

IFRS Adoption, Earnings Quality, and Investment Efficiency: Evidence from Japan

Rong-Ruey Duh¹ Chih-Hsien Liao¹ Chien-Min Pan² Atsuko Takinshi¹

¹ Department of Accounting, National Taiwan University

² Department of Accounting, National Chengchi University

Corresponding author: Chih-Hsien Liao

Address: No. 1, Sec. 4, Roosevelt Rd., Da'an Dist., Taipei City 106319, Taiwan (R.O.C.)

E-mail : chliaol05@ntu.edu.tw

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Abstract

This paper examines the effects of the adoption of International Financial Reporting Standards (IFRS) on Japanese firms' earnings quality and investment efficiency. We use a sample of Japanese firms listed on the Tokyo Stock Exchange (TSE) that voluntarily adopted IFRS during the period of 2010-2016. After controlling for self-selection bias using propensity score matching, we find that, relative to non-adopters, firms adopting IFRS have higher earnings quality in the post-adoption period, as measured by lower discretionary accruals and less income smoothing. In addition, IFRS-adopting firms have better investment efficiency, as evidenced by their lower over-investment and lower under-investment. Our study provides evidence of a reduction in information asymmetry after a switch from domestic accounting standards to IFRS in a country that underwent an institutional shift within a context of traditional cultural values.

Keywords: IFRS adoption, earnings quality, investment efficiency, institutional change

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1. Introduction

This paper examines the effects of adopting International Financial Reporting Standards (IFRS) on earnings quality and investment efficiency in a setting where there are transformations to a Western governance system in a traditionally code-law country. While IFRS have been adopted by more than one hundred jurisdictions around the world,¹ Japan, which currently is the world's third largest economy, did not allow firms to adopt IFRS until March 2010. Although some studies have shown economic benefits associated with IFRS adoption, the empirical evidence is mixed with regard to the effect of IFRS adoption on earnings quality (e.g., Soderstrom and Sun 2007). Thus, whether the adoption of IFRS has been beneficial to the Japanese economy remains an empirical question.

Traditionally, Japan has been classified as a code-law country as opposed to a common-law country, and code-law countries are regarded as having weaker legal investor protection and enforcement than common-law countries (Ball, Kothari, and Robin 2000; La Porta et al. 1998). In addition, the Japanese governance system is generally viewed as a stakeholder-oriented governance system. Unlike the shareholder-oriented governance systems of common-law countries, stakeholder-oriented governance systems are characterized by debt financing, shareholders associated with domestic affiliated interests, and interconnected networks among firms, their trading partners, and the main banks (Hoshi and Kashyap 2001). In particular, the main banks have access to private information and provide direct monitoring of debtors. Under such a system, firms have lower incentives to disclose transparent financial reports to outside investors.

After Japan's economic bubble burst in the 1990s, the Japanese government initiated a series of regulatory reforms aimed at financial liberalization and internationalization that were more in line with the Anglo-American governance system (Tsunogaya and Chand 2012). The resulting opening-up of investment to foreign institutional investors and decreased role of banks in providing financing may have changed the traditional ownership and governance structure in Japan, with implications for the importance of financial reporting quality.² As accounting quality is affected by laws and regulations that represent the regulator's attitudes (Ball, Kothari, and Robin. 2000), such institutional changes would seem to have created a setting that is favorable to the adoption of IFRS.

Using the Japanese setting, Sato and Takeda (2017) find that firms with better corporate governance are more likely to adopt IFRS but experience smaller market reactions around the announcement of IFRS adoption. In a similar vein, Gray, et al. (2019) show that firms that perceive favorable consequences from using IFRS are more likely to adopt IFRS voluntarily. In contrast with the above two studies, we examine whether the adoption of IFRS has changed

¹ According to the IFRS Foundation, 116 jurisdictions required their listed firms to adopt IFRS as of 2015. The 116 jurisdictions include some that do not have stock exchanges (IFRS Foundation, 2015).

² See Roe (1993) and Nobes (2011) for the impact of laws and regulations on capital structure and financial reporting quality.

the earnings quality of the adopting firms. Although some of the existing literature finds that the adoption of IFRS leads to higher-quality financial reporting (e.g., Barth, Landsman, and Lang 2008; Bassemir and Novotny-Farkas 2018; Gassen and Sellhorn 2006), other studies do not find evidence to support this conclusion (e.g., Capkun, Collins, and Jeanjean 2016; Van Tendeloo and Vanstraelen 2005). Moreover, many studies argue that factors other than accounting standards play a first-order role in financial reporting quality (e.g., Soderstrom and Sun 2007; Holthausen 2009). These other factors include managers' incentives, laws and regulations, regulatory enforcement, and cultural factors (e.g., Ball, Kothari, and Robin. 2000; Daske, Hail, Leuz, and Verdi 2013; Gray 1988; Han et al. 2010).

Building on the unique institutional changes as well as societal values in Japan, we examine two research questions: First, do Japanese firms that switch from Japanese accounting standards to IFRS experience an improvement in earnings quality? Second, do Japanese firms adopting IFRS have higher investment efficiency in the post-adoption period? We argue that the changes in the Japanese governance system reduced the dominance of banks and increased reliance on shareholders. Thus, Japanese accounting standards, which focus on debt contracting and tax-book conformity, may no longer satisfy shareholders' demand for higher-quality financial reporting. Accordingly, IFRS, which places a greater emphasis on transparency to outside shareholders, should lead to better earnings quality for IFRS-adopting firms. On the other hand, however, traditional Japanese cultural values might be incompatible with the orientation of IFRS. For example, Japan ranks low in individualism and high in uncertainty avoidance (Hofstede 1980, 2001). A possible consequence in financial reporting is a preference for uniformity, smoothness, and statutory control (Gray 1988), which are in contrast to the IFRS's emphasis on professional judgment. Given the possible opposing influence of Japanese cultural factors, the ultimate effect of IFRS adoption on earnings quality is an empirical question.

If IFRS adoption is accompanied with enhanced disclosures and improved quality of information, we expect that firms adopting IFRS would have a lower degree of information asymmetry and thus a lower amount of suboptimal investments. However, relatively few studies investigate whether IFRS adoption affects firms' investment efficiency. Chen, Young, and Zhuang (2013) examine the externalities of mandatory IFRS adoption in EU countries and find that a firm's investment efficiency increases after IFRS adoption because more information is then available on the investment performance of peer firms. Also focusing on EU countries, Schleicher, Tahoun, and Walker (2010) document that the negative effect of IFRS adoption on investment-cash flow sensitivity is stronger in insider economies than in outsider economies.³ Two recent cross-country studies find that the mandatory adoption of IFRS reduces the probability of suboptimal investments (Biddle et al. 2016; Gao and Sidhu 2018). Nevertheless, findings in those prior studies may not be

³ Both Chen et al. (2013) and Schleicher et al. (2010) focus on EU countries where legal enforcement and investor protection are different from those in Japan.

generalizable to Japan, a country with a distinct institutional environment and traditional values.

We use a sample of Japanese firms listed on the Tokyo Stock Exchange (TSE) that voluntarily adopted IFRS for the period of 2010-2016. After controlling for self-selection bias using propensity score matching, we find that, relative to non-adopters, firms adopting IFRS have higher earnings quality in the post-adoption period, as measured by lower discretionary accruals and less income smoothing. Further cross-sectional analyses suggest that the positive effect of IFRS adoption on earnings quality is conditional on firms having independent directors on the board and having higher levels of foreign institutional ownership. We also find that firms adopting IFRS have higher investment efficiency, as evidenced by lower over-investment as well as lower under-investment. Overall, the results suggest that a commitment to higher-quality accounting standards reduces information asymmetry and facilitates better allocation of capital.

Our paper makes the following contributions. First, this study adds to our understanding of the economic consequences of adopting IFRS in a country whose institutions have traditionally differed from those of Anglophone countries. Previous studies based on the Japanese setting focus only on the market reactions to announcements of IFRS adoption (e.g. Takeda and Watanabe 2016; Sato and Takeda 2017). We extend this literature by exploring whether IFRS adopters experience changes in financial reporting quality. Second, we contribute to the literature by providing evidence that the adoption of IFRS also affects firms' internal investment decisions. Most IFRS-related literature focuses on capital market consequences, and we thus know little about whether IFRS adoption results in real effects on firms' investment activities. Our study documents that IFRS adoption improves firms' investment efficiency, consistent with the anecdotal evidence from a Japanese survey indicating that the adoption of IFRS would improve management resource allocation (FSA, 2015). Our findings have implications for both capital market participants and corporate practitioners.

The remainder of this paper is organized as follows. Section 2 provides a literature review, the institutional background in Japan, and the development of the research hypotheses. Section 3 provides a description of the research methodology, including the data, sample, and empirical models. Section 4 discusses the empirical results. Additional analyses are provided in section 5. Section 6 concludes the paper.

