. Using a prior FSA survey (FSA, 2015) sample of firm-year observations from 2010 to 2014, we find Japanese firms that adopt IFRS with motivation similar to that of the IASB have a relatively lower level of income smoothing and a higher level of conditional conservatism. These results suggest that the positive effects of voluntary IFRS adoption on accounting quality may be the result of positive motivation for adoption.

Soderstrom and Sun (2007) mention that there are three main factors that determine accounting quality: accounting standards, legal and political systems and financial reporting incentives.[3] We further investigate whether capital structure, ownership, tax incentives and investor protection affect the relationship between voluntary IFRS adoption and accounting quality. In this study, we use (1) the debt to assets ratio as a measure of capital structure, (2) bank ownership as a unique ownership characteristic, (3) the effective

tax rate to represent the degree of a firm's incentive to avoid taxes and (4) the proportion of foreign direct investment (FDI) host countries with a high level of anti-director rights (La Porta et al., 1998) to represent a strong investor protection environment. The results of additional tests show that the positive association between voluntary IFRS and accounting quality mainly exists in firms with higher leverage, banker investors, a higher incentive to avoid taxes and in regions with strong outside investor rights.

Several sensitivity tests are provided. First, we employ variations of the measures of the two dependent variables. Second, we apply alternative propensity score matching (PSM) samples for the regression tests. Third, we add three additional control variables to our regression models. Fourth, we impose further sample restrictions to make the sample more constant. The results are robust to all these sensitivity tests.

This study makes several contributions. First, our study contributes to the stream of research on IFRS adoption by showing that voluntary IFRS adoption reduces income smoothing and enhances the extent of conditional conservatism. Barth et al. (2008) find positive effects of IAS adoption on accounting quality; however, whether the improvement in accounting quality due to IFRS adoption is attributable to a change in the firm's incentives and economic environment or the change in accounting standards per se remains an open question. This study adds to the IFRS adoption literature by showing that the motivation for IFRS adoption might be an essential factor that links to a change in accounting quality.

Second, our study adds to the literature on capital structure, ownership characteristics, tax incentives and investor perceptions by showing the relationship between voluntary IFRS adoption and accounting quality is affected by (1) the debt to asset ratio, (2) bank ownership, (3) tax avoidance incentives and (4) the proportion of FDI host countries with strong anti-director rights. Overall, IFRS adoption has a positive effect on accounting quality for firms with higher leverage, banker investors, a higher degree of tax avoidance and in regions with strong outside investor rights.

Third, the study findings are consistent with Christensen et al.'s (2015) conclusion that "incentives dominate accounting standards in determining accounting quality," but add a much clearer explanation of the mechanism that leads to positive outcomes (i.e. voluntary adoption with motivation similar to that of the IASB). While Christensen et al. (2015) did not describe in further detail the incentives of the German firms that voluntarily adopted IFRS, in this study, we borrow the idea from the survey results (FSA, 2015) that most Japanese IFRS adopters have motivation similar to that of the IASB. Also, compared to the European countries (e.g. Germany, Finland and Switzerland) studied in prior voluntary IFRS adoption literature (Auer, 1996; Christensen et al., 2015; Kinnunen et al., 2000; Van Tendeloo & Vanstraelen, 2005), this study adds relatively new evidence (a voluntary sample after the big bang of mandatory adoption for European countries in 2005) from a developed nation in Asia.

Our study has tremendous implications for the regulators of countries that voluntarily adopted IFRS at a limited level and countries that have not yet required or permitted IFRS adoption (e.g. the U.S., China, India, Egypt, Bolivia and Vietnam), especially when they consider the tradeoff between mandatory and voluntary IFRS adoption. Moreover, our study is beneficial to external users and auditors for their evaluation of a firm's accounting information from an accounting standard perspective.

The remainder of this paper is structured as follows: Section 2 provides the literature review and hypotheses development. Section 3 describes the empirical methods, including the regression models and sample selection. Section 4 presents the descriptive statistics, sample correlations and multivariate results. Section 5 describes the additional tests performed and Section 6 reports the results of robustness tests. Section 7 concludes our paper.

2. Literature review and hypotheses development

2.1. IFRS adoption

Many studies discuss IFRS adoption from various perspectives. First, several studies consider the determinants of a specific country's IFRS adoption (Fitó et al., 2012), EU listed firms (Verriest et al., 2013), or in a cross-national data setting (Judge et al., 2010; Renders & Gaeremynck, 2007). Second, De George et al. (2013) and Kim et al. (2012) discuss the effects of mandatory IFRS adoption on audit fees. They argue that mandatory IFRS adoption increases audit complexity, in turn increasing audit effort and leading to higher audit fees. Third, some researchers investigate the economic outcomes of IFRS adoption, such as credit ratings of cross-listed foreign firms (Chan et al., 2013) and cross-border investment (DeFond et al., 2011; Gordon et al., 2012; Khurana & Michas, 2011), institutional investment decisions (Florou & Pope, 2012), frequency of extremely negative stock returns (DeFond et al., 2015) and analyst forecast activities (He & Lu, 2018). Fourth, most researchers focus on the issue of whether mandatory IFRS adoption improves earnings quality by investigating diverse empirical measures. However, the findings regarding the relationship between IFRS adoption and earnings quality are mixed. On one hand, a possible explanation for the mixed findings in different countries is that accounting quality is affected by a country's legal and political systems (Beneish & Yohn, 2008) or reporting environment (Kang et al., 2012). On the other hand, except during the early period before the big bang of mandatory adoption in the EU, the literature on voluntary IFRS adoption for a specific country is still limited (De George et al., 2016). Specifically, it is unclear whether voluntary IFRS adoption improves accounting quality in a developed nation in Asia that has a different culture and institutional background.

2.2. Voluntary IFRS adoption in Japan

In June 2009, the Business Accounting Council (BAC) issued an interim report titled "Opinion on the Application of International Financial Reporting Standards (IFRS) in Japan." This report clarifies that beginning with the fiscal year ending March 2010, Japanese listed firms are allowed to voluntarily adopt IFRS (BAC, 2009). From 2010 to 2014, the compound average growth rate (CAGR) of IFRS adopting firms was 100.6%, higher than that of Japanese GAAP adopting firms (2.2%) and U.S. GAAP adopting firms (−8.5%).[4] On 30 June 2015, Japan established a new set of accounting standards called Japan's Modified International Standards (JMIS). Thus, Japanese listed firms can prepare their financial statements according to four sets of accounting standards (i.e. IFRS, Japanese GAAP, U.S. GAAP and JMIS).[5] In 2015, about 94.5% of

Japanese listed firms chose Japanese GAAP, followed by IFRS (4.8%), and U.S. GAAP (0.8%). The Tokyo Stock Exchange (TSE) announced that as of June 2016, 141 firms, accounting for 29% of the TSE market capitalisation, have adopted or plan to adopt IFRS in the near future.[6] In summary, the use of IFRS has been rapidly growing since 2010, and many IFRS users are firms that influence the market (Nobes & Zeff, 2016).

Tsunogaya (2016) explains why Japan does not mandate that Japanese listed firms adopt IFRS by analysing the BAC members' statements. He argues that due to the diversity of opinions and arguments among different parties (e.g. academics, tax accountants, the manufacturing industry, trade unions and ASBJ are opponents, while the JICPA, financial and services industries, stock exchanges and financial analysts are proponents), mandatory IFRS adoption might not be the proper choice for Japan.

In March 2005, ASBJ and IASB launched a project to achieve convergence between Japanese GAAP and IFRS. After three years, in December 2008, the European Commission (EC) announced that Japanese GAAP is the equivalent of the IFRS adopted by the European Union (EU).[7] Although not many differences exist between Japanese GAAP and IFRS, some remain. For example, amortisation of goodwill is allowed under Japanese GAAP but not under IFRS, the scope of fair value measurement is different, items related to recycling are different, and there is no clear guidance for the initial recognition of intangible assets under Japanese GAAP, while IFRS has specific guidelines for this issue.

In prior research on IFRS adoption in Japan, Sato and Takeda (2017) find that announcing voluntary IFRS adoption leads to higher cumulative abnormal return, which is consistent with the inference that investors positively evaluate the reduction in information asymmetry that results from voluntary IFRS adoption in Japan. Ozu et al. (2018) conduct a survey to investigate the motivation and concerns regarding IFRS adoption by Japanese companies. Their findings highlight that the concern of many Japanese firms about the costs of IFRS adoption are related to staff training, IT systems installation and technical knowledge acquisition, while major Japanese multinational firms are more likely to take advantage of IFRS adoption to improve the comparability of their financial reports. Kashiwazaki et al. (2019) find that the extent of involvement in mergers and acquisitions is positively related to the likelihood of voluntary IFRS adoption in Japan. They further show that IFRS adopting firms are more likely to engage in merger and acquisition activities. Nevertheless, the question of whether voluntary adoption could improve accounting quality in Japan and what mechanism is behind the relationship between voluntary adoption and accounting quality has not been well answered in prior research. In this study, therefore, we are motivated to investigate whether voluntary IFRS adoption improves accounting quality using Japanese data.

2.3. Hypotheses development

2.3.1. IFRS adoption involves a high level of complexity and vague judgement

Several prior studies argue that IFRS adoption is not sufficient to make financial reporting more informative or more comparable. Some researchers point out that the IFRS involve considerable judgment, which is vague (Jeanjean & Stolowy, 2008).

Barth et al. (2008) give two possible reasons IFRS adoption may not lead to high accounting quality. First, IFRS per se may be lower quality than the local GAAP.

