Hedge accounting, IFRS 9 and audit fees: Evidence from China

Journal:	*Accounting and Finance*
Manuscript ID	ACFI-2023-479.R2
Wiley - Manuscript type:	Research Article
Keywords:	IFRS 9, Hedge accounting, Financial derivatives, Audit fees, China
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Abstract

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JEL classification: M41

1. Introduction

There is often a mismatch in the recognition,[1] on the basis of the applicable accounting standards, of value changes in financial derivatives and of hedged items, which may create artificial earnings volatility (Ranasinghe *et al.* 2022). To reduce this artificial volatility from accounting mismatches, International Accounting Standards (IAS) 39 allows firms to use the hedge accounting treatment, under which the value changes of the hedged items are matched with those of the hedging derivatives (Glaum and Klöcker 2011).[2] However, under IAS 39, a hedging relationship needs to satisfy several criteria and should be highly effective to qualify for hedge accounting, with the change in the fair value of cashflows of the hedging instrument offset by 80% to 125% of the change in the fair value of cashflows of the hedged item. Some researchers and practitioners have asserted that these requirements are too complicated and may hence prevent managers from using hedge accounting or cause them to manipulate parameters to satisfy the applicable criteria (Huang 2014; Ministry of Finance 2015; Ranasinghe *et al.* 2022).

Despite these concerns, to date, there is still limited empirical evidence on the influence of hedge accounting on professional third-party experience, such as that of auditors. For example, it is unclear whether the use of hedge accounting would increase or decrease auditing efficiency and thus affect audit pricing. To address this literature gap, our first research question is as

[1] Financial derivatives are measured at fair value, in that their unrealised fair value gains and losses are recognised at fair value through profit or loss. However, the gains and losses from hedged items are often accounted for differently. Depending on their type, hedged items may be measured at cost or fair value, such that their unrealised gains and losses may be recognised at fair value through profit or loss or under other comprehensive income or may not be recognised at all.

[2] In accounting for fair value hedge, the unrealised gains and losses from hedged items can be recognised in the current period profit or loss to match the fair value changes of the hedging derivatives. In accounting for cashflow hedge and overseas net investment hedge, the fair value changes of derivatives can be recorded under other comprehensive income before the hedged items affect profit or loss.

follows: What is the relationship between the use of hedge accounting and audit fees[3] in the context of a major emerging market, namely, China?

The International Accounting Standards Board has been aware of the problems related to IAS 39 and has modified the reporting requirements for hedge accounting recently (IAS Plus 2023). These new hedge accounting requirements under International Financial Reporting Standards 9 Financial Instruments (hereafter, 'IFRS 9') adopt a more principles-based approach, loosen the qualification criteria for hedge accounting and reduce the number of tests for hedge effectiveness (Schueler *et al.* 2023). Specifically, under the IFRS 9 hedge accounting requirements, firms can apply the hedge accounting treatment to a wider range of hedging instruments. In addition, they are not required to apply the quantitative 80%–125% threshold to evaluate hedge effectiveness.[4] Managers can adjust the hedge effectiveness ratios (i.e. 'rebalance') to ensure the hedging relationship remains qualified for hedge accounting treatment. Nevertheless, to date, there is scarce empirical evidence on the implementation of the new hedge accounting requirements under IFRS 9, particularly in the context of relatively less developed markets. Thus, our second research question is as follows: Does IFRS 9 influence the relationship between the use of hedge accounting and audit fees?

We argue the association between the use of hedge accounting and audit fees from two sides. That is, higher earnings volatility could reduce earnings predictability (Dichev and Tang 2009), which may increase auditors' efforts to detect unusual fluctuations as well as their assessments of their clients' inherent risks (Bryan and Mason 2020) and risk premium charges (Bryan *et al.* 2018). Thus, the use of hedge accounting may negatively influence audit fees directly through lower earnings volatility. Further, firms using hedge accounting may reduce their reliance on accruals management to smooth earnings (Barton 2001). Accruals management is positively related to financial reporting misstatement (Jones *et al.* 2008) and, thus, increases audit risk and audit fees (Krishnan *et al.* 2013; Choi *et al.* 2022). Therefore, hedge accounting may negatively influence audit fees indirectly through lower accruals management.

In contrast, it is also possible that the use of hedge accounting positively relates to audit fees. As aforementioned, hedging relationships must satisfy several criteria to qualify for hedge accounting. Thus, auditors may charge for the time they spend on evaluating whether the hedge transactions meet these qualification criteria (Ministry of Finance 2006; Munter and Ratcliffe 2009).[5] In addition, firms may manipulate assumptions and estimations about the amounts, settlement dates or credit risks to qualify for hedge accounting (Glaum and Klöcker 2011; Chiorean *et al.* 2020). Such manipulation could increase auditors' engagement risk, and hence, they may charge more to compensate for such risks (Chiorean *et al.* 2020; Choi *et al.* 2015).

The influence of the IFRS 9 requirements on the association between hedge accounting and audit fees can also be two-sided. IFRS 9 allows firms that engage in hedge transactions to expand their use of hedge accounting, which may lead to lower earnings volatility and less accruals management and, in turn, reduce audit fees at these firms, as already argued. In addition,

[3] We focus on audit fees because they are part of the financial reporting costs representing direct and measurable cash outflows related to changes in financial reporting regulations (De George *et al*. 2013).
[4] Instead, they only need to make a qualitative assessment; further, retrospective effectiveness tests are not required.
[5] For complex transactions, they need to recruit valuation experts to verify hedge effectiveness and to charge clients for these experts' fees. For example, hedge accounting is mentioned as a key audit matter by Ernst & Young in Zijin Mining Group Company Limited's 2016 annual report (stock code: 601899). Financial derivatives valuation experts are recruited by auditors to help check the management's evaluation of hedge effectiveness (Zijin Mining Group Ltd. 2017).

the abandonment of the 80%–125% hedge effectiveness threshold may mitigate management motivations to manipulate parameters to qualify for hedge accounting. This aspect may lead to less perceived audit risk and reduced auditor efforts in verifying hedge effectiveness tests, and, thus, lower audit fees for hedge accounting firms. However, the larger scope of the hedging derivative application under IFRS 9 may result in a higher level of hedge complexity. The loosened effectiveness criteria may cause some 'ineffective' hedges to be classified as 'effective' hedges. Thus, auditors may need to spend more time to audit hedge transactions and may charge these firms higher fees.

We choose China as the research setting for the following reasons. Concerns have been expressed over the suitability and the additional costs of the IFRS implementation for emerging markets with a weak institutional environment (e.g. He *et al.* 2012; Qu and Zhang 2015). China is the largest emerging market to have adopted a set of accounting standards that substantially converges with IFRS (Peng and Bewley 2010), and its institutional environment and derivative markets are less developed (Shen and Xu 2021). In particular, many Chinese firms have limited experience in using financial derivatives for risk management (Shao *et al.* 2019) and in hedge accounting (Huang 2014). Regardless, financial derivatives are gaining popularity and importance in China as a corporate risk management tool (Guo *et al.* 2021). Therefore, the effects of hedge accounting and the IFRS 9 requirements on Chinese companies with derivatives should be a topic of interest for accounting standard setters and practitioners.

We use a sample with non-zero financial derivatives to test our hypotheses. We manually collect data on derivative usage during 2016–2021 from the annual reports of Chinese listed companies.[6] We use an ordinary least squares model with firm fixed effects and year fixed effects to test our first hypothesis about the association between hedge accounting and audit fees. Then, we use a difference-in-differences research design to test the moderation effects of IFRS 9 on the association between hedge accounting and audit fees.[7] Our treatment (control) group consists of sample firm-years using (not using) hedge accounting before and after IFRS 9 implementation.

In summary, our results reveal a positive association between hedge accounting and audit fees. Our difference-in-differences tests show that after IFRS 9 implementation, firms that engage in hedge accounting are more likely to reduce audit fees than are those that do not. This result suggests that the implementation of IFRS 9 effectively mitigates the positive relationship

[6] We focus on the 2016–2021 period because most of the Chinese listed companies adopted the IFRS 9 requirements in 2019. Thus, we are able to compare the audit fees three years before and three years after 2019 to evaluate the effects of IFRS 9 implementation. Specifically, the hedge accounting requirements in China, as detailed in the new Chinese Accounting Standards for Enterprises No. 24-Hedging—or CAS 24—issued in 2017, largely converge with the requirements under IFRS 9 (we refer to 'IFRS 9' or 'IFRS 9 requirements' throughout the text for consistency). This 2017 version of the CAS 24 has been effective since 1 January 2018 for cross-listed companies (i.e. those listed on both foreign and domestic stock exchanges) and since 1 January 2019 for other companies listed on domestic stock exchanges only.