2. Institutional background, literature review and hypotheses

2.1 Institutional background in Japan

The Japanese economy has long been characterized by the existence of the keiretsu system as manifested by the relatively large cross-holdings within corporate groups and the central role of banks in many of these groups, with related implications for financing (Hoshi and Kashyap,

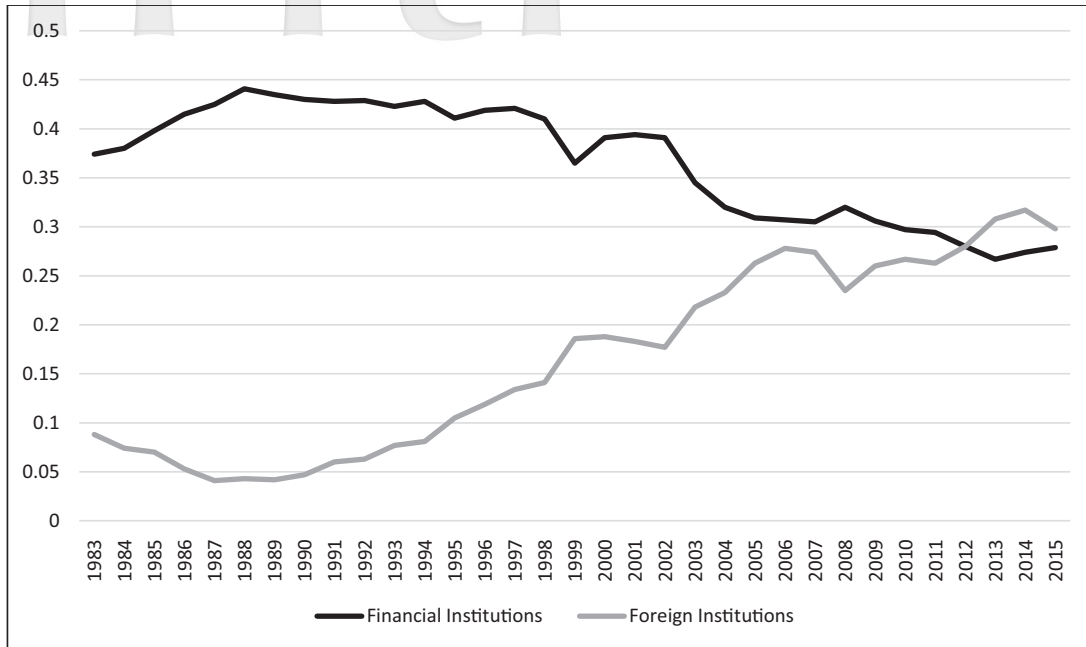
2001). The concentration of ownership in large financial institutions and interconnected member firms promotes efficient monitoring and control by the equity holders without short-term performance pressures (Sheard 1994; McGuire and Dow 2002). The relationships with the main banks and affiliated financial institutions also provide flexible financing. Infrequent trading of shares by the connected firms also stabilizes ownership structure and maintains control in the hands of the banks and connected firms. These features suggest that the stakeholders have channels other than financial reports for monitoring a firm's performance and financial position. Numerous studies point out that Japanese banks play a monitoring role under the bank-centered corporate governance model (e.g., Kaplan and Minton 1994). Firms with bank-centered governance mechanisms use insider communication to resolve the problem of information asymmetry between managers and banks or other stakeholders, and there is less demand for high-quality financial reports to reduce information asymmetry (Ball, Kothari, and Robin. 2000). Financial reporting quality is therefore not as important as in an economy with external shareholder-oriented firms (Dargenidou, McLeay, and Raonic 2007).

In the late 1990s, in response to the prolonged recession that followed the bursting of Japan's asset price bubble at the outset of the 1990's and the consequent slow economic growth, the Japanese government initiated a program of financial liberalization and internationalization through a series of regulatory reforms. These changes encompassed capital market participants, corporate governance, financial reporting and auditing practices. In general, these reforms involved movement towards a more Western model (Tsunogaya and Chand 2012). For example, in 2001, regulators set up the Accounting Standards Board of Japan (ASBJ), which in many ways is modeled after the U.S. Financial Accounting Standards Board (FASB). In 2003, the Japanese government introduced a key feature of the Anglo-American model by allowing firms to switch to an audit committee from the statutory auditor board under the conventional two-tier structure.

Figure 1 shows the average ownership by foreign institutions as well as financial institutions for all firms listed on the TSE. We can see that the shareholdings of foreign institutions increased steadily from less than 10% before 1995 to about 30% after 2013. In contrast, domestic bank shareholdings began to decline in the 2000s, and even became lower than foreign institutions ownership after 2012. These changes in ownership structure may have fueled demand for more transparent financial reports amid concerns that Japanese accounting standards may not satisfy the needs of foreign investors. The ownership patterns in Figure 1 support the argument that the globalization of financial markets and the deregulation of Japanese securities markets may motivate firms to change their financial reporting in response to the demands of global investors rather than those of traditional local stakeholders (McGuire and Dow 2002).

In addition to undertaking regulatory reforms, in March 2010, Japan began allowing firms to adopt IFRS if they meet certain criteria (Nobes and Zeff 2016). The criteria include (1) being a listed firm in Japan, (2) having an appropriate internal framework for IFRS-based consolidated financial reporting, (3) having a board of directors or employees who have working knowledge

Figure 1. Listed Firms' Share Ownership from 1983 to 2016



Data Source: Japan Exchange Group, Data & Statistics (in Japanese) (<http://www.jpx.co.jp/markets/statistics-equities/examination/01-archives-01.html>: accessed on July 15, 2017)

in preparing consolidated financial statements in accordance with IFRS, and (4) conducting significant financial or business activities internationally. In October 28, 2013, criteria (1) and (4) were eliminated so that all listed firms in Japan became eligible to adopt IFRS if they wish. As a result, starting from 2014 the number of firms adopting IFRS increased significantly.⁴ These transformative steps seem designed to bring the Japanese accounting and governance systems more in line with shareholder interests and to put greater emphasis on investor protection, which creates a setting that may be conducive to IFRS implementation.

2.2 Literature review

Many studies have examined the economic consequences of voluntary IFRS adoption, with the majority focusing on the capital market effects. Using a sample of 102 German firms, Leuz and Verrecchia (2000) investigate the impact of changing accounting standards on the cost of capital proxied by bid-ask spreads and share turnover. They find that firms voluntarily switching

⁴ The Japanese government suspended the roadmap toward mandatory adoption, similar to the SEC's decision in the U.S. to postpone the mandatory adoption of IFRS. Instead, the regulators changed their policy to focus on encouraging preparers to choose IFRS (Gray et al. 2019).

from German GAAP to IFRS or US GAAP have lower bid-ask spreads and higher share turnover, suggesting that a substantial increase in firms' commitment to greater disclosure reduces the cost of capital. Ashbaugh and Pincus (2001) examine whether analyst forecast errors decrease after a firm adopts IFRS. Analyzing a sample of 80 non-US firms across 13 countries, they find that forecast errors are positively related to the differences between a country's domestic accounting standards and IFRS. They also show that analyst forecast errors decrease significantly after the adoption of IFRS, suggesting that IFRS adoption reduces analysts' cost of information acquisition and thus improves forecast accuracy. Covrig, DeFond, and Hung (2007) analyze whether voluntary IFRS adoption leads to a reduction in home-country bias among foreign investors and in turn increases foreign ownership. Using a large sample of 24,592 firm-year observations from 1999 to 2002 in 29 countries, they find that, on average, firms voluntarily adopting IFRS experience 45% higher foreign mutual fund ownership than firms using domestic GAAP. They also show that average foreign mutual fund ownership increases by 35% in the year following a voluntary switch from domestic GAAP to IFRS.

While there is consistent evidence showing positive capital market reactions to voluntary IFRS adoption, the evidence on the association between voluntary IFRS adoption and accounting quality is mixed. Van Tendeloo and Vanstraelen (2005) find no differences in earnings management between German firms voluntarily adopting IFRS and those that apply German GAAP. Hung and Subramanyam (2007) also find that income reported under IFRS is less persistent and no more value-relevant than income reported under German GAAP. In contrast, Gassen and Sellhorn (2006) document that German firms voluntarily adopting IFRS have more persistent, less predictable, and more conservative earnings than those applying domestic GAAP. Similar results are observed by Bassemir and Novotny-Farkas (2018), who find that both earnings quality and disclosure levels improve around voluntary IFRS adoption by German private firms. Using an international sample of firms from 21 countries, Barth et al. (2008) find that firms applying IFRS generally show less earnings management, more timely loss recognition, and greater value relevance of accounting numbers than their counterparts that apply non-US domestic standards. Similarly, Barth et al. (2014) find that income adjustments under IFRS are considered value-relevant by investors in European firms. Some studies argue that it is the firms' reporting incentives (rather than the accounting standards per se) that drive the changes in earnings properties after IFRS adoption (e.g., Ball, Kothari, and Robin. 2000; Burgstahler, Hail, and Leuz, 2006; Daske et al. 2013). To distinguish the standards effect from the incentives effect, Christensen, Lee, and Walker (2015) contrast a sample of voluntary IFRS adopters in Germany with firms that switched to IFRS following the EU mandate. They find less earnings management and more timely loss recognition for the voluntary adopters but no such evidence for the mandatory adopters.

A few studies empirically examine whether the adoption of IFRS improves investment efficiency, given that IFRS appears to enhance financial reporting quality. Chen et al. (2013) show

that mandatory IFRS adoption has a spillover effect on a firm's investment efficiency arising from increased disclosures by foreign peers. Schleicher et al. (2010) find that IFRS reduces the investment-cash flow sensitivity of insider economies more than that of outsider economies. Gao and Sidhu (2018) document that mandatory IFRS adoption reduces the probability of under-investment but the probability of over-investment remains unchanged. While these studies focus on mandatory IFRS adoption, our study tests whether voluntary IFRS adoption has an impact on investment efficiency. Also, in contrast with the cross-border studies, our focus on a single country has the advantage of avoiding confounding country-level factors.⁵

2.3 Research hypotheses

2.3.1 Earnings quality

We argue that two forces will contribute to an improvement in earnings quality following IFRS adoption. The first force comes from the shift in ownership structure resulting from regulatory reforms. Traditionally, Japanese firms have relied heavily on borrowing from banks to meet financing needs. The banks also serve as quasi-inside shareholders that provide firms with capital market stability (McGuire and Dow 2002). Under such a bank-dominated system, firms may prefer stable earnings and be more likely to manage earnings when losses occur (Herrmann, Inoue, and Thomas 2003). The series of regulatory reforms since the 1990s has made the capital market more open to foreign investors, resulting in an increase in foreign ownership. Yoshikawa and McGuire (2008) assert that rising equity market pressure from foreign ownership is an important driver leading Japanese firms to adopt practices more consistent with US shareholder-based systems.⁶ Increased activism from foreign investors has also contributed to the social and political pressures faced by Japanese firms to adopt IFRS (Komiyama and Masaoka 2002; Seki 2005; Osi 2009; Sakawa Moriyama and Watanabel 2012). If Japanese GAAP is considered to have an insider orientation, firms adopting IFRS should experience an improvement in earnings quality to meet the demands of outside investors.

