

Audit and Financial Reporting Consequences of Corporate Hedging

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Abstract

We study audit and financial reporting consequences of corporate hedging. In our primary analyses we investigate how hedging influences audit pricing. On one hand, hedging can reduce bankruptcy risk and the expected loss from financial distress; in this sense, hedging can mitigate the litigation risk faced by auditors, resulting in lower audit fees. On the other hand, hedging significantly increases financial reporting complexity and hence the audit risk borne by auditors, in which case auditors would increase their audit effort, leading to higher audit fees. Our results support the latter argument. We find that hedging increases audit fees and that this effect is in part due to increased financial statement complexity. The inference is robust to the use of changes analyses, an instrumental variable approach, and difference-in-differences tests with propensity-score matching. Moreover, by developing a novel measure of the *magnitude* of hedging activities, we find that firms that are more extensively engaged in hedging exhibit greater increases in financial statement complexity and audit fees. We further show that the effect of hedging on audit fees is more pronounced for clients of less experienced auditors and for companies with more opaque information environments. Finally, we test for differences in audit quality. Our evidence suggests that auditors dedicate more effort in auditing financial statements with hedging activities, and thus obtain similar audit quality.

Keywords: Corporate hedging, Derivatives, Financial reporting complexity, Auditing, Audit fees, Disclosure, Textual analysis, Audit quality

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1. Introduction

Active corporate risk management through hedging has become increasingly important (Graham and Rogers 2002; Campello, Lin, Ma, and Zou 2011; Manconi, Massa, and Zhang 2018). Over the past decade or more, growing market volatility, evident in the global financial crisis, has made managing risk a priority for companies (Cohen, Krishnamoorthy, and Wright 2017). This trend has stimulated the use of financial derivatives to hedge risks among nonfinancial companies. According to the Bank for International Settlements (2017), the notional value of outstanding interest rate and foreign exchange derivatives held by nonfinancial firms has risen from \$9.4 trillion to \$20.8 trillion from 2000 to 2017. While prior research has investigated the determinants of corporate hedging (Smith and Stulz 1985; Nance, Smith, and Smithson 1993; Tufano 1996; Geczy, Minton, and Schrand 1997; Graham and Rogers 2002; Faulkender 2005) and the influence of hedging on corporate financing and investment policies (Allayannis and Weston 2001; Carter, Rogers, and Simkins 2006; Campello et al. 2011), evidence on the impact of hedging on auditing and financial reporting is limited. Related studies reveal that the use of derivatives affects earnings smoothness and the mechanisms through which managers manipulate earnings to achieve such smoothed earnings (Barton 2001; Pincus and Rajgopal 2002).

We extend the literature by examining how corporate hedging activities influence auditing and financial reporting. We primarily take an auditing perspective and focus on audit pricing; however we also consider the effects on financial reporting complexity and audit quality. Ex ante, it is unclear how hedging affects auditor behavior due to two competing arguments. One view argues that because hedging reduces the incidence of “left-tail” outcomes (Stulz 1996), it should decrease the litigation risk faced by auditors, which should lead to lower audit fees (Venkataraman, Weber, and Willenborg 2008). Supporting evidence from prior

studies shows that active risk management through hedging decreases bankruptcy risk by reducing cash-flow volatility (Smith and Stulz 1985; Guay 1999), lowering interest spreads, easing capital-expenditure restrictions (Campello et al. 2011), and increasing firms' debt capacity (Graham and Rogers 2002). Hedging also reduces profits of insider trading and lessens short-selling incentives (Manconi et al. 2018), which is expected to decrease the litigation risk imposed on auditors (Hope, Hu, and Zhao 2017).

In contrast, the alternative view argues that because the accounting for hedging activities is "exceedingly complex" (Ryan 2007) and difficult to audit (Bratten, Gaynor, McDaniel, Montague, and Sierra 2013; Cannon and Bedard 2017), hedging increases audit risk and auditor effort, which should result in higher audit fees. Hedging activities are difficult to audit because hedging relies on intricate contracts whose values are based on the underlying assets/liabilities and because managers exert considerable judgment in applying accounting standards to hedging derivatives (Kawaller 2004). The proliferation of innovative financial instruments in recent years and changing accounting standards in this area further complicate the issue.¹ The accounting complexity of hedging, accompanied by the discretion exerted by managers, increases the risk of misstatements (Peterson 2012) and results in higher audit risk. Auditors thus need to devote greater effort to lower the audit risk associated with hedging to an acceptable level (Hogan and Wilkins 2010).

Using hand-collected data on the corporate hedging activities of nonfinancial firms from 2000 to 2014, we find that hedging is associated with higher audit fees. The result holds

¹ Prior to SFAS 133, the accounting guidance for hedging activities was inconsistent. The requirements to qualify as a hedge, the accounting treatment and recognition of derivatives used in hedging, and the measurement or valuation of derivatives used in hedging all varied depending on the type of instrument and risk involved. The effects of derivatives used in hedging were opaque in the financial statements, with some derivatives recognized in the financial statements and others not. To address this controversy, the Financial Accounting Standard Board (FASB) spent several years of consultation and finally issued SFAS 133. Following SFAS 133, the FASB continued to improve hedge accounting through issuing guidance and new or amended standards. We present a brief discussion of those standards in Section 2. Although these standards improve the consistency of hedge accounting, they are still considered to be complicated and difficult to apply by practitioners (Ernst & Young 2017).

for both foreign currency-exchange-rate hedging and interest-rate hedging. Consistent with our argument that financial reporting complexity is a key channel through which hedging affects audit pricing, our results show that corporate hedging results in significantly increased complexity of financial statements. Furthermore, the *extent* to which firms engage in hedging activities varies across hedging firms. Firms engaging in more sophisticated hedging activities should experience greater increases in financial statement complexity and audit fees. To shed light on this issue, we develop a novel measure that takes into consideration the *number* of different types of derivatives used for hedging purposes to proxy for the sophistication of a firm's hedging activities. Consistent with our prediction, firms having more sophisticated hedging arrangements exhibit greater financial statement complexity and higher audit fees. Taken together, our results show that financial reporting complexity and audit fees are affected not only by whether a firm engages in hedging but also by the degree of sophistication of the hedging activities.