[7] In 2019, IFRS 7 Financial Instruments: Disclosures (IFRS 7) also amended the disclosure requirements about the risk exposure for each type of financial instrument and how these risks are managed. To exclude the confounding effects of the disclosure requirement changes under IFRS 7, we check whether the derivatives-related disclosure levels have changed significantly after the implementation of IFRS 7. We do not find significant improvement in derivatives and hedge-related disclosures. For example, many companies still do not disclose the type of hedge they use, and very few companies conform to the IFRS 7 requirement of providing tabular disclosures about their hedge activities. Overall, we do not find that the quality of derivative-related disclosures has improved significantly after the implementation of IFRS 7.

between hedge accounting and audit fees. Then, we test the channels and find that the new hedge accounting requirements negatively influence audit fees by mitigating earnings volatility and accruals management. Heterogeneity tests further reveal that the moderation effect of IFRS 9 is stronger for firms audited by large audit firms, firms located in regions with a high marketisation level and firms with strong corporate governance. Our findings are robust to considering self-selection using the propensity score matching and entropy balancing methods, dropping cross-listed firms, restricting to samples with systematic treatment and control groups, generalising to the financial industry, and using the parallel-paths assumption and placebo testing.

Significantly, our study contributes to three streams of literature. First, it contributes to the literature on financial derivatives and hedge accounting. The existing literature has focused on the influence of derivatives and hedge accounting on the informational environment (Chang *et al.* 2016; Manconi *et al.* 2018; Panaretou *et al.* 2013), and very few studies have considered the influence of hedge accounting on auditors (Hairston and Brooks 2019; Ranasinghe *et al.* 2023). We add to this stream of literature by providing novel evidence that the use of hedge accounting relates to higher audit fees in an emerging market context. This finding is in opposition to that of Ranasinghe *et al.* (2023), who document reduced audit fees relating to the use of hedge accounting in the United States (US). Our findings suggest that the costs and benefits of hedge accounting could depend on the institutional environment.

Second, our study contributes to the debates on principles-based versus rules-based accounting standards and on the global implementation of IFRS (Daske *et al.* 2008; Griffin *et al.* 2009; He *et al.* 2012). Compared with the IAS 39 requirements, the hedge accounting requirements under IFRS 9 incorporate a more principles-based approach (Schueler *et al.* 2023). We show that principles-based standards can help to mitigate the positive association between the application of hedge accounting and audit fees, which would benefit those who prepare financial reports. In addition, whereas some studies on the whole set of IFRS document higher audit fees following their adoption (e.g. De George *et al.* 2013; Kim *et al.* 2012), we find the opposite in the setting of IFRS 9 adoption for firms with derivatives. Thus, our findings highlight the potential variations in the costs and benefits of different standards in IFRS.

Third, this study contributes to the literature on the implementation outcomes of IFRS 9 by investigating auditors' response to the new hedge accounting requirements. Studies on IFRS 9 have generally focused on the consequences of the reclassification requirements for financial instruments and the use of the expected credit loss model (e.g., Fang *et al.* 2022; Guo *et al.* 2019). Unlike these studies, we focus on the IFRS 9 hedge accounting requirements. Our results show that these requirements can help mitigate the positive relationship between hedge accounting and audit fees in China. In particular, the effect is more prominent among firms with stronger external and internal monitoring mechanisms.

In addition to these contributions to the academic literature, our study has important implications for practitioners, accounting standard setters and market regulators. The results suggest that the loosened criteria for hedge accounting qualifications in IFRS 9 may help to enhance the efficient use of hedge accounting and facilitate related audit work for Chinese non-financial companies, which supports the effectiveness of the modifications made by the accounting standard setters to loosen the qualification criteria in an emerging market context. Thus, the findings shed light on the International Accounting Standards Board's post-implementation review of the new hedge accounting requirements in IFRS 9. Our study can

also help to enhance non-financial companies' confidence in using hedge accounting under these new requirements. Further, the finding that the effect of IFRS 9 is more salient for firms with stronger external and internal monitoring mechanisms suggests that a higher level of compliance can bring more benefits to the firms using hedge accounting.

The remainder of this paper is organised as follows. In Section 2, we review the relevant literature. In Section 3, we introduce the institutional background and develop hypotheses. We present our research design in Section 4. In Section 5, we present our research findings, and in Section 6, we conclude the paper.

2. Literature review

2.1. Financial reporting and audit fees

The literature on the determinants of audit fees has identified financial reporting quality and complexity as important influencing factors (Kim *et al.* 2012; Simunic 1980). Some studies have focused on the association between earnings attributes and audit fees. For example, Bryan *et al.* (2018) argue that the time series of earnings characteristics, such as autocorrelation and volatility, affect an auditor's perception of the firm's inherent risk, which is then reflected in the auditor's charges. They document a negative (positive) association between earnings autocorrelation (volatility) and audit fees. Given that earnings management could dampen firms' long-term fundamentals and increase both the litigation risk and audit complexity faced by auditors, some studies find a positive association between the overall level of earnings management and audit fees (Choi *et al.* 2022). For instance, Krishnan *et al.* (2013) find that audit fees are positively associated with the risk of upward earnings management.

The audit fee is a commonly used measure to capture the implementation costs of new accounting requirements, and there is a body of literature on the impact of IFRS on audit fees. For example, Kim *et al.*'s (2012) theoretical model predicts that audit fees increase with IFRS-related audit complexity and decrease with improved financial reporting quality brought about by IFRS adoption. They find higher audit fees brought about by IFRS adoption among a sample of firms from the European Union countries. De George *et al.* (2013) document an increase in audit fees among a sample of publicly listed Australian companies in the post-IFRS period. They construct a survey-based proxy for firm-level IFRS audit complexity and link the increase in audit fees with the increased audit complexity in the post-IFRS period. Griffin *et al.* (2009) also find an increase in audit fees accompanying IFRS adoption among New Zealand companies. Likewise, Choi *et al.* (2018) document an increase in audit fees in the post-IFRS period among Korean companies. These findings in different settings generally support that IFRS adoption relates to higher audit complexity and risk, which increase audit fees. However, fewer studies have focused on the impact of one particular IFRS on audit fees. An example is Fang *et al.* (2022), who find that the implementation of IFRS 9 increases audit fees among a sample of non-financial firms in China. They argue that this increase is driven by the exclusion of the historical cost option for the measurement of equity investments and the implementation of the expected credit loss model. However, this study does not examine whether the new hedge accounting rules under IFRS 9 influence audit fees.

2.2. Impact of derivatives and hedge accounting

Most existing studies on derivatives and hedge accounting focus on their informational and risk management effects and provide mixed evidence on whether hedge-based derivatives usage and hedge accounting improve firm transparency. For instance, Manconi *et al.* (2018) document a

negative association between derivatives hedging and information uncertainty, and their findings suggest that hedging with derivatives effectively reduces firm opacity. Ranasinghe *et al.* (2022) focus on the US oil and gas industry and the airline industry and find a positive (negative) association between hedging and analyst forecast accuracy (dispersion), which is consistent with the notion that hedging improves earnings predictability. Conversely, Campbell *et al.* (2015) find analyst mispricing of unrealised cashflow hedge information, whereas Su *et al.* (2022) document a positive association between financial derivative usage and stock price synchronicity in China. These studies attribute the findings to the complex derivatives transactions and financial reporting requirements. Moreover, some studies provide implications on the informational impact of changes in hedge-related financial reporting requirements. For example, Ahmed *et al.* (2011) find an increase in the risk relevance of derivative exposures among US banks after the implementation of SFAS 133. Further, Panaretou *et al.* (2013) document lower information asymmetry among a sample of firms in the United Kingdom after the implementation of hedge accounting requirements under IAS 39. Meanwhile, Gumb *et al.* (2018), who interviewed French corporate treasurers, report these individuals' concerns over the complex, difficult-to-apply qualification criteria for hedge accounting under IAS 39.