Second, enforcement of IFRS may be lax, leading to an undesirable result in accounting quality improvement. Ahmed et al. (2013) investigate firms from 20 countries that require IFRS adoption and benchmark firms from 15 countries that do not require adoption, and find that IFRS adoption cannot improve accounting quality. They highlight the negative side of IFRS adoption by explaining that managers have incentives to use discretion over accounting choices, and IFRS are looser (principles-based), making them more challenging to enforce.

2.3.2. IFRS adoption produces a high level of financial reporting comparability

A critical incentive behind the IASB's promotion of IFRS adoption is that it believes IFRS adoption can improve the comparability of financial reporting among countries, thus creating economic benefits. During the last decade, several studies have found positive results from IFRS adoption.

Lantto and Sahlström (2009) test the relationship between IFRS adoption and accounting figures and suggest that IFRS adoption improves profitability ratios (e.g. the current ratio, equity ratio, return on equity and quick ratio). Aharony et al. (2010) focus on whether mandatory IFRS adoption enhances value relevance and find positive results in samples from EU countries. Also using a sample from the EU, Schleicher et al. (2010) find that mandatory IFRS adoption relaxes financing constraints by reducing sensitivity to lagged cash flow. Brochet et al. (2013) use UK firms to clarify that mandatory IFRS adoption leads to capital market benefits through enhanced comparability. Valentincic et al. (2017) document improvement in accounting quality among private Slovenian firms after IFRS adoption. Downes et al. (2019) show that the relationship between accruals and cash flows is improved in the post IFRS adoption period. Besides EU samples, several researchers employ Australian firms to investigate the relationship between mandatory IFRS adoption and accounting quality. All report positive results: value relevance is enhanced, earnings management risk is decreased, loss recognition is more timely and analysts' forecast accuracy is improved after IFRS adoption (Chalmers et al., 2011; Chua et al., 2012; Cotter et al., 2012). Additionally, using cross-listed firms in the U.S., Sun et al. (2011) find that IFRS adoption leads to a lower likelihood of beating targets and more persistent earnings. Moreover, based on cross-country evidence, Tiron-Tudor and Achim (2019) show that IFRS adoption improves stock price informativeness.

2.3.3. Motivation of voluntary IFRS adoption in Japan

Barth et al. (2008) find that IAS adoption countries experience less earnings management, more conservatism and greater value relevance during the post-adoption period than non-IAS adoption countries. However, they did not confirm that these differences are directly due to the change in accounting standards. Following Barth et al. (2008), Christensen et al. (2015) further investigate the differences between voluntary IFRS adopters and mandatory IFRS adopters in the context of a single country (i.e. Germany) and find that voluntary adopters exhibit better accounting quality than their counterparts. They argue that motivation plays a vital role in improved accounting quality through IFRS adoption.

As an essential government institution in Japan, the FSA takes responsibility for the national economy's development. Considering the importance of IFRS to industry business practices, as well as the "Japan Revitalization Strategy (Revised in 2014)," the FSA conducted a survey and interviews to clarify the motivation of voluntary IFRS adoption by Japanese listed firms, and how they overcame the challenges they faced. The survey covered sixty-seven Japanese listed firms and two non-listed firms, and the response rate was 94.2%.[8] The FSA summarised two main motivating factors for Japanese firms' voluntary adoption of IFRS. The first is to enhance transparency in management accounting and governance (29 firms), while the second is to improve comparability with competitors and make communication with investors more effortless (21 firms) (FSA, 2015).[9] These motivations of Japanese firms that voluntarily adopt IFRS are highly consistent with the IASB's mission statement:

Our mission is to develop IFRS Standards that bring transparency, accountability and efficiency to financial markets around the world. Our work serves the public interest by fostering trust, growth and long-term financial stability in the global economy.[10]

Expectancy theory predicts that when workers value a particular reward, they will be more likely to improve performance to attain said reward (Vroom, 1964). In accounting practice, the rewards for IFRS adoption for Japanese firms are improved transparency and comparability; thus, those firms will be likely to improve performance to reach that goal. Based on the above research and statements, we expect that voluntarily adopting IFRS with motivations that are consistent with the IASB's mission can improve accounting quality by enhancing motivation along with the guidelines of IFRS, as well as cautiously and positively overcoming complicated issues, which increases the level of financial reporting comparability. Accordingly, we hypothesise:

H1: Voluntary IFRS adoption with motivation similar to that of the IASB is negatively associated with income smoothing.

H2: Voluntary IFRS adoption with motivation similar to that of the IASB is positively associated with conditional conservatism.

3. Empirical methods

3.1. Multivariate regression analyses

Based on prior studies on income smoothing and conditional conservatism, we use regression model (1) to test H1 and model (2) to test H2, as follows:

$$\begin{aligned} VAR\_NIG_{i,t} = {} & \alpha_0 + \alpha_1 JV\_IFRS_{i,t} + \alpha_2 LEV_{i,t} + \alpha_3 SIZE_{i,t} + \alpha_4 BANK_{i,t} + \alpha_5 EQU_{i,t} \\ & + \alpha_6 Q_{i,t} + \alpha_7 RD_{i,t} + \alpha_8 CURR_{i,t} + \alpha_9 LOSS_{i,t} + \alpha_{10} EMP_{i,t} + \alpha_{11} ROA_{i,t} \\ & + \alpha_{12} GR\_ASS_{i,t} + \alpha_{13} OPCF_{i,t} + \alpha_{14} AGE_{i,t} + \alpha_{15} TAGG_{i,t} + \alpha_{16} THAV_{i,t} \\ & + \alpha_{17} CLHC_{i,t} + \alpha_{18} BIG4_{i,t} + \alpha_{19} SCO\_CHA_{i,t} + \alpha_{20} POL\_CHA_{i,t} \\ & + \alpha_{21} NEWAUD_{i,t} + Year\ FE + Industry\ FE + \varepsilon_{i,t} \end{aligned} \quad (1)$$

$$\begin{aligned} NC\_SCORE_{i,t} = {} & \alpha_0+\alpha_1 JV\_IFRS_{i,t}+\alpha_2 LEV_{i,t}+\alpha_3 SIZE_{i,t}+\alpha_4 BANK_{i,t}+\alpha_5 EQU_{i,t} \\ & + \alpha_6 Q_{i,t} + \alpha_7 RD_{i,t} + \alpha_8 CURR_{i,t} + \alpha_9 LOSS_{i,t} + \alpha_{10} EMP_{i,t} + \alpha_{11} ROE_{i,t} \\ & + \alpha_{12} GR\_SAL_{i,t} + \alpha_{13} FORSAL_{i,t} + \alpha_{14} TAGG_{i,t} + \alpha_{15} THAV_{i,t} \\ & + \alpha_{16} CLHC_{i,t} + \alpha_{17} BIG4_{i,t} + \alpha_{18} SCO\_CHA_{i,t} + \alpha_{19} POL\_CHA_{i,t} \\ & + \alpha_{20} NEWAUD_{i,t} + Year\ FE + Industry\ FE + \varepsilon_{i,t} \end{aligned} \tag{2}$$

3.1.1. Dependent variables

In this study, we investigate accounting quality from two different perspectives: income smoothing and conditional conservatism.

We use the volatility of net income growth as a measure of income smoothing. Following prior research (Ahmed et al., 2013; Barth et al., 2008), we first estimate the following model. We then use the residual from the regression model to measure the variance in net income growth:

$$\begin{aligned} \Delta NI_{i,t} = {} & \alpha_0+\alpha_1 GR\_SAL_{i,t}+\alpha_2 GR\_STK_{i,t}+\alpha_3 LEV_{i,t}+\alpha_4 GR\_LIAB_{i,t}+\alpha_5 TURN_{i,t} \\ & + \alpha_6 SIZE_{i,t}+\alpha_7 OPCF_{i,t}+Industry\ FE + \varepsilon_{i,t} \end{aligned} \tag{3}$$

where ΔNI is the change in annual income before extraordinary items, scaled by the market value of equity; *GR_SAL* is the percentage change in total sales; *GR_STK* is the percentage change in common stock; *LEV* is total debt divided by total assets; *GR_LIAB* is the percentage change in total liabilities; *TURN* is total sales divided by total assets; *SIZE* is the natural logarithm of total assets; and *OPCF* is operating cash flow divided by total assets. We measure the variance of the firm-year-level residuals from the model (3) for a six-year period (t to t-5) and label it as *VAR_NIG*. We assume that a lower value of *VAR_NIG* indicates greater income smoothing.

Regarding conditional conservatism, we estimate annual regressions of the following model (Lee et al., 2015) and obtain the coefficients to estimate conditional conservatism:

$$\begin{aligned} \Delta NI_{i,t} = {} & \alpha_0+\alpha_1 SIZE_{i,t}+\alpha_2 MTB_{i,t}+\alpha_3 LEV_{i,t}+DN_{i,t}(\beta_1+\beta_2 SIZE_{i,t}+\beta_3 MTB_{i,t} \\ & +\beta_4 LEV_{i,t})+\Delta NI_{i,t-1}(\delta_1+\delta_2 SIZE_{i,t}+\delta_3 MTB_{i,t}+\delta_4 LEV_{i,t}) \\ & +DN_{i,t} \times \Delta NI_{i,t-1}(\lambda_1+\lambda_2 SIZE_{i,t}+\lambda_3 MTB_{i,t}+\lambda_4 LEV_{i,t}) + \varepsilon_{i,t} \end{aligned} \tag{4}$$

where ΔNI is the change in annual income before extraordinary items, scaled by the market value of equity; *DN* is an indicator variable that equals 1 if ΔNI in the prior year is negative and otherwise 0; *SIZE* is the natural logarithm of total assets; *MTB* is market value divided by book value; and *LEV* is total debt divided by total assets. We take the sum of the coefficients of λ_1, $\lambda_2 SIZE$, $\lambda_3 MTB$ and $\lambda_4 LEV$ and label it as *NC_SCORE*. To allow *NC_SCORE* to increase with conditional conservatism, the measure is multiplied by negative one.