The second force comes from the different orientations of accounting standards. IFRS places greater emphasis on transparency to outside shareholders, whereas Japanese GAAP is driven by contracting and tax-book conformity considerations. The shareholder-oriented nature of IFRS should lead to better earnings quality. More specifically, IFRS requires the fair presentation of a firm's financial position and performance with an emphasis on substance, avoiding the use of explicit threshold rules. In addition, IFRS incorporates the effects of economic events into

⁵ Biddle et al. (2016) argue that contextual and regulatory differences across countries could influence the effect of IFRS adoption.

⁶ For example, Chen et al. (2015) find that Japanese firms that voluntarily switch to the audit committee system tend to be those that cross-list in the US, enjoy higher growth, hire Big 4 auditors, and have lower bank ownership as well as higher foreign ownership. However, the improvement in earnings quality occurs only for those hiring independent, diligent audit committee members with financial expertise.

financial statements in a more volatile manner, leading to reduced income smoothing (Alexander and Archer 2001). Studies also provide empirical evidence supporting the contention that the fair value orientation of IFRS results in a higher frequency of large losses and lower persistence of losses (Barth et al. 2008; Christensen et al. 2015).

However, there are counterarguments that might work against our predictions. First, extant literature suggests that cultural factors or social norms are associated with financial reporting practices (e.g., Gray 1988; Hellman et al. 2015; Sunder 2016). In our setting, traditional Japanese societal values of high uncertainty avoidance suggest a preference for smoothing (Gray 1988), and thus managers adhering to these traditional values could still exercise discretion to smooth earnings. As such, these cultural preferences might serve as a counter force so that no improvement in earnings quality will be observed even after IFRS adoption. Second, Japan is a country with a relatively low level of individualism, meaning, in turn, that it is one which prefers uniformity and statutory control in financial reporting (Gray 1988). In contrast, IFRS emphasizes professional judgment and relies on management estimates. The inherent flexibility in principles-based standards could provide greater opportunities for firms to manage earnings (Capkun et al. 2016). Given the possible influences of societal values, the potential for improvement in earnings quality may be decreased.

Despite the above counterarguments, we expect that the traditional cultural and value influences will be outweighed by the changes in the institutional environment. The regulatory reforms reflect the regulators' mindset toward the Western practice of governance and financial reporting. The Japanese government and regulators have been playing a strong leadership role since 2015 to encourage firms adopting IFRS to activate the capital markets in Japan (FSA 2015). Moreover, strong legal enforcement in Japan (La Porta et al. 1998) also reinforces financial liberalization and globalization, which underscores the transparency of financial reporting that is consistent with the IASB Conceptual Framework for Financial Reporting. Accordingly, we propose the first hypothesis as follows:

H1: *Japanese firms adopting IFRS experience improved earnings quality after IFRS adoption.*

2.3.2 Investment efficiency

Prior research suggests that information asymmetry between managers and investors can cause moral hazard and adverse selection problems, which in turn reduce investment efficiency. For example, managers may consume perquisites and may not invest in the best interest of investors, resulting in over-investment (Jensen and Meckling 1976; Jensen 1986). Thus, if investors are aware of moral hazard problems, they will not provide capital *ex ante*. Similarly, if investors believe that firms seeking capital are more likely to be of the weaker type (i.e., the adverse selection problem), investors will also ration capital or discount the stock price *ex ante*, resulting in under-investment (Akerlof 1970; Myers and Majluf 1984; Stiglitz and Weiss

1981). Prior literature also shows that better financial reporting quality can mitigate information asymmetry between managers and capital providers (Bushman and Smith 2001; Diamond and Verrecchia 1991; Kanodia and Lee 1998; Lambert, Leuz, and Verrecchia 2007). Many empirical studies find that superior financial accounting information facilitates the flow of financial capital to promising investment opportunities, mitigating both over- and under-investment (Biddle, Hilary, and Verdi 2009; Chen et al. 2011; Cheng, Dhaliwal, and Zhang 2013; García Lara, García Osma, and Penalva 2009).

Most studies on the effect of IFRS adoption on firms' investment efficiency are based on samples of firms subject to mandatory IFRS adoption and rely on the information externality argument (Chen et al. 2013; Gao and Sidhu 2018; Schleicher et al. 2010). In the voluntary adoption setting in Japan, we posit that firms voluntarily adopting IFRS can increase their investment efficiency for the following reasons. The information asymmetry between managers and outside suppliers of capital is more severe when firms use the more insider-oriented Japanese accounting standards. The existence of asymmetric information likely causes adverse selection and / or moral hazard, which impede investors' efficient allocation of capital and thus lead to under- or over-investment by managers. Firms that voluntarily adopt IFRS demonstrate a commitment to increased levels of disclosures and higher quality accounting information (Leuz and Verrecchia 2000). Survey evidence in Gray et al. (2019) also indicates that IFRS adopters are motivated to better communicate with global capital market participants even if the adoption of IFRS involves significant costs. Research using firms in Germany, a country with the same legal regime as Japan (La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1998), shows that German firms voluntarily adopting IFRS are more transparent than their counterparts adopting German GAAP (Bassemir and Novotny-Farkas 2018). As enhanced financial reporting transparency reduces information asymmetry, we expect that firms' investment efficiency will improve following the adoption of IFRS. Accordingly, we specify our second hypothesis as follows:

H2: *Japanese firms adopting IFRS experience improved investment efficiency after IFRS adoption.*

3. Methodology

3.1 Basic research design

To test our hypotheses, we follow prior research (e.g., Chan et al. 2015; Lennox and Li 2012) and employ the following research design:⁷

⁷ Chan et al. (2015) examine the effect of voluntary clawback adoption on firms' real and accruals-based earnings management. Lennox and Li (2012) investigate the consequences of an audit firm's decision to become a limited liability partnership. Both studies adopt a similar model and refer to this as a difference-in-differences design (see Chan et al. 2015, p. 155-156; Lennox and Li 2012, p.156, 164).

$$Y_{it} = \beta_0 + \beta_1 POSTIFRS_{it} + \beta_2 X_{it} + \Sigma \gamma Firm_{it} + \Sigma \eta Year_{it} + \varepsilon_{it} \quad (1)$$

where Y is the dependent variable of interest (i.e., our earnings quality and investment efficiency measures). The treatment variable $POSTIFRS$ is an indicator variable that equals 1 if the firm is an IFRS adopter in years in which IFRS is adopted, and 0 otherwise. X is a vector of control variables. We include firm fixed effects to control for firm characteristics that remain constant in the periods before and after IFRS adoption. The year fixed effects control for time-varying characteristics that affect both IFRS and non-IFRS adopters. Therefore, the coefficient on $POSTIFRS$ measures the change in the dependent variable of interest across pre- and post-adoption periods for an IFRS adopter compared to the change over the same interval for a non-IFRS adopter. Finally, standard errors are adjusted based on the Huber-White sandwich estimate of variances and are clustered by firm.

3.1.1 Tests of earnings quality

Hypothesis one tests the effect of IFRS adoption on earnings quality. Following prior literature (Barth et al. 2008; Christensen et al. 2015; Dechow et al. 2010), we operationalize earnings quality using two mostly commonly used manifestations of earnings management: discretionary accruals and earnings smoothing.⁸ Following prior studies, we use performance-adjusted discretionary accruals to proxy for accrual-based earnings management (Kothari et al. 2005). Specifically, we first estimate the following modified Jones (1991) model cross-sectionally for industry-years with at least 15 observations:

$$TA_{it} / Assets_{i,t-1} = \alpha_1 (1 / Assets_{i,t-1}) + \alpha_2 [(\Delta Sales_{it} - \Delta AR_{it}) / Assets_{i,t-1}] + \alpha_3 (PPE_{it} / Assets_{i,t-1}) + \varepsilon_{it} \quad (2)$$

where TA is net income minus operating cash flow in year t . $Assets$ denotes total assets, $\Delta Sales$ denotes change in net sales, ΔAR denotes change in accounts receivable, and PPE is gross property, plant and equipment. The estimated residuals from equation (2) are unadjusted discretionary accruals. We then follow Ashbaugh-Skaife et al. (2008) to performance-adjust the discretionary accruals. Specifically, we rank firms within each industry into ten deciles based on the prior year's ROA , and compute the performance-adjusted discretionary accruals ($PADACC$) as the difference between the sample firm's discretionary accruals and the median discretionary accruals for firms in the same industry ROA decile.

⁸ While prior studies also examine whether IFRS adoption affects conservatism, or timely loss recognition, we do not think this earnings quality attribute will undergo significant changes in the context of Japan. Japanese culture is associated with a preference for conservatism in financial reporting (Gray 1988); thus, there is little difference between Japanese GAAP and IFRS in terms of accounting conservatism. Accordingly, we do not expect conservatism to be significantly different between IFRS-adopting firms and non-IFRS adopting firms.