One concern is that a firm's decision to hedge may be spuriously driven by other firm characteristics that simultaneously influence audit fees. Although our multivariate analyses contain numerous control variables and we investigate both the existence of hedging and the magnitude of hedging, to further address this endogeneity issue, we use changes analyses, treatment regressions with an instrumental variable, and difference-in-differences designs with propensity-score matching. The changes design examines whether audit-fee changes are significant if non-hedging firms *switch* to become hedging firms, relative to firms that maintain their status as non-hedging firms. Next, motivated by prior research we use tax convexity as an instrument for corporate hedging to alleviate the concern that *unobservable* correlated omitted variables drive the results. Finally, the difference-in-differences design provides a focused setting in which we use propensity scores to match firms that are initiating hedging for the first time with similar firms that never use hedging (i.e., "matching on observables"), and examine

whether their audit-fee difference significantly changes after hedging initiation. Results based on different designs provide consistent evidence. Corroborating evidence, using multiple designs, provides more confidence about the inferences drawn about the effect of corporate hedging on audit pricing.

Further, we show that the impact of corporate hedging on audit fees varies with the client firms' information environment and with auditors' expertise and experience in auditing hedging activities. The increased auditor effort associated with hedging is expected to be even higher if the hedging firms' information environment is opaque and if the auditor lacks relevant expertise and experience. Our analyses indeed show that the effect of hedging on audit fees is more pronounced for firms with greater analyst forecast dispersion (our proxy for opacity) and for auditors lacking experience in hedge accounting. Finally, consistent with our argument that auditors dedicate more effort in auditing the financial statements of hedging firms in order to lower the increased audit risk associated with hedging activities to an acceptable level, we find that audit quality of hedging firms is similar to that of non-hedging firms.

This study makes several contributions to the literature. First, it sheds new light on the influence of corporate hedging on financial reporting and auditing. It has long been argued that hedge accounting is extremely complex for both financial statement preparers and users. Our research suggests that auditors, an important party providing assurance on financial information, are sensitive to the financial reporting complexity and the resulting audit risk induced by corporate hedging activities, and in response exert more audit effort and charge higher fees. While prior studies document the impact of hedging on corporate policies such as corporate financing, investments, and tax avoidance (Graham and Rogers 2002; Campello et al. 2011; Allayannis and Weston 2001; Donohoe 2015), we show that the impact of hedging extends to third parties other than the hedging firm itself. Importantly, while prior studies only

focus on the influence of the use of hedging per se, we provide evidence that the sophistication of hedging activities also matters.

Second, prior studies find that, although hedging reduces cash-flow volatility, which in turn results in a number of benefits such as lower cost of debt and higher level of investments (Minton and Schrand 1999; Campello et al. 2011), hedging also incurs direct costs such as transaction costs (Bodnar, Hayt, Marston, and Smithson 1995) and indirect costs such as a worsened information environment (Campbell et al. 2015; Chang, Donohoe, and Sougiannis 2016). Given that audit fees are arguably a type of monitoring cost imposed on firms (Hope et al. 2017), our finding of increased audit fees caused by hedging activities suggests another potential cost associated with hedging and contributes to the debate on the benefits and costs of hedging activities. Moreover, since all derivatives used in hedging must be measured at fair value, our research also contributes to the long-standing debate concerning the costs and benefits of expanding the use of fair-value accounting. Proponents argue that expanding fair-value accounting makes financial statements more relevant to users, whereas opponents posit that such practice complicates financial statements and reduces their reliability. While the trade-off between the benefits and costs of fair-value accounting is beyond the scope of this study, our findings imply that fair-valued financial instruments, which are applied in hedging, are complex and can impose a significant audit risk even though hedging reduces the overall business risk of a firm.

Third, this study contributes to the literature on risk management. Although firms are increasingly aware of the need to effectively manage risks and are actively engaging in risk-management activities, evidence regarding the influence of companies' risk-management activities on external auditors' behavior is scarce (Cohen et al. 2017). We show that the initiation of corporate financial hedging, an important part of companies' risk-management

activities, significantly increases the difficulty of financial statement audits and leads to increased audit fees.

2. Prior Literature and Hypothesis Development

2.1 Economic Consequences of Corporate Hedging Activities

Risk management through financial hedging is an important aspect of corporate financial policy and has contributed to the explosion in financial innovation over the last decade. Growth in the currency and interest-rate derivative markets and the market of over-the-counter derivatives (e.g., swaps) has contributed to the supply of tools to hedge specific risks (DeMarzo and Duffie 1995; Campello et al. 2011). Given the increasing prevalence of hedging activities, it is important to address their economic consequences.

The existing literature suggests that hedging incurs both benefits and costs. For example, hedging brings benefits to corporations by improving debt capacity, facilitating investments, and enhancing firm valuation (Graham and Rogers 2002; Campello et al. 2011; Allayannis and Weston 2001). However, managers may implement hedging for tax-avoidance purposes (Donohoe 2015) and use hedging as a substitute for accruals manipulation so as to achieve a desired level of earnings volatility (Barton 2001; Pincus and Rajgopal 2002). Moreover, while Manconi et al. (2018) find that hedging increases firms' information transparency and reduces profits from insider trading, Chang et al. (2016) report that financial analysts, despite their expertise in interpreting accounting and financial information, routinely misjudge the earnings implication of firms' hedging activities, leading to inaccurate forecasts.

2.2 Complexity of Hedge Accounting

Hedge accounting has navigated years of controversy. Prior to SFAS 133, derivative accounting was criticized as being fragmented and inconsistent (Choi, Mao, and Upadhyay

2014).² In response, the Financial Accounting Standard Board (FASB) began deliberating issues related to derivatives and hedging transactions in 1992 and issued SFAS 133, *Accounting for Derivative Instruments and Hedging Activities*, which became effective in 2000. In following years, the FASB continued to amend accounting standards related to derivatives and hedging activities and released several relevant standards, including SFAS 155, *Accounting for Certain Hybrid Financial Instruments*, SFAS 157, *Fair Value Measurements*, and SFAS 161, *Disclosure about Derivative Instruments and Hedging Activities*.³

The complexity involved in accounting for hedging activities is threefold. First, SFAS 133 requires all derivatives to be carried at their fair values, regardless of the purpose of holding. Prior studies have demonstrated that fair-value assets, especially level-3 assets, are subject to significant measurement discretion and are thus more likely to contain intentional or unintentional errors in accounting estimates (Cannon and Bedard 2017). Inspection reports from the Public Company Accounting Oversight Board (PCAOB) continue to cite audit deficiencies in auditing fair values and related estimations (PCAOB 2012, 2013).

Second, for a derivative to be qualified as hedging, SFAS 133 requires firms to demonstrate that the hedging is effective, which requires further managerial judgment (Zhang 2009). Moreover, for a derivative that qualifies as a hedging instrument, the recognition of any gain or loss on the derivative depends on the type of hedges.⁴ For instruments that qualify as

² Before SFAS 133, standards related to derivatives and hedging include SFAS 80, *Accounting for Future Contracts*, SFAS 105, *Disclosure of Information about Financial Instruments with Off-Balance-Sheet Risk and Financial Instruments with Concentrations of Credit Risk*, SFAS 119, *Disclosure about Derivative Financial Instrument and Fair Value of Financial Instruments*, and SFAS 52, *Foreign Currency Translation*.