3.1.2. Test variable

To examine H1 and H2, we analyse the coefficients of *JV_IFRS* in each model. We define *JV_IFRS* as an indicator variable that equals 1 if a Japanese firm adopted IFRS voluntarily and 0 otherwise. We expect that most Japanese IFRS adopters have motivation similar to that of the IASB (FSA, 2015), which means that during the sample period from 2010 to 2014, *JV_IFRS* = 1 represents voluntary IFRS adoption with motivation similar to that of the IASB. For model (1), if the association between *JV_IFRS* and *VAR_NIG* is positive, then H1 is supported; for model (2), if the association between *JV_IFRS* and *NC_SCORE* is positive, then H2 is supported.

3.1.3. Control variables

Because the proxies for accounting quality are affected by different factors, we investigate each proxy using different models and different portfolios of control variables. Following the examples of previous studies (Ahmed et al., 2013; Ball & Shivakumar, 2005; Dou et al., 2013; Francis et al., 2004; García Lara et al., 2009; Gassen & Fülbier, 2015; Haw et al., 2015), we control for determinants that affect income smoothing and conditional conservatism in terms of firm characteristics (*LEV*, *SIZE*, *BANK*, *EQU*, *Q*, *RD*, *CURR*, *LOSS*, *EMP*, *ROA*, *GR_ASS*, *OPCF*, *AGE*, *ROE*, *GR_SAL* and *FORSAL*), tax incentives (*TAGG*, *THAV*), legal system (*CLHC*), and audit attributes (*BIG4*, *SCO_CHA*, *POL_CHA* and *NEWAUD*). All control variable definitions are shown in Appendix.

3.2. Endogeneity

It is possible that self-selection bias could affect the results. Given the possibility that Japanese firms that adopt IFRS voluntarily may be inherently different from their counterparts (i.e. firms who do not adopt IFRS), we use a propensity score matching method. For the Japanese setting, a vast gap exists between the number of firms in the IFRS adoption group and its counterpart group. Therefore, it is necessary to match these two groups using a PSM approach (Shipman et al., 2017).

To apply the PSM method, we first build a probit model to estimate the probability that a Japanese firm adopts IFRS. Along with prior studies (Christensen et al., 2007; Fitó et al., 2012; Francis et al., 2008; Van Tendeloo & Vanstraelen, 2005), we use the following probit regression model:

$$\begin{aligned} JV\_IFRS_{i,t} = {} & \alpha_0 + \alpha_1 LEV_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 ROE_{i,t} + \alpha_4 ABS\_OPCF_{i,t} + \alpha_5 FOREC_{i,t} \\ & + \alpha_6 GR\_EQU_{i,t} + \alpha_7 INVEST_{i,t} + \alpha_8 FORE_{i,t} + \alpha_9 GEO\_SEG_{i,t} \\ & + \alpha_{10} BIG4_{i,t} + Year\ FE + Industry\ FE + \varepsilon_{i,t} \end{aligned} \tag{5}$$

where *JV_IFRS* is an indicator variable that equals 1 if a firm adopted IFRS and 0 otherwise; *LEV* is total debt divided by total assets; *SIZE* is the natural logarithm of total assets; *ROE* is the income before extraordinary items divided by shareholder's equity; *ABS_OPCF* is the absolute value of operating cash flow scaled by lagged total assets; *FOREC* is an indicator variable that equals 1 if a firm met or just beat their

Table 1. Sample selection.

Listed companies for fiscal years 2010 to 2014	11,644
(less) Financial companies	−786
(less) Financial data unavailable	−2,634
(less) Stock data unavailable	−194
(less) Income smoothing and conservatism data unavailable	−1,243
(less) Sample unmatched	−2,373
Propensity score matched samples	4,414

Note: Downloaded data from the *NEEDS Financial Quest* database using the criteria: fiscal year-end at the end of March. Stock data contain information about stock price and market value. At least ten firms per year are required for each industry to be retained in the sample. For the PSM sample matched by the kernel method, we set the bandwidth for 0.01, and 0.05 of the treatment observations.
Source: Author's calculation based on the *NEEDS Financial Quest* database.

last net income forecast (ratio of the difference between net income and firm's last net income forecast to lagged total assets was between 0 and 0.005) and 0 otherwise; *GR_EQU* is percentage change in total equity; *INVEST* is the total investment outflows divided by total non-current assets; *FORE* is an indicator variable that equals 1 if a firm's major shareholders is a foreigner and 0 otherwise; *GEO_SEG* is the number of geographic reporting segments; and *BIG4* is an indicator variable that equals 1 if a firm selected a Big 4 auditor (i.e. Deloitte/EY/KPMG/PwC) and 0 otherwise.

We then predict the propensity score based on probit regression model (5). Guo and Fraser (2009) mention that kernel-based matching is a robust estimator since it uses propensity scores derived from multiple matches to calculate a weighted mean that is used as a counterfactual. Accordingly, we apply the kernel-based matching sample for the main tests.[11]

3.3. Sample selection

We developed our motivation hypotheses based on the outcomes of the FSA survey (FSA, 2015). To enhance the statistical power of the tests of our motivation hypotheses, we use the prior FSA survey (FSA, 2015) firm-year data from fiscal years 2010 to 2014 because the motivations for IFRS adoption may have changed after the FSA survey in 2015. Table 1 presents information about the sample selection process. Stock and financial statement information is obtained from the *NEEDS Financial Quest* database. Most listed Japanese companies have fiscal years that end on 31 March. We chose these companies to avoid any possible effects from the differences in year ends. After restricting the sample to companies with a fiscal year ending on 31 March and excluding financial companies and firms with missing data, the full available matching sample consists of 4,414 firm-years.[12]

4. Results

4.1. Descriptive statistics and correlations

Table 2 presents the descriptive statistics of the voluntary IFRS adoption group and its counterpart separately. For the dependent variables, the mean values of *VAR_NIG* and *NC_SCORE* in the voluntary IFRS adoption (counterpart) sample column is 0.003 (0.003) and 1.236 (0.872), respectively. The mean value of *NC_SCORE* is higher for the IFRS adoption group than for the non-IFRS group. Table 2 also compares the

Table 2. Descriptive statistics.

	JV_IFRS = 1 (*N* = 91)					*JV_IFRS* = 0 (*N* = 4,323)						
Variable	Mean	SD	Q1	Median	Q3	Mean	SD	Q1	Median	Q3	Diff.	t-stat
VAR_NIG	0.003	0.007	0.001	0.001	0.003	0.003	0.006	0.000	0.001	0.003	0.001	1.16
NC_SCORE	1.236	1.458	0.759	1.253	1.661	0.872	0.785	0.514	0.794	1.114	0.364	4.27***
LEV	0.508	0.204	0.331	0.520	0.691	0.481	0.190	0.338	0.478	0.623	0.027	1.34
SIZE	13.316	1.575	12.193	13.112	14.500	11.267	1.501	10.243	11.043	12.082	2.049	12.88***
BANK	0.095	0.057	0.056	0.097	0.133	0.071	0.061	0.024	0.061	0.109	0.024	3.77***
EQU	1.101	2.020	0.286	0.687	1.074	0.597	0.755	0.271	0.421	0.669	0.504	5.94***
Q	1.187	0.587	0.877	0.968	1.298	1.012	0.558	0.781	0.915	1.078	0.175	2.95***
RD	0.032	0.039	0.000	0.017	0.053	0.020	0.027	0.000	0.012	0.029	0.012	4.33***
CURR	2.063	1.164	1.424	1.830	2.239	2.184	1.728	1.302	1.741	2.535	−0.121	−0.66
LOSS	0.143	0.352	0.000	0.000	0.000	0.163	0.369	0.000	0.000	0.000	−0.020	−0.51
EMP	9.509	1.403	8.502	9.678	10.318	7.597	1.505	6.538	7.388	8.500	1.911	12.00***
ROA	0.068	0.065	0.028	0.055	0.091	0.051	0.045	0.027	0.045	0.071	0.017	3.43***
GR_ASS	0.101	0.130	0.035	0.074	0.138	0.054	0.156	−0.001	0.040	0.090	0.047	2.84***
OPCF	0.086	0.060	0.041	0.077	0.120	0.063	0.059	0.034	0.062	0.091	0.023	3.75***
AGE	1.568	0.291	1.322	1.716	1.813	1.544	0.260	1.322	1.653	1.732	0.024	0.88
ROE	0.083	0.130	0.058	0.086	0.128	0.065	0.113	0.038	0.066	0.098	0.018	1.49
GR_SAL	0.075	0.174	−0.009	0.052	0.118	0.062	0.181	−0.009	0.043	0.106	0.013	0.68
FORSAL	0.068	0.224	0.000	0.000	0.000	0.058	0.174	0.000	0.000	0.000	0.010	0.53
TAGG	0.637	0.483	0.000	1.000	1.000	0.448	0.497	0.000	0.000	1.000	0.190	3.60***
THAV	0.319	0.744	0.000	0.000	0.000	0.021	0.203	0.000	0.000	0.000	0.297	12.36***
CLHC	4.132	2.386	2.000	4.000	6.000	1.396	1.734	0.000	1.000	2.000	2.736	14.76***
BIG4	0.967	0.180	1.000	1.000	1.000	0.789	0.408	1.000	1.000	1.000	0.178	4.15***
SCO_CHA	0.330	0.473	0.000	0.000	1.000	0.575	0.494	0.000	1.000	1.000	−0.245	−4.69***
POL_CHA	0.033	0.180	0.000	0.000	0.000	0.052	0.223	0.000	0.000	0.000	−0.019	−0.82
NEWAUD	0.011	0.105	0.000	0.000	0.000	0.048	0.214	0.000	0.000	0.000	−0.037	−1.64

Note: *, **, *** indicate significance at the 0.10, 0.05 and 0.01 levels, respectively, in two-tailed tests. See Appendix for definitions and measurements of the variables.
Source: Author's calculation based on the *NEEDS Financial Quest* database.

mean values of the variables for the subsamples of IFRS adoption and non-IFRS adoption using a t-test. In general, Japanese listed firms that adopt IFRS have significantly higher *NC_SCORE* values than their counterparts, which is consistent with the H2.