We measure earnings smoothing using the ratio of the standard deviation of net income to the standard deviation of cash flow from operations (*SMOOTH*), where the standard deviations are calculated based on the previous three years.⁹ Firms engaging in earnings smoothing will have smaller income variability relative to cash flow variability, resulting in lower values of *SMOOTH*.

To examine whether firms adopting IFRS have lower accruals management and lower earnings smoothing in the post-adoption period, we estimate the following regression model (e.g., Barth et al. 2008; Christensen et al. 2015):

$$EM_{it} = \alpha_0 + \alpha_1 POSTIFRS_{it} + \alpha_2 SIZE_{it} + \alpha_3 GROWTH_{it} + \alpha_4 EISSUE_{it} + \alpha_5 LEV_{it} + \alpha_6 CFO_{it} + \alpha_7 BigN_{it} + \alpha_8 MB_{it} + \alpha_9 FIRMAGE_{it} + \Sigma \gamma Firm_{it} + \Sigma \eta Year_{it} + \varepsilon_{it} \quad (3)$$

where *EM* is alternately measured by *PADACC* and *SMOOTH*. *POSTIFRS* is an indicator variable that equals 1 if the firm is an IFRS adopter in years in which IFRS is adopted, and 0 otherwise. Based on hypothesis one that IFRS adoption improves earnings quality, we expect the coefficient on *POSTIFRS* to be negative (positive) when the dependent variable is measured by *PADACC* (*SMOOTH*). *SIZE* is the natural logarithm of total assets. *GROWTH* is the percentage change in sales. *EISSUE* is an indicator that equals one if the firm issued equity in year *t*. *LEV* is the ratio of total liabilities to total assets. *CFO* is cash flow from operations scaled by end-of-year total assets. *Big N* is an indicator variable that equals one if the firm's auditor is a Big N auditor. *MB* is the market-to-book ratio of equity. *FIRMAGE* is the natural logarithm of firm age. Finally, we control for firm fixed effects and year fixed effects.

3.1.2 Tests of investment efficiency

Hypothesis two tests the effect of IFRS adoption on investment efficiency. We follow Biddle et al. (2009) and classify firms as having efficient investments if all of their investments have a positive net present value. Under this definition, over- and under-investment suggest that firms deviate from the optimal level of investment by investing in projects with negative net present value (over-investment) and forgoing investment projects with positive net present value (under-investment). To capture the optimal level of investment, we estimate the modified version of Biddle et al.'s (2009) model suggested by Chen et al. (2011). In this modified model, investment is a function of growth opportunities, and the relation between investment and growth opportunities varies between firms experiencing a sales increase and those experiencing a sales decrease. Specifically, we estimate the following regression for each industry-year grouping with at least 15 observations:

⁹ We obtain similar results when earnings smoothing is measured by the correlation between changes in net income and changes in cash flow from operations.

$$\begin{aligned}
 INVESTMENT_{it} / Assets_{i,t-1} = & \alpha_1 + \alpha_2 (\Delta SALES_{i,t-1} / SALES_{i,t-2}) + \alpha_3 NEG_{i,t-1} \\
 & + \alpha_4 NEG_{i,t-1} \times (\Delta SALES_{i,t-1} / SALES_{i,t-2}) + \varepsilon_{it}
 \end{aligned} \quad (4)$$

where *INVESTMENT* is the total investment in year *t*, calculated as the sum of R&D expenditure, capital expenditure, and acquisition expenditure, less cash receipts from the sale of property, plant, and equipment. $\Delta SALES$ is the change in net sales from year *t*–2 to year *t*–1. *NEG* is an indicator variable that equals one if firm *i* experiences a sales decline in year *t*–1, and zero otherwise.

The residual of equation (4) represents the deviation from the optimal level of investment; thus, the greater the magnitude of the residual, the more the firm deviates from its optimal level of investment. A positive value of the residual represents over-investment, and a negative value of the residual represents under-investment. Thus, we use the absolute value of the residual, denoted *INV_INEFF*, as an inverse measure of investment efficiency. Larger values of *INV_INEFF* suggest greater deviations from an optimal level of investment and, thus, lower investment efficiency.

To examine whether the adoption of IFRS affects firms' investment efficiency, we estimate the following regression (e.g., Bae et al. 2017; Cheng et al. 2013):

$$\begin{aligned}
 INV_INEFF_{it} = & \beta_0 + \beta_1 POSTIFRS_{it} + \beta_2 SIZE_{it} + \beta_3 CASH_{it} + \beta_4 TANGIBILITY_{it} \\
 & + \beta_5 TOBINQ_{it} + \beta_6 LEV_{it} + \beta_7 Z_SCORE_{it} + \beta_8 STDCFO_{it} + \beta_9 CYCLE_{it} + \\
 & \beta_{10} FIRMAGE_{it} + \beta_{11} LOSS_{it} + \Sigma \gamma Firm_{it} + \Sigma \eta Year_{it} + \varepsilon_{it}
 \end{aligned} \quad (5)$$

Hypothesis two predicts that IFRS adoption improves investment efficiency, thus we expect the coefficient on *POSTIFRS* to be negative. Equation (5) includes control variables previously shown to affect investment efficiency. *SIZE* is the logarithm of total assets. *CASH* is cash scaled by total assets. *TANGIBILITY* is property, plant, and equipment scaled by total assets. *TOBINQ* is the market value of total assets (total debt plus market value of equity) divided by the book value of total assets. *LEV* is the ratio of total liabilities to total assets. *Z_SCORE* is a proxy for a firm's financial health and is derived based on the formula of Altman (1968). *STDCFO* is the standard deviation of cash flow from operations scaled by total assets in the previous five years. *CYCLE* is the logarithm of operating cycle. *FIRMAGE* is the logarithm of firm age. *LOSS* is an indicator variable equal to one if the firm's net.

Table 1. Summary Distribution of IFRS Adopters

Panel A: IFRS-adoption sample by year

Year	Frequency	Percent	Cumulative %
2010	1	0.69	0.69
2011	2	1.39	2.08
2012	4	2.78	4.86
2013	8	5.56	10.42
2014	19	13.19	23.61
2015	43	29.86	53.47
2016	67	46.53	100.00
Total	144	100.00	

Panel B: IFRS-adoption sample by industry

Industry	Frequency	Percent	Cumulative %
Food	5	3.47	3.47
Chemicals	7	4.86	8.33
Pharmaceuticals	19	13.19	21.53
Rubber	1	0.69	22.22
Ceramics	8	5.56	27.78
Steel	2	1.39	29.17
Metal products	3	2.08	31.25
Machinery	7	4.86	36.11
General electronics	23	15.97	52.08
Automobiles	10	6.94	59.03
Precision equipment	9	6.25	65.28
Trading	10	6.94	72.22
Other	6	4.17	76.39
Real estate	4	2.78	79.17
Ground transportation	2	1.39	80.56
Communications	4	2.78	83.33
Services	24	16.67	100.00
Total	144	100.00	

Notes: income before extraordinary items is negative, and zero otherwise. We also include firm- and year-fixed effects in equation (5).

3.2 Data and sample

Our sample consists of Japanese firms listed on the TSE¹⁰ from years 2005 to 2016. We obtain financial data from Nikkei NEEDS-FinancialQUEST¹¹ and governance data from Nikkei NEEDS-Cges¹² (corporate governance evaluation system). We identify voluntary IFRS-adopting firms using the information summarized by the TSE.¹³ We exclude 11 firms that switch from US GAAP to IFRS because these two standards are generally viewed as being of comparable quality (Leuz and Verrecchia 2000). Therefore, the firms in our sample either keep using Japanese GAAP or convert from Japanese GAAP to IFRS. These requirements yield a primary sample of 144 observations (67 firms) that adopt IFRS by fiscal year-end 2016, and 25,527 observations (2,416 firms) without IFRS adoption.¹⁴

Table 1 shows the sample distribution of IFRS adopters. As shown in Panel A, in 2010 only one firm had adopted IFRS. However, the number of IFRS adopters increases sharply, especially after 2014. In Panel B, we present the industry distribution for the 144 adopter firm-years. The table indicates that the service industry accounted for the highest percentage (16.67%) of the IFRS adopters, followed by the general electronics industry (15.97%) and the pharmaceutical industry (13.19%).

3.3 Propensity score matching

To reduce the self-selection concern that arises when firms can choose their reporting standards, we use the propensity score matching (PSM) approach to further match our IFRS adopters to non-IFRS adopters. More specifically, we use a logistic regression to estimate the probability of being an IFRS adopter. That is, the dependent variable is *IFRS*, an indicator equal to 1 if the firm adopts IFRS during our sample period, and 0 otherwise. As shown in Table 1 Panel A, there are 67 IFRS-adopting firms during our sample period, and this yields 708 firm-year observations with *IFRS* = 1. As suggested by Shipman et al. (2017), we use all the control variables in equation (3) to estimate the propensity score for the earnings quality test, and use all the control variables in equation (5) to estimate the propensity score for the investment efficiency test. We require each firm to have complete data on all matching variables as well as

¹⁰ We use firms listed in the first and second sections of the TSE. Firms listed in the emerging market are not included in our analysis since no firms in the emerging market adopted IFRS during our sample period.

¹¹ Skinner (2008), Kato, Skinner, and Kunimura (2009), and Kato, Li, and Skinner (2017) use the same data source.

¹² Nikkei NEEDS-Cges is also used by Nakano and Nguyen (2012).