³ Under SFAS 133, all derivatives are carried at fair value. While hedge accounting continues, the accounting varies based on the types of hedge relationship. Because all derivatives are on the balance sheet, the mechanics of hedge accounting impact other accounts on the balance sheet in order to preserve the hedging effect in the income statements. Although additional disclosure is also required under SFAS 133, this standard does not provide adequate information about how derivative and hedging activities affect an entity's financial position, financial performance, and cash flows. To address the concern about the inadequate disclosure requirements in SFAS 133, SFAS 161 further requires disclosure of the objectives for using derivative instruments in terms of underlying risk and accounting designation.

⁴ The FASB classifies hedges into fair-value hedges, cash-flow hedges, and hedges of foreign-currency exposure. Fair-value hedges hedge the exposure to changes in fair values of recognized assets or liabilities or of an unrecognized firm commitment; cash-flow hedges hedge the exposure to variability in expected future cash flows of recognized assets or liabilities or of unrecognized forecasted transactions; hedges of foreign currency exposure

fair-value hedges, the gain (loss) along with the offsetting loss (gain) on the hedged item is recognized in earnings. For instruments that qualify as cash-flow hedges, the effective portion of the gain (loss) is reported as other comprehensive income until the underlying transaction is closed when the gain (loss) from cash-flow hedges is offset with the loss (gain) from the underlying transaction. In contrast, the ineffective portion of the gain or the loss is immediately recognized in earnings.

Third, in addition to the issues related to measurement and recognition, the disclosure of derivatives and hedging activities is complex, inconsistent across firms, and presented in a disaggregated matter in the notes to the financial statements (Campbell et al. 2015; Pierce 2017; Campbell, Khan, and Pierce 2017). Although SFAS 161 mandates more detailed disclosure of firms' hedging activities, whether the additional disclosure helps improve firms' information environment is still under debate (Chang et al. 2016). Moreover, when responding to the FASB's proposed Accounting Standards Updates, *Accounting for Financial Instruments and Revisions to the Accounting for Derivative Instruments and Hedging Activities*, both financial statement preparers and auditors expressed concerns over the current and proposed standards regarding hedge accounting presentation and disclosures (FASB, 2010).

2.2 Hypothesis Development

Simunic's (1980) audit-fee model, based on an auditor's cost function, consists of two components: a resource-cost component that increases with audit risk and effort and an expected future-loss component that increases with auditor litigation risk (Willekens 2011). Based on this model, prior literature on audit-fee determinants shows that factors increasing auditor effort, such as client size and complexity, and factors exposing auditors to higher

hedge the translation exposure to changes in foreign exchange rates. Campbell (2015) and Campbell, Downes, and Schwartz (2015) reveal that cash-flow hedges are particularly complex transactions, and even sophisticated information users, such as financial analysts, cannot fully incorporate the information disclosed in the fair value of cash-flow hedges.

litigation risk, such as financial distress, are associated with higher audit fees (e.g., Hay, Knechel, and Wong 2006; DeFond and Zhang 2014).

Corporate hedging activities affect litigation risk and audit risk faced by an auditor in different directions. This provides an interesting setting to examine which audit-pricing component has the most significant effect on audit fees. On one hand, given that hedging reduces cash-flow volatility (Minton and Schrand 1999; Zhang 2009), lowers interest spreads, eases capital-expenditure restrictions (Campello et al. 2011), increases firms' debt capacity (Graham and Rogers 2002), and increases firm value (Allayannis and Weston 2001; Perez-Gonzalez and Yun 2013), it is expected to reduce a firm's bankruptcy risk. Prior research suggests that the primary consideration in the auditor's assessment of litigation risk is a client's overall financial condition and its probability of future bankruptcy (Pratt and Stice 1994). Moreover, recent studies find that short-selling threats increase the litigation risk imposed on auditors, which leads to higher audit fees (Cassell, Drake, and Rasmussen 2011; Hope et al. 2017). Hedging is found to reduce the information advantage of informed traders and thus lessens short-selling threats, which should in turn decrease the litigation risk auditors face. To the extent that hedging reduces auditors' litigation risk, it should lead to lower audit fees.⁵

On the other hand, auditing financial statements containing hedging activities is extremely complicated and induces significant audit risk whereby the auditor issues a clean opinion when the financial statements contain material misstatements. The increased audit risk stems from the intricate complexity of hedging contracts and the considerable judgment that managers make in applying accounting standards related to hedging activities. Prior studies find that misreporting increases with accounting complexity (Peterson 2012) and that managers

⁵ In addition to developing the arguments based on the prior literature, we explicitly test whether firms engaging in hedging activities have lower litigation risk. Specifically, following Field, Lowry, and Shu (2005), we obtain firm-level litigation data from the Stanford Law School Securities Class Action Clearing House and investigate whether hedging is associated with a lower likelihood of firms being sued in the future. We find supporting evidence.

have incentives to use hedging for opportunistic reasons, such as aggressive tax avoidance and manipulation of earnings through tax accounts (Donohoe 2015; Hanlon, Krishnan, and Mills 2012). In order to lower the heightened audit risk associated with hedging activities to an acceptable level, auditors need to invest significant resources to gain the necessary knowledge in order to be able to apply complex estimates and attain professional judgment to verify the assertions made by managers. This increases auditor effort, which should result in increased audit fees.

Given the potential opposite effects of hedging on litigation risk and audit risk, it is not clear, *ex ante*, how corporate hedging activities will influence audit pricing. Therefore, our hypothesis, stated in the null form, is as follows:

Hypothesis: Corporate hedging does not affect audit fees.

In additional analyses, we further examine whether hedging affects financial reporting complexity (i.e., a channel analysis) and whether the degree of sophistication of hedging activities affects financial reporting complexity and audit fees (i.e., whether the *magnitude* of hedging matters). We also test whether the effect, if any, varies with the client information environment and auditor experience. To the extent that auditors exert more effort when auditing the financial statements of firms with hedging activities, the increased audit effort would suggest that the audit quality of firms with hedging activities should be at least the same, if not higher, than the audit quality of firms without hedging. Thus, we also investigate the influence of hedging on audit quality.

