ACCOUNTING & FINANCE

afaanz

Accounting & Finance 60 (2020) 3367–3406

The role of the national institutional environment in IFRS convergence: a new approach

June Cao[a], Chris Patel[b]

[a]Department of Applied Finance, Macquarie University,
[b]Department of Accounting and Corporate Governance, Macquarie University, North Ryde, NSW, Australia

Abstract

This study uses an ideal setting to capture the influence of the national institutional environment on outcomes (i.e., earnings quality) of IFRS convergence using a within-country approach. We show that earnings quality in terms of discretionary accruals and persistence has increased, while conservatism has decreased after IFRS convergence. The results are more pronounced in companies with a strong institutional environment. Our results are robust after considering incentives and other confounding factors. Our findings show differences in earnings quality in firms within a country adopting the same standards, let alone in firms worldwide. This indicates the context embeddedness of accounting standards.

Key words: Earnings quality; IFRS convergence; Institutional environment; Within-country approach

JEL classification: M41

doi: 10.1111/acfi.12525

1. Introduction

This study contributes to a growing body of new institutional accounting research (Wysocki, 2011) and International Financial Reporting Standards (IFRS) convergence literature in the Asia-Pacific region by exploring an ideal setting (i.e., two different types of listed companies within mainland China) to investigate how the weaker versus stronger national institutional environment influences economic consequences (i.e., earnings quality) of IFRS convergence.

Please address correspondence to June Cao via email: lacleman0618@hotmail.com, june.cao@hdr.mq.edu.au

We use a within-country rather than cross-country approach and apply a systematic method to this event study situation. This study extends previous research by bridging the gap of the influence of the institutional environment on IFRS adoption in the Asia-Pacific region and employing an ideal setting to mitigate the numerous limitations of the existing literature to provide rigorous and convincing evidence.

IFRS convergence aims to develop a single set of high quality and globally accepted accounting standards, which should require high-quality information in financial statements (International Accounting Standards Board, 2018b). Over 140 countries and jurisdictions had adopted IFRS by 2017 (IASB 2018b). However, whether IFRS convergence enhances earnings quality remains inconclusive. This is because IASB largely fails to consider heterogeneities in the institutional environment among countries (Chua and Taylor, 2008; Heidhues and Patel, 2012). These heterogeneities are important given that accounting is embedded in specific contexts, and countries' institutions have a first-order effect in shaping accounting practices (Wong, 2016). Heterogeneities in the institutional environment may lead to inconsistencies between *de jure* convergence, which refers to formal convergence in accounting standards and regulations (Canibano and Mora, 2000), and [1]*de facto* convergence, which refers to material convergence in accounting practices and applications (Canibano and Mora, 2000). [2]This challenges the ultimate goal of IASB, which is *de facto* convergence (Doupnik and Perera, 2012).

The objective of this study is to directly capture the influence of the national institutional environment on IFRS convergence and earnings quality in the largest IFRS adopter, China. Although numerous previous studies have examined this important issue (Ball *et al*., 2003; Daske *et al*., 2013; Christensen *et al*., 2015), there has been little research investigating the influence of this first-order effect factor, i.e., the institutional environment, on IFRS in the Asia-Pacific region. An extensive number of studies in Asia-Pacific journals show that 'newer and less-developed markets with different institutional and regulatory characteristics, different stock market settings and different investment behaviours present many opportunities for further research, particularly regarding the general applicability of existing research findings to all markets' (Linnenluecke *et al*., 2017a, p. 196). It is particularly important to investigate whether IFRS originated in Anglo-American contexts (Wong, 2016) could achieve its goal in the Asia-Pacific region.

Benson *et al*. (2015) synthesise IFRS-related research (from 2011 to 2013) in the Asia-Pacific region based on nine of the main accounting journals.[1] They document that the majority of these papers focus on IFRS and value relevance

[1] Accounting, Auditing and Accountability Journal, Australian Accounting Review, Abacus, Accounting and Finance, Australian Journal of Management, Accounting Research Journal, Journal of Contemporary Accounting and Economics, Managerial Auditing Journal, and Pacific Accounting Review.

(Goodwin *et al*., 2008; Chalmers *et al*., 2011; Lopes *et al*., 2013), and some work is conducted in an emerging economy such as Romania (e.g., Albu and Albu, 2012). In addition, Linnenluecke et al. (2017b) review the four Pacific Basin accounting journals[2] between 2008 and 2015. They document that IFRS is the largest research stream and these papers concentrate on seven dimensions of IFRS impacts including value relevance, disclosure, auditing, accounting ratios, classification, analysts' forecasts and public sector.

Based on the studies by Benson *et al*. (2015) and Linnenluecke *et al*. (2017b), we extend the IFRS-related literature review of the nine accounting journals in the Asia-Pacific region to 2018. We identify that 33 articles specifically discuss the outcomes of IFRS adoption such as the readability of financial statements (Richards and van Staden, 2015; Cheung and Lau, 2016), predictability of earnings (Bodle *et al*., 2016; Palea and Scagnelli, 2017), earnings transparency (Ye *et al*., 2018), audit (Nam, 2018), usefulness and accuracy of goodwill disclosure (Amorós Martínez and Cavero Rubio, 2018), and information asymmetry of the stock market (Abad *et al*., 2018). Additionally, numerous studies investigate IFRS-related issues in emerging markets such as Jordan (Al-Htaybat, 2018), Malaysia (Che Azmi and English, 2016), Oman (Lourenço *et al*., 2016), Brazil (Nakao and Gray, 2018), and China (Yang *et al*., 2018; Ye *et al*., 2018). However, there is little attention paid to the influence of one of the most important determinants, the institutional environment, on the consequences of IFRS convergence in the Asia-Pacific region. This study bridges this gap by investigating how the institutional environment influences IFRS convergence and earnings quality in China.

The majority of prior studies investigate this issue using a cross-country approach[3] (Armstrong *et al*., 2010; Daske *et al*., 2013). These studies suffer from numerous limitations, which lead to inconclusive and biased results. The first limitation is the difficulty in obtaining consistent results across countries (Van Tendeloo and Vanstraelen, 2005; Soderstrom and Sun, 2007; Ahmed *et al*., 2013; Christensen *et al*., 2015). Another major limitation is that they generally ignore heterogeneities within a country and omit other significant differences between countries. Importantly, heterogeneities between countries are enormous and unobserved (Ke *et al*., 2015). It is impossible to control all the differences among countries. Therefore, the cross-country method suffers from a serious omitted related variable problem (Miller, 2004; Gul, 2006; Ke *et al*., 2015). This may induce endogeneity, making the estimated results unreliable, biased and spurious (Antonakis *et al*., 2014). As a result, this reduces the internal validity.

[2] Abacus, Accounting and Finance, Australian Accounting Review, and the Australian Journal of Management.

[3] This is because cross-country enables us to observe the variation of the national institutional environment.

Another limitation of cross-country studies is the weak construct validity, namely, measurement errors. Prior research captures the national institutional environment using simplistic proxies. For example, Daske *et al.* (2008) and Byard *et al.* (2011) use rule-of-law or security regulation indexes to measure the strength of enforcement. Li (2010) measures the legal enforcement variable based on the framework of La Porta *et al.* (1998), which is used to capture the efficiency of the judicial system, the rule of law and corruption (De George *et al.*, 2016). De George *et al.* (2016) document that '[t]hese measures notably appear to neglect any dimension of financial reporting enforcement or auditing characteristics. Therefore, it is unclear whether these enforcement variables are capturing enforcement and the incentives related to financial reporting outcomes' (p. 992). Consequently, these proxies are not efficient for reporting enforcement (Brown *et al.*, 2014). Thus, it is difficult to draw convincing conclusions on how the national institutional environment influences IFRS convergence and earnings quality.

Furthermore, cross-country research often suffers from disproportion numbers of observations among countries.[4] Thus, the findings would be sensitive to the variation of the national-level variables (Miller, 2004; Ke *et al.*, 2015). Another limitation is potential self-selection bias. Ramanna and Sletten (2014) document that the decision to adopt IFRS by a country may not be entirely exogenous and one of the main determinants of IFRS adoption may be the national network benefits.[5] As a result, the findings of cross-country studies may be contaminated by an endogeneity problem.

To alleviate these limitations of cross-country research, our study explores an appropriate setting to solve this national-level issue using a within-country approach. Specifically, we investigate how the weaker versus stronger national institutional environment influences IFRS convergence and earnings quality within China by comparing the pre-IFRS (2000–2006) with the post-IFRS convergence (2007–2015) in two types of companies with different institutional environments. Importantly, it is worth noting that unlike prior studies examining the impact of IFRS convergence on earnings quality in China[6]

[4] For instance, Ahmed *et al.* (2013) test whether mandatory adoption of IFRS improves earnings quality across 20 countries. In their sample set, the observation number in Austria is 55, while that in the United Kingdom is 1,990. For the control group, the observation number in Pakistan is 5, while that in Japan is 3,340.

[5] For example, if a country builds up strong economic connections with other countries that have already adopted IFRS, this country is more likely to also adopt IFRS (De George *et al.*, 2016).

[6] An extensive number of researchers have studied convergence in China (Olesen and Cheng, 2011; Piotroski and Wong, 2012; Zhang *et al.*, 2013; Hou *et al.*, 2014; Chen *et al.*, 2015). However, the objective of our study does not focus on China, but on the national institutional environment; China simply provides a unique setting to examine the influence of the national institutional environment on IFRS by using a within-country approach.

(Liu *et al*., 2011), we use China as an empirical setting which enables us to solve this national-level issue using a within-country approach to directly examine the influence of the institutional environment (the details are discussed below). That is, the strength of the national institutional environment is a variable of interest in our empirical models.[7]

This within-country study has several distinct advantages of measuring the influence of the institutional environment. First, all companies are listed in mainland China. We explore a unique setting in China, which includes A-shares listed only in mainland China (A-companies) and AH-shares listed in both mainland China and Hong Kong (AH-companies). It is worth noting that we do not compare earnings quality of companies in mainland China with those in Hong Kong but compare earnings quality of A-companies with AH-companies within mainland China. Previous research shows that the stronger institutional environment of Hong Kong has a positive spillover effect on AH-companies in mainland China (Ke *et al*., 2015). However, A-companies do not have this positive spillover effect. As a result, AH-companies are under a relatively stronger institutional environment than A-companies, although they are both in mainland China. Therefore, by comparing the earnings quality of A-companies with AH-companies, we can identify how the weaker versus stronger institutional environment influences IFRS convergence and earnings quality. This avoids using simplistic proxies, reducing measurement errors of the institutional environment and increasing the construct validity.

Second, our within-country results are not contaminated by unobserved heterogeneities between countries and are not sensitive to the variations of national-level variables. Third, the within-country study enables us to better reduce contamination from potential confounding events, which may have asymmetric effects on the dependent variable when doing cross-country studies (De George *et al*., 2016). Fourth, this study avoids other unobservable differences among countries which may result in correlated omitted variable issues. In addition, given that IFRS convergence is mandatory in China for A- and AH-companies, selection bias is less of a concern than in cross-country studies.

---

[7] To clarify this point, we apply the following simple models to show the differences between prior country-specific research and our study.
Prior study: $Earningsquality = \alpha_0 + \alpha_1 IFRS + ControlVariables + \varepsilon$.
Our study: $Earningsquality = \alpha_0 + \alpha_1 IFRS + \alpha_2 InstitutionalEnvironment + \alpha_3 IFRS * InstitutionalEnvironment + ControlVariables + \varepsilon$.
Based on the two models above, we clearly show our research applies a country-specific setting to address a national-level issue using a within-country method. This is because the special setting of mainland China includes both A-companies and AH-companies. The stronger institutional environment of Hong Kong provides positive spillover effects to AH-companies rather than A-companies. Therefore, we can identify the influence of the strength of the institutional environment on outcomes of IFRS convergence by comparing these two types of companies within a single country.

From the empirical methodology perspective, most prior studies on IFRS adoption rely on linear regression (De George *et al*., 2016).[8] Abundant evidence shows that deviating linearity and stationarity are important features of real data (Hamilton, 1989). For example, De George *et al*. (2016) document that '[IFRS] may be affected by nonlinearity in the earnings-returns relationship' (p. 916). In addition, other salient features of real accounting data such as fat tails, clustering, asymmetry and mean reversion are also well documented (Poon and Granger, 2003). However, a simple linear model cannot capture these important features (Tong, 1990). Therefore, estimates based on a linear model may reach spurious conclusions.