¹³ Summary statistics by the Japanese Exchange Group. See <http://www.jpx.co.jp/listing/others/ifrs/index.html> (last accessed on September 8, 2017).

¹⁴ In contrast with Sato and Takeda (2017) and Gray et al. (2019), the IFRS adopters in our sample do not include firms that announced their adoption plans but have not actually implemented IFRS.

the dependent variable in equation (3) or equation (5). The logistic regression results are reported in Table 2.

Table 2. Logistic Regression of the Probability of IFRS Adoption

	Earnings Quality Test	Investment Efficiency Test
	<i>IFRS</i>	<i>IFRS</i>
<i>SIZE</i>	0.752*** (7.22)	0.763*** (7.31)
<i>CASH</i>		2.075 (1.50)
<i>TANGIBILITY</i>		-3.392*** (-2.80)
<i>TOBINQ</i>		-0.155 (-0.71)
<i>LEV</i>		-0.154 (-0.15)
<i>Z_SCORE</i>		0.031** (2.01)
<i>STDCFO</i>		1.387 (1.06)
<i>CYCLE</i>		-0.144 (-0.51)
<i>FIRMAGE</i>	-0.367* (-1.95)	-0.257 (-1.30)
<i>LOSS</i>		0.172 (0.76)
<i>GROWTH</i>	0.336 (0.65)	
<i>EISSUE</i>	0.383 (1.50)	
<i>LEV</i>	-0.051 (-0.44)	
<i>CFO</i>	5.743** (2.36)	
<i>BigN</i>	0.643 (1.41)	
<i>MB</i>	0.027 (0.33)	
Constant	-13.058*** (-7.60)	-10.746*** (-5.30)
Observations	16,696	17,531
Observations with <i>IFRS</i> = 1	584	560
Observations with <i>IFRS</i> = 0	16,112	16,971
Pseudo R-squared	0.221	0.220

Notes: Robust t-statistics are reported in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% levels respectively in a two-tailed test. *IFRS* is an indicator equal to one if the firm is an IFRS adopter, and 0 otherwise. See the Appendix for the variable definitions.

We then use the nearest-neighbor matching approach without replacement to identify the matched non-IFRS adopters and test our hypotheses based on the matched pairs. For the earnings quality test, the PSM procedure results in a sample of 1,168 firm-years with 584 matched pairs. Among the 584 treatment (IFRS-adopters) firm-years, 132 observations are in the post-adoption period and 452 observations are in the pre-adoption period. For the investment efficiency test, we obtain a PSM sample of 1,120 firm-years with 560 matched pairs. Among the 560 treatment (IFRS-adopters) firm-years, 111 observations are in the post-adoption period and 449 observations are in the pre-adoption period.

Table 3 reports the effectiveness of our matching procedure. Panel A compares the mean values of the matching variables used in the earnings quality regression, and Panel B compares the mean values of the matching variables used in the investment efficiency regression. The results indicate that before the matching the IFRS adopter and non-IFRS adopter groups exhibit significant differences in many characteristics. After the matching the two groups have no significant differences in all matching covariates, suggesting that our PSM procedure is effective in reducing differences between the treatment and control group.¹⁵

Table 3. Test of the Effectiveness of the Propensity Score Matches

Variable		N for IFRS/N for non-IFRS	Mean value for IFRS group (1)	Mean value for non-IFRS group (2)	Diff. (1)-(2)
<i>SIZE</i>	Pre-match	584/16,112	13.03	11.11	1.92***
	Post-match	584/584	13.02	13.05	-0.03
<i>GROWTH</i>	Pre-match	584/16,112	0.05	0.03	0.02***
	Post-match	584/584	0.05	0.06	-0.01
<i>EISSUE</i>	Pre-match	584/16,112	0.14	0.09	0.05***
	Post-match	584/584	0.13	0.13	0.00
<i>LEV</i>	Pre-match	584/16,112	1.58	1.54	0.04
	Post-match	584/584	1.50	1.57	-0.07
<i>CFO</i>	Pre-match	584/16,112	0.08	0.06	0.02***
	Post-match	584/584	0.08	0.08	0.00
<i>BigN</i>	Pre-match	584/16,112	0.88	0.74	0.14***
	Post-match	584/584	0.88	0.87	0.01
<i>MB</i>	Pre-match	584/16,112	1.46	1.20	0.26***
	Post-match	584/584	1.47	1.53	-0.06
<i>FIRMAGE</i>	Pre-match	584/16,112	3.91	3.97	-0.06***
	Post-match	584/584	3.93	3.94	-0.01

¹⁵ As a robustness test, we also include foreign institutional ownership as one of the matching variables in the logistic regression to conduct PSM. The empirical results for our hypotheses remain similar based on this alternatively matched sample.

Table 3. Test of the Effectiveness of the Propensity Score Matches (continued)

Variable		N for IFRS/N for non-IFRS				
<i>SIZE</i>	Pre-match	560/16,971	13.05	11.16	1.89***	
	Post-match	560/560	12.98	13.00	-0.02	
<i>CASH</i>	Pre-match	560/16,971	0.16	0.15	0.01***	
	Post-match	560/560	0.15	0.15	0.00	
<i>TANGIBILITY</i>	Pre-match	560/16,971	0.23	0.30	-0.07***	
	Post-match	560/560	0.23	0.24	-0.01	
<i>TOBINQ</i>	Pre-match	560/16,971	1.20	1.06	0.14***	
	Post-match	560/560	1.18	1.15	0.03	
<i>LEV</i>	Pre-match	560/16,971	1.60	1.60	0.00	
	Post-match	560/560	1.39	1.35	0.04	
<i>Z_SCORE</i>	Pre-match	560/16,971	3.53	2.84	0.69***	
	Post-match	560/560	3.49	3.48	0.01	
<i>STDCFO</i>	Pre-match	560/16,971	0.03	0.03	0.00	
	Post-match	560/560	0.03	0.03	0.00	
<i>CYCLE</i>	Pre-match	560/16,971	4.93	4.77	0.16***	
	Post-match	560/560	4.94	4.95	-0.01	
<i>FIRIMAGE</i>	Pre-match	560/16,971	3.88	3.96	-0.08***	
	Post-match	560/560	3.97	4.02	-0.05	
<i>LOSS</i>	Pre-match	560/16,971	0.11	0.13	-0.02	
	Post-match	560/560	0.12	0.11	0.01	

Note: *, ** and *** indicate significance at the 10%, 5%, and 1% levels respectively in a two-tailed test. See the Appendix for the variable definitions.

4. Empirical Results

4.1 Multivariate results

Table 4 reports the regression results for tests of the association between IFRS adoption and earnings quality. In column (1), the dependent variable is performance-adjusted discretionary accruals. We find that the coefficient on *POSTIFRS* is negative and significant (-0.004, significant at $p < 5\%$), suggesting that relative to non-IFRS adopters, IFRS-adopting firms use less accruals-based earnings management after IFRS adoption. In column (2), the dependent variable is earnings smoothing. The results show that the coefficient on *POSTIFRS* is positive and significant (0.181, significant at $p < 5\%$), indicating that IFRS adopters have lower earnings smoothing in the post-adoption period. Overall, the results in Table 3 support hypothesis one that Japanese firms adopting IFRS exhibit higher earnings quality after IFRS adoption than those that continue using Japanese GAAP.

Table 4. IFRS Adoption and Earnings Quality

	PADACC	SMOOTH
<i>POSTIFRS</i>	-0.004** (-2.26)	0.181** (2.26)
<i>SIZE</i>	-0.002*** (-4.08)	-0.016 (-0.91)
<i>GROWTH</i>	0.012** (2.19)	-0.358** (-2.22)
<i>EISSUE</i>	0.002 (0.87)	-0.016 (-0.27)
<i>LEV</i>	0.001 (1.46)	-0.002 (-0.09)
<i>CFO</i>	0.026 (1.30)	0.348 (0.59)
<i>BigN</i>	0.001 (0.36)	0.131*** (2.59)
<i>MB</i>	0.001* (1.83)	0.048*** (2.69)
<i>FIRMAGE</i>	-0.001 (-0.57)	-0.002 (-0.04)
<i>Constant</i>	0.043*** (4.43)	0.813** (2.50)
Firm fixed effect	Yes	Yes
Year fixed effect	Yes	Yes
<i>N</i>	1,168	1,168
Adjusted R-squared	0.131	0.105

Notes: Robust t-statistics are reported in parentheses. Standard errors are clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels respectively in a two-tailed test. See the Appendix for the variable definitions.