3. Research Design

3.1 Sample and Data

Following previous literature (Allayannis and Weston 2001; Purnanandam 2008; Campello et al. 2011; Manconi et al. 2018), we focus on firms' use of financial instruments to hedge against interest-rate risk and/or foreign exchange-rate risk, and search for associated keywords in firms' 10-K and 10-Q filings that are downloaded through EDGAR on SEC's website.^{6,7} A firm is defined as using foreign exchange-rate hedging (FX Hedge=1) if the firm's filings contain keywords related to foreign exchange-rate hedging; similarly, a firm is defined as employing interest-rate hedging (IR Hedge=1) if the firm's filings contain keywords associated with interest-rate hedging. A firm is considered as using hedging (FX/IR Hedge=1) if the firm utilizes either foreign exchange-rate or interest-rate hedging. After identifying hedging firms by keywords, we manually screen the filings of identified hedging firms to ensure that the financial instruments, as mentioned by the keywords, are actually used for the hedging purpose. We obtain financial and audit-related variables from Audit Analytics, Compustat, and CRSP. Our final pooled sample consists of 35,595 firm-year observations from

⁶ We focus on hedges against foreign exchange-rate risk and interest-rate risk because they are the most commonly used hedging instruments and represent 96% of the notional value of outstanding derivatives (Bank for International Settlements 2017). With a selective sample of large firms, Guay and Kothari (2003) also find that most firms hedge their exposure to interest-rate and foreign exchange-rate risks. Nevertheless, in untabulated analyses we rerun our analyses after excluding 2,001 firm-year observations from the oil, gas, and coal extraction and production industries (SIC 1200-1399 and 2900-2999), which are the most likely to engage in commodity hedging. Our conclusions remain unchanged.

⁷ We follow exactly Manconi et al. (2018) to identify hedging firms. Specifically, we use the following keywords when searching for interest-rate hedging activities: "interest-rate swap," "interest-rate cap," "interest-rate collar," "interest rate floor," "interest rate forward," "interest rate option," and "interest rate future." For foreign exchange-rate hedging activities, we use the following keywords: "foreign exchange forward," "forward foreign exchange," "foreign exchange rate forward," "currency forward," "currency rate forward," "foreign exchange option," "currency option," "foreign exchange rate option," "currency rate option," "foreign exchange future," "currency future," "foreign exchange swap," "currency swap," "foreign exchange rate swap," "currency rate swap," "foreign exchange cap," "currency cap," "foreign exchange rate cap," "currency rate cap," "foreign exchange collar," "currency collar," "foreign exchange rate collar," "currency rate collar," "foreign exchange floor," "currency floor," "foreign exchange rate floor," and "currency rate floor." For both interest-rate hedging and foreign exchange-rate hedging, we require the keywords to be mentioned at least three times in the 10-K and 10-Q filings. In addition, we carefully exclude filings containing phrases such as "do (does) not use (have, utilize, enter) interest rate (foreign exchange rate) derivatives."

2000 to 2014. Our sample begins in 2000 because this is the year in which data on audit fees became available in Audit Analytics.

3.2 Empirical Models for Pooled Sample

To test our hypothesis regarding the influence of hedging activities on audit pricing, we first estimate the following OLS regression using the pooled full sample (firm-year subscripts suppressed):

$$\text{Audit Fees} = \alpha_0 + \alpha_1 \text{Hedge} + \sum \alpha_k \text{Control}_k + \varepsilon \quad (1)$$

where the dependent variable, *Audit Fees*, is the natural logarithm of annual total audit fees. Our test variable, *Hedge*, is an indicator variable that equals one if a firm is identified as a hedger, and zero otherwise. Given that we focus on both foreign exchange-rate and interest-rate hedging, a firm is considered as a hedger if it uses interest-rate hedging (*IR Hedge* = 1), or foreign-exchange hedging (*FX hedge* = 1), or either (*IR/FX Hedge* = 1). A positive (negative) and significant coefficient on *Hedge* suggests that hedging is associated with higher (lower) audit fees.

We control for several firm characteristics that are documented to influence audit fees, which are represented by *Control* in equation (1). Following prior studies (e.g., Hay et al. 2006; Engel, Hayes, and Wang 2010; Hope et al. 2017), we include general firm characteristics related to firm size, complexity, and risk, which are identified as key drivers of audit fees, as well as audit-related factors. Specifically, in the first group of controls, we employ firm size (both *Log of Assets* and *Log of Sales*), leverage (*Leverage*), market-to-book ratio (*MTB*), performance (both *ROA* and *Return*), the number of business segments (*Business Segments*), the number of foreign geographic segments (*Foreign Segments*), an indicator variable for

reporting foreign-currency adjustments (*FOROPS*), R&D intensity (*R&D*), and an indicator for involvement in mergers and acquisitions (*M&A*).

In the second group, we add an indicator variable for negative reported earnings (*Loss*), the ratio of inventory and accounts receivable to total assets (*Receivable/Inventory Intensity*), tax aggressiveness proxied by the GAAP effective tax rate (*GETR*), an indicator variable for operating in high litigation-risk industries (*Litigation Industry*),⁸ an indicator variable for being audited by Big-4 auditors (*Big4*), an indicator variable for receiving a going-concern opinion (*Going Concern*), an indicator variable for December fiscal years (*Busy Season*), and the number of days between the fiscal year-end and the auditor report date (*Audit Report Lag*). We also include industry and year fixed effects and cluster the standard errors at the firm level. All variables are defined in the Appendix.

3.3 Addressing Potential Endogeneity

A firm's decision to use hedging is not random. A concern of cross-sectional analyses of the levels of audit fees is that some firm characteristics, not included in the regression but correlated with both the decision to use hedging and audit fees, could drive the results. Although we control for numerous firm characteristics that could potentially affect both audit fees and the likelihood of firms engaging in hedging activities, our results could still suffer from an endogeneity problem related to unknown correlated omitted variables. We use three approaches to address and, at least partially, mitigate such concerns: change-level analyses, Heckman self-selection model, and difference-in-differences with propensity-score matching (PSM) designs. In addition, although this is not the primary reason for also examining the *degree* (or sophistication) of hedging activities, this analysis can also help address endogeneity

⁸ Based on prior literature, *Litigation Industry* includes industries with SIC code of 2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7374. Note that we can include both *Litigation Industry* and industry fixed effects as these are measured at different SIC levels (4-digit and 2-digit SIC codes, respectively).

issues. That is, clearly the degree to which firms engage in hedging is also potentially endogenous, however it is not the exact same source of endogeneity as when considering whether firms hedge or not.