Panel A in Table 3, presents the annual descriptive statistics of the sample over five years. Each year covered in the sample represents around 19 to 20% of the overall sample. Based on this rough analysis of the distribution, the annual concentration of the sample does not appear to be a problem. Further, Panel A presents the information by subsamples. From 2010 to 2014, the CAGR of Japanese firms that voluntarily adopt IFRS is 108.8%, substantially higher than that of their counterparts, suggesting that over time, firms that voluntarily adopt IFRS grow much faster than non-IFRS firms. Panel A also shows the means of the subsamples' dependent variables. We note that the yearly differences in *VAR_NIG* and *NC_SCORE* between IFRS adopting firms and non-IFRS adopting firms are different.

Panel B in Table 3 presents an industry breakdown of the sample based on the TSE industry classifications.[13] The electric appliances industry accounts for the highest proportion (16.47%) of the full sample, followed by wholesale trade (16.02%) and machinery (13.53%). Panel B also presents the subsample of IFRS by industry. The electric appliances industry has the highest number of IFRS adoptions (21 observations), followed by wholesale trade (18 observations) and transportation equipment (12 observations). Panel B indicates that the industry representation of the subsample of IFRS adopters differs from that of the full sample.

Table 3. Distribution by year and industry.

Panel A: Distribution by year

					VAR_NIG		*NC_SCORE*	
	Full sample		*JV_IFRS* = 0	*JV_IFRS* = 1	*JV_IFRS* = 0	*JV_IFRS* = 1	*JV_IFRS* = 0	*JV_IFRS* = 1
Year	Obs.	Percent	Obs.	Obs.	Mean	Mean	Mean	Mean
2010	852	19.30	850	2	0.003	0.001	0.703	0.351
2011	871	19.73	866	5	0.003	0.007	1.033	−0.745
2012	894	20.25	879	15	0.003	0.006	0.539	0.502
2013	899	20.37	868	31	0.003	0.003	1.086	1.104
2014	898	20.34	860	38	0.002	0.002	1.001	1.940
Total	4,414	100.00	4,323	91	0.003	0.003	0.872	1.236
CAGR from 2010 to 2014			0.3%	108.8%				

Panel B: Distribution by industry

					VAR_NIG		*NC_SCORE*	
	Full sample		*JV_IFRS* = 0	*JV_IFRS* = 1	*JV_IFRS* = 0	*JV_IFRS* = 1	*JV_IFRS* = 0	*JV_IFRS* = 1
Industry	Obs.	Percent	Obs.	Obs.	Mean	Mean	Mean	Mean
Chemicals	590	13.37	586	4	0.001	0.001	0.903	1.775
Electric appliances	727	16.47	706	21	0.003	0.008	0.843	1.114
Glass and ceramics products	149	3.38	144	5	0.002	0.001	0.809	0.524
Information and communication	380	8.61	372	8	0.004	0.002	0.959	2.300
Iron and steel	184	4.17	182	2	0.003	0.003	0.803	1.743
Land transportation	233	5.28	231	2	0.000	0.000	0.716	1.428
Machinery	597	13.53	592	5	0.004	0.002	0.882	1.326
Pharmaceutical	110	2.49	102	8	0.003	0.006	1.086	1.582
Rubber products	55	1.25	54	1	0.002	0.001	0.896	1.257
Services	323	7.32	318	5	0.003	0.003	1.095	0.595
Transportation equipment	359	8.13	347	12	0.003	0.002	0.806	1.416
Wholesale trade	707	16.02	689	18	0.003	0.000	0.799	0.782
Total	4,414	100.00	4,323	91	0.003	0.003	0.872	1.236

Note: This table presents the distribution, respectively, by year and industry. Panel A presents the annual descriptive statistics of the sample over five years. Panel B presents an industry breakdown of the sample on the basis of the TSE industry classifications. See Appendix for definitions and measurements of the variables.
Source: Author's calculation based on the *NEEDS Financial Quest* database.

Table 4 presents the univariate Pearson correlations (lower diagonal) and Spearman correlations (upper diagonal). Consistent with H1 and H2, *JV_IFRS* is positively associated with *VAR_NIG* and *NC_SCORE* (both Pearson and Spearman correlations). However, these univariate correlations do not control for other factors of accounting quality. It is necessary to use multivariate regression to control for several potential attributes.

In general, the results of the correlation test show weak associations between variables. Given that some correlations exceed 0.5, we check for multicollinearity by calculating the variance inflation factor (VIF) for models (1) and (2). The VIF shows how the variance of an estimator is inflated by the existence of multicollinearity (Gujarati & Porter, 2009). We find that all values (without fixed effects) are less than 7.25, and the average VIF of the independent variables (without fixed effects) is 2.40 and 2.27 for models (1) and (2), respectively. These results suggest that multicollinearity is not a problem.