Notably, few studies examine the association between hedge-based derivative usage and audit fees. Ranasinghe *et al.* (2023) document a negative association between audit fees and the extent of derivative hedging, which is consistent with the auditors charging for the client's business risk premiums. They also find that the use of hedge accounting reduces audit fees among their sample of US oil and gas exploration and production firms. Hairston *et al.* (2023) use a sample of US bank holding companies and find higher audit fees among firms that use derivatives for hedging. Some studies examine the influence of financial derivatives on audit fees in China and provide some evidence of the influence of hedging and hedge accounting. For example, Liu *et al.* (2017) find that firms with derivative usage pay higher audit fees than those without derivatives. However, they do not test whether audit fees differ between firms that use hedge accounting and those that do not use this accounting treatment. Using data for 2010–2016 on 16 Chinese listed banks, Guo *et al.* (2018) document a positive association between audit fees and the accounting complexity of financial derivatives. One of their measures of the accounting complexity of derivatives is a dummy variable for firm use of hedge accounting. They argue that hedge accounting treatment is complex and can increase audit fees, and their findings are consistent with this argument. However, whether their findings can be generalised to non-financial firms and can be influenced by IFRS 9 are both unknown.

3. Institutional background and hypothesis development

3.1. Hedging and hedge-accounting-related requirements in China

In 2006, China published its first set of formal accounting standards for hedging activities, Accounting Standards for Enterprises No. 24-Hedging (2007).[8] The requirements in CAS 24 (2007) are similar to those in IAS 39. The standards define hedging and classify it into fair value hedge, cashflow hedge and overseas net investment hedge. Firms are allowed to apply hedge accounting treatment to their hedges if they prepare formal documentation of the hedging relationship, risk management objectives and strategies. The hedging relationship should be highly effective; the change in the fair value or cashflows of the hedging instrument should offset 80% to 125% of the change in the fair value or cashflows of the hedged item. Many enterprises complain that the requirements in CAS 24 (2007) are complex and difficult to apply,

[8] Hereafter, CAS 24 (2007).

and they are prevented from using hedge accounting because of the strict quantitative qualification criteria and the costs of the continuous assessment of hedge effectiveness (Huang 2014).[9]

Following the issuance of IFRS 9, China's Ministry of Finance also modified CAS 24 (2007) to converge with IFRS. The new CAS 24 was issued in March 2017. This new CAS 24 became effective on 1 January 2018 for cross-listed companies (listed both on foreign and domestic stock exchanges), and it has been effective since 1 January 2019 for other companies listed on domestic stock exchanges only (Ministry of Finance 2017). Early adoption was allowed. Firms adopting the new CAS 24 can now designate non-financial derivatives that are measured at fair value through profit or loss as a hedging instrument. The scope of the hedged item has also been expanded to include the risk components of non-financial items and a financial derivative. Firms are required to conduct prospective effectiveness tests to assess the applicability of hedge accounting, and the retrospective test is no longer mandatory. The 80%–125% bright line threshold for hedge effectiveness has been replaced with qualitative assessment criteria. Firms are permitted to 'rebalance' the hedging relationship to ensure its effectiveness remains qualified for hedge accounting treatment. These revisions are made to reduce complexity and for closer alignment of hedge accounting with enterprise risk management practices (Ministry of Finance 2017).

3.2. Hedge accounting and audit fees

For hedge accounting, the changes in values of both the hedging instrument and the hedged item are recognised in the same place with the opposite sign. Hence, under hedging accounting, all gains and losses attributed to the hedge risk are offset and do not affect earnings. However, for ineffective hedging not qualified for hedge accounting, the fair value adjustment for the hedging instruments is recorded in the income statement, while the gain or loss related to the hedged item may not be recorded or is included in other comprehensive income. This mismatch in the recognition of the value changes in the hedging instruments and the income from the hedged items results in an accounting effect that could increase earnings volatility (Ranasinghe *et al.* 2022). Hence, firms that use hedge accounting experience less earnings volatility than do non-users.

In the analytical procedure, auditors are required to compare and analyse time series financial data to identify unexpected fluctuations that could suggest a material misstatement. Previous studies show that volatile earnings are less predictable and more uncertain (Dichev and Tang 2009), which could be challenging for auditors to interpret. Ranasinghe *et al.* (2022) find that hedges deemed ineffective for hedge accounting can increase earnings volatility and significantly impair earnings predictability. When auditors are less able to benchmark current earnings against previous earnings, they may increase their assessment of clients' inherent risks (Bryan and Mason 2020) and charge higher audit premiums. In addition, they may need to collect more information and conduct substantive tests to justify current earnings, which may

[9] Considering the urgent demand of enterprises for the hedge accounting treatment for commodity futures, the Ministry of Finance issued a 'Temporary Hedge Accounting Regulations for Commodity Futures' on 26 November 2015. It was effective from 1 January 2016 and was terminated after the new CAS 24 came into effect. This set of temporary regulations adopted the IFRS 9 hedge accounting rules, removed the 80%–125% qualification criterion and introduced the rebalance effective assessment approach (Huang and Shi 2015). However, owing to lack of publicity and implication guidance, few companies adopted this set of temporary regulations (Huang *et al*. 2016). Our check of the annual reports revealed that only 47 listed companies mentioned the use of this set during 2016–2018. We removed these firms from our sample.

increase audit efforts. Bryan *et al.* (2018) demonstrate a positive association between earnings volatility and audit fees. Therefore, hedge accounting may have a negative association with audit fees directly through lower earnings volatility.

Moreover, hedge accounting may influence audit fees through its indirect impact on other earnings management, such as discretionary accruals. Prior studies (e.g. Barton 2001) show that firms use derivatives hedging and accruals-based strategies as substitutes to smooth earnings. Firms that apply hedge accounting would benefit from the accounting effect of reduced earnings volatility and, hence, could lower their reliance on accruals management. However, firms that are not qualified for hedge accounting may resort to discretionary accruals to smooth earnings. Prior studies provide evidence of the positive relationship between earnings management and financial reporting misstatement (Jones *et al.* 2008). Hence, earnings management increases clients' inherent risk and audit risk. Auditors need to spend more time on assessing the future likelihood of accruals being realised into cashflows (Gul *et al.* 2003) to reduce detection risk. To compensate for the residual risk that cannot be mitigated after further efforts, they may charge a risk premium (Krishnan *et al.* 2013). Several studies have shown a positive association between clients' discretionary accruals and audit pricing (Krishnan *et al.* 2013; Choi *et al.* 2022). Therefore, hedge accounting may have a negative relationship with audit fees indirectly through lower accruals earnings management.

However, current accounting standards in general require that several conditions be cumulatively fulfilled for hedging relationships to qualify for hedge accounting. The effectiveness test for hedging relationships is usually considered the most difficult and burdensome aspect of hedge accounting under IFRS requirements (Glaum and Klöcker 2011). To evaluate hedge effectiveness, the management needs to estimate the degree to which changes in the fair value or cashflow of the hedged item that are attributable to a hedge risk are offset by corresponding changes in the hedging instruments. However, owing to the less developed derivatives markets in China, many of the financial derivatives used for hedging purposes may lack active market prices and are estimated at level 3 model-based fair values (Su *et al.* 2022).

Thus, auditing the information related to the hedge effectiveness test would require extensive expertise and judgement. Substantive tests are required for firms that apply hedge accounting treatments so that auditors can obtain evidence that supports the management's assertions about hedge effectiveness. Thus, auditors may charge higher fees to compensate for their time and effort required to understand and verify the parameters provided by managers.

In addition, auditors may need to perform additional tests on internal control efficiency and substantive testing of the firms' risk control mechanisms regarding their hedge transactions to assess effectiveness (Ministry of Finance 2006; Munter and Ratcliffe 2009). Moreover, potential manipulations associated with parameters underlying the hedge transactions to satisfy hedge effectiveness conditions could also increase audit risk (Choi *et al.* 2015). Hence, auditors could charge higher fees to compensate for the reputation and litigation risks arising from the undetected manipulations. In line with these arguments, we propose the following null hypothesis:

H1: Among firms with derivative investments, there is no difference in audit fees between hedge accounting users and non-users.