3.3.1 Changes Analyses

In the change-level analyses (that control for potential time-invariant omitted variables), we test whether turning from a non-hedger (hedger) to a hedger (non-hedger) leads to increased (decreased) audit fees. Specifically, we estimate the following OLS regression (firm-year subscripts suppressed):

$$\Delta \text{Audit Fees} = \beta_0 + \beta_1 \text{KeepUsing} + \beta_2 \text{TurnUsing} + \beta_3 \text{QuitUsing} + \sum \beta_k \text{Control}_k + \varepsilon \quad (2)$$

where the dependent variable, $\Delta \text{Audit Fees}$, is the change in audit fees from the previous year to the current year. For the independent variables, *KeepUsing* equals one if a firm continues to be a hedger from the previous year to the current year, and zero otherwise; *TurnUsing* equals one if a firm turns from a non-hedger to a hedger from the previous year to the current year, and zero otherwise; *QuitUsing* equals one if a firm turns from a hedger to a non-hedger from the previous year to the current year, and zero otherwise. By coding variables this way, the benchmark group in equation (2) consists of firms that continue to be non-hedgers from the previous year to the current year. Our test variables are *TurnUsing* and *QuitUsing*. A positive (negative) coefficient on *TurnUsing* (*QuitUsing*) suggests that adopting (quitting) hedging activities leads to increased (decreased) audit fees. The control variables in equation (2) are the same as those included in equation (1). Year and industry fixed effects are included in all models, and standard errors are clustered at the firm level.

3.3.2 Heckman Two-Stage Model

As a more direct way to address the endogeneity issue related to *unobservable* omitted variables, we follow prior literature and perform a Heckman treatment regression, relying on a salient institutional feature of the U.S. corporate tax code, namely corporate income-tax convexity, as an instrument of corporate hedging (Graham and Smith 1999; Campello et al. 2011; Manconi et al. 2018). Corporate income-tax convexity exists because of a nonlinear tax treatment of corporate earnings in different tax brackets, as well as the existence of net operating loss carry-forwards/carry-backs, investment tax credits, and the alternative minimum tax (Graham and Smith 1999). The degree of tax convexity influences the potential benefits that firms can obtain from hedging and is found to have significant predictive power for firms' choice of hedging activities. Greater tax convexity incentivizes firms to hedge, but a priori tax convexity is not expected to have a direct, first-order effect on audit fees. A number of prior studies use tax convexity as an instrumental variable in their identification strategy when testing for hedging consequences (e.g., Campello et al. 2011; Manconi et al. 2017).

We carefully follow prior studies in constructing the variable *TaxConvexity* and estimate a probit model of the determinants of corporate hedging, using *TaxConvexity* as the instrumental variable (Graham and Smith 1999; Campello et al. 2011; Manconi et al. 2018).⁹ We then calculate the Inverse Mills Ratio (*Mills*) and add it to our second-stage regression of audit fees. Given that our hedging variable is an indicator variable, we rely on the treatment-regression methodology that jointly estimates first- and second-stage equations via maximum likelihood to achieve greater estimation precision (Cameron and Trivedi 2005).

⁹ Specifically, we follow Graham and Smith (1999) and use the following model to calculate *TaxConvexity*:
 $TaxConvexity = 4.88 + 0.019 \times TIVol - 5.50 \times TICorr - 1.28 \times DITC + 3.29 \times DNOL + 7.15 \times DSmallNeg$

$$+ 1.60 \times DSmallPos - 4.77 \times DNOL \times DSmallNeg - 1.93 \times DNOL \times DSmallPos$$

where *TIVol* is the volatility of taxable income, *TICorr* is the serial correlation of taxable income, *DITC* is an indicator for investment tax credits, *DNOL* is an indicator for net operating losses, and *DSmallNeg* (*DSmallPos*) is an indicator for small negative (positive) taxable income. According to Graham and Smith (1999), the index can be viewed as the expected percentage savings in tax liability arising from a 5% reduction in taxable income volatility.

3.3.3 Difference-in-Differences Design with PSM

Our third approach to alleviate endogeneity (related to observable firm characteristics across firms as well as time-invariant firm-level factors) relies on a difference-in-differences design in which we focus on first-time new hedging users (treated firms). Following Donohoe (2015) and Chang et al. (2016), a firm is considered as a first-time hedger if the firm did not report using hedging when it first appears in the sample, but did report to start using hedging in one of the subsequent years. Firms enter the group of treated firms only if they report hedging for the first time. We identify firms that *never* employ hedging throughout the sample period as potential control firms and conduct propensity-score matching (PSM) between treated and control firms. Specifically, we first predict firms' probabilities of initiating hedging for the first time using the model from Manconi et al. (2018) and calculate their propensity scores.¹⁰ For each treated firm in the hedging initiation year, we match it with a control firm from the same industry-year that has the closest propensity score and require the score not to be larger than 0.1.¹¹

We then examine whether audit fees for treated firms significantly increase after they initiate hedging relative to their matched control firms. The specific model used in the difference-in-differences design is as follows (firm-year subscripts suppressed):

$$\text{Audit Fees} = \gamma_0 + \gamma_1 \text{Initiate} + \gamma_2 \text{Post} + \gamma_3 \text{Initiate} \times \text{Post} + \sum \gamma_k \text{Control}_k + \varepsilon \quad (3)$$

¹⁰ Specifically, the following model is used to predict firms' probabilities of initiating hedging (firm-year subscripts suppressed):

$$\begin{aligned} \text{Initiate} = & \beta_0 + \beta_1 \text{Tax Convexity} + \beta_2 \text{Log of Assets} + \beta_3 \text{MTB} + \beta_4 \text{Lev} + \beta_5 \text{Cash Flow} + \beta_6 \text{Prior Return} \\ & + \beta_7 \text{Institutional Ownership} + \beta_8 \text{Analyst Coverage} + \beta_9 \text{Foreign Income Ratio} + \beta_{10} \text{No Foreign Income} \\ & + \beta_{11} \text{Floating Debt Ratio} + \beta_{12} \text{Rated} + \text{Year Indicator} + \text{Industry Indicator} + \varepsilon \end{aligned}$$

¹¹ We formally test the parallel-trend assumption and find supportive evidence. Specifically, the difference between the treatment group and the matched control group remains stable in the pre-hedging-initiation period. We use a caliper distance of 0.1 because we achieve covariate balance (see Panel B of Table 6). Nevertheless, as untabulated robustness checks, we use caliper distances of 0.08 or 0.03 and obtain consistent results.

where *Initiate* equals one for treated firms and zero for matched control firms. For each pair of matched firms, *Post* equals one for the post-hedging period, and zero for the pre-hedging period. We use two different windows to specify pre- and post-hedging periods. In the first identification method, for a pair of matched firms, we consider *all* years before the treated firm adopted hedging as the pre-hedging period and *all* years after the hedging adoption as the post-hedging period. In the second identification method, we constrain the pre- and post-hedging periods to be five years before and five years after the hedging initiation. Our focus is on testing whether the audit-fee differences between first-time hedgers and their matched control firms significantly increase from the pre- to the post-hedging period, which is captured by the interaction term, $Initiate \times Post$. If hedging leads to increased (decreased) audit fees, the coefficient on the interaction term should be positive (negative) and significant. Again, we include all the control variables specified previously as well as year and industry fixed effects, and cluster the standard errors at the firm level.¹²

4. Empirical Results

4.1 Descriptive Statistics and Univariate Analyses

We describe the distributions of hedgers and non-hedgers in our pooled sample across different years and industries in Panels A and B of Table 1, in which industry groups are based on the Fama-French 12-industry classification. The industry distribution shows that the use of hedging varies significantly across industries, with the proportion of hedgers ranging from 24.2% in healthcare, medical equipment, and drugs, to 68.5% in chemicals and allied products. Overall, 43.5% of the sample firm-years indicate engagement in hedging, suggesting that

¹² No inferences are affected if we also interact *Post* with all control variables.

hedging activities have been widely adopted. The percentages of hedging firms across years are similar to those reported in prior studies (e.g., Chang et al. 2016).