Table 5 presents the regression results for tests of the association between IFRS adoption and investment efficiency. Column (1) reports the estimate of equation (5) when the dependent variable is the absolute value of abnormal investment. In support of hypothesis two, we find that the coefficient on *POSTIFRS* is negative and significant (-0.016, significant at $p < 1\%$), suggesting that abnormal investment decreases after firms adopt IFRS. Next, we decompose the sample to separately examine over-investment and under-investment. Column (2) shows that *POSTIFRS* is negatively associated with

Table 5. IFRS Adoption and Investment Efficiency

	<i>INV_INEFF</i>	<i>Over-investment</i>	<i>Under-investment</i>
<i>POSTIFRS</i>	-0.016*** (-3.05)	-0.019** (-2.07)	-0.011** (-2.51)
<i>SIZE</i>	0.016** (2.19)	0.028** (2.14)	0.001 (0.20)
<i>CASH</i>	-0.090*** (-3.40)	-0.128*** (-2.96)	0.016 (0.60)
<i>TANGIBILITY</i>	0.099** (2.30)	0.106 (1.39)	-0.070** (-1.98)
<i>TOBINQ</i>	0.008 (1.40)	0.011 (1.15)	-0.012** (-2.06)
<i>LEV</i>	0.068*** (2.81)	0.053 (1.35)	0.037 (1.52)
<i>Z_SCORE</i>	-0.003** (-2.30)	-0.004 (-1.60)	0.001 (0.36)
<i>STDCFO</i>	0.010 (0.16)	-0.090 (-0.82)	0.186*** (3.68)
<i>CYCLE</i>	-0.019** (-2.12)	-0.063*** (-3.53)	0.009 (1.42)
<i>FIRMAGE</i>	-0.018 (-1.13)	-0.037 (-1.21)	-0.010 (-0.85)
<i>LOSS</i>	-0.005 (-1.00)	0.002 (0.30)	-0.009* (-1.94)
<i>Constant</i>	-0.034 (-0.30)	0.118 (0.54)	0.021 (0.25)
Firm fixed effect	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes
<i>N</i>	1,120	551	569
Adjusted R-squared	0.176	0.296	0.542

Notes: Robust t-statistics are reported in parentheses. Standard errors are clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels respectively in a two-tailed test. See the Appendix for the variable definitions.

over-investment and that the coefficient is -0.019 , significant at $p < 5\%$. Consistently, column (3) shows that *POSTIFRS* is significantly and negatively related to under-investment (-0.011 , significant at $p < 5\%$). Overall, these results suggest that the adoption of IFRS improves investment efficiency in that both over-investment and under-investment are reduced subsequent

to IFRS adoption. These findings support the argument that IFRS results in lower information asymmetry, which in turn increases investors' ability to evaluate and monitor managers' investment decisions. The results also support the anecdotal survey evidence in which 45% of the responding companies consider contributions to business management to be the most important benefit of IFRS adoption (FSA 2015).¹⁶

4.2 Alternative measure of investment efficiency

To examine whether our results in Table 6 are robust to an alternative measure of investment efficiency, we follow the methodology of McNichols and Stubben (2008) and model the optimal investment as follows:

$$INVESTMENT_{it} / Assets_{i,t-1} = \alpha_1 + \alpha_2(\Delta TOBINQ_{it}) + \alpha_3(CF_{it} / Assets_{i,t-1}) + \varepsilon_{it} \quad (6)$$

where *CF* is the cash flow of the firm, and is included to control for the cash flow sensitivity of investment (Almeida, Campello, and Weisbach 2004; Altı 2003; Bae et al. 2017). We then use the residuals of equation (6) as the dependent variable and re-estimate equation (5). The results are presented in Table 6.

Column (1) of Table 6 shows that the coefficient on *POSTIFRS* is negative and significant (-0.013 , significant at $p < 5\%$), consistent with the prediction that IFRS adoption improves investment efficiency. Columns (2) and (3) present the sub-sample results when investment inefficiency is decomposed into over-investment and under-investment. We find consistent results in column (3) that *POSTIFRS* is negatively related to under-investment (coefficient = -0.005 , significant at $p < 10\%$). However, the coefficient on *POSTIFRS* in column (2) is positive and significant (0.009 , significant at $p < 10\%$), which does not suggest a negative effect of IFRS adoption on over-investment. Overall, our findings based on the alternative model of investment efficiency still support the hypothesis that the adoption of IFRS is associated with better investment efficiency.

5. Additional Analyses

5.1 Earnings management through sale of assets

Our main analysis uses accrual-based earnings management as an inverse measure of

¹⁶ The survey conducted by the Financial Services Agency (FSA 2015) indicates the primary benefits anticipated by companies before the transition to IFRS. The ranking of anticipated benefits by percentage of firms anticipating them is as follows: contributions to business management (45%), improved comparability (23%), facilitating explanations to foreign investors (9%), better reflection of performance (9%), and easier financing from abroad (8%).

Table 6. Alternative Measures of Investment Efficiency

	<i>INV_INEFF</i>	<i>Over-investment</i>	<i>Under-investment</i>
<i>POSTIFRS</i>	-0.013** (-2.08)	0.009* (1.72)	-0.005* (-1.80)
<i>SIZE</i>	-0.004 (-1.47)	-0.001 (-1.23)	-0.002*** (-3.66)
<i>CASH</i>	-0.044 (-1.53)	-0.059*** (-3.14)	0.044*** (4.84)
<i>TANGIBILITY</i>	-0.084** (-2.07)	0.009 (0.45)	-0.028*** (-3.66)
<i>TOBINQ</i>	0.011** (2.16)	0.021*** (5.46)	-0.004*** (-3.12)
<i>LEV</i>	0.013 (0.98)	-0.025* (-1.95)	0.025*** (4.84)
<i>Z_SCORE</i>	-0.026** (-2.56)	-0.002** (-2.16)	0.001 (0.12)
<i>STDCFO</i>	0.283** (2.01)	0.044 (0.75)	0.175*** (6.46)
<i>CYCLE</i>	-0.030*** (-2.69)	-0.006 (-1.17)	0.001 (0.69)
<i>FIRMAGE</i>	-0.013*** (-2.79)	-0.012*** (-4.06)	-0.003** (-2.56)
<i>LOSS</i>	0.009 (1.01)	0.015*** (3.23)	0.001 (0.00)
<i>Constant</i>	0.345*** (3.30)	0.148*** (4.04)	0.052*** (3.15)
Firm fixed effect	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes
<i>N</i>	1,118	556	562
Adjusted R-squared	0.060	0.143	0.517

Notes: Robust t-statistics are reported in parentheses. Standard errors are clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels respectively in a two-tailed test. See the Appendix for the variable definitions.

earnings quality; in this section we examine whether IFRS adoption also affects earnings management through real activities. In Japan, all listed firms are required to provide management earnings forecasts on next-period sales along with their announcements of current period realized earnings. Herrmann, Inoue, and Thomas (2003) show that Japanese firms have incentives to sell fixed assets and marketable securities to meet management earnings forecasts. As the use of

asset sales to manage earnings is a special phenomenon in Japan (Chen et al. 2015), we explore whether IFRS adoption mitigates this type of real earnings management.

Following Herrmann, Inoue, and Thomas (2003), we use the following regression to estimate the effect of IFRS adoption on earnings management through asset sales:

$$EISA_{it} = \lambda_0 + \lambda_1 POSTIFRS_{it} + \lambda_2 CP_{it} + \lambda_3 CP_{it} \times POSTIFRS_{it} + \lambda_4 SIZE_{it} + \lambda_5 FP_{it} + \lambda_6 LEV_{it} + \lambda_7 GROWTH_{it} + \lambda_8 EISA_{it-1} + \Sigma \gamma Firm_{it} + \Sigma \eta Year_{it} + \varepsilon_{it} \quad (7)$$

The dependent variable *EISA*, excess income from the sale of assets, is measured as income from the sale of fixed assets and marketable securities minus the median value for the corresponding industry-year, scaled by lagged assets. *CP*, the forecast error for ordinary income, equals the current ordinary income for year *t* minus the forecasted ordinary income for year *t*, scaled by total assets at year *t*−1. When *CP* is negative (positive), managers have an incentive to realize gains (losses) through the sale of assets, which can offset some forecast errors in ordinary income and generate lower forecast errors in net income. Therefore, the coefficient on *CP* (λ_1) is expected to be negative. Our main variable of interest is the interaction term $CP \times POSTIFRS$. If IFRS adopters have a lower tendency to manage forecast errors in the post-adoption period, we expect λ_5 to be significantly positive. We also control for lagged *EISA* (i.e., $EISA_{t-1}$) and expected future performance (*FP*), which equals management's forecast of ordinary income for year *t*+1 minus ordinary income for year *t*, scaled by total assets at year *t*−1. *LEV*, *SIZE*, and *GROWTH* are defined in section 3.1.

Table 7 shows the results of the effect of IFRS adoption on earnings management through asset sales. Consistent with our expectation, the coefficient on $CP \times POSTIFRS$ is positive and significant (0.094, significant at $p < 10\%$), indicating a reduction in the use of asset sales to manage earnings by IFRS-adopting firms in the post-adoption period. Taken together, these results constitute some evidence that IFRS-adopting firms also engage in less real earnings management in the post-adoption period.

5.2 Capital versus non-capital investment

Our primary measure of investment includes capital and non-capital expenditures. As an additional analysis, we consider these two types of investment separately. Specifically, we compute non-capital expenditures as the sum of R&D expenses and acquisition costs. Table 8 column (1) presents the results when the dependent variable relating to investment efficiency is based on capital expenditures. Similar to the main results, the coefficient on *POSTIFRS* is negative and significant (−0.008, significant at $p < 5\%$). In column (2) when the dependent variable is based on non-capital expenditures, we again find that the coefficient on *POSTIFRS* is consistently negative and significant (−0.018, significant at $p < 10\%$). Taken together, the results

Table 7. IFRS Adoption and Earnings Management through Asset Sales

	<i>EISA</i>
<i>POSTIFRS</i>	-0.002 ^{***} (-3.21)
<i>CP</i>	-0.017 ^{***} (-2.89)
<i>CP</i> × <i>POSTIFRS</i>	0.094 [*] (1.91)
<i>SIZE</i>	0.001 (1.03)
<i>FP</i>	0.004 (1.07)
<i>LEV</i>	0.001 (0.13)
<i>GROWTH</i>	-0.001 (-0.14)
<i>EISAt-1</i>	0.007 (0.24)
<i>Constant</i>	-0.002 (-0.66)
Firm fixed effect	Yes
Year fixed effect	Yes
<i>N</i>	1,011
Adjusted R-squared	0.527

Notes: Robust t-statistics are reported in parentheses. Standard errors are clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels respectively in a two-tailed test. See the Appendix for the variable definitions.

in Table 8 reveal that both capital and non-capital expenditures exhibit similar behavior in that the efficiency of both types of investment increases with the adoption of IFRS.