Another limitation of the methodology of previous event studies on IFRS adoption is the *ad hoc* solutions to standard errors in the presence of within-cluster correlation such as clustering on region, industry or year. Numerous researchers point out the importance of recognising volatility clustering in the context of event studies (Brown and Warner, 1985; Bollerslev *et al*., 1992). Bera and Higgins (1993) state that '[e]pisodes of volatility are generally characterized as the clustering of large shocks to the dependent variable' (p. 309). This is because there may be other shocks from confounding or contamination events driving changing volatility of the dependent variable for either short- or long-window event studies, which results in standard error clustering. Most prior researchers deal with this problem by clustering standard errors in their main analysis to get better estimates (De George *et al*., 2016).[9]

How to produce unbiased standard errors for possible dependence in the residuals is a key issue in accounting and finance research to get accurate estimations, but the majority of previous studies do not solve it appropriately (Petersen, 2009).[10] Petersen (2009) provides a comprehensive and critical discussion about the different approaches to deal with standard errors in the presence of possible time-series and cross-sectional dependence in the residuals. The findings show that in the presence of a firm effect, 'standard errors are biased when estimated by OLS, White, Newey–West (modified for panel data sets), Fama–MacBeth, or Fama–MacBeth corrected for first-order

[8] De Franco *et al*. (2011) investigate how IFRS adoption affects the relationship between earnings and returns based on linear regression.

[9] It is important to get correct standard error estimates to make statistical inferences (Bollerslev *et al*., 1992, p. 31). 'It is well known that OLS standard errors are unbiased when the residuals are independent and identically distributed. When the residuals are correlated across observations, OLS standard errors can be biased and either overestimate or underestimate the true variability of the coefficient estimates' (Petersen, 2009, p. 435).

[10] Petersen (2009) searches papers published during 2001–2004 in the top finance journals including *The Journal of Finance*, *Journal of Financial Economics* and *The Review of Financial Studies*, revealing that 42 percent of papers did not provide unbiased standard errors for possible dependence in the residuals.

autocorrelation' (p. 475). However, the standard errors clustered by the firm are unbiased for both permanent and temporary firm effects. If the firm effect is permanent, the fixed effects and the random effects models also produce unbiased standard errors. In the presence of a time effect, Fama–MacBeth and standard errors clustered by time (when the number of clusters is sufficient) produces unbiased standard errors. In the presence of both a time effect and firm effect, standard errors clustered on multiple dimensions produce unbiased standard errors when the number of clusters is sufficient in each dimension.

Based on the conclusions of Petersen (2009), standard errors clustered on multiple dimensions seem to work well for unbiased estimation; however, this requires a sufficient number of clusters. This study does not have a sufficient number of time clusters. In addition, standard error clustering is an *ad hoc* choice without rigorous methodological inferences. Thus, consistent with Bollerslev *et al*. (1992) and De Jong *et al*. (1992), this study applies a more systematic and rigorous approach: non-linear methods using autoregressive conditional heteroscedasticity (ARCH) and generalised ARCH (GARCH). ARCH/GARCH models most precisely and powerfully capture the three ubiquitous characteristics of real accounting data, namely, unpredictability, fat tails and volatility clustering (Engle, 2004; Siu *et al*., 2004; Elliott *et al*., 2012). It is important that a model can capture these features, as ignoring these results in spurious conclusions (De Jong *et al*., 1990).

Prior studies in accounting largely fail to consider conditional heteroscedasticity or changing volatility[11] of the real accounting data. It is a general belief that the global financial and business climates during both the pre- and post-IFRS convergence periods are highly volatile due to the outbreaks of several (un)-expected global and regional financial crises, different market events, policy changes or internet bubble. Consequently, it may not be reasonable to assume that the volatilities of the dependent variables considered in our study would remain constant over time. Therefore, our study further contributes to the (empirical) accounting literature by incorporating conditional heteroscedasticity through applying ARCH/GARCH models to this event study.

Specifically, our study addresses several research questions related to the influence of the strength of the national institutional environment on IFRS convergence and earnings quality. We first examine whether earnings quality of all Chinese listed companies has improved after IFRS convergence. To maintain comparability with prior studies and demonstrate the advantages of our setting and method, we measure earnings quality with a focus on discretionary accruals, persistence and conservatism. We find that earnings quality in terms of discretionary accruals and persistence has improved, while conservatism has decreased after IFRS convergence. We further investigate

[11] The square root of the variance is called the volatility (Engle, 2004, p. 405). The volatilities of many financial and economic series are changing over time. This important stylised fact is coined as conditional heteroscedasticity.

how the strength of the institutional environment influences IFRS convergence and earnings quality. Due to the positive spillover effect of Hong Kong's stronger institutional environment on AH-companies (Ke *et al*., 2015), we find that most earnings quality attributes of companies under the strong institutional environment have improved more than of companies under the weak institutional environment.

The remainder of this paper is organised as follows. The second section provides background information regarding the empirical setting of this study, mechanisms of the positive spillover effect of Hong Kong's stronger institutional environment, and our research hypotheses. The third section presents our research design and methodology. The fourth section presents and discusses the results, and the fifth section concludes with a discussion of research implications.

2. Background information and hypotheses

2.1. IFRS convergence and earnings quality

Based on the theoretical model of Dechow *et al*. (2010), our study modifies the relationship between accounting standards and earnings quality as follows:

$$Reported\,Earnings = f(X) + \varepsilon$$

Reported Earnings refers to observable earnings measured by accounting standards. X is firms' financial performance, and f represents IFRS convergence. ε represents an idiosyncratic part which cannot be explained by the systematic part $f(X)$. This theoretical model indicates that earnings quality is determined by not only fundamental performance but also accounting standards. Therefore, high-quality standards should result in high earnings quality when fundamental performance is controlled.

As discussed earlier, IFRS convergence is based on the implicit assumption that it leads to higher earnings quality, which means IFRS provide more relevant and faithfully represented financial information that reflects the nature and contexts rather than the legal form of business transactions. However, in the pre-economic reform period in China (i.e., before 1978), Chinese Accounting Standards (CAS) were subject to bureaucracy and were highly legalistic, focusing on reporting the government's economic plans and budgets. As such, they largely failed to reflect the 'spirit' of business transactions (Doupnik and Perera, 2012). In 2007, CAS substantially converged with IFRS. IFRS are based strongly on a *substance over form* approach that requires accountants and auditors to exercise extensive professional judgments to reflect the nature and contexts rather than the legal form of business transactions (Agoglia *et al*., 2011; Bradbury and Schröder, 2012). This should be reflected in

more informative accounting numbers after IFRS convergence. Therefore, our study develops the following hypothesis:

H1: Earnings quality of Chinese companies has improved after IFRS convergence.

2.2. The weaker versus stronger institutional environment and mechanisms of the spillover effect

As the largest IFRS adopter in the world, China provides a unique setting which enables us to examine the influence of the national institutional environment on IFRS convergence and earnings quality using a within-country approach. Mainland China includes A-companies and AH-companies. Compared with AH-companies, A-companies are under the weaker institutional environment. This is because the stronger institutional environment of Hong Kong provides a positive spillover effect to AH-companies rather than A-companies. We demonstrate the strength of the institutional environment between A- and AH-companies and mechanisms of the positive spillover effect as follows.

2.2.1. Comparison of the institutional environment of mainland China with Hong Kong

The Chinese capital market is characterised as having 'weak legal systems, highly politicised institutional arrangements, rent-seeking behavior, and corruption ... opaque information environments and weak corporate transparency' (Piotroski and Wong, 2012, p. 202). Chinese enterprises and capital market are under the supervision and intervention of the government rather than the market mechanism (Wong, 2016). One salient feature of government intervention reflects the dominance of state-owned enterprises (SOEs).[12] The three main regulatory bodies, China Security Regulatory Commission (CSRC), State-owned Assets Supervision and Administration Commission (SASAC), and the Ministry of Finance (MOF) are subject to government control (Wong, 2016). Thus, '[t]he most glaring problem in China's accounting system is the lack of independent and professional auditors' (Allen *et al.*, 2005, p. 70). The strength of Chinese auditing and reporting standards is ranked 68 out of 138, while Hong Kong is ranked 7 out of 138; China's regulatory quality is within the 47.55th to 44.23rd percentile rank among all 215 economies under assessment, while Hong Kong is within the 98.53rd to 99.52nd percentile in 2016 (World Bank, 2016). Therefore, the independence of Chinese accountants and auditors, in addition to regulatory quality, are relatively weak compared with Hong Kong.

[12] SOEs (the total number is 1,019) account for about 47 percent of the total market value of all 2,887 Chinese listed companies by the end of June 2016 (OECD, 2017).

The Chinese capital market is treated as a counterexample in terms of the significance of law and enforcement for capital market growth (Allen *et al.*, 2005; Zhang, 2016). China's judicial independence is ranked 56 out of 138, while Hong Kong is ranked 8 out of 138 (World Economic Forum, 2017).[13] One main reason for weak enforcement in China is 'the intrinsic conflict of interest between "fair play" in practicing law and the monopoly power of the single ruling party, especially in cases in which government officials or their affiliates are involved' (Allen *et al.*, 2005, p. 66). Thus, if SOEs or politically connected companies are involved in litigation, judgment may not be fair.

In addition, no class action lawsuits are allowed in China (Wong, 2016). Moreover, the code-law origin provides extraordinarily weak protection to shareholders and minority investors. The strength of Chinese minority investors is ranked 123rd in 2016 of 190 economies while Hong Kong is ranked 3rd (World Bank, 2017). The general strength of investor protection is ranked 108 out of 138 in 2016 in China, while Hong Kong is ranked 1 out of 138 (World Economic Forum, 2017).

Corporate governance in Chinese companies is also weak. Tenev *et al.* (2002) and Chen *et al.* (2007) document that institutional investors are highly unlikely to monitor and engage in shareholder activism. This is because institutional investors are neither large shareholders, nor do they have long-run horizons in China. Jiang and Kim (2015) document that because of lower bankruptcy costs, debt is highly unlikely to be a disciplinary mechanism in China. China is treated as one of the most restrictive media environments in the world, and dissemination mechanisms play limited roles (Freedom House, 2017), while it is free in Hong Kong (Hung *et al.*, 2012). The media in Hong Kong plays an important role to disclose information regarding regulatory agencies' investigations (Ke *et al.*, 2015).

The market mechanism facilitates business activities in Hong Kong, and listed companies are under stronger supervision from the Hong Kong Securities and Futures Commission (HKSFC), Hong Kong Stock Exchange (HKSE), Hong Kong Institute of Certified Public Accountants (HKICPA) and Independent Commission against Corruption (ICAC). HKSFC is charged with regulating securities and futures markets, which is part of the government but operates independently from the government. ICAC is an independent institution to clean up corruption through law enforcement, prevention and community education to keep Hong Kong fair, just, stable and prosperous (Hong Kong ICAC, 2016). In summary, the institutional environment of Hong Kong is much stronger than that of mainland China.

[13] According to the World Governance Indicators (WGI), China is within the range of 36.36th to 43.75th percentile rank in the rule of law,[13] and 43.90th to 50.00th percentile rank in the control of corruption among all of the 215 economies under assessment, while Hong Kong is ranked from 68.42nd to 94.71st percentile in the rule of law, and 90.73rd to 92.31st percentile in control of corruption from 2010 to 2015 (World Bank, 2016).

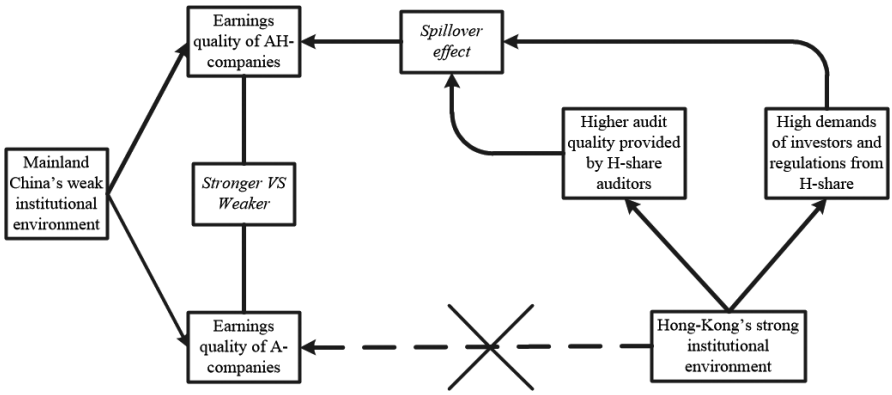

Figure 1 Mechanisms of spillover effect.