Table 4. Correlation coefficients between variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1. *VAR_NIG*		−0.01	0.00	−0.01	**−0.21**	**−0.07**	**0.05**	**0.04**	**0.22**	**0.14**	**0.20**	**−0.15**	−0.01	0.00	0.00	**−0.05**	0.02	**0.04**	**0.08**	**0.14**	−0.02	**0.13**	**−0.04**	**−0.05**	**0.04**	**0.06**
2. *NC_SCORE*	0.02		**0.08**	0.02	**0.17**	**0.06**	**0.05**	**0.06**	0.02	0.01	−0.01	**0.17**	**0.03**	**0.07**	**0.05**	0.02	**0.06**	0.01	−0.01	**0.05**	**0.17**	**0.17**	**0.06**	**−0.07**	−0.01	−0.02
3. *JV_IFRS*	0.02	**0.06**		**−0.09**	−0.01	**−0.04**	**0.16**	**0.07**	0.01	**0.07**	**−0.06**	−0.02	**0.16**	**0.15**	**0.07**	**−0.09**	**0.10**	**0.16**	0.01	**−0.04**	**−0.04**	−0.02	0.01	**−0.04**	0.02	0.01
4. *LEV*	0.01	0.02	**−0.18**		**0.14**	**0.04**	**−0.54**	**0.19**	**−0.20**	**−0.86**	**0.14**	**0.15**	**−0.29**	**−0.09**	**−0.21**	**0.26**	**0.14**	−0.02	**−0.08**	**0.05**	**0.12**	0.02	0.00	**0.11**	0.01	−0.01
5. *SIZE*	**−0.20**	**0.19**	**−0.07**	**0.17**		**0.45**	**0.11**	**0.26**	**0.19**	**−0.15**	**−0.12**	**0.85**	**0.10**	**0.09**	**0.14**	**0.35**	**0.17**	**0.04**	**0.06**	**0.06**	**0.19**	**0.50**	**0.20**	**0.35**	**0.08**	**−0.11**
6. *BANK*	**−0.08**	**0.06**	**−0.05**	0.02	**0.41**		**0.08**	**0.12**	**0.19**	**−0.03**	**−0.06**	**0.41**	**0.06**	**0.06**	**0.08**	**0.32**	**0.10**	**0.07**	**0.03**	**0.05**	**0.11**	**0.35**	**0.08**	**0.15**	0.03	**−0.10**
7. *EQU*	**0.14**	**0.09**	**0.26**	**−0.31**	−0.03	0.03		**0.63**	**0.28**	**0.49**	**−0.24**	**0.14**	**0.62**	**0.35**	**0.44**	**−0.20**	**0.37**	**0.21**	**0.07**	−0.01	**−0.06**	**0.16**	**0.05**	**0.06**	0.02	−0.01
8. *Q*	**0.15**	**0.04**	**0.26**	**−0.05**	**0.04**	**0.04**	**0.84**		**0.14**	**−0.13**	**−0.11**	**0.27**	**0.45**	**0.22**	**0.30**	−0.01	**0.51**	**0.16**	0.01	**0.05**	**0.04**	**0.19**	**0.08**	**0.16**	**0.03**	−0.03
9. *RD*	**0.10**	**0.07**	0.02	**−0.17**	**0.17**	**0.14**	**0.11**	**0.08**		**0.27**	**0.06**	**0.29**	**0.13**	**0.09**	**0.17**	**0.15**	0.02	**0.07**	**0.17**	0.02	0.03	**0.43**	**0.05**	**0.06**	**0.09**	−0.03
10. *CURR*	**0.11**	−0.01	**0.10**	**−0.66**	**−0.12**	**−0.04**	**0.25**	**0.09**	**0.23**		**−0.08**	**−0.16**	**0.24**	**0.09**	**0.10**	**−0.26**	**−0.12**	0.03	**0.08**	**−0.04**	**−0.07**	**0.05**	**−0.03**	**−0.11**	0.00	0.03
11. *LOSS*	**0.13**	−0.01	**−0.06**	**0.15**	**−0.11**	**−0.05**	**−0.11**	**−0.08**	**0.05**	0.01		**−0.07**	**−0.41**	**−0.23**	**−0.24**	**0.05**	**−0.33**	**−0.07**	−0.02	**0.05**	0.02	−0.02	**−0.05**	−0.02	**0.03**	**0.07**
12. *EMP*	**−0.16**	**0.18**	**−0.07**	**0.17**	**0.88**	**0.40**	−0.03	**0.05**	**0.24**	**−0.16**	**−0.06**		**0.12**	**0.10**	**0.22**	**0.28**	**0.18**	**0.07**	**0.12**	**0.04**	**0.18**	**0.57**	**0.19**	**0.38**	**0.09**	**−0.09**
13. *ROA*	**0.05**	**0.05**	**0.23**	**−0.26**	**0.04**	**0.05**	**0.59**	**0.53**	**0.05**	**0.04**	**−0.38**	**0.06**		**0.34**	**0.57**	**−0.21**	**0.78**	**0.32**	**0.12**	**−0.08**	**−0.06**	**0.13**	**0.05**	**0.04**	−0.01	**−0.03**
14. *GR_ASS*	**0.10**	**0.04**	**0.07**	**−0.03**	0.02	0.01	**0.26**	**0.14**	**0.12**	0.00	**−0.14**	**0.03**	**0.21**		**0.25**	**−0.14**	**0.34**	**0.49**	**0.11**	−0.01	0.03	**0.15**	0.01	**0.08**	0.03	−0.03
15. *OPCF*	0.02	**0.06**	**0.11**	**−0.19**	**0.09**	**0.06**	**0.40**	**0.33**	**0.10**	−0.01	**−0.22**	**0.16**	**0.60**	**0.25**		**−0.08**	**0.47**	**0.20**	**0.08**	0.00	**−0.04**	**0.13**	**0.07**	**0.06**	0.00	−0.03
16. *AGE*	**−0.08**	0.01	**−0.13**	**0.23**	**0.32**	**0.29**	**−0.25**	**−0.18**	**0.07**	**−0.19**	**0.05**	**0.27**	**−0.24**	**−0.12**	**−0.11**		**−0.06**	**−0.09**	**−0.04**	**0.09**	**0.12**	**0.21**	**−0.04**	**0.05**	**0.05**	**−0.04**
17. *ROE*	0.02	0.02	**0.08**	**−0.03**	**0.06**	**0.06**	**0.21**	**0.21**	−0.02	**−0.06**	**−0.31**	**0.06**	**0.56**	**0.19**	**0.35**	**−0.06**		**0.33**	**0.07**	**0.04**	0.02	**0.13**	**0.04**	**0.09**	0.00	−0.03
18. *GR_SAL*	**0.08**	0.01	**0.07**	−0.01	0.00	**0.03**	**0.19**	**0.11**	**0.08**	**−0.03**	0.01	0.02	**0.21**	**0.66**	**0.21**	**−0.07**	**0.16**		**0.11**	−0.01	0.02	**0.13**	0.00	**0.04**	0.02	**−0.04**
19. *FORSAL*	−0.01	0.01	0.00	**−0.07**	**0.09**	0.02	0.02	0.00	**0.14**	0.03	0.01	**0.16**	**0.06**	**0.05**	**0.04**	**−0.03**	**0.04**	**0.07**		0.02	**0.05**	**0.27**	−0.01	**0.03**	0.01	0.03
20. *TAGG*	**0.16**	**0.05**	−0.02	**0.05**	**0.07**	**0.04**	0.01	**0.03**	**0.06**	−0.01	**0.05**	**0.05**	**−0.07**	0.02	−0.02	**0.08**	−0.03	0.01	**0.03**		**0.06**	**0.08**	−0.01	0.01	**0.04**	0.01
21. *THAV*	−0.02	**0.18**	**−0.06**	**0.11**	**0.26**	**0.09**	**−0.04**	−0.01	0.01	**−0.04**	0.00	**0.22**	**−0.04**	0.01	−0.03	**0.10**	0.00	0.00	**0.03**	**0.07**		**0.21**	**0.05**	**0.06**	0.00	−0.01
22. *CLHC*	**−0.03**	**0.22**	**−0.06**	**0.06**	**0.56**	**0.33**	**0.04**	**0.07**	**0.34**	**−0.03**	−0.02	**0.63**	**0.06**	**0.05**	**0.09**	**0.23**	0.02	**0.06**	**0.25**	**0.08**	**0.34**		**0.10**	**0.28**	**0.09**	**−0.06**
23. *BIG4*	**−0.09**	**0.06**	−0.01	0.00	**0.21**	**0.08**	0.03	**0.04**	**0.07**	0.00	**−0.05**	**0.19**	**0.05**	−0.02	**0.08**	**−0.08**	0.01	−0.01	0.00	−0.01	**0.05**	**0.11**		**0.06**	0.02	**−0.24**
24. *SCO_CHA*	**−0.04**	**−0.07**	**−0.04**	**0.11**	**0.34**	**0.14**	0.02	**0.07**	**0.05**	**−0.09**	−0.02	**0.37**	0.03	**0.07**	**0.05**	0.03	**0.04**	**0.04**	**0.04**	0.01	**0.05**	**0.28**	**0.06**		**0.05**	**−0.03**
25. *POL_CHA*	0.01	−0.01	**0.04**	0.01	**0.08**	0.03	**0.03**	**0.04**	**0.07**	0.00	**0.03**	**0.09**	0.00	0.02	0.00	**0.04**	0.02	0.02	0.02	**0.04**	−0.01	**0.08**	0.02	**0.05**		−0.02
26. *NEWAUD*	**0.11**	−0.02	0.01	−0.01	**−0.12**	**−0.10**	−0.01	−0.01	−0.02	0.00	**0.07**	**−0.10**	**−0.04**	0.01	**−0.04**	−0.02	−0.02	−0.02	0.02	0.01	−0.01	**−0.05**	**−0.24**	**−0.03**	−0.02	

Note: Correlations are based on 4,414 firm-year observations. Correlation coefficients in bold are statistically significant at the 0.10 level or better. Pearson (Spearman) correlations are in the lower (upper) diagonal. See Appendix for definitions and measurements of the variables.
Source: Author's calculation based on the *NEEDS Financial Quest* database.

Table 5. Voluntary IFRS adoption and income smoothing.

	Dependent variable: *VAR_NIG*							
	(A)		(B)		(C)		(D)	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Test variable								
JV_IFRS	0.002	3.04***	0.002	2.53**	0.002	2.49**	0.002	2.77***
Firm characteristics								
LEV	0.006	7.58***	0.005	7.49***	0.005	7.49***	0.005	7.58***
SIZE	−0.001	−7.00***	−0.001	−7.38***	−0.001	−7.38***	−0.001	−6.81***
BANK	−0.001	−0.61	−0.001	−0.77	−0.001	−0.79	−0.001	−0.41
EQU	0.000	0.80	0.000	0.79	0.000	0.78	0.000	0.76
Q	0.001	3.48***	0.001	3.09***	0.001	3.09***	0.001	3.03***
RD	0.031	7.16***	0.028	6.43***	0.027	6.26***	0.028	6.46***
CURR	0.001	7.85***	0.001	7.86***	0.001	7.86***	0.001	7.95***
LOSS	0.002	6.14***	0.002	6.06***	0.002	6.06***	0.002	5.75***
EMP	0.000	0.14	0.000	0.29	0.000	0.18	0.000	−0.15
ROA	0.007	2.32**	0.010	3.24***	0.010	3.24***	0.010	3.23***
GR_ASS	0.003	5.37***	0.003	5.17***	0.003	5.17***	0.003	4.80***
OPCF	0.000	−0.05	−0.001	−0.27	−0.001	−0.27	0.000	−0.05
AGE	0.001	1.60	0.000	0.92	0.000	0.90	0.000	0.52
Tax incentives								
TAGG			0.002	10.82***	0.002	10.79***	0.002	10.66***
THAV			0.000	0.41	0.000	0.32	0.000	0.37
Legal system								
CLHC					0.000	0.32	0.000	0.19
Audit attributes								
BIG4							−0.001	−2.81***
SCO_CHA							0.000	1.18
POL_CHA							0.000	0.77
NEWAUD							0.002	4.52***
Intercept	0.006	4.46***	0.006	4.57***	0.006	4.51***	0.006	4.40***
Year FE	Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes	
Adjusted R^2	0.131		0.153		0.153		0.160	
Observations	4,414		4,414		4,414		4,414	

Note: *, **, *** indicate significance at the 0.10, 0.05 and 0.01 levels, respectively, in two-tailed test. This table presents the multivariate regression results for four different specifications by including various controls that affect income smoothing on a sample of 4,414 firm-year observations. All the regression models include industry fixed effects based on the TSE industry classifications and year fixed effects. See Appendix for definitions and measurements of the variables.

Source: Author's calculation based on the *NEEDS Financial Quest* database.

4.2. Multivariate results

Table 5 presents the multivariate results of model (1) for four different equations that include different attributes that affect income smoothing. Equation (A) includes *JV_IFRS*, thirteen variables representing firm characteristics that affect income smoothing, year fixed effects and industry fixed effects. Additionally, equation (B) adds two tax incentive variables that affect income smoothing. Further, equation (C) includes one variable to represent the legal system, which affects income smoothing. Finally, equation (D) adds four audit factors that may affect income smoothing.

All the coefficients of the test variable (*JV_IFRS*) are significant and positive in the equations in Table 5. This result supports H1, which predicts that voluntary IFRS adoption with motivation similar to that of the IASB has a negative effect on income smoothing. In equation (D), the coefficient of *JV_IFRS* equals 0.002 and is significant at the 0.01 level. This translates into a 0.002 increase in the volatility of net income

Table 6. Voluntary IFRS adoption and conditional conservatism.