3.3. Moderation effect of IFRS 9 on the association between hedge accounting and audit fees

Before the introduction of IFRS 9, owing to stringent hedge accounting requirements, many hedges did not qualify for hedge accounting and were deemed 'ineffective' for financial reporting purposes. Many practitioners and policymakers have expressed a concern that these stringent requirements introduced 'artificial and inappropriate' financial statement volatility for 'ineffective hedges', even when firms used derivatives purely for hedging purposes (Ranasinghe *et al.* 2022). Following the introduction of IFRS 9, the scope of hedging instruments and hedged items has been expanded and the 80%–125% bright line threshold for testing hedge effectiveness has been replaced with qualitative assessment criteria. Firms are permitted to 'rebalance' the hedging relationship to ensure its effectiveness remains qualified for hedge accounting treatment. The loosened qualification criteria in IFRS 9 allow firms to expand their use of hedge accounting to more types of hedging instruments and hedged items that were not previously qualified for hedge accounting treatment. With more hedge transactions qualified for hedge accounting treatment, firms that adopt hedge accounting can more effectively match the recognition of the gains or losses on a hedging instrument with the gain or loss on the hedged items. The 'rebalance' approach to adjust for hedge effectiveness also enables firms to apply hedge accounting to enhance accounting matches on a continuous basis. This improved accounting match would lead to lower artificial financial statement volatility directly and less discretionary accruals management indirectly at hedge accounting firms. As argued in Hypothesis 1, lower earnings volatility and less discretionary accruals are negatively associated with audit pricing owing to reduction in audit efforts and risk premiums.

Moreover, the removal of the 80%–125% hedge effectiveness benchmark may reduce firms' incentives to manipulate the assumptions and estimates related to hedge transactions in order to qualify for hedge accounting treatment. Therefore, the audit complexity and the perceived audit risks associated with manipulation related to hedge effectiveness tests could decrease. The simplified hedge effectiveness tests could also reduce auditors' efforts to verify the management's assertions about hedge effectiveness.

However, since the implementation of IFRS 9, the expanded range for hedging instruments and hedged items may expose hedge accounting firms to a higher level of hedge complexity. The new standards rely more on managers' subjective estimations of hedge effectiveness, which may cause a new issue—that is, more 'ineffective' hedges may be classified as 'effective' hedges. Prior studies reveal potential manipulative behaviour related to subjective estimation options by managers in China's context (Lin and Yen 2016; Wang and Huang 2017). Auditors may need to spend more time on hedge transactions and may also charge a fee premium to compensate for the new potential audit risk. On the basis of these arguments, we establish the following null hypothesis:

H2: The implementation of the new hedge accounting requirements does not influence the association between hedge accounting and audit fees.

4. Research design

4.1. Sample and data collection

Our sample selection procedures begin with 17,992 firm-year observations, which include firms listed on the main board of the Shanghai Stock Exchange and the Shenzhen Stock Exchange during 2016–2021. We chose the sample period of three years before and three years after 2019 to help us evaluate the effects of the new hedge accounting requirements under IFRS 9 because

most firms were mandatorily required to implement the new requirements in 2019. First, we exclude 9,714 firm-year observations with zero balance in the accounts of 'Trading securities' and 'Financial derivatives'.[10] We also exclude 1,580 firm-year observations with the listing status of 'ST',[11] firms that terminated listing during the sample period, the year of initial public offer firms first listed since 2018 and financial firms. Then, for those firms with a non-zero balance under 'Trading securities', we manually check the fair value hierarchy disclosure table and exclude firms that do not report any balance related to financial derivatives.[12] After screening, 1,993 firm-year observations that report non-zero financial derivatives remain in the sample. Then, we follow Guo *et al.* (2021) and Su *et al.* (2022) and check all the remaining annual reports for details about firms' use of financial derivatives, hedging and hedge accounting by searching for the following words: 'hedge accounting', 'hedging', 'derivatives', 'risk management', 'financial derivative assets', 'financial derivative liabilities', 'options', 'future', 'swaps', 'forwards', and 'NDF'. We then exclude observations with missing values in the audit fee model. Further, to absorb time-invariant firm characteristics and to control for unknown sources of endogeneity at the firm level, we include firm fixed effects. Since we will estimate regressions with firm fixed effects, we also exclude firms that are observed only once, and these firms will not contribute to identification. Therefore, our final sample includes 1,697 observations. We collect audit-related data and financial data from the WIND and China Stock Market and Accounting Research databases.

4.2. Regression models

We construct the following models to test H1 about the association between audit fees and the use of hedge accounting and H2 about the moderation effect of the new hedge accounting requirements.

$$Auditfee_{it} = \beta_0 + \beta_1 Hedgeacc_{it} + \beta_2 Big4_{it} + \beta_3 Audittenure_{it} + \beta_4 Size_{it} + \beta_5 Lev_{it} + \beta_6 Quick_{it} + \beta_7 ROA_{it} + \beta_8 AccInv_{it} + \beta_9 sub_{it} + \beta_{10} MB_{it} + \beta_{11} Reportlag_{it} + \beta_{12} Inst_{it} + \beta_{13} ChairCEO_{it} + \beta_{14} Crosslist_{it} + \beta_{15} SOE_{it} + \beta_{16} Derivtype_{it} + \beta_{17} Derivrisk_{it} + firm\ fixed\ effect + year\ fixed\ effect + \varepsilon. \quad (1)$$

$$Auditfee_{it} = \beta_0 + \beta_1 Hedgeacc_{it} + \beta_2 HedgeaccEvent_{it} + Control\ variables + firm\ fixed\ effect + year\ fixed\ effect + \varepsilon. \quad (2)$$

The dependent variable is the natural logarithm of the audit fees ($Auditfee_{it}$). The main test variable for model (1) is $Hedgeacc_{it}$, a dummy variable that equals 1 for observations that use hedge accounting, and 0 otherwise. We have no expectations for the coefficient of $Hedgeacc_{it}$. The main test variable for model (2) is the interaction between $Hedgeacc_{it}$ and $Event_{it}$

[10] These include both assets and liabilities.
[11] 'ST' means 'special treatment', and it implies financial distress and a high risk of delisting. A Chinese listed company will have to add 'ST' before its name in several situations, such as when it reports negative net income in two consecutive years.
[12] This is because some firms do not establish an individual account of 'derivatives' but classify their derivatives into 'Trading securities'. In this situation, we could only identify the amounts of derivatives investment from manually checking the fair value hierarchy table in the footnote disclosure.

($HedgeaccEvent_{it}$). For firms listed only on the stock markets in Mainland China, $Event_{it}$ equals 1 for observations from 2019 to 2021 and 0 for observations from 2016 to 2018. For firms cross-listed on the stock markets in Mainland China and the stock markets in Hong Kong or overseas, $Event_{it}$ equals 1 for observations from 2018 to 2021 and 0 for observations from 2016 to 2017. We have no expectations regarding the sign of the coefficient of $HedgeaccEvent_{it}$.

In addition, we control for several variables that may have influenced audit fees ($Auditfee_{it}$). We include $Big4_{it}$ to control for the audit fee premiums for Big 4 audit firms and $Audittenure_{it}$ to control for audit firm tenures. We include client size ($Size_{it}$) and expect that larger clients are associated with higher audit efforts and audit fees. Following previous studies (Chang *et al.* 2019), we include leverage (Lev_{it}), quick ratio ($Quick_{it}$) and profitability (ROA_{it}) to control for client-specific financial risks. Next, we control for client firms' operational complexity by including $AccInv_{it}$ (the sum of account receivables and inventories divided by total assets) and sub_{it} (the number of subsidiaries) and expect a positive association between operational complexity and audit fees. We also control for the market-to-book ratio (MB_{it}). Moreover, we include audit report lag ($Reportlag_{it}$) and expect it to have a positive relationship with audit fees. Then, we include two corporate governance variables $Inst_{it}$ (the ownership of institutional investors) and $ChairCEO_{it}$(CEO duality) and expect that good corporate governance may reduce audit risks, and thus audit fees. We also include $Crosslist_{it}$ to control for the firms cross-listed on the Hong Kong or overseas stock markets and include SOE_{it} to control for the impact of state-owned enterprises. We further control for two characteristics related to financial derivatives: $Derivtype_{it}$ (the number of types of financial derivatives) and $Derivrisk_{it}$ (the number of types of risks managed by financial derivatives). Last, we include firm fixed effects and year fixed effects in the regressions (see the Appendix for the definitions of all variables).

5. Research findings

5.1. Descriptive statistics

Table 1 presents the descriptive statistics for the full sample. We winsorise all of the continuous variables at the first percentile of each end of the data distribution. The mean value of the natural logarithm of the audit fee ($Auditfee_{it}$) is 14.343 (the mean value of the audit fee is RMB2,383,926 ≈ USD331,722). On average, of the firms in the sample, 35.6% use hedge accounting, 16.3% select Big 4 audit firms and 8.8% are cross-listed on Hong Kong or overseas stock markets.