2.2.2. *Mechanisms of the positive spillover effect*

There are at least two channels through which the strong institutional environment of Hong Kong provides a spillover effect on AH-companies in mainland China (Figure 1 illustrates the mechanisms of positive spillover effect). First, from a demand perspective, AH-companies are required to prepare two sets of financial reports for both H-share and A-share investors before 2010. H-share companies are regulated by all Hong Kong regulatory agencies. HKSFC works closely with mainland China regulatory agencies to deal with regulatory issues arising from cross-border activities (HKSFC, 2013). Thus, AH-companies face a far more demanding reporting regime than A-companies.

Second, H-share financial reports are required to be audited by auditors from Hong Kong, and A-share financial reports are audited by auditors in mainland China (Ke *et al*., 2015). Although AH-companies are not mandatorily audited by Hong Kong auditors after 2010, the majority continue to do so (Ke *et al*., 2015). Auditors in Hong Kong are also supervised by the HKSFC, HKSE and HKICPA and are subject to Hong Kong's stronger environment (Ke *et al*., 2015). Thus, A-share audit of AH-companies results in indirect benefits from H-share audit of AH-companies. This is because it is difficult for auditors in mainland China to compromise audit quality when they audit AH-companies. Therefore, from a supply perspective, auditors of AH-companies are more likely to provide high audit quality. However, A-companies are little exposed to Hong Kong's institutional environment, without such positive spillover effect. Rather than compare mainland China with Hong Kong, we compare changes in earnings quality of A-companies (a proxy for the weak institutional environment) from pre- to post-IFRS convergence with AH-companies (a proxy for the strong institutional environment) within mainland China by adopting a difference in difference approach (DID).

2.3. Influence of the institutional environment on IFRS convergence and earnings quality

Prior research provides evidence that the national institutional environment has a significant influence on IFRS convergence and earnings quality (Ball *et al.*, 2000a,b, 2003; Houqe *et al.*, 2012). Soderstrom and Sun (2007) document that earnings quality is a function of the country's institutional environment and accounting standards. Pincus *et al.* (2007) conclude that a stronger legal system leads to higher earnings quality. Hope *et al.* (2006) and Daske *et al.* (2008) document that the improvement of earnings quality due to IFRS convergence could be especially expected for countries with a relatively weak institutional environment. A-companies are under a weaker institutional environment than AH-companies. Thus, we hypothesise that:

H2: Earnings quality of A-companies has improved more than its counterpart of AH-companies after IFRS convergence.

3. Research design

3.1. Sample

The sample is from the China Securities Market and Accounting Research (CSMAR) database over the period 2000 to 2015 inclusive. On 1 January 2007, CAS substantially converged with IFRS. Therefore, from 2000 to 2006 is the pre-IFRS convergence period, and from 2007 to 2015 is the post-IFRS convergence period. We exclude all financial companies because the regulation and fundamental characteristics of the financial industry are different from other industries. In total, 207 observations of the financial industry are removed from the sample. The industry indicators are collected according to CSRC industry classification, including 90 industry categorisations. To ensure that outliers do not drive the estimated results, we winsorise continuous variables at the top and bottom percentiles.

3.2. Research design for earnings quality attributes: models without conditional heteroscedasticity

$$EQ = \alpha_i + \beta_{1,i} IFRS + \gamma ControlVariables + \varepsilon_i \quad (1)$$

$$EQ = \alpha_i + \beta_{1,i} IFRS + \beta_{2,i} INS + \beta_{3,i} IFRS * INS + \gamma ControlVariables + \varepsilon_i \quad (2)$$

The random error term ε_i is assumed to have a constant variance, say σ^2, when conditional heteroscedasticity is absent. The dependent variable *EQ* takes the value of earnings quality attributes in terms of discretionary accruals, persistence and conservatism. *IFRS* equals 1 in 2007–2015 and 0 otherwise. *INS* represents the

institutional environment indexes. Consistent with Barth *et al.* (2008) and Ahmed *et al.* (2013), we focus on the coefficient of interaction between IFRS convergence and the institutional environment, which explains the incremental effect of the weaker institutional environment on IFRS convergence and earnings quality relative to the stronger institutional environment.

3.2.1. Earnings quality: accruals quality

According to the performance-controlled modified Jones' model of Kothari *et al.* (2005):

$$\frac{TA_{i,t}}{Asset_{i,t-1}} = \alpha_{1,i} + \alpha_{2,i}\frac{1}{Asset_{i,t-1}} + \beta_{1,i}\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{Asset_{i,t-1}} + \beta_{2,i}\frac{PPE_{i,t}}{Asset_{i,t-1}} + \beta_{3,i}\frac{ROA_{i,t}}{Asset_{i,t-1}} + \varepsilon_i \tag{3}$$

TA is total accruals, ΔREV is the revenue growth, ΔREC is the credit sales and PPE is the gross property, plant and equipment. All variables are divided by the lagged total assets. ROA is the firms' fundamental performance.

$$DA_{i,t} = \frac{TA_{i,t}}{Asset_{i,t-1}} - (\hat{\alpha}_{1,i} + \hat{\alpha}_{2,i}\frac{1}{Asset_{i,t-1}} + \hat{\beta}_{1,i}\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{Asset_{i,t-1}} + \hat{\beta}_{2,i}\frac{PPE_{i,t}}{Asset_{i,t-1}} + \hat{\beta}_{3,i}\frac{ROA_{i,t}}{Asset_{i,t-1}}) \tag{4}$$

DA is discretionary accruals measured by the absolute value of the residual of Model (3). This is because our study does not focus on the direction of earnings management.[14] A larger value of DA means lower earnings quality. The

[14] As an extensive number of previous studies suggested, whether it is necessary to separately examine discretionary accruals depends on whether the direction of earnings management is the focus. We focus on the overall earnings quality including both increasing and decreasing earnings management. This is consistent with an extensive number of prior studies (Bartov *et al.*, 2000; Reynolds and Francis, 2000; Krishnan, 2003; Francis *et al.*, 2005; Chen *et al.*, 2008). For example, Cohen *et al.* (2008) investigate real and accrual-based earnings management in the pre- and post-Sarbanes-Oxley periods and they also use the absolute value of discretionary accruals to proxy for accrual-based earnings management. They provide detailed explanations regarding why they use absolute value rather than directional values: 'We use the absolute value because our hypotheses do not predict any specific direction for earnings management. Moreover, the absolute value also captures accrual reversals following earnings management' (p. 769). In addition, 'Warfield *et al.* (1995) and Francis *et al.* (1999) argue that the extent to which companies use accruals to manage earnings is best measured by the unsigned (absolute) value of accruals. The magnitude of unsigned accruals measures a company's success in managing earnings either up or down, as needed, depending on year-specific situations (Healy, 1985; DeFond and Park, 1997)' (Reynolds and Francis, 2000, p. 380).

absolute value of discretionary accruals *DA* is then used as a dependent variable in the following regression equation:

$$DA_{it} = \alpha_i + \beta_{1,i}IFRS + \beta_{2,i}INS + \beta_{3,i}IFRS * INS + \gamma ControlVariables + \varepsilon_i \quad (5)$$

According to our hypotheses, we expect that after IFRS convergence, discretionary accruals will have decreased. Thus, the coefficient $\beta_{1,i}$ should be negative. The coefficient of interaction between IFRS and the institutional environment $\beta_{3,i}$ should be negative, which would indicate that, after IFRS convergence, discretionary accruals decreased more under the weak institutional environment (A-companies) than the strong institutional environment (AH-companies).

3.2.2. Earnings quality: persistence

According to Perotti and Wagenhofer (2014), persistence is measured as follows:

$$\begin{aligned} NIBE_{i,t} = {} & \alpha_i + \beta_{1,i}NIBE_{i,t-1} + \beta_{2,i}IFRS + \beta_{3,i}INS + \beta_{4,i}NIBE_{i,t-1} \\ & * IFRS + \beta_{5,i}NIBE_{i,t-1} * INS + \beta_{6,i}NIBE_{i,t-1} * IFRS \\ & * INS + \gamma ControlVariables + \varepsilon_i \end{aligned} \quad (6)$$

NIBE is net income before extraordinary items divided by the lagged total assets. Note that a first-order linear autoregressive (AR) model is used to describe the temporal dependence of *NIBE* in Model (6). *Persistence* is equal to the slope coefficient β of Model (6). A coefficient of β close to 1 indicates persistent earnings, whereas a coefficient of β close to 0 indicates transitory earnings. As discussed earlier, CAS were fully subject to the bureaucracy, were highly legalistic, and focused on reporting the government's economic plans and budgets before IFRS convergence, thus largely failing to reflect the 'spirit' of business transactions (Doupnik and Perera, 2012). IFRS emphasise 'substance over form' and require accountants and auditors to exercise extensive professional judgments to reflect the nature rather than the legal form of business transactions (Agoglia *et al*., 2011; Bradbury and Schröder, 2012). This could be reflected in more persistent earnings after IFRS convergence. Thus, the coefficient $\beta_{4,i}$ should be positive.

3.2.3. Earnings quality: conservatism

Following Basu (1997), our measure of conservatism is based on the following model:

$$NIBE_{i,t} = \alpha_i + \beta_{1,i}D_{i,t} + \beta_{2,i}RET_{i,t} + \beta_{3,i}D_{i,t} * RET_{i,t} + \beta_{4,i}IFRS + \beta_{5,i}INS + \beta_{6,i}D_{i,t} * RET_{i,t} * IFRS + \beta_{7,i}D_{i,t} * RET_{i,t} * INS + \beta_{8,i}D_{i,t} * RET_{i,t} * IFRS * INS + \gamma ControlVariables + \varepsilon_i \quad (7)$$

RET is the annual market-adjusted return; $D = 1$ if $RET < 0$ and 0 otherwise, and *NIBE* is net income before extraordinary items divided by the lagged total assets. According to Basu (1997), if earnings are conservative, $\beta_{3,i}$ should be positive. Ball (2006) documents that IFRS adoption offers timelier financial information. Thus, we predict that after IFRS convergence, the coefficient of interaction among bad news, stock returns and IFRS ($\beta_{6,i}$) is significantly positive.

3.3. Modelling structure with conditional heteroscedasticity

This research is a long-window event study. It is important to control the clustering of large shocks of confounding or contamination events. Macroeconomic condition changes (e.g., the financial crises in 2008), capital market regulation or policy changes (e.g., the share reform in 2005), and the anti-corruption campaign in 2012, may trigger changing volatilities of earnings quality. In contrast to the majority of prior research that uses an ad-hoc approach such as standard error clustering on regions, industry or year in their estimation, we apply a systematic and parsimonious approach using GARCH in event study situations. Bollerslev *et al.* (1992) and De Jong *et al.* (1992) document GARCH is a fairly general and systematic approach used in a wide variety of event study situations (details are provided in Appendix I).

4. Empirical results

4.1. Specification and diagnostic tests of conditional heteroscedasticity

Table 1 shows that the skewness of most variables deviates from normality (i.e., the value of skewness is significantly different from zero). That is, all these variables tend to be leptokurtic. Similarly, the kurtosis of all variables is significantly different from three (critical value of normal distribution). This indicates heavy-tailed distributions of these variables, which provides strong evidence that extremes are more substantial than would be expected from a normal random variable, which indirectly shows the presence of an ARCH/GARCH effect.[15] To make this point intuitionally understandable, we provide plots of conditional variance. Figure 2 obviously shows that the conditional variance of dependent variables changes over time. In particular, all variables

[15] The ARCH/GARCH model of Bollerslev (1986) is used to capture conditional variance and heavy-tailed error distributions (De Jong *et al.*, 1992).