	Dependent variable: *NC_SCORE*							
	(A)		(B)		(C)		(D)	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Test variable								
JV_IFRS	0.378	4.67***	0.407	4.98***	0.426	5.19***	0.437	5.25***
Firm characteristics								
LEV	−0.985	−10.85***	−0.967	−10.63***	−0.967	−10.63***	−0.971	−10.67***
SIZE	−0.005	−0.31	−0.001	−0.06	0.000	0.02	−0.001	−0.03
BANK	−0.522	−2.53**	−0.515	−2.50**	−0.468	−2.26**	−0.450	−2.17**
EQU	−0.105	−3.41***	−0.106	−3.44***	−0.104	−3.37***	−0.106	−3.44***
Q	0.478	11.52***	0.479	11.55***	0.481	11.59***	0.481	11.60***
RD	−0.714	−1.29	−0.679	−1.22	−0.465	−0.82	−0.478	−0.84
CURR	−0.028	−3.08***	−0.027	−2.96***	−0.027	−3.00***	−0.027	−2.99***
LOSS	0.026	0.76	0.028	0.82	0.026	0.77	0.022	0.65
EMP	−0.024	−1.32	−0.024	−1.31	−0.013	−0.67	−0.014	−0.72
ROE	0.180	1.68*	0.176	1.65	0.167	1.56	0.160	1.50
GR_SAL	0.160	2.45**	0.161	2.47**	0.162	2.48**	0.160	2.46**
FORSAL	−0.050	−0.73	−0.042	−0.61	−0.022	−0.31	−0.021	−0.30
Tax incentives								
TAGG			−0.027	−1.22	−0.025	−1.12	−0.028	−1.23
THAV			−0.113	−2.23**	−0.084	−1.61	−0.079	−1.50
Legal system								
CLHC					−0.021	−2.20**	−0.022	−2.28**
Audit attributes								
BIG4							−0.009	−0.32
SCO_CHA							0.000	0.02
POL_CHA							0.171	3.39***
NEWAUD							−0.005	−0.09
Intercept	1.144	8.05***	1.096	7.61***	1.013	6.81***	1.028	6.84***
Year FE	Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes	
Adjusted R^2	0.172		0.173		0.173		0.175	
Observations	4,414		4,414		4,414		4,414	

Note: *, **, *** indicate significance at the 0.10, 0.05 and 0.01 levels, respectively, in two-tailed tests. This table presents the multivariate regression results for four different specifications by including various controls that affect conditional conservatism on a sample of 4,414 firm-year observations. All the regression models include industry fixed effects based on the TSE industry classifications and year fixed effects. See Appendix for definitions and measurements of the variables.

Source: Author's calculation based on the *NEEDS Financial Quest* database.

growth (the range of *VAR_NIG* from the lower quartile to upper quartile in the non-IFRS group is 0.003) when firms adopt IFRS voluntarily.

Table 6 presents the multivariate results of model (2) for four different equations that include different attributes that affect conditional conservatism. Similarly, equation (A) includes the *JV_IFRS*, twelve variables of firm characteristics that affect conditional conservatism, year fixed effects and industry fixed effects. The model specifications for equations (B) to (D) are similar to those in Table 5.

All the coefficients of the test variable (*JV_IFRS*) are significant and positive in the equations in Table 6. This result supports H2, which predicts that voluntary IFRS adoption with motivation similar to that of the IASB has a positive effect on conditional conservatism. In equation (D), the coefficient of *JV_IFRS* equals 0.437 and is significant at the 0.01 level. This translates into a 0.437 increase in conditional conservatism (the range of *NC_SCORE* from the lower quartile to the upper quartile in the non-IFRS group is 0.600) when firms adopt IFRS voluntarily.

4.3. Discussion of the results

The multivariate results validate the motivation hypotheses we developed based on expectancy theory (Vroom, 1964). Specifically, they show that voluntary IFRS adoption with motivation similar to that of the IASB is statistically and economically related to higher accounting quality in terms of less income smoothing and more conditional conservatism. All the results are obtained after controlling for main firm characteristics, tax incentives, the legal system, audit attributes and fixed effects.

Our findings validate the existing argument in the IFRS adoption literature. For example, Barth et al. (2008) note that "we cannot be sure our findings are attributable to the change in the financial reporting system rather than to changes in firms' incentives and the economic environment" (p. 467). This study sheds light on the important role of the motivation for IFRS adoption in the outcome of accounting quality. The empirical results also align with Christensen et al.'s (2015) study on motivation for IFRS adoption and add a much clearer explanation of the mechanism. Moreover, our study complements voluntary IFRS adoption research (Auer, 1996; Christensen et al., 2015; Kinnunen et al., 2000; Van Tendeloo & Vanstraelen, 2005) by providing evidence on the role of motivation in accounting standard adoption based on the unique Japanese setting.

5. Additional tests

Soderstrom and Sun (2007) discuss the determinants of accounting quality after IFRS adoption. They argue that, besides accounting standards, legal and political systems, financial market development, capital structure, ownership and tax systems affect accounting quality. Consequently, we further investigate whether capital structure, ownership, tax incentives and investor protection affect the relationship between voluntary IFRS adoption and accounting quality.

5.1. Effects of capital structure

Capital structure reflects the proportions of a firm's sources of funds. We use the debt to asset ratio, *LEV*, as a measure of capital structure. To examine the effects of capital structure on the relationship between voluntary IFRS adoption and accounting quality, we further partition the sample by the median (0.478) of *LEV*.

Panel A in Table 7 presents the regression results of models (1) and (2) for two subsamples based on capital structure. Columns (A) and (B) present results on capital structure's influence on how IFRS adoption affects income smoothing and show that the coefficient of *JV_IFRS* is positive and significant only when $LEV \geq 0.478$ (0.002, p-value <0.01). Columns (C) and (D) present results on capital structure's influence on how IFRS adoption affects conditional conservatism and show that the coefficient of *JV_IFRS* is positive and significant in both subsamples. Moreover, the differences in the coefficient magnitudes between subsamples are all insignificant. These findings suggest that voluntary IFRS adoption improves accounting quality, mainly in firms with higher leverage.

Table 7. Cross-sectional analyses.

Panel A: Capital structure

	Dependent variable: *VAR_NIG*				Dependent variable: *NC_SCORE*			
	LEV ≥ 0.478		*LEV* < 0.478		*LEV* ≥ 0.478		*LEV* < 0.478	
	(A)		(B)		(C)		(D)	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
JV_IFRS	0.002	3.08***	0.002	1.49	0.257	2.67***	0.619	5.45***
Controls	Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes	
Adjusted R^2	0.184		0.170		0.281		0.405	
Observations	2,207		2,207		2,207		2,207	
High versus Low in *JV_IFRS* χ^2 (Prob > χ^2)	0.24 (0.622)				1.30 (0.254)			

Panel B: Bank ownership

	Dependent variable: *VAR_NIG*				Dependent variable: *NC_SCORE*			
	BANK ≥ 0.062		*BANK* < 0.062		*BANK* ≥ 0.062		*BANK* < 0.062	
	(A)		(B)		(C)		(D)	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
JV_IFRS	0.002	4.33***	0.001	0.63	0.375	3.99***	0.570	3.69***
Controls	Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes	
Adjusted R^2	0.197		0.197		0.281		0.140	
Observations	2,207		2,207		2,207		2,207	
High versus Low in *JV_IFRS* χ^2 (Prob > χ^2)	0.54 (0.461)				0.23 (0.634)			

Panel C: Tax incentive

	Dependent variable: *VAR_NIG*				Dependent variable: *NC_SCORE*			
	ETR ≥ 0.369		*ETR* < 0.369		*ETR* ≥ 0.369		*ETR* < 0.369	
	(A)		(B)		(C)		(D)	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
JV_IFRS	0.000	0.21	0.002	2.54**	−0.019	−0.14	0.659	6.25***
Controls	Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes	
Adjusted R^2	0.126		0.185		0.198		0.186	
Observations	2,207		2,207		2,207		2,207	
High versus Low in *JV_IFRS* χ^2 (Prob > χ^2)	4.12 (0.042)				5.85 (0.016)			

Panel D: Investor protection

	Dependent variable: *VAR_NIG*				Dependent variable: *NC_SCORE*			
	ADR ≥ 0.375		*ADR* < 0.375		*ADR* ≥ 0.375		*ADR* < 0.375	
	(A)		(B)		(C)		(D)	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
JV_IFRS	0.001	2.24**	0.002	1.14	0.343	4.66***	0.724	3.09***
Controls	Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes	
Adjusted R^2	0.189		0.188		0.272		0.133	
Observations	2,238		2,176		2,238		2,176	
High versus Low in *JV_IFRS* χ^2 (Prob > χ^2)	0.08 (0.772)				0.25 (0.614)			

Note: *, **, *** indicate significance at the 0.10, 0.05 and 0.01 levels, respectively, in two-tailed tests. This table presents the multivariate regression results on the test variable (i.e. *JV_IFRS*) based on the cross-sectional analyses from the perspective of capital structure, bank ownership, tax incentive and investor protection. All the regression models include industry fixed effects based on the TSE industry classifications and year fixed effects. See Appendix for definitions and measurements of the variables.

Source: Author's calculation based on the *NEEDS Financial Quest* database.

5.2. Effects of bank ownership

We chose bank ownership as a unique ownership characteristic. Gebhardt and Novotny-Farkas's (2011) findings suggest that mandatory IFRS adoption has a positive effect on accounting quality by reducing banks' income smoothing behavior . To examine the effects of bank ownership on the relationship between voluntary IFRS adoption and accounting quality, we further partition the sample by the median (0.062) of *BANK*. Here, *BANK* is the number of shares held by bank investors in the top five shareholders divided by total shares.

Panel B in Table 7 presents the regression results of models (1) and (2) for two subsamples based on bank ownership. Columns (A) and (B) report the results of bank ownership's influence on how IFRS adoption affects income smoothing and show that the coefficient of *JV_IFRS* is positive and significant only when $BANK \geq 0.062$ (0.002, p-value < 0.01). In addition, columns (C) and (D) present results on bank ownership's influence on how IFRS adoption affects conditional conservatism and show that the coefficient of *JV_IFRS* is positive and significant in both subsamples. Moreover, the differences in the coefficient magnitudes between subsamples are all insignificant. These findings suggest that voluntary IFRS adoption improves accounting quality, mainly in firms with a higher level of bank ownership.