Panel A of Table 2 summarizes descriptive statistics of the variables used in the regressions. Among the 43.5% of firms engaged in corporate hedging, 21.8% of them hedge against foreign exchange-rate risk and 32.9% of them hedge against interest-rate risk.¹³ These ratios are consistent with prior studies (e.g., Campello et al. 2011; Manconi et al. 2018). The mean value of the natural logarithm of audit fees is 13.57, which translates into \$1.812 million US dollars, which is also similar to previous studies (e.g., Hope et al. 2017).

Panel B of Table 2 compares firm characteristics across hedgers and non-hedgers. The panel shows that hedgers are generally charged higher audit fees compared to non-hedgers: the mean (median) of log of audit fees for hedgers is 14.183 (14.184) or \$2.899 (\$1.446) million if unlogged, while the mean (median) of the log of audit fees for non-hedgers is 13.09 (13.10) or \$0.977 (\$0.489) million if unlogged. The difference in audit fees between hedgers and non-hedgers is both statistically and economically significant. Moreover, hedgers are associated with larger size, higher ROA, higher leverage, greater presence in litigious industries, and higher tendency to choose Big-4 auditors.

Panel C presents the correlation matrix for the variables used in regressions. Consistent with hedging being associated with higher audit fees, the correlations between log audit fees and our corporate hedging measures (i.e., FX Hedge, IR Hedge, and FX/IR Hedge) are all positive at the 1% significance level.

¹³ Recall that some firms use both foreign exchange-rate risk and interest-rate risk hedging.

4.2 Regression Results

4.2.1 Analyses of Levels of Audit Fees

We report the results of cross-sectional differences in the levels of audit fees based on the pooled full sample regression in Table 3. Columns (1), (2), and (3) present the results for *FX Hedge*, *IR Hedge*, and *FX/IR Hedge*, respectively. We find strong evidence that corporate hedging is associated with higher audit fees: the coefficients on the hedging indicators across the columns are all positive and statistically significant at the 1% level (using two-sided tests). The magnitude of the coefficients reveals that the influence of hedging on audit fees is also economically significant: *ceteris paribus*, a firm that engages in foreign exchange-rate hedging (*FX Hedge* = 1) is charged approximately 18.3% higher audit fees, or equivalently \$228,135 based on the mean value of audit fees for firms without foreign exchange-rate hedging. The influence of interest-rate hedging on audit fees is smaller in magnitude: relative to firms not using interest-rate hedging (*IR Hedge* = 0), firms engaging in interest-rate hedging (*IR Hedge* = 1) face 4.6% higher audit fees, which is equivalent to \$55,213 based on the mean value of audit fees charged to firms without interest-rate hedging. If both foreign exchange-rate and interest-rate hedging are considered (*FX/IR Hedge* = 1), firms engaging in hedging are associated with 7.8% higher audit fees, an increase equivalent to \$76,206.^{14,15}

4.2.2 Changes Analyses

We tabulate the results for the changes analyses in Table 4. Column (1), (2), and (3) present the results for *FX Hedge*, *IR Hedge*, and *FX/IR Hedge*, respectively. These results are

¹⁴ Our inferences stay consistent if we explicitly control for firms' bankruptcy risk and performance volatility. Specifically, when we add Altman z-score (Altman 1968), volatility of ROA, and volatility of stock returns into the regression, *FX Hedge* (coefficient = 0.172, $p < 0.01$), *IR Hedge* (coefficient = 0.043, $p < 0.01$), and *FX/IR Hedge* (coefficient = 0.072, $p < 0.01$) remain positive and significant.

¹⁵ In untabulated analyses we consider whether the introduction of SFAS 161 affected the importance of hedging for auditors. That is, the additional disclosure requirements under SFAS 161 could further increase audit risk. We observe that the estimated coefficient on *FX/IR Hedge* increases by 20%. Specifically, the coefficient on *FX/IR Hedge* is 0.065 ($p < 0.01$) for the pre-SFAS 161 period and increases to 0.078 ($p < 0.01$) for the post-SFAS 161 period. However, the difference is not statistically different (two-sided p -value of 0.36).

consistent with the levels findings reported above. Specifically, the coefficients on *TurnUsing* are positive and significant at the 1% level (using two-sided tests) across all columns, suggesting that, compared to audit-fee changes incurred by firms that continue to be non-hedgers, audit-fee changes for firms switching from being non-hedgers to becoming hedgers are significantly larger. On average, compared to the audit-fee changes of firms keeping their status as non-hedgers, firms changing to use either foreign-exchange or interest-rate hedging (i.e., switching from *FX/IR Hedge* = 0 to *FX/IR Hedge* = 1) experience a 4.8% increase in audit fees (or an increase of \$46,896).

In a similar spirit, the coefficients on *QuitUsing* are negative and significant (at the 5% level or better) across all columns, suggesting that, relative to firms that continue to be non-hedgers, firms switching from hedgers to non-hedgers experience significant audit-fee decreases. The magnitude of the coefficients suggests that, relative to firms keeping their status as non-hedgers, firms that stop using *FX Hedge*, *IR Hedge*, or *FX/IR Hedge* incur 4.2%, 3.6%, and 3.7% decreases in audit fees, respectively.