[Insert Table 1 about here]

Table 2 presents the descriptive statistics partitioned by group (treatment and control). The treatment group includes firms using hedge accounting, and the control group consists of firms not using it. The statistics show that compared with the firms in the control group, those in the treatment group spend more on audit fees, are more likely to choose Big 4 audit firms ($Big4_{it}$) and have higher auditor turnover rate ($Audittenure_{it}$) . The selection of Big 4 audit firms indicates that a higher level of expertise and efforts could be required for auditing the hedge accounting users than the non-users. The higher auditor turnover rate at firms with hedge accounting suggests that hedge accounting may relate to higher audit risk. In addition, firms

using hedge accounting tend to be larger in size ($Size_{it}$), have a lower return on assets (ROA_{it}), and have higher leverage (Lev_{it}). The lower financial performance and higher financial risks are consistent with the notion that firms with greater demand for smoother earnings are more likely to adopt hedge accounting (Glaum and Klöcker 2011; Lu *et al.* 2023). Moreover, the hedge accounting users invest in more types of derivatives ($Derivtype_{it}$) and manage more types of risks ($Derivrisk_{it}$) than the non-users.

[Insert Table 2 about here]

5.2. Main findings

Table 3 presents the results of the testing of Hypothesis 1 regarding the association between the use of hedge accounting and audit fees. The results with and without control variables are displayed to ensure robustness. Across the different models, the results are similar and highly significant, which demonstrates that the reported baseline results are robust. The analysis is performed using the results of models with control variables as an example. In Column 2, the coefficient of $Hedgeacc_{it}$ of 0.054 is significant at the 5% level (t-statistic = 2.139). This indicates that, on average, firms using hedge accounting pay 5.55% (= e^0.054 −1) higher audit fees than firms not using it, which equals USD18,411 (= USD331,722 * 5.43%) and is economically significant. These results are consistent with the hypothesis that using hedge accounting may increase the required audit effort and the audit risks related to the hedging effectiveness tests and thus lead to higher audit fees.

The coefficients for the control variables are mostly in accordance with our predictions. For example, the positive coefficient of $Big4_{it}$ at the 1% significance level indicates that Big 4 audit firms charge higher audit fees. The positive coefficient of $Size_{it}$ at the 1% significance level is consistent with our prediction that larger firms pay higher audit fees. The significantly positive coefficient of $AccInv_{it}$ and of Sub_{it} suggest that auditors charge higher audit fees for firms with more operational complexity. The positive coefficient of $Reportlag_{it}$, significant at the 1% level, is consistent with our expectation that increased report lag relates to higher audit fees. The positive and significant coefficient of SOE_{it} indicates that, in general, state-owned enterprises pay higher audit fees than non-state-owned enterprises.

[Insert Table 3 about here]

Table 4 presents the results of the testing of Hypothesis 2 regarding the moderation effect of IFRS 9 on the association between hedge accounting and audit fees. In Column 2, the negative coefficient of $HedgeaccEvent_{it}$ of −0.044 at the 5% level (t-statistic = −2.026) shows that after the implementation of IFRS 9, firms with hedge accounting are more likely to reduce audit fees than those without hedge accounting. On average, after the implementation of the new hedge accounting requirements, compared with firms in the control group, firms in the treatment group pay 4.46% (= e^0.044 −1) lower audit fees, which equals to USD14,795 (= USD331,722 * 4.46%) and is economically significant. The result indicates that the new hedge accounting requirements negatively influence audit fees for hedge accounting firms. The coefficients for the control variables are also generally consistent with our predictions.

[Insert Table 4 about here]

5.3. Channels through which the new standards influence the association between hedge accounting and audit fees

Next, we examine the possible mechanism of the moderation effect of the new standards. In the theoretical analysis, we argue that for hedge accounting firms, IFRS 9 may encourage the application of hedge accounting to a larger scope of hedging transactions and further reduce earnings volatility and firms' reliance on accruals earnings management, which would mitigate auditors' efforts and audit risk. Therefore, we use the stepwise regression method to test the effectiveness of the mechanism. The specific model is set as follows:

$$ROEstd_{it}\ (DAab_{it}) = \beta_0 + \beta_1 Hedgeacc_{it} + \beta_2 HedgeaccEvent_{it} + Control\ variables + \ firm\ fixed\ effect + year\ fixed\ effect\ + \varepsilon. \quad (3)$$

$$Auditfee_{it} = \beta_0 + \beta_1 Hedgeacc_{it} + \beta_2 HedgeaccEvent_{it} + \beta_3 ROEstd_{it}\ (DAab_{it}) + \ Control\ variables + \ firm\ fixed\ effect + \ year\ fixed\ effect\ + \varepsilon. \quad (4)$$

In the formula, $ROEstd_{it}$ is the standard deviation of return on equity over three years and measures earnings volatility. $DAab_{it}$ is the absolute value of the performance-matched discretionary accruals (Kothari *et al.* 2005) and measures the level of earnings management. The results are presented in Table 5.

Column 1 of Table 5 reports the results of the influence of IFRS 9 on earnings volatility at hedge accounting firms. The coefficient of $HedgeaccEvent_{it}$ is significantly negative (coefficient = −0.036, *t*-statistic = −2.009), which indicates that the implementation of this new standard helps to reduce earnings volatility. The results in Column 2 show that after the mechanism variables are included in the regression model, the core test variable $HedgeaccEvent_{it}$ is still significantly negative, which indicates that the implementation of the new hedge accounting requirement, through reducing earnings volatility, effectively decreases audit fees for treatment firms with hedge accounting. Columns 3 and 4 present the results for the mechanism of reducing accruals earnings management ($DAab_{it}$). The results show that IFRS 9 also decreases audit fees by reducing accruals management in the treatment group firms. To summarise, the results provided in Table 5 demonstrate that IFRS 9 implementation helps reduce earnings volatility and accruals earnings management for hedge accounting firms, which leads to lower audit fees.

[Insert Table 5 about here]

5.4. Heterogeneity tests of the moderation effect of IFRS 9

5.4.1. Audit firm reputation and size

Further, we test whether the moderation effect of IFRS 9 is heterogeneous for different audit firms. First, we test the subsamples with and without Big 4 audit firms. The results are presented in Column 1 and Column 2 of Table 6, Panel A. The coefficient of $HedgeaccEvent_{it}$ is only significantly negative for Big 4 audit firms and not significant for non-Big 4 audit firms (Chow test chi-square = 4.114). The, we test the subsample with the Top 10 audit firms and the subsample with the small audit firms. The results are presented in Column 3 and Column 4 of

Table 6, Panel A. The coefficient of $HedgeaccEvent_{it}$ is only significantly negative for the Top 10 audit firms and not significant for small audit firms (Chow test chi-square = 3.844). In general, the results in Panel A of Table 6 show that the moderation effect of IFRS 9 on the association between hedge accounting and audit fees is more pronounced for the large audit firms.

[Insert Table 6 about here]

5.4.2. External environment and corporate governance

In China, although laws and regulations apply equally in all provinces within the country, economic marketisation varies among the provinces (Amit *et al.* 2015). Next, we test whether the moderation effect of IFRS 9 varies across different provinces. Regions with higher marketisation levels could have stronger legal enforcement, which would drive firms to comply with accounting standard requirements better. Following Amit *et al.* (2015), we classify the provinces as High (Low)-marketisation when they are above (below) the median index value based on Fan and Wang's (2018) index of the market development of Chinese provinces. The results are presented in Columns 1 and 2 of Table 6, Panel B. The coefficient of $HedgeaccEvent_{it}$ is only negative and significant for the High marketisation subsample but not significant for the Low marketisation subsample (Chow test chi-square = 5.070). The result indicates that the moderation effect of the new hedge accounting requirements is more pronounced in regions with better institutional environments. Thus, improving the local institutional environments helps to ensure the implementation of better accounting standards.

In addition, we test whether the moderation effect of the new hedge accounting requirements varies across firms with different levels of corporate governance. Stronger corporate governance helps to enhance compliance with accounting standard requirements. We measure corporate governance according to the ownership of institutional investors. We classify firms as strong (weak) corporate governance firms when their institutional invests' ownership is above (below) the median value. The results are presented in Columns 3 and 4 of Table 6, Panel B. The coefficient of $HedgeaccEvent_{it}$ is significantly negative only for the strong corporate governance subsample and is insignificant for the weak corporate governance subsample (Chow test chi-square = 4.136). The result suggests that the moderation effect of IFRS 9 is more salient in firms with strong corporate governance, and strong governance may facilitate the implementation of the new accounting standard.