5.3. Effects of tax incentive

In the financial reporting incentive literature, tax incentives and accounting quality are negatively related (Mayberry et al., 2015). To examine the effects of tax incentives on the relationship between voluntary IFRS adoption and accounting quality, we partition the sample by the median (0.369) of the tax avoidance proxy *ETR*. Here, *ETR* is calculated as current tax expense divided by pre-tax book income. *ETR*s are reset to 1(0) if greater(less) than 1(0).

Panel C in Table 7 presents the regression results of models (1) and (2) for two subsamples based on tax avoidance incentive. Columns (A) and (B) report results on tax incentive's influence on how IFRS adoption affects income smoothing and show that the coefficient of *JV_IFRS* is positive and significant only when $ETR < 0.369$ (0.002, p-value < 0.05). Columns (C) and (D) present results on tax incentive's influence on how IFRS adoption affects conditional conservatism and shows that the coefficient of *JV_IFRS* is positive and significant only when $ETR < 0.369$ (0.659, p-value < 0.01). Moreover, the differences in the coefficient magnitudes between subsamples are all significant. These findings suggest that voluntary IFRS adoption improves accounting quality, mainly in firms with a higher degree of tax avoidance.

5.4. Effects of investor protection

Houqe et al. (2012) suggest that earnings quality increases under mandatory IFRS adoption when a country has a high level of investor protection. We consider a firm that has foreign direct investment in host countries with high levels of anti-director rights represents investment in a high investor protection environment (La Porta et al., 1998). To examine the effects of investor protection on the relationship

between voluntary IFRS adoption and accounting quality, we further partition the sample by the median (0.375) of *ADR*. Here, *ADR* is the proportion of countries with a higher level of anti-director rights in a firm's FDI host country portfolio.

Panel D in Table 7 presents the regression results of models (1) and (2) for two subsamples based on investor protection. Columns (A) and (B) report results on investor protection's influence on how IFRS adoption affects income smoothing and show that the coefficient of *JV_IFRS* is positive and significant only when $ADR \geq 0.375$ (0.001, p-value < 0.05). Columns (C) and (D) present results on investor protection's influence on how IFRS adoption affects conditional conservatism and show that the coefficient of *JV_IFRS* is positive and significant in both subsamples. Moreover, the differences in the coefficient magnitudes between subsamples are all insignificant. These findings suggest that voluntary IFRS adoption improves accounting quality, mainly in regions with strong outside investor rights.

6. Robustness tests

6.1. Alternative dependent variables

We employ variations of the two dependent variable measures. Specifically, for model (1), we substitute the variance of the residuals from model (3) for six years (*VAR_NIG*) with the variance of the residuals from model (3) for eight years (*VAR_NIG2*). For model (2), we substitute the firm-year conditional conservatism measure based on Lee et al.'s (2015) current and lagged earnings-changes model (*NC_SCORE*) with firm-year conditional conservatism based on Lee et al.'s (2015) earnings per share model (*BC_SCORE*). All additional variables are defined in Appendix. The results in Panel A of Table 8 are all consistent with the previous multivariate regression results. The coefficients of *JV_IFRS* in models (1) and (2) are 0.002 (p-value < 0.05) and 0.006 (p-value < 0.05), respectively.

6.2. Alternative PSM samples

As a further robustness test, we apply two other PSM approaches: nearest neighbour matching and radius matching. For the PSM sample matched using the nearest neighbour method, we match each IFRS sample with two counterparts, which produces a matching sample with 268 firm-year observations. For the PSM sample matched by the radius method, we match each IFRS sample with a radius caliper of 0.001, which leads to a matching sample with 1,609 firm-year observations. As shown in Panels B and C in Table 8, the results are qualitatively similar to our main test results.

6.3. Omitted control variables

To improve the robustness of the results, we add three more variables to capture the influence of U.S. cross-listing (*USLIST*), audit report lag (*REPLAG*) and auditor industry expertise (*IND_EXP*) to the regression models. All additional variables are defined in Appendix. The results in Panel D of Table 8 are all consistent with the

Table 8. Robustness tests.

Panel A: Alternative dependent variables

	Dependent variable: *VAR_NIG2*		Dependent variable: *BC_SCORE*	
	(A)		(B)	
	Coeff.	t-stat	Coeff.	t-stat
JV_IFRS	0.002	2.03**	0.006	2.56**
Controls	Yes		Yes	
Year FE	Yes		Yes	
Industry FE	Yes		Yes	
Adjusted R^2	0.118		0.533	
Observations	4,414		4,414	

Panel B: Alternative PSM samples (nearest neighbour matching with two counterparts)

	Dependent variable: *VAR_NIG*		Dependent variable: *NC_SCORE*	
	(A)		(B)	
	Coeff.	t-stat	Coeff.	t-stat
JV_IFRS	0.001	2.33**	0.378	2.45**
Controls	Yes		Yes	
Year FE	Yes		Yes	
Industry FE	Yes		Yes	
Adjusted R^2	0.292		0.388	
Observations	268		268	

Panel C: Alternative PSM samples (radius matching with a radius caliper of 0.001)

	Dependent variable: *VAR_NIG*		Dependent variable: *NC_SCORE*	
	(A)		(B)	
	Coeff.	t-stat	Coeff.	t-stat
JV_IFRS	0.003	3.74***	0.269	3.17***
Controls	Yes		Yes	
Year FE	Yes		Yes	
Industry FE	Yes		Yes	
Adjusted R^2	0.126		0.262	
Observations	1,609		1,609	

Panel D: Omitted variables

	Dependent variable: *VAR_NIG*		Dependent variable: *NC_SCORE*	
	(A)		(B)	
	Coeff.	t-stat	Coeff.	t-stat
JV_IFRS	0.002	2.89***	0.431	5.17***
USLIST	0.002	1.97**	−0.286	−2.57**
REPLAG	0.000	1.49	−0.001	−0.56
IND_EXP	0.000	−0.01	−0.018	−0.70
Controls	Yes		Yes	
Year FE	Yes		Yes	
Industry FE	Yes		Yes	
Adjusted R^2	0.160		0.176	
Observations	4,414		4,414	

Panel E: Sample restrictions (a relatively constant number of observations for each year)				
	Dependent variable: *VAR_NIG*		Dependent variable: *NC_SCORE*	
	(A)		(B)	
	Coeff.	t-stat	Coeff.	t-stat
JV_IFRS	0.001	2.07**	0.427	5.40***
Controls	Yes		Yes	
Year FE	Yes		Yes	
Industry FE	Yes		Yes	
Adjusted R^2	0.152		0.222	
Observations	4,256		4,256	
Panel F: Sample restrictions (similar size firms)				
	Dependent variable: *VAR_NIG*		Dependent variable: *NC_SCORE*	
	(A)		(B)	
	Coeff.	t-stat	Coeff.	t-stat
JV_IFRS	0.001	2.91***	0.432	5.18***
Controls	Yes		Yes	
Year FE	Yes		Yes	
Industry FE	Yes		Yes	
Adjusted R^2	0.194		0.193	
Observations	4,236		4,236	
Panel G: Sample restrictions (outliers winsorized at the 1 and 99% levels)				
	Dependent variable: *VAR_NIG*		Dependent variable: *NC_SCORE*	
	(A)		(B)	
	Coeff.	t-stat	Coeff.	t-stat
JV_IFRS	0.001	3.42***	0.380	6.01***
Controls	Yes		Yes	
Year FE	Yes		Yes	
Industry FE	Yes		Yes	
Adjusted R^2	0.209		0.205	
Observations	4,414		4,414	

Note: *, **, *** indicate significance at the 0.10, 0.05 and 0.01 levels, respectively, in two-tailed tests. This table presents the multivariate regression results on the test variable (i.e. *JV_IFRS*) through a series of robustness tests. All the regression models include industry fixed effects based on the TSE industry classifications and year fixed effects. See Appendix for definitions and measurements of the variables.
Source: Author's calculation based on the *NEEDS Financial Quest* database

former multivariate regression results. The coefficients of *JV_IFRS* in models (1) and (2) are 0.002 (p-value < 0.01) and 0.431 (p-value < 0.01), respectively.

6.4. Sample restrictions

To maintain a relatively constant number of observations for each year, we drop 158 firm-year observations for firms missing observations in two or more years and reestimate the regression models. The results are qualitatively similar to those reported in Tables 5 and 6. For Panel E in Table 8, the coefficients of *JV_IFRS* in models (1) and (2) are 0.001 (p-value < 0.05) and 0.427 (p-value <0.01), respectively.

Considering most Japanese firms that adopted IFRS are large and middle-size firms, we drop 178 firm-year observations that are lower/higher than the minimum (9.061)/maximum (16.591) value of *SIZE* for the IFRS sample and reestimate the

regression models. For Panel F in Table 8, the coefficients of *JV_IFRS* in models (1) and (2) are 0.001 (p-value < 0.01) and 0.432 (p-value <0.01), respectively.

Given the potential effect of outlier variables, we winsorize outlier variables (continuous variables) at the 1 and 99% levels. The results remain unchanged. For Panel G in Table 8, the coefficients of *JV_IFRS* in models (1) and (2) are 0.001 (p-value $<$ 0.01) and 0.380 (p-value <0.01), respectively.