4.2.3 Treatment Regression with Instrumental Variable

Results based on treatment regressions using tax convexity as an instrument for corporate hedging are reported in Table 5. Panel A presents the results of the first-stage determinant model of corporate hedging and Panel B presents the results of the second-stage regression of audit fees. Panel A shows that, regardless of the hedging indicator considered, *TaxConvexity* has significant power of predicting hedging activities, which is in line with prior literature (Graham and Smith 1999; Campello et al. 2011; Manconi et al. 2018).¹⁶ We also find

¹⁶ We check the validity of *TaxConvexity* to be used as the instrumental variable. First, the correlation between *TaxConvexity* and audit fees is insignificant (correlation = 0.0081, p-value = 0.1484, two-tailed). Second, in all three regressions, *TaxConvexity* passes the weak IV test (see Table 5). Third, the average Variance-Inflation-Factors (VIFs) are below 10 across the three models, suggesting that multicollinearity is not a problem in our model specifications.

that larger firms, firms with greater current assets and greater foreign income, and firms involved in M&A activities are more likely to engage in hedging, consistent with firms exposed to more risks being incentivized to hedge those risks.

More importantly, Panel B reports the second-stage regression results for which we add *Mills* into the regression.¹⁷ We find that the coefficients on *FX Hedge*, *IR Hedge*, and *FX/IR Hedge* remain positive and significant (at the 1% level), confirming our OLS regression results and suggesting that our findings are not driven by potential self-selection effects.

4.2.4 Difference-in-Differences Analyses with PSM

Panel A of Table 6 presents the regression results for the determinant model of first-time hedging initiation. The signs and significance of the determinant variables are consistent with Manconi et al. (2018). We are able to match 384 first-time hedgers with control firms. We compare the descriptive statistics of covariates after PSM and present the results of comparisons in Panel B of Table 6. This panel shows that the differences of covariates across treated firms and their matched control firms are all insignificant with the exception of *Leverage*.¹⁸

Regression results based on the difference-in-differences design are reported in Panel C of Table 6, with Column (1) presenting the results when all sample years are used to identify pre- and post-hedging periods and Column (2) presenting the results when pre- and post-hedging periods are defined within a 10-year window around treated firms' initiation of hedging (i.e., five years before and after initiation). In both columns, the insignificant coefficient on *Initiate* suggests that before the treated firms initiate hedging, there is no

¹⁷ *Mills* is statistically significant in all three second-stage models.

¹⁸ Note that we include all matching dimensions as control variables, including *Leverage*. No inferences are affected if we additionally include the square or the square root of *Leverage* in the regression as controls. Recall further that we have also run all analyses after including Altman z-score (Altman1968), volatility of ROA, and volatility of stock returns as additional regressors.

significant difference in audit fees across the treated firms and their matched control firms. More importantly, the coefficients on the interaction term *Initiate*×*Post* are positive and statistically significant (at the 10% level in Column 1 and 5% level in Column 2, using two-sided tests), consistent with the initiation of hedging leading to higher audit fees. Specifically, after the hedging initiation, the audit-fee difference between the treated and control firms widens by 8.2% (7.1% if the 10-year window is used) and the increase is statistically significant. Since the difference-in-differences design embeds strong controls for potential omitted variables, these results provide relatively strong evidence that the use of hedging leads to increased audit fees.

Overall, the analyses based on levels, changes, treatment regressions, and difference-in-differences designs show consistent results whereby the use of corporate hedging is associated with higher audit fees. However, we acknowledge that residual endogeneity may exist and our findings should be interpreted with that caveat in mind.

5. Additional Analyses

5.1 Channel Analyses: Corporate Hedging and Financial Reporting Complexity

We argue that the financial reporting complexity associated with hedging is one of the major factors that leads to increased audit risk and audit fees when firms adopt hedging activities. To provide empirical evidence to support this argument, we investigate whether corporate hedging increases financial reporting complexity. We use the number of complex words in firms' 10-K filings as the proxy for financial statement complexity, where complex words are defined as words containing three or more syllables (Guay, Samuel, and Taylor 2017). Data on the number of complex words are obtained directly from the SEC Analytics

Suite. We test whether hedging leads to more complex financial statements, using levels, changes, and difference-in-differences designs.

The regression results are reported in Table 7. Panel A presents the results regarding the cross-sectional differences of the levels of financial statement complexity across hedgers and non-hedgers, based on our pooled full sample. The coefficients of the hedging indicators *FX Hedge*, *IR Hedge*, and *FX/IR Hedge*, are all positive and significant (at the 5% level or better), suggesting that hedging is associated with more complex financial statements.

The results of the change-level analyses are presented in Panel B of Table 7. *KeepUsing*, *TurnUsing*, and *QuitUsing* are defined in the same way as in equation (2). The estimated coefficient on *TurnUsing* is positive and significant (at the 5% level or better), regardless of the hedging indicator considered. This result further supports our argument that hedging increases firms' financial reporting complexity.

Finally, the results based on the difference-in-differences design are presented in Panel C of Table 7. We find that before hedging initiation, there is no significant difference in financial statement complexity between treated firms and control firms. However, the positive and significant coefficient on *Initiate*×*Post* suggests that, relative to matched control firms that never use hedging, treated firms experience significant increases in financial statement complexity after initiating hedging.

Overall, the results from these analyses offer support for the idea that hedging increases financial reporting complexity, thus empirically corroborating our argument that financial reporting complexity is an important channel through which hedging leads to higher audit fees.

As an additional (untabulated) analysis, we add financial statement complexity as an *additional control variable* into our main regression that tests the effect of hedging on audit fees. Employing this additional control, the coefficient on *Hedge* still remains positive and significant. However, as expected, the magnitude of the coefficient decreases, consistent with

the importance of financial statement complexity. Specifically, the coefficient on *FX Hedge* reduces from 0.183 to 0.168, the coefficient on *IR Hedge* reduces from 0.046 to 0.038, and the coefficient on *FX/IR Hedge* reduces from 0.078 to 0.066.

5.2 The Degree of Sophistication of Hedging Activities

So far we have shown that whether or not a firm engages in hedging activities has implications for financial statement complexity and audit fees. For firms that adopt hedging activities, the magnitude or sophistication of the hedging activities is expected to vary, and such variation should influence the degree of financial reporting complexity induced by hedging activities as well as the auditor's effort and audit fees.

To shed light on how the extent of hedging activities influences financial statement complexity and audit fees, we rely on textual analysis of firms' 10-K and 10-Q filings and develop a novel measure of the degree of hedging sophistication. Specifically, we identify the number of different financial instruments that a firm uses for the hedging purpose, and consider firms using more diversified instruments in hedging as having a more sophisticated hedging arrangement. For hedging activities related to foreign currency-exchange-rate risks, we consider foreign-currency swaps, foreign-currency caps, foreign-currency collars, foreign-currency forwards, foreign-currency options, foreign-currency futures, and foreign-currency floors. For hedging activities related to interest-rate risks, we consider interest-rate swaps, interest-rate caps, interest-rate collars, interest-rate forwards, interest-rate options, interest-rate futures, and interest-rate floors.