5.5. Robustness and sensitivity tests

5.5.1. Propensity score matching method and entropy balancing method

Table 2 shows that the fundamental characteristics of treatment firms with hedge accounting may have differed from those of control firms without hedge accounting. To mitigate partially against a potential source of selection bias, we adopt the propensity score matching procedure. We establish a probit model[13] to estimate the propensity score in the first stage. We then match, with no replacements, the firms in the treatment group with the firms in the control group with the closest propensity scores.[14] We then run all models, again using the matched samples.

[13] The dependent variable for the probit model is $Hedgeacc_{it}$. The control variables are those from the audit fee model.

[14] The closest propensity score is 0.001. The untabulated results show that after matching, no significant differences are found in all control variables between the treatment group and the control group.

Column 1 and Column 2 of Table 7 present the propensity score matching results, which are consistent with the main results provided in Tables 3 and 4.

To minimise the potential selection bias of the connected firms further, we adopt the entropy balancing method. On using this method, every observation in the control sample receives a weight such that the mean, variance and skewness of the distribution for each matched variable in the control sample is similar to those for its counterpart in the treatment sample. Specifically, there are no significant differences between the treatment and control groups. We re-run all the models using the entropy-balanced sample. The results are presented in the last two columns of Table 7 and are consistent with the main results and the propensity score matching results.

[Insert Table 7 about here]

5.5.2. Excluding cross-listed firms

To check whether our results are dominated by firms cross-listed on Hong Kong or overseas markets, we conduct a robustness test by eliminating these firms. The results are reported in the first two columns of Table 8. The coefficients of $Hedgeacc_{it}$ and $HedgeaccEvent_{it}$ are significant at the 5% level. These results are similar to the main results.

[Insert Table 8 about here]

5.5.3. Sample with systematic treatment and control groups

Some firms may change from non-users to hedge-accounting users after the implementation of IFRS 9, which may bias the moderation effect of IFRS 9. As a robustness check, we include only the sample with systematic treatment and control groups. The treatment and control groups include only firms with and without hedge accounting throughout the whole sample period, respectively. The results for the sample with systematic treatment and control groups are presented in Column 3 of Table 8. The results are qualitatively consistent with the main results provided in Table 4.[15]

5.5.4. Financial industry sample

We conduct a robustness test to determine whether our results can be generalised to the financial industry sample. We apply the same models to the financial industry and drop those control variables not applicable to the financial industry (e.g., $Quick_{it}$ and $AccInv_{it}$). The results are presented in the last two columns of Table 8. The coefficient of $Hedgeacc_{it}$ is insignificant and the coefficient of $HedgeaccEvent_{it}$ is significantly negative. We do not find a positive association between hedge accounting and audit fees in general for the financial industry sample in our sample periods. However, we still find that after IFRS 9, firms with hedge accounting are more likely to reduce audit fees than those without hedge accounting.

5.5.5. Test for the parallel-paths assumption and the placebo test

We conduct the parallel-paths assumption test to ensure there are no significant changes in the audit fees trend between the treatment group and the control group before the implementation of IFRS 9. We use two dummy variables $Eventbef1_{it}$ and $Eventbef2_{it}$, which represent one and two years ahead of the implementation of IFRS 9, respectively. The interaction term $HedgeaccEventbef1_{it}$ ($HedgeaccEventbef2_{it}$) equals $Hedgeacc_{it}$* $Eventbef1_{it}$

[15] The variable $Hedgeacc_{it}$ is dropped owing to collinearity with the firm fixed effect.

($Hedgeacc_{it}$* $Eventbef2_{it}$). We expect that if the pre-event trends are parallel, then the coefficients of $Hedgeacc_{it}$* $Eventbef1_{it}$ and $Hedgeacc_{it}$* $Eventbef2_{it}$ will be insignificantly different from 0. Panel A of Table 9 displays the regression results for the parallel-paths assumption test, which support our expectation that there are no changes in the trend in audit fees between the treatment group and the control group in the pre-event periods.

To strengthen the robustness of our main findings, we also perform placebo tests to ensure that our results are not affected by random factors. We construct a randomly assigned treatment group and a control group. Then we re-run each model using the pseudo treatment and control samples and obtain the coefficient estimates for the test variable $HedgeaccEvent_{it}$. We repeat this exercise 1,000 times and report the descriptive statistics of these 1,000 pseudo-sample coefficient estimates. Panel B of Table 9 reports the results of the coefficients and the *t*-statistics for the test variable $HedgeaccEvent_{it}$ for each regression model based on randomly assigned treatment groups and control groups. The results show that the placebo coefficients in all three models largely follow a normal distribution centered at zero, thus confirming that our results are not obtained by chance.

[Insert Table 9 about here]

6. Conclusion

Using a sample of Chinese non-financial listed companies, we investigate how hedge accounting usage relates to audit fees, and the moderation effect of IFRS 9 on the association between hedge accounting usage and audit fees. We find higher audit fees among the financial derivative users who also use hedge accounting treatment, and that the implementation of IFRS 9 helps mitigate the positive association between hedge accounting and audit fees. We further document that the mitigation effect of IFRS 9 is significant only among firms with better internal and external monitoring.

Overall, this study contributes to several streams of the literature and has implications for accounting researchers and policymakers. First, the opposite results regarding the association between hedge accounting and audit fees between our study and that of Ranasinghe *et al.* (2023) highlight the importance of investigating the costs and benefits of hedge accounting usage in different institutional settings. Second, whereas prior studies on IFRS and audit fees generally document a positive relationship between IFRS adoption and audit fees, we find that there could be a negative relationship between one particular standard in the set of IFRS (i.e. IFRS 9) and audit fees. The findings highlight the importance of understanding the costs and benefits in the settings of a particular standard in IFRS, since some standards may be associated with additional fees and others with reduced fees. Third, we find that the favourable influence of IFRS 9 is only significant among firms with better corporate governance and those in regions with stronger market institutions. The findings imply that improving accounting standards alone may not be sufficient to generate beneficial outcomes for companies in emerging markets—it is also important to attempt to improve corporate governance and market institutions.

Despite the significant contributions of the study, it has the following limitations to be addressed by future studies. First, the findings may not be generalisable to other countries or regions with different market institutions. Second, we cannot test directly whether the reduced audit fees in the post-IFRS 9 period are driven by reduced audit efforts in checking hedge effectiveness because data on audit hours are unavailable. Future studies could employ

alternative research methods such as interviews and field studies to investigate the specific ways that IFRS 9 influences auditors.

Appendix

Definition of Variables

$Auditfee_{it}$	A natural logarithm of audit fee at firm *i* for period *t*.
$Hedgeacc_{it}$	A dummy variable that equals 1 if firm *i* uses hedge accounting in period *t*, and 0 otherwise.
$Event_{it}$	For firms listed only on the stock markets in Mainland China, it equals 1 for observations in 2019–2021 and 0 for observations in 2016–2018. For firms cross-listed on Mainland China and Hong Kong or overseas stock markets, it equals 1 for observations in 2018–2021 and 0 for observations in 2016–2017.
$Eventbef1_{it}$	For firms listed only on the stock markets in Mainland China, it equals 1 for observations in 2018–2021 and 0 for observations in 2016–2017. For firms cross-listed on Mainland China and Hong Kong or overseas stock markets, it equals 1 for observations in 2017–2021 and 0 for observations in 2016.
$Eventbef2_{it}$	It equals 1 for observations in 2017–2021 and 0 for observations in 2016.
$Big4_{it}$	A dummy variable that equals 1 if the auditor is one of the Big 4 audit firms at firm *i* in period *t*, and 0 otherwise.
$Audittenure_{it}$	The number of years that the audit firm has audited firm *i* in period *t*.
$Size_{it}$	A natural logarithm of total assets of firm *i* in period *t*.
Lev_{it}	The ratio of total liabilities to total assets of firm *i* in period *t*.
$Quick_{it}$	The ratio of the sum of cash and account receivables to current liabilities of firm *i* in period *t*.
ROA_{it}	The ratio of net profit to total assets of firm *i* at the end of period *t*.
$AccInv_{it}$	The ratio of the sum of accounts receivables and inventory to total assets of firm *i* in period *t*.
Sub_{it}	The number of subsidiaries of firm *i* in period *t*.
Age_{it}	The number of years since the initial public offer of firm *i* in period *t*.
MB_{it}	The ratio of market value to book value of firm *i* in period *t*.
$Reportlag_{it}$	A natural logarithm of days between fiscal year-end and audit report issuance date of firm *i* in period *t*.
$Inst_{it}$	The percentage of institutional ownership of firm *i* in period *t*.
$ChairCEO_{it}$	A dummy variable if the chair and the chief executive officer of firm *i* in period *t* are the same person, and 0 otherwise.
$Crosslist_{it}$	A dummy variable if firm *i* cross-listed on Hong Kong or overseas stock markets in period *t*, and 0 otherwise.
SOE_{it}	A dummy variable that equals 1 if firm *i* is a state-owned-enterprise in period *t*, and 0 otherwise.
$Derivtype_{it}$	The number of types of financial derivatives used by firm *i* in period *t*.
$Derivrisk_{it}$	The number of types of risks managed by firm *i* in period *t* by using financial derivatives.
DA_{it}	Performance-matched discretionary accruals (Kothari *et al.* 2005) of firm *i* for period *t*.
$DAab_{it}$	The absolute value of discretionary accruals (DA_{it}) of firm *i* for period *t*.
$ROEstd_{it}$	The standard deviation of return on equity of firm *i* over three years in period *t*.