5.3 The moderating effect of corporate governance

Corporate governance can exert significant influence on a firm's financial reporting policy. As mentioned earlier, Japan began to introduce elements of the Anglo-American governance model in the 2000s. More specifically, it introduced the independent director system to replace the traditional two-tier governance system. Thus, it is worth investigating whether the new governance approach strengthens the effect of IFRS adoption on earnings quality. Furthermore,

Table 8. Capital versus Non-capital Investment Efficiency

	<i>CAPEX_INEFF</i>	<i>NONCAPEX_INEFF</i>
<i>POSTIFRS</i>	-0.008** (-2.17)	-0.018* (-1.84)
<i>SIZE</i>	0.002 (0.49)	0.009 (0.66)
<i>CASH</i>	-0.004 (-0.24)	-0.223*** (-4.50)
<i>TANGIBILITY</i>	0.010 (0.37)	-0.114 (-1.41)
<i>TOBINQ</i>	0.003 (1.13)	0.019* (1.88)
<i>LEV</i>	0.013 (0.89)	0.118*** (2.58)
<i>Z_SCORE</i>	-0.001 (-1.39)	-0.006*** (-2.84)
<i>STDCFO</i>	0.005 (0.15)	0.046 (0.43)
<i>CYCLE</i>	-0.001 (-0.20)	-0.046*** (-2.78)
<i>FIRMAGE</i>	0.002 (0.27)	-0.024 (-0.79)
<i>LOSS</i>	0.001 (0.03)	-0.007 (-0.82)
<i>Constant</i>	-0.006 (-0.10)	0.237 (1.13)
Firm fixed effect	Yes	Yes
Year fixed effect	Yes	Yes
<i>N</i>	1,120	1,120
Adjusted R-squared	0.286	0.166

Notes: Robust t-statistics are reported in parentheses. Standard errors are clustered by firm. *, ** and *** indicate significance at the 10%, 5%, and 1% levels respectively in a two-tailed test. See the Appendix for the variable definitions.

as indicated in Figure 1, the shareholdings of financial institutions are declining, whereas foreign institutional ownership is increasing. The demand of foreign investors for higher transparency might enhance the benefits of IFRS adoption, thus we also test whether the effect of IFRS on earnings quality is more pronounced in firms with higher foreign institutional shareholdings.

To facilitate the interpretation of results, in this cross-sectional analysis we assign a pseudo-adoption year for non-IFRS adopters. As the majority of IFRS-adopters began adopting IFRS in year 2016, we use year 2016 to define the post-adoption period for non-IFRS adopters (i.e., $POST = 1$ for year 2016 and $POST = 0$ for years prior to 2016).¹⁷ The indicators *IFRS* and *POST* are suppressed by the firm fixed effects and year effects respectively. To test the moderating effect of corporate governance, we create two indicator variables: *BDIND*, which equals one if the firm has at least one independent director and zero otherwise, and *FOREIGN*, which equals one if the firm's foreign institutional ownership is above the industry median and zero otherwise.¹⁸ We then interact these two variables with *POSTIFRS* in equation (3) to examine whether the effect of IFRS adoption on earnings quality depends on the strength of corporate governance.

Table 9 presents the earnings quality results after inclusion of the governance variables. The first two columns use discretionary accruals as the dependent variable. In column (1), the coefficient on *POSTIFRS* is not significant, indicating that for firms without independent directors the adoption of IFRS does not increase earnings quality. On the other hand, we find a negative and significant coefficient on the interaction term $POSTIFRS \times BDIND$ (-0.012, significant at $p < 10\%$). These results suggest that the negative effect of IFRS adoption on accruals management is mainly present in firms with independent directors on the board, although the joint test of $POSTIFRS + POSTIFRS \times BDIND = 0$ is not significant (F-value is 0.76). Column (2) shows that the interaction term $POSTIFRS \times FOREIGN$ has a negative and significant coefficient (-0.042, significant at $p < 1\%$). The F-value of the joint test of $POSTIFRS + POSTIFRS \times FOREIGN = 0$ is 4.73 and significant at $p < 5\%$. These results suggest that the effect of IFRS adoption on accruals management is conditional on the level of foreign institutional ownership.

In columns (3) and (4) we measure earnings quality by earnings smoothing. The results are consistent with the first two columns. The insignificant coefficient on *POSTIFRS* suggests that firms do not experience an improvement in earnings quality after IFRS adoption without the monitoring of independent directors or foreign institutions. Column (3) shows that the coefficient on $POSTIFRS \times BDIND$ is positive and significant (0.416, significant at $p < 10\%$), but the joint test of $POSTIFRS + POSTIFRS \times BDIND = 0$ is not significant (F-value is 0.15). Column (4) shows that the coefficient on *FOREIGN* is positive and significant (0.708, significant at $p < 5\%$), suggesting that foreign institutional ownership reduces earnings smoothing even before IFRS adoption. Moreover, we find a positive and significant coefficient on the interaction term $POSTIFRS \times FOREIGN$ (1.515, significant at $p < 10\%$). The F-value of the joint test of *POSTIFRS*

¹⁷ As a robustness test, we also conduct the test using year 2015 as the pseudo adoption year for non-IFRS adopters. The inferences remain consistent.

¹⁸ We use indicator variables as this approach facilitates results interpretation. As a robustness test, we also measure board independence by the number of independent directors on the board and foreign ownership by the percentage of outstanding shares held by foreign institutions. The results are qualitatively similar.

Table 9. IFRS Adoption and Earnings Quality: The Moderating Effect of Corporate Governance (using year 2016 as pseudo adoption year for non-IFRS adopters)

	<i>PADACC</i>	<i>PADACC</i>	<i>SMOOTH</i>	<i>SMOOTH</i>
<i>POSTIFRS</i>	0.016 (1.64)	0.011* (1.68)	-0.610 (-0.81)	-0.428 (-0.11)
<i>BDIND</i>	-0.005 (-1.11)		0.070 (1.13)	
<i>POSTIFRS</i> × <i>BDIND</i>	-0.012* (-1.92)		0.416* (1.88)	
<i>FOREIGN</i>		0.020** (2.29)		0.708** (2.55)
<i>POSTIFRS</i> × <i>FOREIGN</i>		-0.042*** (-2.94)		1.515* (1.84)
<i>SIZE</i>	0.000 (0.05)	-0.002 (-0.21)	0.091 (0.21)	0.154 (0.37)
<i>GROWTH</i>	0.030*** (2.81)	0.025 (1.41)	-0.362 (-0.71)	-0.335 (-0.69)
<i>EISSUE</i>	0.003 (0.72)	-0.004 (-0.62)	-0.094 (-0.57)	-0.051 (-0.39)
<i>LEV</i>	-0.006*** (-4.32)	-0.006*** (-2.99)	0.083 (0.74)	0.071 (0.70)
<i>CFO</i>	-0.547*** (-12.17)	-0.493*** (-7.38)	-2.506* (-1.91)	-2.456* (-1.85)
<i>BigN</i>	0.004 (0.50)	-0.001 (-0.07)	0.127 (0.59)	0.157 (0.65)
<i>MB</i>	0.004*** (3.61)	0.003 (1.62)	0.019 (0.41)	0.046 (0.93)
<i>FIRMAGE</i>	-0.008 (-0.62)	0.010 (0.28)	-1.134 (-0.93)	-1.051 (-0.85)
<i>Constant</i>	0.058 (0.51)	0.031 (0.20)	4.100 (0.64)	3.247 (0.50)
Firm fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
<i>N</i>	1,168	1,168	1,168	1,168
Adjusted R-squared	0.494	0.296	0.107	0.112

Notes: Robust t-statistics are reported in parentheses. Standard errors are clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels respectively in a two-tailed test. See the Appendix for the variable definitions.

+ $POSTIFRS \times FOREIGN = 0$ is 3.12 and significant at $p < 10\%$. These findings collectively indicate that the effect of IFRS adoption on earnings smoothing is more pronounced in firms that have independent directors on the board and in firms that have higher foreign institutional shareholdings. Taken together, the findings in Table 9 support that the positive effect of IFRS adoption on earnings quality depends on the strength of the firm's corporate governance.¹⁹

6. Conclusion

We examine how earnings quality and investment efficiency are affected by the voluntary adoption of IFRS for a sample of Japanese firms. We exploit the setting in Japan because of its three unique features. First, traditionally, Japan is well-known for its main bank system wherein a group of firms are connected with the same bank and characterized by cross-holding of shares by the member firms. Second, there was a series of regulatory reforms before the adoption of IFRS was formally allowed. These reforms stimulated significant changes in ownership structure away from the traditional bank-dominated system. Third, Japanese accounting standards are heavily influenced by cultural values that might be in conflict with the orientation of IFRS. These features allow us to test whether the adoption of IFRS results in positive economic consequences for Japanese firms.