`Table 1
Descriptive statistics

Variable	*N*	Mean	SD	Min	P25	P50	P75	Max	Skewness	Kurtosis
Size	27,564	21.29	1.177	18.76	20.52	21.16	21.92	26.90	**0.778**	**4.542**
ROA	26,003	0.022	0.046	−0.185	0.003	0.016	0.040	0.186	**−0.405**	**8.807**
NIBE	24,236	0.060	0.130	−0.128	0.007	0.026	0.064	0.927	**4.149**	**24.65**
Return	26,609	0.542	0.749	−0.389	0.008	0.396	0.865	3.462	**1.423**	**5.564**
PC	26,461	0.090	0.286	0	0	0	0	1	**2.873**	**9.254**

All variable definitions are presented in Appendix II. The bold values of Skewness column mean these values significantly deviate from the critical value of normality zero, and the bold values of Kurtosis column mean these values significantly deviate from the critical value of normal distribution three.

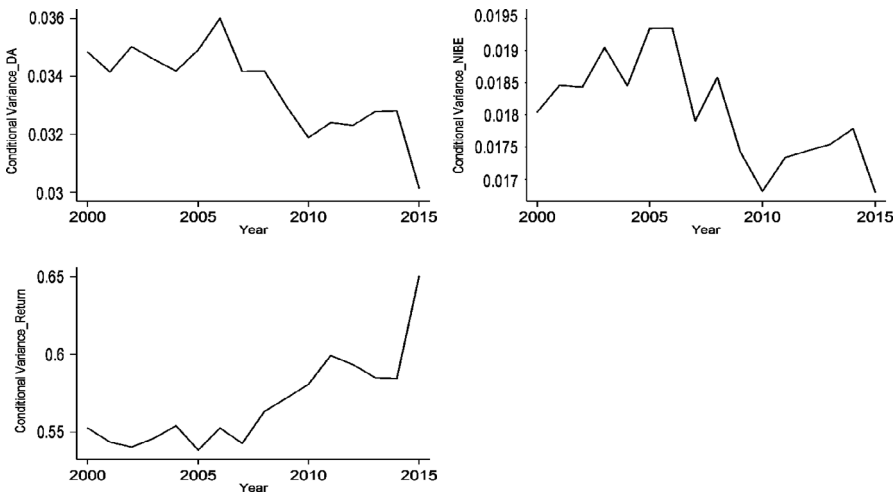

Figure 2 Plots of conditional variance of dependent variables.

experience highly changing volatilities during the financial crisis period (from 2007 to 2009), which indicates that macroeconomic conditions significantly drive the conditional changes in accounting items.

Further indirect evidence is provided by kernel density estimation[16] (Figure 3), qnorm[17] (Figure 4), and pnorm[18] (Figure 5), indicating all these real data against a normal distribution.

[16] Kernel density estimation is a statistical curve estimation technique to describe the probability density function of data by the kernel method (Silverman, 1986).

[17] qnorm plots the quantiles of variables against the normal distribution.

[18] pnorm plots a standardised normal probability of variables.

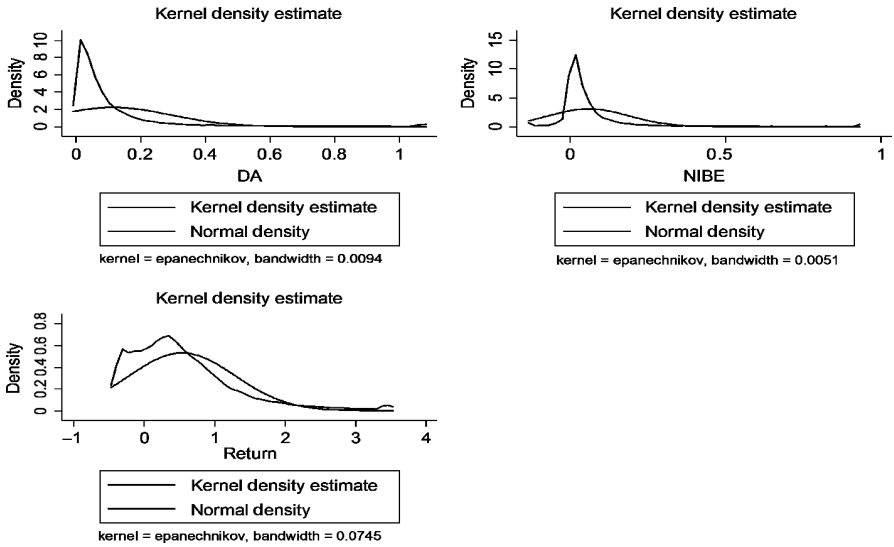

Figure 3 Kernel density estimates of dependent variables.

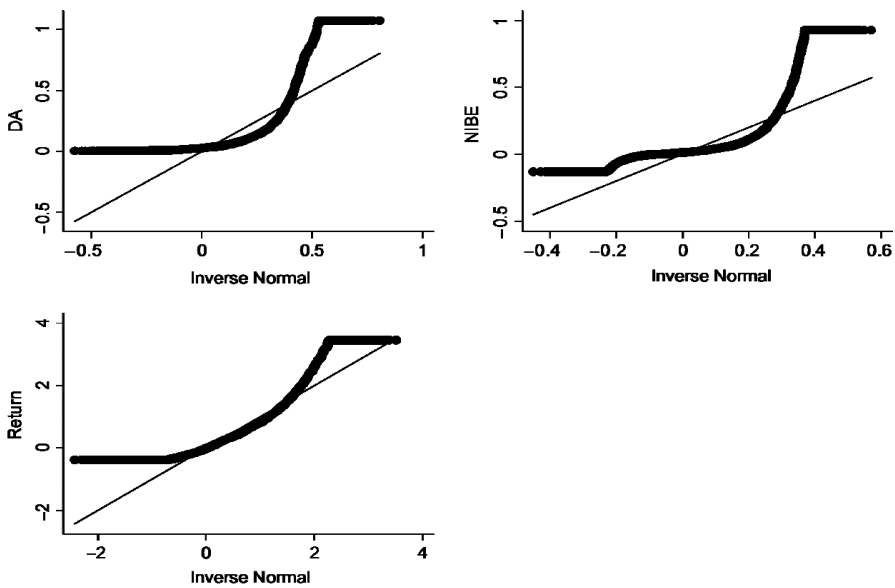

Figure 4 Plots of the quantiles of dependent variables against the quantiles of the normal distribution.

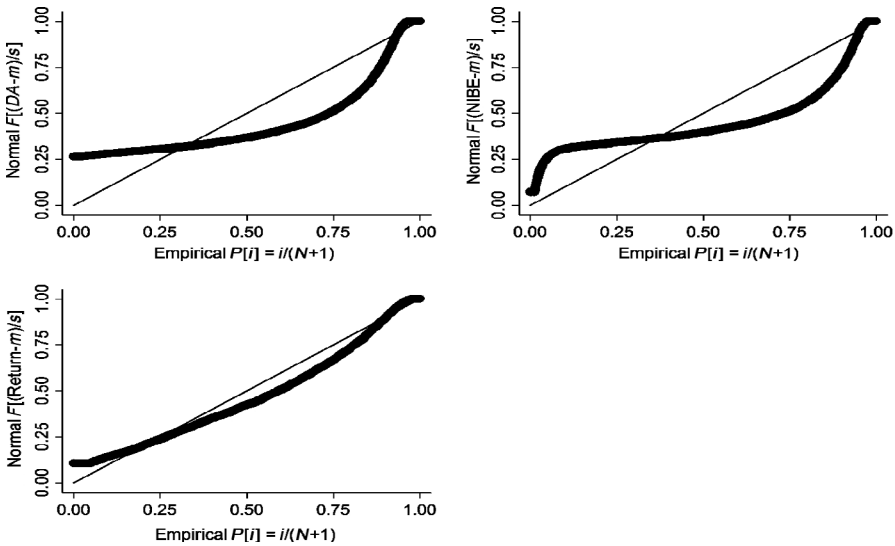

Figure 5 Standardised normal probability plots of dependent variables.

Consistent with De Jong *et al.* (1992), the direct ARCH/GARCH effect is examined by applying a conditional maximum likelihood ratio test. The likelihood ratio test compares the value of the log-likelihood of a constant variance with the log-likelihood of conditional variance. Table 2 reveals that ARCH/GARCH effects significantly exist in almost all earnings quality attributes (all p-values <0.01). This provides convincing statistical evidence of the presence of ARCH/GARCH effects in the earnings quality attributes.

4.2. Correlation analysis

Table 3 provides a correlation matrix of key variables. Numbers above the diagonal matrix are the Spearman's rank correlations, and the lower triangle are Pearson's correlation coefficients. The correlation matrix indicates that there is no serious multicollinearity problem among the variables in our study (all correlations are smaller than 0.5 with p-value <0.1). We observe the negative correlation between the absolute value of discretionary accruals and the strong institutional environment, which shows that the stronger institutional environment correlates with the smaller discretionary accruals. We also find a negative correlation between the absolute value of discretionary accruals and IFRS, indicating that discretionary accruals have reduced after IFRS convergence. It is worth noting that political connections negatively correlate with discretionary accruals, showing political connections play a positive role in enhancing earnings quality in terms of discretionary accruals.

Table 2
ARCH/GARCH effects of each dependent variable

	DA	*NIBE*	*Return*
_cons	0.105***	0.053***	0.464***
	(59.53)	(69.88)	(154.21)
ARCH	**0.224*****	**0.163*****	**0.418*****
	(31.93)	(55.03)	(48.59)
GARCH	**0.697*****	**0.848*****	**0.545*****
	(71.51)	(206.09)	(81.76)
_cons	0.003	0.0002***	0.0339***
	(14.45)	(4.89)	(19.08)
N	15,950	24,330	26,801
AIC	−10,760.3	−33,186.0	53,888.4
BIC	−10,729.6	−33,153.6	53,921.2

All variable definitions are presented in Appendix II; *t*-statistics appear in parentheses; *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$. The bold values mean the coefficients of our variables of interest are statistically significant.

Table 3
Pearson/Spearman correlation matrix

	DA	*AH*	*IFRS*	*NIBE*	*Return*	*PC*
DA		−0.031*	−0.016	0.250*	−0.055*	−0.015
AH	−0.015*		0.012	0.001	−0.087*	0.033*
IFRS	−0.044*	−0.030*		0.013	0.194*	0.032*
NIBE	0.475*	0.010	−0.005		−0.052*	0.017
Return	−0.047*	−0.057*	0.153*	−0.044*		0.011
PC	−0.020*	0.022*	0.029*	0.001	0.007	

All variable definitions are presented in Appendix II; numbers above the diagonal matrices are the Spearman's rank correlations, while Pearson's correlation coefficients are shown in the lower triangle; *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

4.3. Regression results of H1

First, we conduct a univariate regression model to test the variation in earnings quality from pre- (2000–2006) to post-IFRS convergence (2007–2015). Table 4 presents results with and without considering ARCH/GARCH effects. The results with ARCH/GARCH effects show that the coefficient of IFRS on discretionary accruals is negative (coefficient −0.014) and significant (*t*-statistic −5.44 with *p*-value <0.01), which indicates that discretionary accruals have decreased after IFRS convergence, revealing higher earnings quality. Similarly, the coefficient of IFRS on the lag of net income before extraordinary items is positive (0.060) with *t*-statistic 5.39 (*p*-value <0.01), which means earnings

Table 4
Regression results of the whole sample

	DA			Persistence			Conservatism		
	Expected sign	With GARCH	Without GARCH	Expected sign	With GARCH	Without GARCH	Expected sign	With GARCH	Without GARCH
IFRS	–	−0.014***	−0.018***	?	−0.005***	−0.001	?	−0.010***	−0.006***
		(−5.44)	(−5.97)		(−3.11)	(−0.63)		(−7.25)	(−2.79)
L.NIBE				–	−0.033***	−0.016			
					(−3.73)	(−1.43)			
L.NIBE_IFRS				+	0.060***	0.032**			
					(5.39)	(2.04)			
D							+	0.007***	0.007*
								(3.74)	(1.72)
Return							–	−0.011***	−0.010***
								(−13.37)	(−7.21)
D_Return							+	0.103***	0.090***
								(12.18)	(6.04)
D_Return_IFRS							+	−0.076***	−0.078***
								(−7.32)	(−4.67)
_cons		0.118***	0.126***		0.062***			0.071***	0.071***
		(44.96)	(51.04)		(36.82)			(49.33)	(34.09)
ARCH		−0.409***			0.584***			0.457***	
		(−12.96)			(18.93)			(26.17)	
TARCH		0.610***			−0.422***			−0.270***	
		(19.36)			(−14.16)			(−16.01)	
GARCH		0.560***			0.776***			0.727***	
		(30.14)			(29.43)			(56.66)	
_cons		0.009***			0.001**	0.062***		0.002***	
		(17.80)			(2.50)	(35.20)		(8.67)	

(continued)

Table 4 (continued)

	DA			Persistence			Conservatism		
	Expected sign	With GARCH	Without GARCH	Expected sign	With GARCH	Without GARCH	Expected sign	With GARCH	Without GARCH
N		15,950	15,950		16,117	16,117		24,225	24,225
AIC		−1.1e+04	−9.5e+03		−2.0e+04	−1.9e+04		−3.2e+04	−3.0e+04
BIC		−1.1e+04	−9.5e+03		−2.0e+04	−1.9e+04		−3.2e+04	−3.0e+04

L.NIBE is the first lag of NIBE; *L.NIBE_IFRS* is the interaction between *IFRS* and the lag of NIBE; *D_Return* is the interaction between bad news and stock return; *D_Return_IFRS* is the interaction between IFRS and conservatism coefficient; other variables are defined in Appendix II; *t*-statistics appear in parentheses; *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

quality in terms of persistence has increased after IFRS convergence. We also find significantly negative coefficients (−0.076) on conservatism with *t*-statistic −7.32 (*p*-value < 0.01), indicating earnings quality in terms of conservatism has decreased. In addition, the results show that ARCH/GARCH effects significantly exist in discretionary accruals, persistence and conservatism. Overall, the results with ARCH/GARCH effects show that after IFRS convergence, earnings quality has increased in terms of discretionary accruals and persistence but decreased in terms of conservatism.