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Table 1
Descriptive statistics for the full sample

Variable	N	Mean	Std. Dev.	25th Percentile	Median	75th Percentile
$Auditfee_{it}$	1,697	14.343	0.782	13.743	14.221	14.827
$Hedgeacc_{it}$	1,697	0.356	0.479	0	0	1
$Event_{it}$	1,697	0.654	0.476	0	1	1
$Big4_{it}$	1,697	0.163	0.370	0	0	0
$Audittenure_{it}$	1,697	7.232	4.022	3	8	11
$Size_{it}$	1,697	23.475	1.431	22.387	23.366	24.478
Lev_{it}	1,697	0.504	0.179	0.376	0.515	0.639
$Quick_{it}$	1,697	1.416	1.147	0.825	1.127	1.650
ROA_{it}	1,697	0.041	0.056	0.018	0.038	0.066
$AccInv_{it}$	1,697	0.253	0.137	0.147	0.242	0.341
Sub_{it}	1,697	34.193	40.257	7	23	45
MB_{it}	1,697	2.484	2.100	1.220	1.911	2.976
$Reportlag_{it}$	1,697	4.623	0.166	4.500	4.673	4.771
$Inst_{it}$	1,697	0.065	0.073	0	0.043	0.102
$ChairCEO_{it}$	1,697	0.199	0.399	0	0	0
$Crosslist_{it}$	1,697	0.088	0.283	0	0	0
SOE_{it}	1,697	0.361	0.480	0	0	1
$Derivtype_{it}$	1,697	1.216	0.472	1	1	1
$Derivrisk_{it}$	1,697	1.166	1.136	0	1	2

This table reports the summary statistics for the full sample. All continuous variables are winsorised at the top and bottom 1 percent of their distributions. All *p*-values are two-tailed; ***, ** and * represent statistical significance at the 1, 5 and 10 percent levels, respectively.

Table 2
Univariate tests between firms in treatment and control groups

	Treatment Group $Hedge\_acc_{it}$=1	Control Group $Hedge\_acc_{it}$=0	Difference
$Auditfee_{it}$	14.574	14.215	0.359***
$Big4_{it}$	0.227	0.128	0.099***
$Audittenure_{it}$	6.709	7.521	-0.812***
$Size_{it}$	23.983	23.194	0.789***
Lev_{it}	0.546	0.480	0.066***
$Quick_{it}$	1.243	1.511	-0.268***
ROA_{it}	0.034	0.044	-0.010***
$AccInv_{it}$	0.258	0.250	0.008
Sub_{it}	43.548	29.023	14.525***
MB_{it}	2.175	2.655	-0.480***
$Reportlag_{it}$	4.612	4.629	-0.017**
$Inst_{it}$	0.072	0.061	0.011***
$ChairCEO_{it}$	0.217	0.189	0.028
$Crosslist_{it}$	0.123	0.069	0.054***
SOE_{it}	0.401	0.339	0.062**
$Derivtype_{it}$	1.333	1.152	0.181***
$Derivrisk_{it}$	1.522	0.969	0.553***

This table presents the comparison of summary statistics for the treatment group and control group. All continuous variables are winsorised at the top and bottom 1 percent of their distributions. All *p*-values are two-tailed; ***, ** and * represent statistical significance at the 1, 5 and 10 percent levels, respectively.

Table 3
Regression results for Hypothesis 1 on the association between hedge accounting and audit fees

$Auditfee_{it}$	Predicted Sign	(1)	(2)
$Hedgeacc_{it}$	**?**	**0.069****	**0.054****
		(2.224)	**(2.139)**
Big_{it}	+		0.122***
			(2.693)
$Audittenure_{it}$	?		0.001
			(0.525)
$Size_{it}$	+		0.217***
			(6.270)
Lev_{it}	?		-0.101
			(-0.892)
$Quick_{it}$	?		-0.008
			(-1.425)
ROA_{it}	?		-0.095
			(-0.649)
$AccInv_{it}$	+		0.766***
			(4.393)
Sub_{it}	+		0.002***
			(3.560)
MB_{it}	?		0.006
			(1.278)
$Reportlag_{it}$	+		0.105***
			(2.843)
$Inst_{it}$	-		-0.038
			(-0.367)
$ChairCEO_{it}$	+		-0.007
			(-0.409)
$Crosslist_{it}$	?		0.064
			(0.727)
SOE_{it}	?		0.118***
			(2.822)
$Derivtype_{it}$	+		0.006
			(0.277)
$Derivrisk_{it}$	+		0.004
			(0.308)
Constant	?	14.318***	8.449***
		(1176.952)	(10.719)
Firm fixed effect		Included, but not reported for brevity	
Year fixed effect		Included, but not reported for brevity	
Adjusted R^2		0.967	0.973
F-stat.		4.945***	9.344***
Sample size		1,697	1,697

This table reports the results for the association between hedge accounting and audit fees. The test variable is $Hedgeacc_{it}$, a dummy variable that equals 1 if an observation uses hedge accounting, and 0 otherwise. All continuous variables are winsorised at the top and bottom 1 percent of their distributions. All *p*-values are two-tailed; ***, ** and * represent statistical significance at the 1, 5 and 10 percent levels, respectively. *t*-statistics are based on standard errors adjusted for firm-year level clustering.

Table 4
Regression results for Hypothesis 2 on the moderation effect of IFRS 9

$Auditfee_{it}$	Predicted Sign	(1)	(2)
$Hedgeacc_{it}$	?	0.094**	0.067**
		(2.474)	(1.993)
$\boldsymbol{HedgeaccEvent_{it}}$	**?**	-0.048**	-0.044**
		(-2.048)	(-2.026)
Big_{it}	+		0.188***
			(3.020)
$Audittenure_{it}$	?		0.004
			(1.491)
$Size_{it}$	+		0.244***
			(6.604)
Lev_{it}	?		-0.190
			(-1.505)
$Quick_{it}$	?		-0.020*
			(-1.894)
ROA_{it}	?		-0.170
			(-1.094)
$AccInv_{it}$	+		0.719***
			(4.233)
Sub_{it}	+		0.001***
			(3.535)
MB_{it}	?		0.006
			(1.281)
$Reportlag_{it}$	+		0.110***
			(2.944)
$Inst_{it}$	-		-0.042
			(-0.334)
$ChairCEO_{it}$	+		-0.014
			(-0.799)
$Crosslist_{it}$	?		0.030
			(0.302)
SOE_{it}	?		0.115***
			(2.656)
$Derivtype_{it}$	+		0.005
			(0.241)
$Derivrisk_{it}$	+		0.007
			(0.536)
Constant	?	14.352***	7.912***
		(1140.698)	(9.359)
Firm fixed effect		Included, but not reported for brevity	
Year fixed effect		Included, but not reported for brevity	
Adjusted R^2		0.971	0.976
F-stat.		3.415***	8.246***
Sample size		1,697	1,697

This table reports the results for the moderation effect of IFRS 9 on the association between hedge accounting and audit fees. The test variable is $HedgeaccEvent_{it}$ ($Hedgeacc_{it}$*$Event_{it}$). All continuous variables are winsorised at the top and bottom 1 percent of their distributions. All *p*-values are two-tailed; ***, ** and * represent statistical significance at the 1, 5 and 10 percent levels, respectively. *t*-statistics are based on standard errors adjusted for firm-year level clustering.