7. Conclusions

In this study, we are motivated to examine the effects on accounting quality of voluntary IFRS adoption by firms with motivations consistent with the IASB's mission. Based on the mixed results from prior IFRS adoption studies, it seems that voluntary IFRS adoption may lead to higher accounting quality because it results in higher comparability of financial reports or to lower accounting quality due to its high level of complexity and vague judgments. According to expectancy theory (Vroom, 1964), we predict that voluntary IFRS adoption by Japanese listed firms may lead to higher accounting quality. We conduct two multivariate regression tests for our hypotheses on the relationship between voluntary IFRS adoption and two proxies of accounting quality.

Using a sample of firm-year observations of Japanese listed firms from 2010 to 2014, we find that voluntary IFRS adoption based on motivation similar to that of the IASB enhances accounting quality by decreasing the extent of income smoothing and increasing conditional conservatism. These relationships are both statistically and economically significant. Based on our additional tests, we find that these associations mainly exist in firms with higher leverage, banker investors, a higher degree of tax avoidance and in regions with strong outside investor rights. In addition, we conduct several robustness tests of the central findings. The results remain unchanged.

To summarise, this study suggests that voluntary IFRS adoption based on motivation similar to that of the IASB affects income smoothing and conditional conservatism. The study findings are consistent with the idea that voluntarily adopting IFRS with motivation similar to that of the IASB can improve accounting quality by enhancing motivation along with the guidelines of IFRS, as well as cautiously and positively overcoming the complicated issues, which increases the comparability in financial reporting. The findings contribute to the literature by demonstrating expectancy theory (Vroom, 1964) is appropriate as a tool for explaining the relationship between voluntary IFRS adoption and accounting quality in Japan.

This study has three main caveats. First, the motivation hypothesis in this study has a limitation. We roughly recognise that all Japanese IFRS adopters are voluntary with motivation similar to that of the IASB, based on the FSA survey report (FSA, 2015) but fail to clarify the degree of positive motivation for voluntary IFRS adoption. Second, this study's sample period does not include the period after the year of the FSA survey (i.e. 2015) because we would not be able to capture the possible change in motivation for new adopters during the post FSA survey period. More specific first-hand survey data are necessary for motivation analysis. Third, considering the

inherent difficulty in identifying accounting quality measurements (Gunny, 2010), we could not adequately address endogeneity concerns about the measurements of the accounting quality proxies used in this study. These issues should be considered in future research.

Notes

1. The IFRS home page (https://www.ifrs.org/use-around-the-world/use-of-ifrs-standards-by-jurisdiction/#analysis, accessed 3 November 2020) mentions that 144 jurisdictions require IFRS for all or most domestic publicly accountable entities (listed companies and financial institutions) in their capital markets.
2. The IFRS home page (https://www.ifrs.org/use-around-the-world/use-of-ifrs-standards-by-jurisdiction/#analysis, accessed 3 November 2020) mentions that there are 12 jurisdictions that permit, rather than require, IFRS Standards (i.e., Bermuda, Cayman Islands, Guatemala, Honduras, Japan, Madagascar, Nicaragua, Panama, Paraguay, Suriname, Switzerland, and Timor-Leste). Few studies investigate the effect of voluntary IFRS adoption on accounting quality using evidence from these countries.
3. Several factors affect financial reporting incentives, including ownership characteristics, capital structure, tax incentives, and others.
4. The accounting standard information is collected from the *NEEDS Financial Quest* Database. The ratio calculation is based on the raw data before the sample selection process shown in Table 1.
5. Most Japanese listed firms follow Japanese GAAP, which are issued by the Accounting Standards Board of Japan (ASBJ) and the Financial Accounting Standards Foundation (FASF).
6. Source: https://www.jpx.co.jp/english/news/1020/20160720-01.html, accessed 3 November 2020.
7. EC home page (https://ec.europa.eu/commission/presscorner/detail/en/IP_08_1962, accessed 3 November 2020) mentions that the GAAP of Japan is found to be equivalent to IFRS as adopted by the EU.
8. Forty firms had adopted IFRS by 28 February 2015 and the rest of the firms had announced plans to voluntarily adopt IFRS.
9. Other firms aim for a better reflection of their performance (6 firms), smoother financing from abroad (5 firms), and other reasons (5 firms).
10. See IFRS home page (https://www.ifrs.org/about-us/who-we-are/, accessed 3 November 2020).
11. For the PSM sample matched using the kernel method, we set the bandwidth at 0.01, and 0.05 of the treatment observations. Further, for the robustness tests, we apply two other PSM approaches: nearest neighbor matching and radius matching. For the PSM sample matched using the nearest neighbor method, we match each IFRS sample with two counterparts. For the PSM sample matched using the radius method, we match each IFRS sample with a radius caliper of 0.001. As shown in Table 8, the results are qualitatively similar to our main test results.
12. Because the performance indicators related to the capital structures of financial companies differ from those of non-financial firms, we remove all financial companies from the dataset. Further, we exclude all firm-year observations where there are fewer than ten observations in any industry in any given year (at least ten firms per year are required for any industry to be retained in the sample).
13. Based on the sample selection process, we eventually drop 21 industries from the 33 TSE industry classifications. These 21 industries are fishery, agriculture, and forestry; mining, oil, and coal products; air transportation; banks; securities and commodities futures; insurance; construction; foods; textiles and apparel; pulp and paper; nonferrous metals; metal products; precision instruments; other products; electric power and gas; marine transportation; warehousing and harbor transportation; retail trade; real estate; services; and other financing business.

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Appendix

Definitions and measurements of the variables

Variables	Definitions
Dependent variables	
NC_SCORE	Firm-year conditional conservatism measure based on Lee et al.'s (2015) current and lagged earnings-changes model. Similarly, in order to let the *NC_SCORE* increases with conditional conservatism, the measures are multiplied by negative one.
VAR_NIG	The variance of the firm-year-level residuals from the net income growth model for a six-year period (t to t-5). The net income growth model is based on Ahmed et al. (2013) and Barth et al. (2008). Lower values of *VAR_NIG* indicate greater income smoothing.
Test variable	
JV_IFRS	Indicator variable that equals 1 if a firm adopted IFRS voluntarily and 0 otherwise.
Control variables	
AGE	Log number of years firm listed in the stock market.
BANK	The number of shares held by bank investors in the top five shareholders divided by total shares.
BIG4	Indicator variable that equals 1 if a firm selected a Big 4 auditor (i.e. Deloitte/EY/KPMG/PwC) and 0 otherwise.
CLHC	The number of common law countries in a firm's FDI host country portfolio. Country-level information on legal systems is obtained from the *CIA Factbook,* and firm-year-level host country information is obtained from Toyo Keizai's *Overseas Japanese Companies* database.
CURR	Current assets divided by current liabilities.
EMP	The natural logarithm of the number of employees.
EQU	The market value of equity divided by lagged total assets.
FORSAL	The ratio of foreign sales to net sales.
GR_ASS	The percentage change in total assets.
GR_SAL	The percentage change in total sales.
LEV	Total debt divided by total assets.
LOSS	Indicator variable that equals 1 if there was a reported loss for a three-year period (t to t-2) and 0 otherwise.
NEWAUD	Indicator variable that equals 1 if the auditor firm relationship is two years or less and 0 otherwise.
OPCF	Operating cash flow divided by total assets.
POL_CHA	Indicator variable that equals 1 if a firm changed in accounting policy and 0 otherwise.
Q	The total market value of firm divided by total asset value.
RD	Research and development expenses divided by lagged total assets.
ROA	Operating income divided by total assets.
ROE	Income before extraordinary items divided by shareholder's equity.
SCO_CHA	Indicator variable that equals 1 if a firm changed in scope of consolidation and 0 otherwise.
SIZE	The natural logarithm of total assets (in millions of yen).
TAGG	Indicator variable that equals to 1 if a firm was tax aggressive and 0 otherwise. Tax aggressiveness is defined as a firm with either a *CAS_ETR* or *CUR_ETR* in the lowest tertile by year and industry. *CAS_ETR* is cash effective tax rate of the six-year sum (t to t-5) of cash taxes paid to the six-year sum of pre-tax book income. *CAS_ETR*s are reset to 1 (0) if greater (less) than 1 (0). *CUR_ETR* is the current effective tax rate of the six-year sum (t to t-5) of current tax expense to the six-year sum pre-tax book income. *CUR_ETR*s are reset to 1 (0) if greater (less) than 1 (0).
THAV	The number of subsidiaries incorporated in a tax haven. Tax haven is based on the definition of tax haven (OECD) in Dharmapala (2008).
Variables added in additional and robustness tests	
ADR	The proportion of countries with a higher level of anti-director rights in a firm's FDI host country portfolio. Here, a higher level of anti-director rights is defined as anti-director rights that are higher than the upper quartile for all country observations. Anti-director rights are estimated following La Porta et al. (1998).
BC_SCORE	Firm-year conditional conservatism measure based on Lee et al.'s (2015) earnings per share model. Conditional conservatism is increasing in *BC_SCORE*.
ETR	Current tax expense to pre-tax book income. *ETR*s are reset to 1(0) if greater(less) than 1(0).
IND_EXP	Indicator variable that equals 1 if a firm was audited by an audit firm that had 25% or more market share in an industry in each year and 0 otherwise. An audit firm's market share for an industry is calculated as the sum of sales of its individual clients in an industry divided by the sum of sales for all companies in the industry.
REPLAG	The number of days between a firm's fiscal year-end date and the issuance date of the auditor's report.
USLIST	Indicator variable that equals 1 if a firm cross-lists in the U.S. and 0 otherwise.
VAR_NIG2	The variance of the firm-year-level residuals from the net income growth model for an eight-year period (t to t-7). The net income growth model is based on Ahmed et al. (2013) and Barth et al. (2008). Lower values of *VAR_NIG2* indicate greater income smoothing.

Source: Made by the author with reference to related literature.