The results without considering ARCH/GARCH effects show an insignificant coefficient of IFRS on persistence. In addition, all models with ARCH/GARCH effects in Table 4 have smaller AIC[19] and BIC,[20] which indicates that these models have higher goodness of fit. The significance of ARCH/GARCH and their asymmetric effects indicates that it is important to incorporate the changing volatilities of real data into the empirical models. Our findings show that the methodology plays a substantial role in accounting research.

4.4. Regression results of H2

H2 predicts that earnings quality of A-companies has improved more than AH-companies after IFRS convergence. Therefore, we focus on the coefficient of interaction between IFRS convergence and the institutional environment. First, we conduct a univariate analysis, and the results are presented in Table 5. The results with ARCH/GARCH effects show significant coefficients of interaction between IFRS and the institutional environment on absolute discretionary accruals (coefficient −0.035 with *p*-value <0.05), persistence (coefficient −0.242 with *p*-value <0.01) and conservatism (coefficient −0.081 with *p*-value <0.1), respectively. Note that, for convenience analysis, the institutional environment in the persistence model represents the weak institutional environment. Overall, these results show that after IFRS convergence, earnings quality in terms of absolute discretionary accruals has increased more in AH-companies than A-companies. Although we find persistence has increased for all listed companies, persistence of A-companies has decreased, which means the increase in earnings quality in terms of persistence is more pronounced in AH-companies. Earnings quality in terms of conservatism has decreased more in AH-companies. However, the results without incorporating ARCH/GARCH effects in Table 5 show insignificant coefficient of the

[19] Akaike information criterion (AIC) is a criterion to measure the goodness of fit of a model for a given set of data (Akaike, 1974). AIC = −2*ln(likelihood) + 2**k*, where *k* is the degrees of freedom of a model. The smaller AIC, the better fit the model provides.

[20] Bayesian information criterion (BIC) is another criterion to measure the goodness of fit of a model for a given set of data (Burnham and Anderson, 2002). BIC = −2*ln (likelihood) + ln(*N*)**k*, where *k* is the degrees of freedom of a model and *N* is the number of observations.

Table 5
Regression results of univariate analysis of A-companies versus AH-companies

	DA			Persistence			Conservatism		
	Expected sign	With GARCH	Without GARCH	Expected sign	With GARCH	Without GARCH	Expected sign	With GARCH	Without GARCH
IFRS	–	−0.014***	−0.019***	?	−0.002	0.007	?	−0.011***	−0.006***
		(−5.20)	(−5.91)		(−0.42)	(1.15)		(−8.52)	(−2.87)
AH	–	0.021	−0.000				?	0.042***	0.029***
		(1.53)	(−0.02)					(12.76)	(3.24)
IFRS_AH	–	−0.035**	−0.022				?	−0.052***	−0.035***
		(−2.02)	(−1.15)					(−4.84)	(−3.02)
L.NIBE				?	−0.026***	−0.009			
					(−3.35)	(−0.84)			
L.NIBE_IFRS				+	0.053***	0.025*			
					(5.62)	(1.72)			
HA				?	−0.009***	−0.005			
					(−4.29)	(−1.12)			
L.NIBE_HA				–	0.242***	0.240***			
					(589.41)	(55.99)			
IFRS_HA				?	0.013**	0.008			
					(2.47)	(1.25)			
IFRS_HA_L.NIBE				+	−0.242***	−0.240***			
					(−587.36)	(−55.91)			
D							+	0.008***	0.008**
								(4.37)	(2.07)
Return							–	−0.010***	−0.009***
								(−13.15)	(−6.41)
D_Return							+	0.109***	0.092***
								(12.82)	(5.80)

(continued)

Table 5 (continued)

	DA			Persistence			Conservatism		
	Expected sign	With GARCH	Without GARCH	Expected sign	With GARCH	Without GARCH	Expected sign	With GARCH	Without GARCH
D_Return_IFRS							+	−0.084***	−0.079***
								(−8.23)	(−4.38)
D_Return_IFRS_AH							+	−0.081*	0.016
								(−1.95)	(0.28)
_cons		0.117***	0.127***		0.055***	0.051***		0.072***	0.071***
		(43.18)	(48.93)		(24.12)	(12.37)		(49.18)	(32.16)
ARCH		−0.387***			0.789***			0.556***	
		(−12.28)			(19.64)			(25.73)	
TARCH		0.585***			−0.640***			−0.354***	
		(18.53)			(−16.39)			(−16.76)	
GARCH		0.579***			1.080***			0.651***	
		(30.11)			(35.08)			(51.14)	
_cons		0.009***			−0.003***	0.051***		0.002***	0.071***
		(16.18)			(−7.23)	(12.37)		(13.95)	(32.16)
N		15,202	15,202		16,117	16,117		22,483	22,483
AIC		−1.0e+04	−9.1e+03		−2.3e+04	−2.2e+04		−3.0e+04	−2.8e+04
BIC		−1.0e+04	−9.1e+03		−2.3e+04	−2.2e+04		−3.0e+04	−2.8e+04

HA is equal to 1 if a company is an A-company; zero otherwise; *L.NIBE_HA* is the interaction between the lag of *NIBE* and the weak institutional environment; *IFRS_HA_L.NIBE* is the interaction between *IFRS*, coefficient of persistence and the institutional environment; *D_Return_IFRS_AH* is the interaction between conservatism, *IFRS* and the institutional environment; other variables are defined in Table 4 and Appendix II *t*-statistics appear in parentheses; *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

interaction between IFRS and the institutional environment on IFRS_AH, L. NIBE, HA and IFRS_HA on persistence, and opposite coefficients of interaction on conservatism (*D_Return_IFRS_AH*). Furthermore, the AIC and BIC of models incorporating ARCH/GARCH effects are much smaller.

5. Additional analysis

5.1. Incentives

It is well documented that earnings quality is determined by both the institutional environment and incentives of managers (Soderstrom and Sun, 2007; De George *et al*., 2016). All samples of our study are from mainland China. Thus, they are under the same regulation by CSRC and have many incentives in common. One main potential reason for driving significantly different financial reporting incentives within mainland China is the existence of political connections (Wong, 2016).

Political connections have a dominant influence on managers' incentives for financial reporting (He *et al*., 2012; Yi *et al*., 2012). Wong (2016) documents '[a]s China is still transitioning from a state-controlled economy to a market-based economy, many of the listed firms are still under majority control by the state' (p. 265). Thus, building up political connections is a necessity of doing business in China (Wong, 2016). Due to government protection, companies with strong political connections tend to have fewer incentives to provide higher earnings quality.

Piotroski *et al*. (2015) document that firms with political connections have fewer incentives to provide transparent financial information and stronger motivation to avoid bad news. This is because 'suppression of bad news allows politicians and politically astute managers to hide inefficiencies, expropriation-related activities, and mask the inefficient allocation of resources to achieve political objectives' (Piotroski and Wong, 2012, p. 224). Furthermore, Jian and Wong (2010) show that firms with political connections tend to use related-party sales to boost earnings in order to meet regulatory requirements. In summary, companies with political connections have fewer incentives to provide high earnings quality.

The results of the influence of political connections are provided in Table 6. The results with the ARCH/GARCH effects show that after IFRS convergence, companies with political connections experience lower discretionary accruals (coefficient -0.019 with p-value <0.1), more persistent earnings (coefficient 0.047 with p-value < 0.05), and higher conservatism (coefficient 0.122 with p-value <0.01). Interestingly, these results are inconsistent with prior studies (Piotroski *et al*., 2015). The main reason for this positive influence of

Table 6
Regression results of multiple analysis of PC versus non-PC

	DA			Persistence			Conservatism		
	Expected sign	With GARCH	Without GARCH	Expected sign	With GARCH	Without GARCH	Expected sign	With GARCH	Without GARCH
IFRS	−	−0.012***	−0.018***	?	−0.002	0.007	?	−0.013***	−0.007***
		(−4.50)	(−5.51)		(−0.42)	(1.16)		(−9.32)	(−3.35)
AH	−	0.022	0.000				?	0.013***	0.008
		(1.64)	(0.00)					(5.20)	(1.43)
IFRS_AH	−	−0.035**	−0.022						
		(−2.07)	(−1.13)						
PC	−	0.010	−0.010	?	−0.000	−0.001	?	0.003	0.002
		(1.27)	(−1.07)		(−0.05)	(−0.23)		(1.24)	(0.68)
PC_IFRS	+	−0.019*	−0.003						
		(−1.92)	(−0.25)						
L.NIBE				+	−0.026***	−0.009			
					(−3.37)	(−0.85)			
L.NIBE_IFRS				+	0.049***	0.021			
					(5.15)	(1.40)			
HA				?	−0.009***	−0.005			
					(−4.33)	(−1.12)			
L.NIBE_HA				?	0.242***	0.240***			
					(586.40)	(55.99)			
IFRS_HA				?	0.013**	0.008			
					(2.46)	(1.23)			
IFRS_HA_L.NIBE				+	−0.242***	−0.240***			
					(−584.37)	(−55.91)			
PC_IFRS_L.NIBE				−	0.047**	0.043			
					(2.19)	(1.34)			

(continued)

Table 6 (continued)

	DA			Persistence			Conservatism		
	Expected sign	With GARCH	Without GARCH	Expected sign	With GARCH	Without GARCH	Expected sign	With GARCH	Without GARCH
D							+	0.008***	0.008**
								(4.22)	(2.05)
Return							−	−0.010***	−0.009***
								(−12.61)	(−6.37)
D_Return							+	0.106***	0.091***
								(12.35)	(5.76)
D_Return_IFRS							+	−0.097***	−0.091***
								(−9.27)	(−4.90)
D_Return_IFRS_AH							+	0.006	0.072
								(0.22)	(1.37)
PC_D_Return_IFRS							−	0.122**	0.113**
								(2.28)	(2.48)
_cons		0.116***	0.127***		0.055***	0.051***		0.072***	0.072***
		(42.45)	(47.44)		(23.97)	(12.37)		(48.31)	(32.25)
ARCH		−0.414***			0.801***			0.531***	
		(−12.53)			(19.66)			(25.29)	
TARCH		0.610***			−0.650***			−0.332***	
		(18.44)			(−16.41)			(−16.20)	
GARCH		0.579***			1.064***			0.661***	
		(30.14)			(34.87)			(50.75)	
_cons		0.009***			−0.003***			0.002***	
		(16.39)			(−6.77)			(13.11)	
N		15,202	15,202		16,117	16,117		22,483	22,483
AIC		−1.0e+04	−9.1e+03		−2.3e+04	−2.2e+04		−3.0e+04	−2.8e+04
BIC		−1.0e+04	−9.1e+03		−2.3e+04	−2.2e+04		−3.0e+04	−2.8e+04

PC_IFRS_L.NIBE is the interaction between *PC*, *IFRS* and *L.NIBE*; *PC_D_Return_IFRS* is the interaction between *PC*, *D*, *Return* and *IFRS*; other variables are defined in Tables 4, and 5 and Appendix II; *t*-statistics appear in parentheses; *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

political connections may be the anti-corruption campaign[21] with the aim of cutting back on corruption and rent-seeking activities (Lin *et al*., 2016).[22] Thus, managers with political connections who attract more attention from the public are expected to have stronger incentives to provide high earnings quality and protect their reputation and official image. Another reason for this result may be from model specification errors. The results without the ARCH/GARCH effects show insignificant results compared with the models with the ARCH/GARCH effects.