After controlling for the incentives to adopt IFRS, we find that IFRS-adopting firms experience an increase in earnings quality, as reflected in lower accruals management and less income smoothing. In addition, IFRS-adopting firms have better investment efficiency, as evidenced by their lower over-investment and lower under-investment. Further analyses show that the effect of IFRS adoption on earnings quality is conditional on the strength of the firm's corporate governance, measured by board independence and the level of foreign institutional ownership. Overall, the results suggest that the institutional changes in recent years have helped create an environment for Japanese firms to move toward a stronger shareholder orientation that is consistent with the focus of IFRS. Therefore, firms adopting IFRS benefit from such a commitment to enhanced disclosures not only in greater financial reporting quality but also in more efficient investment. Our study provides evidence of a reduction in information asymmetry after a switch from the domestic accounting standards to IFRS in a country that underwent an institutional shift within a context of traditional cultural values.

¹⁹ We do not include *BDIND* and *FOREIGN* together in the same regression as these two variables are highly correlated (correlation is 0.305, significant at $p < 0.01$). Inclusion of these two variables in the same regression results in high multicollinearity. The highest VIF is 15.12 when the dependent variable is *PADACC* and the highest VIF is 14.79 when the dependent variable is *SMOOTH*.

In considering the results of our study, one should note the following caveats. First, the generalizability of the empirical results is subject to the limitation of small sample size due to the limited number of public firms voluntarily switching to IFRS. Second, measuring earnings quality is inherently difficult, and the measures we adopt from prior research may not fully capture the underlying constructs. For example, Dechow, Ge, and Schrand (2010) suggest that it is difficult to differentiate between earnings smoothness resulting from the fundamental earnings process and that relating to opportunistic accounting choices. Third, although we attempt to reduce the self-selection concern by propensity score matching, we cannot rule out the possibility that there still exists some differences between voluntary adopters and non-adopters. In other words, the PSM procedure may not fully include all possible matching covariates and thus self-selection concerns cannot be fully eliminated. Despite the above caveats, our study provides insights into how changes in accounting standards can have positive influences on financial reporting quality under a fundamental shift in an institutional environment within a context of traditional cultural values. The findings also underline the importance of future research examining other possible benefits of IFRS adoption by Japanese enterprises.

Appendix: Summary of Variable Definitions

Variables	Definitions
<i>IFRS</i>	An indicator variable that equals 1 if the firm is an IFRS adopter, and 0 otherwise
<i>POSTIFRS</i>	An indicator variable that equals 1 if the firm is an IFRS adopter in years in which IFRS is adopted, and 0 otherwise
<i>PADACC</i>	Performance-adjusted discretionary accruals based on modified Jones (1991) model and Kothari et al. (2005)
<i>SMOOTH</i>	Income smoothing, measured as the ratio of standard deviation of net income to the standard deviation of cash flow from operations based on the previous three years
<i>INV_INEFF</i>	Investment inefficiency, the absolute value of residuals derived from regression (4), where the dependent variable is the sum of R&D expenditure, capital expenditure, and acquisition expenditure, less cash receipts from the sale of property, plant, and equipment
<i>CAPEX_INEFF</i>	The absolute value of residuals derived from regression (4), where the dependent variable is capital expenditure less cash receipts from the sale of property, plant, and equipment
<i>NONCAPEX_INEFF</i>	The absolute value of residuals derived from regression (4), where the dependent variable is the sum of R&D expenditure and acquisition expenditure
<i>EISA</i>	Excess income from the sale of assets, measured as income from the sale of fixed assets and marketable securities minus the median value for the corresponding industry-year
<i>CP</i>	The forecast error for ordinary income, which equals current ordinary income for year t minus the forecasted ordinary income for year t , scaled by total assets at year $t-1$
<i>FP</i>	Management's forecast of ordinary income for year $t+1$ minus ordinary income for year t , scaled by total assets at year $t-1$
<i>SIZE</i>	Logarithm of total assets
<i>GROWTH</i>	The percentage change in total sales
<i>EISSUE</i>	An indicator that equals 1 if the firm issued equity, and 0 otherwise
<i>LEV</i>	Leverage ratio, measured as total liabilities divided by total assets
<i>CFO</i>	Net cash flow from operations, scaled by total assets
<i>BigN</i>	An indicator variable that equals 1 if the firm's auditor is a Big N auditor, and 0 otherwise
<i>MB</i>	Market-to-book ratio of equity
<i>FIRMAGE</i>	Natural logarithm of firm age
<i>CASH</i>	Cash, scaled by total assets
<i>TANGIBILITY</i>	Property, plant and equipment, scaled by total assets
<i>TOBINQ</i>	Tobin's Q, measured as the market value of total assets (total debt plus market value of equity) divided by the book value of total assets
<i>Z_SCORE</i>	A proxy for a firm's financial health, derived based on Altman (1968)

Appendix: Summary of Variable Definitions (continued)

Variables	Definitions
<i>STDCFO</i>	Standard deviation of cash flow from operations, scaled by total assets in the previous five years
<i>CYCLE</i>	Logarithm of operating cycle
<i>LOSS</i>	An indicator variable that equals 1 if net income is negative, and 0 otherwise
<i>BDIND</i>	An indicator equal to 1 if the firm has at least one independent director on the board, and 0 otherwise
<i>FOREIGN</i>	An indicator equal to 1 if the firm's foreign ownership is above the industry median, and 0 otherwise

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採行國際財務報導準則對盈餘品質與投資效率之影響：以日本為例

杜榮瑞¹ 廖芝嫻¹ 潘健民² 滝西敦子¹

¹ 國立臺灣大學會計學系

² 國立政治大學會計學系

通訊作者：廖芝嫻

通訊地址：106319 台北市羅斯福路四段 1 號

E-mail：chliao105@ntu.edu.tw

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摘要

本文旨在探討日本企業於自願採行國際財務報導準則後，對其盈餘品質與投資效率之影響。我們以在東京證券交易所上市並在 2010-2016 年期間自願採行國際財務報導準則的日本公司為樣本，以傾向分數配對法 (propensity score matching) 進行分析，實證結果顯示，相較於未採行國際財務報導準則的日本企業，自願採行國際財務報導準則的日本公司在採行後有較低之裁決性應計數與較低之盈餘平穩化，顯示其盈餘管理程度下降；另外本文亦發現，過度投資與投資不足的現象減少，顯示採行國際財務報導準則之後，企業之投資效率也有改善。本文提供證據說明對於經歷體制改變又存在既有文化價值的國家而言，採行國際財務報導準則能減少資訊不對稱。

關鍵詞：採行國際財務報導準則、盈餘品質、投資效率、體制變動

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東華書局
Tung Hua Book Co., Ltd.

1. 研究議題

本研究以日本企業為研究對象，探討自願採行國際財務報導準則 (International Financial Reporting Standards, 簡稱 IFRS) 對於盈餘品質與投資效率的影響。日本雖為世界第三大經濟體，但是一直到 2010 年 3 月才容許其企業自行決定是否採行 IFRS，且至今並無強制採行 IFRS 的計畫。本研究探討傳統以來一直是成文法體系的日本，在其經濟與金融以及公司治理體制的改革朝向歐美體制的方向後，採行 IFRS 為企業所帶來的經濟效益。為此，本研究聚焦探討日本企業在採行 IFRS 之後盈餘品質與投資效率是否提升。

2. 研究假說

本研究推論日本企業在採行 IFRS 後盈餘品質會提升，主要原因有二，其一，日本體制改革後，外資持股逐漸上升而銀行持股逐漸下降，有鑑於外資對財務報導品質的要求較高，傳統銀行體制下較不透明的日本會計準則已不符合需求；其二，IFRS 是以股東為導向的原則式準則，重視經濟實質以及如何公允表達企業財務績效，有助於減少管理者的盈餘操縱行為。基於上述兩個論點，本研究提出的第一個假說如下：

H1：日本企業於採行 IFRS 之後，盈餘品質會增加。

過去文獻指出資訊不對稱容易導致過度投資或投資不足的問題，而較佳的財務會計資訊有助於降低資訊不對稱進而提高投資效率。採行 IFRS 象徵著企業致力於提高財務報導品質，當資訊透明程度提高後，可減少因資訊不對稱引起的過度投資或投資不足。因此本研究提出第二個假說如下：

H2：日本企業於採行 IFRS 之後，投資效率會增加。

3. 研究方法

本研究首先從東京證券交易所的網站上取得採行 IFRS 企業的資料。財務與公司治理等相關資料則取自於日本經濟新聞所提供之資料庫 (Nikkei NEEDS-FinancialQUEST 與 CGES)。日本允許企業自願採行 IFRS，因此為降低樣本有自我選擇的疑慮，本研究使用傾向分數配對法 (propensity score matching)，自未採行 IFRS 的企業中選出控制組，進行差異中之差異 (difference-in-differences) 實證分析。

本研究使用裁決性應計數與盈餘平穩化作為盈餘品質的代理變數，而投資效率的衡量則依照先前文獻的方法。

4. 研究結果

本研究的實證結果均支持假說的推論：相對於採行日本會計準則的企業，日本企業在自行採用 IFRS 之後，其盈餘品質增加、投資效率提高。本研究另分別使用其他的盈餘管理以及投資效率之代理變數加以測試，皆得到相同結論。此外，本研究亦探討採行 IFRS 對盈餘品質的影響，是否會因公司治理的優劣而有不同，結果發現在獨立性較高以及外國法人持股較高的公司，採行 IFRS 對盈餘品質的正向影響較為顯著。

5. 研究貢獻

在諸多探討採行 IFRS 之經濟效益的文獻當中，本研究的貢獻在於提供證據說明對於經歷體制改變又存在既有文化價值的國家而言，採行國際財務報導準則能減少資訊不對稱。本文也說明，一個國家即使其傳統的文化價值（例如強調平穩與保守）未必與 IFRS 的精神契合，但經濟與金融體制（含公司治理）的改革朝向歐美體制的方向後，採行 IFRS 可以提升盈餘品質與投資效率。