Table 5
Channels through which IFRS 9 influences the association between hedge accounting and audit fees

	(1) $ROEstd_{it}$	(2) $Auditfee_{it}$	(3) $DAab_{it}$	(4) $Auditfee_{it}$
$Hedgeacc_{it}$	0.040	0.066**	0.013	0.086***
	(1.578)	(2.181)	(0.600)	(3.627)
$\boldsymbol{HedgeaccEvent_{it}}$	**-0.036****	**-0.040****	**-0.038****	**-0.045****
	(-2.008)	**(-1.979)**	**(-2.305)**	**(-2.293)**
$ROEstd_{it}$		0.055**		
		(2.130)		
$DAab_{it}$				0.026**
				(2.173)
Control variables		Included, but not reported for brevity		
Firm fixed effect		Included, but not reported for brevity		
Year fixed effect		Included, but not reported for brevity		
Adjusted R^2	0.913	0.973	0.527	0.972
F-stat.	4.035***	8.627***	1.659**	11.996***
Sample size	1,697	1,697	1,688	1,688

This table presents the channels through which IFRS 9 influences the association between hedge accounting and audit fees. Columns (1) and (2) report the mediation effect of earnings volatility ($ROEstd_{it}$) measured by the standard deviation of ROE over three years in period *t* for firm *i*. Columns (3) and (4) present the mediation effect of earnings quality ($DAab_{it}$) measured by the absolute value of performance-matched discretionary accruals (Kothari et al., 2005) in period *t* for firm *i*. All continuous variables are winsorised at the top and bottom 1 percent of their distributions. All *p*-values are two-tailed; ***, ** and * represent statistical significance at the 1, 5 and 10 percent levels, respectively. *t*-statistics are based on standard errors adjusted for firm-year level clustering.

Table 6
Heterogeneity tests of the moderation effect of IFRS 9

Panel A Regression results of heterogeneity tests by audit firm reputation and size

$Auditfee_{it}$	(1) Big 4	(2) Non-Big 4	(3) Top 10 audit firms	(4) Small audit firms
$Hedgeacc_{it}$	0.214**	0.054*	0.111***	0.033
	(2.441)	(1.666)	(2.837)	(0.836)
$\boldsymbol{HedgeaccEvent_{it}}$	**-0.106****	**-0.015**	**-0.069*****	**-0.001**
	(-2.119)	(-0.642)	(-2.687)	(-0.034)
Control variables	Included, but not reported for brevity			
Firm fixed effect	Included, but not reported for brevity			
Year fixed effect	Included, but not reported for brevity			
Adjusted R^2	0.966	0.959	0.980	0.971
F-stat.	2.738***	7.115***	7.219***	2.805***
Sample size	272	1,416	1,219	449
Chow test				
Chi^2	4.114**		3.844**	

Panel B Regression results of heterogeneity tests by external environment and corporate governance

$Auditfee_{it}$	(1) High marketisation	(2) Low marketisation	(3) Strong corporate governance	(4) Weak corporate governance
$Hedgeacc_{it}$	0.064*	0.087	0.124***	0.024
	(1.876)	(1.119)	(3.423)	(0.371)
$\boldsymbol{HedgeaccEvent_{it}}$	**-0.054****	**0.025**	**-0.069****	**0.002**
	(-2.309)	**(0.683)**	**(-2.563)**	**(0.053)**
Control variables	Included, but not reported for brevity			
Firm fixed effect	Included, but not reported for brevity			
Year fixed effect	Included, but not reported for brevity			
Adjusted R^2	0.972	0.983	0.981	0.964
F-stat.	7.514***	6.785***	5.734***	4.888***
Sample size	1,493	204	792	597
Chow test				
Chi^2	5.070**		4.136**	

This table presents the results of heterogeneity tests. Panel A reports the results of these tests by audit firm reputation and size. Panel B presents the results of cross-sectional tests by external environment and corporate governance. All continuous variables are winsorised at the top and bottom 1 percent of their distributions. All *p*-values are two-tailed; ***, ** and * represent statistical significance at the 1, 5 and 10 percent levels, respectively. *t*-statistics are based on standard errors adjusted for firm-year level clustering.

Table 7
Propensity score matching method and entropy balancing approach

$Auditfee_{it}$	(1)	(2)	(3)	(4)
	PSM		EB	
$\boldsymbol{Hedgeacc_{it}}$	0.061**	0.091**	0.057**	0.081**
	(2.189)	(2.352)	(1.994)	(2.486)
$\boldsymbol{HedgeaccEvent_{it}}$		-0.064**		-0.050**
		(-2.308)		(-2.292)
Control variables	Included, but not reported for brevity			
Firm fixed effect	Included, but not reported for brevity			
Year fixed effect	Included, but not reported for brevity			
Adjusted R^2	0.977	0.977	0.977	0.974
F-stat.	7.284***	7.785***	6.997***	6.919***
Sample size	710	710	1,697	1,697

This table presents the results on using the propensity score matching method and the entropy balancing approach. Columns (1) and (2) report the regression results of the propensity score matching method (PSM). Columns (3) and (4) present the regression results of the entropy balancing approach (EB). All continuous variables are winsorised at the top and bottom 1 percent of their distributions. All p-values are two-tailed; ***, ** and * represent statistical significance at the 1, 5 and 10 percent levels, respectively. t-statistics are based on standard errors adjusted for firm-year level clustering.

Table 8
Additional robustness and sensitivity tests

$Auditfee_{it}$	(1)	(2)	(3)	(4)	(5)
	Excluding cross listed firms		Sample with systematic treatment and control	Financial industry sample	
$\boldsymbol{Hedgeacc_{it}}$	0.044**	0.052**		-0.083	-0.041
	(2.035)	(2.102)		(-1.135)	(-0.796)
$\boldsymbol{HedgeaccEvent_{it}}$		-0.041**	-0.079***		-0.083**
		(-2.004)	(-3.236)		(-2.376)
Control variables	Included, but not reported for brevity				
Firm fixed effect	Included, but not reported for brevity				
Year fixed effect	Included, but not reported for brevity				
Adjusted R^2	0.966	0.967	0.981	0.980	0.969
F-stat.	15.101***	14.008***	10.988***	1.507***	2.889***
Sample size	1,548	1,548	1,153	343	343

This table reports the results of a series of robustness and sensitivity tests. Columns (1) and (2) present the results on excluding cross-listed firms. Column (3) reports the results for the sample with systematic treatment and control groups, which include firms with and without hedge accounting in all sample periods, respectively. Columns (4) and (5) present the results for the sample of firms in the financial industry. All continuous variables are winsorised at the top and bottom 1 percent of their distributions. All p-values are two-tailed; ***, ** and * represent statistical significance at the 1, 5 and 10 percent levels, respectively. t-statistics are based on standard errors adjusted for firm-year level clustering.

Table 9
Test for the parallel-paths assumption and the placebo test

Panel A Regression results of the test for the Parallel-Paths assumption

$Auditfee_{it}$	
$Hedgeacc_{it}$	0.085*
	(1.818)
$HedgeaccEvent_{it}$	-0.044**
	(-1.973)
$HedgeaccEventbef2_{it}$	0.009
	(0.283)
$HedgeaccEventbef1_{it}$	-0.034
	(-0.710)
Control variables	Included, but not reported for brevity
Firm fixed effect	Included, but not reported for brevity
Year fixed effect	Included, but not reported for brevity
Adjusted R^2	0.973
F-stat.	9.411***
Sample size	1,697

Panel B The results of the placebo test

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Estimation	Actual	Mean	p1	p5	p10	p25	p50	p75	p90	p95	p99
coefficients	**-0.044****	**0.004**	-0.046	-0.032	-0.024	-0.011	0.003	0.021	0.033	0.042	0.055
t-statistics	**(-2.026)**	**0.192**	-2.080	-1.507	-1.062	-0.488	0.136	0.937	1.482	1.822	2.375

Panel A presents the results of the test for the parallel-paths assumption and Panel B presents the results of the placebo test. The test variables are $HedgeaccEventbef1_{it}$ (which is the interaction between $Hedgeacc_{it}$ and $Eventbef1_{it}$) and $HedgeaccEventbef2_{it}$ (which is the interaction between $Hedgeacc_{it}$ and $Eventbef2_{it}$). $Eventbef1_{it}$ is a dummy variable that represents one year ahead of IFRS 9 adoption. $Eventbef2_{it}$ is a dummy variable that represents two years ahead of IFRS 9 adoption. All continuous variables are winsorised at the top and bottom 1 percent of their distributions. All *p*-values are two-tailed; ***, ** and * represent statistical significance at the 1, 5 and 10 percent levels, respectively. *t*-statistics are based on standard errors adjusted for firm-year level clustering.