5.2. *Potential self-selection bias and contamination events*

A potential concern for this study is self-selection bias. An alternative explanation of our findings may be the inherent differences in earnings quality between A- and AH-companies. Numerous prior studies document that companies with high earnings quality are more likely to self-select to cross-list in Hong Kong (Fernandes and Ferreira, 2008; Hung *et al*., 2012; Ke *et al*., 2015). That is, AH-companies have inherently higher earnings quality than A-companies. Thus, prior research documents that, in order to deal with the potential endogeneity problem, it is necessary to model the likelihood of the cross-listing decision at the first stage (Fernandes and Ferreira, 2008; Hung *et al*., 2012; Ke *et al*., 2015). However, this is not a problem for our study for at least five reasons.

First, we focus on changes in earnings quality between pre- and post-IFRS convergence (DID approach) rather than comparing levels of earnings quality of AH-companies with A-companies. That is, A- and AH-companies themselves are their benchmark. Second, self-selection of cross-listing in Hong Kong does not mean that self-selection of the decision to adopt IFRS, or IFRS convergence does not drive a mainland company's decision to cross-list in Hong Kong. That is, if AH-companies are more likely to self-select to adopt IFRS than A-companies, this will lead to self-selection bias in our study. However, IFRS convergence is a decision made by the MOF and is effective for both A- and AH-companies since 2007. Third, another potential self-selection bias is that IFRS convergence means that companies are more likely to cross-list in Hong Kong. Thus, consistent with prior research (Fernandes and Ferreira, 2008; Hung *et al*., 2012; Ke *et al*., 2015), we build up the following logit model to calculate the likelihood of a company's decision to cross-list in Hong Kong.

---

[21] On 4 December 2012, the Eight-point Regulation of the Centre was stipulated by president Xi Jinping at the meeting of Politburo of the Communist Party of China.

[22] Two key officials of CSRC, namely Yujun Zhang and Gang Yao, were recently punished for their malfeasance (CSRC, 2015), which attracts the public's close attention and enhances requirements for accounting and auditing independence and their gatekeeper roles.

$$AH = \alpha_0 + \alpha_1 SIZE + \alpha_2 LEV + \alpha_3 ROE + \alpha_4 LOSS + \alpha_5 MTB + \alpha_6 SALESGROWTH + \alpha_7 CAPOUT + \alpha_8 STATEOWNERSHIP + \alpha_9 FOREIGN + \alpha_{10} SHARE1 + \alpha_{11} SEGMENTS + \alpha_{12} CUR + \alpha_{13} II + \alpha_{14} REC + \alpha_{15} RETURN + \alpha_{16} OCF + \alpha_{17} PC + \alpha_{18} INTERNAL + \alpha_{19} IND + \alpha_{20} INVENTORY + \alpha_{21} IFRS + \varepsilon \quad (8)$$

All variable definitions are provided in Appendix II. Our untabulated results show that IFRS is not a factor determining the likelihood of cross-listing in Hong Kong. Fourth, it is generally believed that AH-companies are larger than A-companies. The size of companies may not be a problem in this study as each variable is scaled by total assets (the proxy for size). Fifth, another challenge for our second hypothesis is that AH-companies inherently have higher earnings quality which, consequently, means changes in earnings quality of AH-companies are less than of A-companies. However, we find earnings quality in terms of discretionary accruals and persistence has improved more in AH-companies than A-companies after IFRS convergence. This further indicates that self-selection bias does not challenge our findings.

It is further worth noting that another concern for this event study is that our findings may be contaminated by other confounding events. Indeed, this is a general concern for all short- and long-window event studies, because there are always numerous observable or unobservable events happening simultaneously with a treatment event. For our study, several events – the internet bubble during 2001 and 2002, the split share structure reform in 2005,[23] the financial crisis in 2008, and the anti-corruption campaign in 2012 – may all drive changes in earnings quality. To deal with this issue, we use the ARCH/GARCH models to systematically and parsimoniously capture the shocks to dependent variables and standard errors clustering. Consistent with De Jong *et al.* (1992), we emphasise that the ARCH/GARCH models could be used for a wide variety of event studies to capture the contamination influence of observable and unobservable confounding events.

6. Conclusions

Our study explores an ideal and unique setting to examine the influence of the national institutional environment on outcomes of IFRS convergence using a

[23] In April 2005, the Chinese government initiated a reform of the split share structure. As Shanghai and Shenzhen Stock Exchange were established in the 1990s, a split share structure was also established. Around two-thirds of domestically listed A-shares were not tradable and held by the state and legal persons. Tradable shares were held by domestic and foreign individual investors and domestic institutional investors. The purpose of the split share structure reform was to convert all non-tradable shares into tradable shares (Li *et al.*, 2011).

non-linear and within-country approach. We provide several important findings. First, by comparing earnings quality of pre- with post-IFRS convergence periods, we find that earnings quality in terms of discretionary accruals and persistence has increased after IFRS convergence. However, earnings quality in terms of conservatism has decreased. These results are different from prior studies. For example, Ball (2006) suggests that IFRS adoption provides more conservative earnings.

Second, by comparing two types of companies within mainland China, namely, A- and AH-companies, we identify how the strength of the institutional environment influences IFRS convergence and earnings quality using a within-country approach. We show that earnings quality in terms of discretionary accruals and persistence has improved more in AH-companies than A-companies. This is inconsistent with Hope *et al.* (2006) and Daske *et al.* (2008), who document that earnings quality is expected to improve more for countries with a relatively weak institutional environment after IFRS convergence. A potential reason for these different findings could be the limitations of the cross-country approach and linear models used in previous studies, and failure to consider the changing volatility of real accounting data.

Our study addresses the numerous limitations of cross-country studies by exploring an ideal setting which enables us to investigate more accurately the influence of the national institutional environment on outcomes of IFRS convergence. This avoids serious omitted variables issues and oversimplification measurement problems of cross-country studies. The importance of our study is further reflected in using a systematic and parsimonious method (ARCH/GARCH models) for event studies in accounting. ARCH/GARCH and asymmetric ARCH models enable us to capture the changing volatility, error clustering and fat tails of real data, providing more rigorous evidence and improving accounting research. Our study shows that, comparing the results incorporating ARCH/GARCH effects to the results obtained under the usual assumptions on the error process (e.g., homoscedasticity and normal distribution), ignoring the fat tails, clustering errors and the heteroscedasticity may lead to spurious results (De Jong *et al.*, 1992). Thus, ARCH/GARCH models could be used in a wide variety of events studies in accounting and finance (De Jong *et al.*, 1992).

Our study has important implications for standard setters such as the IASB and CASC. With the irreversible rise of IFRS as the global accounting standards, it is important to consider the significant heterogeneities in the institutional environments between countries, and the importance of compatibility between the institutional environment and accounting standards. IFRS, mostly Anglo-American accounting standards, are rooted in an environment with common law traditions, a well-developed market, a strong legal system and enforcement, and standards requiring accountants to exercise professional judgments. We find that the weaker institutional environment and lower quality of corporate governance play negative roles in IFRS convergence and

earnings quality. Therefore, it is important that standards setters and regulators provide detailed guidance and strengthen the infrastructures for standards application.

Moreover, our study enriches the emerging institutional accounting research by documenting significant heterogeneities in earnings quality within a country, let alone firms in the Asia-Pacific region or worldwide. Our study suggests that it is equally important for regulators and practitioners to understand the heterogeneities in the institutional environment within a country. There are significant differences in earnings quality between A- and AH-companies, as well as between companies with different quality of corporate governance, which indicates that adopting global converged accounting standards cannot alone guarantee higher earnings quality. It is important for countries to strengthen enforcement and to improve corporate governance mechanisms.

A potential limitation of our study is that our findings, based on the Chinese institutional environment, may not be generalised to other settings. However, this is not a serious problem for our study, because the subject of our study is not a specific Chinese issue. China is selected as our empirical setting because it provides a unique setting that enables us to measure the institutional environment accurately and systematically, avoiding the numerous limitations of cross-country studies. To provide deeper and more comprehensive insights into the influence of the national institutional environment on IFRS convergence and earnings quality, future studies may apply a top-down analysis framework to conduct multilevel analysis to investigate simultaneous effects among different levels of institutions.

Data Availability

All data are available from public sources.

References

Abad, D., M. F. Cutillas-Gomariz, J. P. Sánchez-Ballesta, and J. Yagüe, 2018, Does IFRS mandatory adoption affect information asymmetry in the stock market?, *Australian Accounting Review* 28, 61–78.

Agoglia, C. P., T. S. Doupnik, and G. T. Tsakumis, 2011, Principles-based versus rules-based accounting standards: the influence of standard precision and audit committee strength on financial reporting decisions, *The Accounting Review* 86, 747–767.

Ahmed, A. S., M. Neel, and D. Wang, 2013, Does mandatory adoption of IFRS improve accounting quality? Preliminary evidence, *Contemporary Accounting Research* 30, 1344–1372.

Akaike, H., 1974, A new look at the statistical model identification, *IEEE Transactions on Automatic Control* 19, 716–723.

Al-Htaybat, K., 2018, IFRS adoption in emerging markets: the case of Jordan, *Australian Accounting Review* 28, 28–47.

Albu, N., and C. N. Albu, 2012, International Financial Reporting Standards in an emerging economy: lessons from Romania, *Australian Accounting Review* 22, 341–352.

Allen, F., J. Qian, and M. Qian, 2005, Law, finance, and economic growth in China, *Journal of Financial Economics* 77, 57–116.

Amorós Martínez, A., and J. A. Cavero Rubio, 2018, The economic effects of IFRS goodwill reporting, *Australian Accounting Review* 28, 309–322.

Antonakis, J., S. Bendahan, P. Jacquart, and R. Lalive, 2014, Causality and endogeneity: problems and solutions, in: D. V. Day, ed., *The Oxford Handbook of Leadership and Organizations* (Oxford University Press, New York), 93–117.

Armstrong, C. S., M. E. Barth, A. D. Jagolinzer, and E. J. Riedl, 2010, Market reaction to the adoption of IFRS in Europe, *The Accounting Review* 85, 31–61.

Ball, R., 2006, International Financial Reporting Standards (IFRS): pros and cons for investors, *Accounting and Business Research* 36, 5–27.

Ball, R., S. P. Kothari, and A. Robin, 2000, The effect of international institutional factors on properties of accounting earnings, *Journal of Accounting and Economics* 29, 1–51.

Ball, R., A. Robin, and J. S. Wu, 2003, Incentives versus standards: properties of accounting income in four East Asian countries, *Journal of Accounting and Economics* 36, 235–270.

Barth, M., W. Landsman, and M. Lang, 2008, International accounting standards and accounting quality, *Journal of Accounting Research* 46, 467–498.

Bartov, E., F. A. Gul, and J. S. Tsui, 2000, Discretionary-accruals models and audit qualifications, *Journal of Accounting and Economics* 30, 421–452.

Basu, S., 1997, The conservatism principle and the asymmetric timeliness of earnings, *Journal of Accounting and Economics* 24, 3–37.

Benson, K., P. M. Clarkson, T. Smith, and I. Tutticci, 2015, A review of accounting research in the Asia Pacific region, *Australian Journal of Management* 40, 36–88.

Bera, A. K., and M. L. Higgins, 1993, ARCH models: properties, estimation and testing, *Journal of Economic Surveys* 7, 305–366.

Bodle, K. A., P. J. Cybinski, and R. Monem, 2016, Effect of IFRS adoption on financial reporting quality: evidence from bankruptcy prediction, *Accounting Research Journal* 29, 292–312.

Bollerslev, T., 1986, Generalized autoregressive conditional heteroscedasticity, *Journal of Econometrics* 31, 307–327.

Bollerslev, T., R. Y. Chou, and K. F. Kroner, 1992, ARCH modeling in finance: a review of the theory and empirical evidence, *Journal of Econometrics* 52, 5–59.

Bradbury, M. E., and L. B. Schröder, 2012, The content of accounting standards: principles versus rules, *The British Accounting Review* 44, 1–10.

Brown, S. J., and J. B. Warner, 1985, Using daily stock returns: the case of event studies, *Journal of Financial Economics* 14, 3–31.

Brown, P., J. Preiato, and A. Tarca, 2014, Measuring country differences in enforcement of accounting standards: an audit and enforcement proxy, *Journal of Business Finance and Accounting* 41, 1–52.

Burnham, K. P., and D. R. Anderson, 2002, *Model Selection and Multimodel Inference: A Practical Information-Theoretic Approach*, 2nd edn. (Springer-Verlag, Berlin).

Byard, D., Y. Li, and Y. Yu, 2011, The effect of mandatory IFRS adoption on financial analysts' information environment, *Journal of Accounting Research* 49, 69–96.

Canibano, L., and A. Mora, 2000, Evaluating the statistical significance of de facto accounting harmonization: a study of European global players, *European Accounting Review* 9, 349–369.

Chalmers, K., G. Clinch, and J. M. Godfrey, 2011, Changes in value relevance of accounting information upon IFRS adoption: evidence from Australia, *Australian Journal of Management* 36, 151–173.

Che Azmi, A., and L. M. English, 2016, IFRS disclosure compliance in Malaysia: insights from a small-sample analytical study, *Australian Accounting Review* 26, 390–414.

Chen, X., J. Harford, and K. Li, 2007, Monitoring: which institutions matters?, *Journal of Financial Economics* 86, 279–305.

Chen, C. Y., C. J. Lin, and Y. C. Lin, 2008, Audit partner tenure, audit firm tenure, and discretionary accruals: does long auditor tenure impair earnings quality?, *Contemporary Accounting Research* 25, 415–445.

Chen, Y., G. Hu, L. Lin, and M. Xiao, 2015, GAAP difference or accounting fraud? Evidence from Chinese reverse mergers delisted from US markets, *Journal of Forensic and Investigative Accounting* 7, 122–145.

Cheung, E., and J. Lau, 2016, Readability of notes to the financial statements and the adoption of IFRS, *Australian Accounting Review* 26, 162–176.

Christensen, H. B., E. Lee, M. Walker, and C. Zeng, 2015, Incentives or standards: what determines accounting quality changes around IFRS adoption?, *European Accounting Review* 24, 31–61.

Chua, W. F., and S. L. Taylor, 2008, The rise and rise of IFRS: an examination of IFRS diffusion, *Journal of Accounting and Public Policy* 27, 462–473.

Cohen, D. A., A. Dey, and T. Z. Lys, 2008, Real and accrual-based earnings management in the pre- and post-Sarbanes-Oxley periods, *The Accounting Review* 83, 757–787.

CSRC, 2015, The decision on the punishment of Gang Yao's Serioud Illegal Act. Available at: http://www.csrc.gov.cn/pub/newsite/zjhxwfb/xwdd/201511/t20151113_286692.html

Daske, H., L. Hail, C. Leuz, and R. Verdi, 2008, Mandatory IFRS reporting around the world: early evidence on the economic consequences, *Journal of Accounting Research* 46, 1085–1142.

Daske, H., L. Hail, C. Leuz, and R. Verdi, 2013, Adopting a label: heterogeneity in the economic consequences around IAS/IFRS adoptions, *Journal of Accounting Research* 51, 495–547.

De Franco, G., S. P. Kothari, and R. S. Verdi, 2011, The benefits of financial statement comparability, *Journal of Accounting Research* 49, 895–931.

De George, E. T., X. Li, and L. Shivakumar, 2016, A review of the IFRS adoption literature, *Review of Accounting Studies* 21, 898–1004.

De Jong, F., A. Kemna, and T. Kloek, 1990, The impact of option expirations on the Dutch stock market, unpublished (Erasmus University, Rotterdam).

De Jong, F., A. Kemna, and T. Kloek, 1992, A contribution to event study methodology with an application to the Dutch stock market, *Journal of Banking and Finance* 16, 11–36.

Dechow, P., W. Ge, and C. Schrand, 2010, Understanding earnings quality: a review of the proxies, their determinants and their consequences, *Journal of Accounting and Economics* 50, 344–401.

DeFond, M. L., and C. W. Park, 1997, Smoothing income in anticipation of future earnings, *Journal of Accounting and Economics* 23, 115–139.

Doupnik, T., and H. Perera, 2012, *International Accounting*, 3rd edn (McGraw-Hill, New York).

Elliott, R. J., J. W. Lau, H. Miao, and K. T. Siu, 2012, Viterbi-based estimation for Markov-switching GARCH model, *Applied Mathematical Finance* 19, 219–231.

Engle, R. F., 1982, Autoregressive conditional heteroscedasticity with estimates of the variance of United Kingdom inflations, *Econometrics* 50, 987–1007.

Engle, R., 2004, Risk and volatility: econometric models and financial practice, *The American Economic Review* 94, 405–420.
Fernandes, N., and M. A. Ferreira, 2008, Does international cross listing improve the information environment?, *Journal of Financial Economics* 88, 216–244.
Francis, J. R., E. L. Maydew, and H. C. Sparks, 1999, The role of Big 6 auditors in the credible reporting of accruals, *Auditing: Journal of Practice and Theory* 18, 17–34.
Francis, J., R. LaFond, P. Olsson, and K. Schipper, 2005, The market pricing of accruals quality, *Journal of Accounting and Economics* 39, 295–327.
Freedom House, 2017, Freedom of the Press: China profile. Available at: https://freedomhouse.org/report/freedom-press/2017/China
Glosten, L. R., R. Jagannathan, and D. E. Runkle, 1993, On the relation between the expected value and the volatility of the nominal excess return on stocks, *The Journal of Finance* 48, 1779–1801.
Goodwin, J. A., K. Ahmed, and R. Heaney, 2008, The effects of International Financial Reporting Standards on the accounts and accounting quality of Australian firms: a retrospective study, *Journal of Contemporary Accounting and Economics* 4, 89–119.
Gul, F., 2006, Auditors' response to political connections and cronyism in Malaysia, *Journal of Accounting Research* 44, 931–963.
Hamilton, J. D., 1989, A new approach to the economic analysis of non-stationary time series and the business cycle, *Econometrica: Journal of the Econometric Society* 57, 357–384.
He, X., T. J. Wong, and D. Young, 2012, Challenges for implementation of fair value accounting in emerging markets: evidence from China, *Contemporary Accounting Research* 29, 538–562.
Healy, P. M., 1985, The effect of bonus schemes on accounting decisions, *Journal of Accounting and Economics* 7, 85–107.
Heidhues, E., and C. Patel, 2012, *Globalisation and Contextual Factors in Accounting: The Case of Germany* (Emerald Group Publishing, Bradford).
Hong Kong Independent Commission against Corruption, 2016, Brief history. Available at: https://www.icac.org.hk/en/about/history/index.html
Hong Kong Securities and Futures Commission, 2013, Enforcement: enforcement philosophy. Available at: http://www.sfc.hk/web/EN/regulatory-functions/enforcement/enforcement-philosophy.html.
Hope, O. K., J. Jin, and T. Kang, 2006, Empirical evidence on jurisdictions that adopt IFRS, *Journal of International Accounting Research* 5, 1–20.
Hou, Q., Q. Jin, and L. Wang, 2014, Mandatory IFRS adoption and executive compensation: evidence from China, *China Journal of Accounting Research* 7, 9–29.
Houqe, M. N., T. van Zijl, K. Dunstan, and A. W. Karim, 2012, The effect of IFRS adoption and investor protection on earnings quality around the world, *The International Journal of Accounting* 47, 333–355.
Hung, M., T. J. Wong, and T. Zhang, 2012, Political considerations in the decision of Chinese SOEs to list in Hong Kong, *Journal of Accounting and Economics* 53, 435–449.
International Accounting Standards Board. 2018b. IFRS application around the world: jurisdiction profile. Available at: https://www.ifrs.org/use-around-the-world/use-of-ifrs-standards-by-jurisdiction/
Jian, M., and T. J. Wong, 2010, Propping through related party transactions, *Review of Accounting Studies* 15, 70–105.
Jiang, F., and K. A. Kim, 2015, Corporate governance in China: a modern perspective, *Journal of Corporate Finance* 32, 190–216.
Jones, J. J., 1991, Earnings management during import relief investigations, *Journal of Accounting Research* 29, 193–228.

Ke, B., C. S. Lennox, and Q. Xin, 2015, The effect of China's weak institutional environment on the quality of Big 4 audits, *The Accounting Review* 90, 1591–1619.
Kothari, S., A. Leone, and C. Wasley, 2005, Performance matched discretionary accrual measures, *Journal of Accounting and Economics* 39, 163–197.
Krishnan, G. V., 2003, Audit quality and the pricing of discretionary accruals, *Auditing: Journal of Practice and Theory* 22, 109–126.
La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny, 1998, Law and finance, *Journal of Political Economy* 106, 1113–1155.
Li, S., 2010, Does mandatory adoption of International Financial Reporting Standards in the European Union reduce the cost of equity capital?, *The Accounting Review* 85, 607–636.
Li, K., T. Wang, Y. L. Cheung, and P. Jiang, 2011, Privatization and risk sharing: evidence from the split-share structure reform in China, *The Review of Financial Studies* 24, 2499–2525.
Lin, C., R. Morck, B. Yeung, and X. Zhao, 2016, Anti-corruption reforms and shareholder valuations: event study evidence from China. NBER Working Paper No. 22001 (National Bureau of Economic Research, Cambridge, MA).
Linnenluecke, M. K., X. Chen, X. Ling, T. Smith, and Y. Zhu, 2017a, Research in finance: a review of influential publications and a research agenda, *Pacific-Basin Finance Journal* 43, 188–199.
Linnenluecke, M. K., J. Birt, X. Chen, X. Ling, and T. Smith, 2017b, Accounting research in Abacus, A&F, AAR, and AJM from 2008–2015: a review and research agenda, *Abacus* 53, 159–179.
Liu, C., L. J. Yao, N. Hu, and L. Liu, 2011, The impact of IFRS on accounting quality in a regulated market: an empirical study of China, *Journal of Accounting, Auditing and Finance* 26, 659–676.
Lopes, A.I., I. Lourenço, and M. Soliman, 2013, Do alternative methods of reporting non-controlling interests really matter?, *Australian Journal of Management*, 38, 7–30.
Lourenço, I. C., R. Sarquis, M. C. Branco, and N. Magro, 2016, International differences in accounting practices under IFRS and the influence of the US, *Australian Accounting Review* 28, 468–481.
Miller, G. S., 2004, Discussion of: 'What determines corporate transparency?', *Journal of Accounting Research* 42, 253–268.
Nakao, S. H., and S. J. Gray, 2018, The impact of IFRS in Brazil: the legacy of mandatory book-tax conformity, *Australian Accounting Review* 28, 482–495.
Nam, H. J., 2018, The impact of mandatory IFRS transition on audit effort and audit fees: evidence from Korea, *Australian Accounting Review* 28, 512–524.
OECD, 2017, Corporate Governance Factbook. Available at: http://www.oecd.org/daf/ca/corporate-governance-factbook.htm
Olesen, K., and F. Cheng, 2011, Convergence of accounting standards does not always lead to convergence of accounting practices: the case of China, *Asian Journal of Business and Accounting* 4, 23–58.
Palea, V., and S. D. Scagnelli, 2017, Earnings reported under IFRS improve the prediction of future cash flows? Evidence from European banks, *Australian Accounting Review* 27, 129–145.
Perotti, P., and A. Wagenhofer, 2014, Earnings quality measures and excess returns, *Journal of Business Finance and Accounting* 41, 545–571.
Petersen, M. A., 2009, Estimating standard errors in finance panel data sets: comparing approaches, *The Review of Financial Studies* 22, 435–480.
Pincus, M., S. Rajgopal, and M. Venkatachalam, 2007, The accrual anomaly: international evidence, *The Accounting Review* 82, 169–203.

Piotroski, J. D., and T. J. Wong, 2012, Institutions and information environment of Chinese listed firms, in: J. P. H. Fan, R. Morck, eds., *Capitalizing China* (University of Chicago Press, Chicago, IL), 201–242.

Piotroski, J. D., T. J. Wong, and T. Zhang, 2015, Political incentives to suppress negative financial information: evidence from state-controlled Chinese firms, *Journal of Accounting Research* 53, 405–459.

Poon, S. H., and C. W. Granger, 2003, Forecasting volatility in financial markets: a review, *Journal of Economic Literature* 41, 478–539.

Ramanna, K., and W. Sletten, 2014, Network effects in countries' adoption of IFRS, *The Accounting Review* 89, 1517–1543.

Reynolds, J. K., and J. R. Francis, 2000, Does size matter? The influence of large clients on office-level auditor reporting decisions, *Journal of Accounting and Economics* 30, 375–400.

Richards, G., and C. J. van Staden, 2015, The readability impact of International Financial Reporting Standards, *Pacific Accounting Review* 27, 282–303.

Silverman, B. W., 1986, *Density Estimation for Statistics and Data Analysis*. (CRC Press, Boca Raton, FL).

Siu, T. K., H. Tong, and H. Yang, 2004, On pricing derivatives under GARCH models: a dynamic Gerber-Shiu approach, *North American Actuarial Journal* 8, 17–31.

Soderstrom, N. S., and K. M. Sun, 2007, IFRS adoption and accounting quality: a review, *European Accounting Review* 16, 675–702.

Taylor, S. J., 1986, *Modelling Financial Time Series* (Wiley, Chichester, UK).

Tenev, S., C. Zhang, and L. Brefort, 2002, *Corporate Governance and Enterprise Reform in China: Building the Institutions of Modern Markets* (World Bank Publications, Washington, DC).

Tong, H., 1990, *Non-Linear Time Series: A Dynamical System Approach* (Oxford Science Publications, Oxford).

Van Tendeloo, B., and A. Vanstraelen, 2005, Earnings management under German GAAP versus IFRS, *European Accounting Review* 14, 155–180.

Warfield, T. D., J. J. Wild, and K. L. Wild, 1995, Managerial ownership, accounting choices, and informativeness of earnings, *Journal of Accounting and Economics* 20, 61–91.

Wong, T. J., 2016, Corporate governance research on listed firms in China: institutions, governance and accountability, *Foundations and Trends® in Accounting* 9, 259–326.

World Bank, 2016, The Worldwide Governance Indicators project. Available at: http://info.worldbank.org/governance/wgi/#home

World Bank, 2017, Doing business: measuring business regulations. Available at: http://www.doingbusiness.org/data/exploreeconomies/china

World Economic Forum, 2017, The Global Competitiveness Report 2016–2017. Available at: http://www.nmi.is/media/338436/the_global_competitiveness_report_2016–2017.pdf

Wysocki, P., 2011, New institutional accounting and IFRS, *Accounting and Business Research* 41, 309–328.

Yang, H. H., C. Clark, C. Wu, and A. Farley, 2018, Insights from accounting practitioners on China's convergence with IFRS, *Australian Accounting Review* 28, 14–27.

Ye, Q., J. Gao, and W. Zheng, 2018, Accounting standards, earnings transparency and audit fees: convergence with IFRS in China, *Australian Accounting Review* 28, 525–537.

Yi, X., Z. M. Xie, and J. L. Tang, 2012, Institutional environment, political connections and earnings quality – empirical evidence from China, *The Theory and Practice of Finance and Economics* 2012, 49–54.

Zhang, Z., 2016, Law and finance: the case of stock market development in China, *Boston College International and Comparative Law Review* 39, 283–360.
Zhang, Y., K. Uchida, and H. Bu, 2013, How do accounting standards and insiders' incentives affect earnings management? Evidence from China, *Emerging Markets Review* 16, 78–99.

Appendix I

Modeling structure with conditional heteroscedasticity: ARCH/GARCH effects of earnings quality

The ARCH model was introduced by Engle (1982) to estimate changing uncertainty from historical data even though the true volatility was never observed (Engle, 2004). GARCH is a generalised ARCH model, parsimoniously representing a high order ARCH process introduced by Bollerslev (1986) and Taylor (1986). GARCH models most precisely and powerfully capture the three ubiquitous characteristics of real accounting data, namely, unpredictability, fat tails and volatility clustering (Engle, 2004; Elliott *et al*., 2012). It is important that a model can capture these features, as ignoring these results in spurious conclusions (De Jong *et al*., 1990).

This study conducts comprehensive tests on the presence of conditional heteroscedasticity described by ARCH/GARCH models in the dependent variables. Our empirical results are provided and discussed in the fourth section. We now illustrate how the conditional heteroscedasticity can be incorporated into earnings quality using ARCH/GARCH models and their variants. We use a generic dependent variable, say y_t, to represent earnings quality attributes presented in our research design. We also use a generic vector of explanatory variables, say x_t, to represent those explanatory variables in each of the regression equations. The generic modelling structure with ARCH/GARCH effects can be typified as follows:

$$y_t = \beta x_t + e_t \quad e_t \sim (0, \sigma_t^2) \tag{A1}$$

Here the random error term e_t has zero mean and conditional variance σ_t^2 given information up to and including time $t - 1$.

$$\sigma_t^2 = Var(e_t|\Omega_{t-1}) = E_{t-1}(e_t^2) = \alpha_0 + \sum_{i=1}^{p} \alpha_i e_{t-i}^2 \tag{A2}$$

σ_t^2 is the conditional variance at time t given the information set $\Omega_{t\text{-}1}$ up to and including time $t - 1$.

Bollerslev (1986) and Taylor (1986) introduced the $GARCH(p, q)$ model as follows:

$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^{p} \alpha_i e_{t-i}^2 + \sum_{i=1}^{q} \alpha_i \sigma_{t-i}^2 \quad (A3)$$

GARCH(1, 1) is remarkable, in that one model can be used to describe the volatility dynamics of almost any finance data (Bera and Higgins, 1993; Engle, 2004). Bera and Higgins (1993) document that it is rare that a dataset requires the higher order, say *GARCH*(1, 2) or *GARCH*(2, 1) Thus, we consider *GARCH*(1, 1) in our study:

$$\sigma_t^2 = \alpha_0 + \alpha_1 e_{t-1}^2 + \alpha_1 \sigma_{t-1}^2 \quad (A4)$$

Besides the conditional variance σ_t^2, the errors in a GARCH model have an unconditional variance σ^2. By taking unconditional expectations in Equation (A4), this unconditional variance can be typified as follows:

$$\sigma^2 = \alpha_0 + \sum_{i=1}^{p+q} \alpha_i \sigma^2 \Rightarrow \sigma^2 = \alpha_0/(1 - \sum_{i=1}^{p+q} \alpha_i) \quad (A5)$$

For *GARCH*(1, 1):

$$\sigma^2 = \alpha_0/(1 - \alpha_1 - \alpha_2) \quad (A6)$$

Substituting α_0 into Equation (A4), we obtain the following model:

$$\sigma_t^2 - \sigma^2 = \alpha_1(e_{t-1}^2 - \sigma_{t-1}^2) + (\alpha_1 + \alpha_2)(\sigma_{t-1}^2 - \sigma^2) \quad (A7)$$

Here, $\alpha_1(e_{t-1}^2 - \sigma_{t-1}^2)$ indicates the conditional variance caused by prior shocks, capturing clustering of the larger shocks to earnings quality. $(\alpha_1 + \alpha_2)(\sigma_{t-1}^2 - \sigma^2)$ is a mean-reversion process for the conditional variance with mean σ^2 and the adjustment parameter $(\alpha_1 + \alpha_2)$.

If $\alpha_1 = \alpha_2 = 0$, then $\sigma_t^2 = \sigma^2$. This indicates that the variance is constant. Thus, the null hypothesis of the GARCH effect test should be $(\alpha_1 = \alpha_2 = 0)$. That is, if α_1, $\alpha_2 \neq 0$, we can show that the GARCH effect exists.

If $\alpha_1 + \alpha_2 = 1$, according to Equation (A7), the unconditional variance σ^2 does not exist. *GARCH*(1, 1) becomes:

$$\sigma_t^2 = \sigma_{t-1}^2 + \alpha_1(e_{t-1}^2 - \sigma_{t-1}^2) \quad (A8)$$

Based on the GARCH model for a wide variety of event studies in accounting and finance by De Jong *et al.* (1992), we model the influence of the institutional environment on IFRS convergence and earnings quality as follows:

$$EQ_{it} = \alpha_i + \beta_{1,i}IFRS + \beta_{2,i}INS + \beta_{3,i}IFRS * INS + \gamma ControlVariables + e_t e_t \sim (0, \sigma_t^2) \quad (A9)$$

Here, in a general case, $\sigma_t^2 - \sigma^2 = \alpha_1(e_{t-1}^2 - \sigma_{t-1}^2) + (\alpha_1 + \alpha_2)(\sigma_{t-1}^2 - \sigma^2)$.

We incorporate a dummy variable *IFRS* to investigate the influence of IFRS convergence on earnings quality. According to De Jong *et al*. (1992), this results in adding a dummy variable to the unconditional variance, and Equation (A9) then becomes:

$$\sigma_t^2 - (\sigma^2 + \alpha_3 IFRS) = \alpha_1(e_{t-1}^2 - \sigma_{t-1}^2) + (\alpha_1 + \alpha_2)(\sigma_{t-1}^2 - (\sigma^2 + \alpha_3 IFRS)) \quad (A10)$$

Furthermore, previous studies have documented that negative changes and positive changes have different impacts on conditional volatility (Glosten *et al*., 1993). This is termed an asymmetric or leverage effect of ARCH/GARCH models. Intuitively, this effect seems to be quite common in accounting fields. For example, it is well documented that bad news and good news may have different impacts on earnings (Basu, 1997). In view of this, the asymmetric effect in ARCH/GARCH models will also be considered in our study. Consistent with Glosten *et al*. (1993), we use a threshold ARCH (TARCH) model to capture the asymmetric effect.

Appendix II
Definitions of the dependent and independent variables

Variables	Definition
DA	The absolute value of the discretionary accrual measured by the performance matched modified Jones model (Jones, 1991), as shown in Model (4)
Persistence	The slope coefficient β from a regression of current earnings on lagged earnings as shown in Model (6)
Conservatism	The slope coefficient of interaction between bad news and returns in a reverse regression of earnings on returns based on Basu (1997) as shown in Model (8)
IFRS	Equal to 1 in 2007–2015; 0 otherwise
AH	Institutional environment, 1 if the company is one of the AH companies; 0 otherwise
HA	Institutional environment, 1 if the company is one of the A-companies; 0 otherwise
PC	

(continued)

Table (continued)

Variables	Definition
	Political connections of top management, a dummy variable equal to 1 if the Chairman or CEO is an ex- or current-officer of the central government, a local government, or the military; 0 otherwise
TA	The period t of total accruals scaled by total assets of period $t-1$
Size	Natural logarithm of total assets
ΔREV	Revenue growth divided by the lagged total assets
PPE	Gross property, plant and equipment divided by the lagged total assets
ΔREC	Credit sales divided by the lagged total assets
ROA	Return on assets divided by the lagged total assets
NIBE	Net income before extraordinary items divided by the lagged total assets
$\Delta NIBE$	Changes in *NIBE* in year t and divided by the lagged total assets
Return	The annual market-adjusted return
D	Dummy variable, 1 if return <0; 0 otherwise
ARCH	Autoregressive conditional heteroscedasticity
GARCH	Generalised autoregressive conditional heteroscedasticity
TARCH	Threshold autoregressive conditional heteroscedasticity
II	Institutional investors, the percentage of share ownership by institutional investors
LEV	Leverage, total debt divided by total owners' equity
ROE	Return on equity in the year t
LOSS	Loss, 1 if the company reports a loss; 0 otherwise
CUR	Current assets divided by current liabilities
MTB	Market value divided by book value
SALESGROWTH	Growth rate of sales
CAPOUT	Capital expenditure divided by total assets
STATEOWNERSHIP	Percentage of stock that is state owned
FOREIGN	Percentage of stock that is owned by foreign investors
SHARE1	Percentage of stock that is owned by the company's largest shareholder
SEGMENTS	Natural logarithm of segments
REC	Receivables divided by total assets
OCF	Operational cash flow
PC	Political connections of top management
INTERNAL	Quality of internal control
IND	Proportion of board that is independent
INVENTORY	Inventory divided by total assets