The variable *FX Hedge Numbers* (*IR Hedge Numbers*) is calculated as the number of different types of financial instruments used by a firm to hedge risks related to foreign currency-exchange-rate (interest-rate), and the variable *FX/IR Hedge Numbers* is the total

number of different types of financial instruments used in hedging risks related to both foreign currency-exchange-rate and interest rate.¹⁹

Using the above novel measures of the degree of hedging sophistication instead of the indicator variables of whether a firm is engaged in hedging, we re-estimate our main regressions and report the results in Table 8.²⁰ Panel A presents the results for audit fees and Panel B presents the results for financial statements complexity. In both tables, the coefficients on *FX Hedge Number*, *IR Hedge Number*, and *FX/IR Hedge Number* are all positive and significant, suggesting that more sophisticated hedging activities are associated with greater increases in financial statements complexity and audit fees. These results are important, because most prior studies focus only on whether a firm engages in hedging and, we are the first (or at least among the first) to show that the influence of hedging relates to the degree of sophistication of the hedging activities.²¹

5.3 Cross-Sectional Variations: Client Information Environment and Auditor Experience

We predict that the effects of corporate hedging on audit fees will vary with client firms' information environment and their auditors' experience. Auditors should worry less about the hedging-induced increase in audit risk if the client has a more transparent information environment and hence a lower likelihood of misstatements and/or if the auditors have relevant expertise and experience that can help them effectively and efficiently address the audit issues arising from hedging activities. To test these predictions and to provide further corroborating

¹⁹ No inferences are affected if we use log-transformed values instead.

²⁰ We tabulate the results for the full sample. Conclusions are unaffected if we focus only on firms engaged in hedging activities and exclude non-hedging firms from the analyses.

²¹ The closest we are aware of is Chang et al. (2016) who employ an indicator of whether a firm uses more than two types of derivatives.

evidence for our main findings, we examine whether the effects of hedging on audit fees vary with client firms' information environment and auditor experience.

Following prior studies, we measure the opacity of a firm's information environment using analyst forecast dispersion (Diether, Malloy, and Scherbina 2002; Armstrong, Balakrishnan, and Cohen 2012). *Low Dispersion* is an indicator variable that equals one if a firm's analyst forecast dispersion is lower than the median of the firm's peers in the same industry-year, and zero otherwise. We then examine whether the influence of hedging on audit fees differs significantly across the groups of firms with high versus low forecast dispersion. The results are reported in Panel A of Table 9. We find that the hedging indicator, *FX/IR Hedge*, is positive and significant for both subsamples. Comparing the coefficients of *FX/IR Hedge* across the subsamples, we find that the magnitude of the coefficient on *FX/IR Hedge* is significantly larger for firms with higher analyst forecast dispersion (i.e., *Low Dispersion* = 0) than for firms with low forecast dispersion (i.e., *Low Dispersion* = 1). This result is consistent with hedging having a stronger effect on audit fees for more opaque firms.

Regarding auditors' expertise and prior experience, we measure an auditor's expertise in hedge accounting using the proportion of its clients that engage in hedging activities. *High Expertise* is an indicator variable that equals one if the auditor has hedging expertise that is above the sample median, and zero otherwise. We then estimate the effect of hedging on audit fees within the subsamples of high versus low expertise. The results are reported in Panel B of Table 9. Again, we find that the coefficients on *FX/IR Hedge* are positive and significant in both subsamples. However, a comparison of the magnitude of the coefficients across the subsamples reveals that the effect is significantly larger for firms with low-expertise auditors than for firms with high-expertise auditors, thus confirming that the influence of hedging on audit fees is more pronounced for auditors lacking experience in auditing financial statements with hedging activities.

Not only are the results of these cross-sectional analyses interesting by themselves but they also provide further support for our primary results. We find that the effect of hedging on audit fees is stronger in subsamples in which we have ex-ante reasons to expect the effects to be more prevalent. This provides further control for potential correlated omitted variables.

5.4 Audit Quality

If, as we argued before, auditors act upon the increased financial reporting complexity induced by hedging activities and accordingly increase their audit effort and charge higher fees, the increased audit effort would suggest that the audit quality of firms with hedging activities should be the same, if not higher, than the audit quality of firms without hedging. We empirically test this conjecture by investigating whether audit quality differs between hedging firms and non-hedging firms.

We proxy for audit quality using the likelihood of accounting misstatements (as revealed by future restatements) and the propensity of meeting or beating analyst forecasts.²² The results are tabulated in Table 10. Column (1) reports the results for misstatements in which the dependent variable *MISSTATE* equals one if a firm's financial statements contain material misstatements and are subsequently restated, and zero otherwise. We find that the coefficient on *FX/IR Hedge* is not statistically significant, suggesting that the audit quality does not differ significantly across hedging and non-hedging firms.

Column (2) reports the results for the analysis of the likelihood of meeting or beating analyst forecasts. The dependent variable *MEET/BEAT* equals one if a firm's earnings per share just meet or beat the most recent consensus analysts' earnings forecast by one cent or less, and

²² We do not use discretionary accruals to measure audit quality because prior studies find that managers may use discretionary accruals and hedging as substitutes for earnings-manipulation purposes (Barton 2001). In this sense, observing decreased discretionary accruals for hedging firms does not reflect increased audit quality. Moreover, we do not use the likelihood of auditors issuing going-concern opinions to proxy for audit quality because hedging is expected to reduce firms' bankruptcy risk that will mechanically influence auditors' going-concern opinions.

zero otherwise (Fang, Huang, and Karpoff 2016; Donohoe and Knechel 2014). The coefficient on *FX/IR Hedge* is negative and significant (z-statistic of 2.41, p-value <0.05), suggesting that the audit quality of hedging firms is higher than that of non-hedging firms.²³ Collectively, the results are consistent with the argument that auditors dedicate more effort in auditing financial statements with hedging activities (and thus obtain similar, if not higher, audit quality).²⁴

6. Conclusion

As an important risk-management tool, hedging activities have become increasingly prevalent among nonfinancial firms. While several prior studies examine the influence of hedging activities on firm risk and investment policies, this paper extends this stream of literature by showing that hedging affects auditing and financial reporting. Specifically, we tackle the financial reporting consequences of hedging activities from an auditing perspective, and find that audit fees increase following firms' engagement in hedging activities (and also increase with the degree of hedging). This result is at least partially driven by the significantly increased financial reporting complexity induced by hedging activities. In cross-sectional analyses, we further show that the influence of hedging on audit fees is more pronounced for firms with opaque information environments and for auditors lacking experience/expertise in auditing financial statements containing hedging activities.

We believe that this study enhances our understanding of the implications of hedging activities, and in a broader sense, the implications of firms' risk-management activities. It is important to understand the economic consequences of hedging. Although many studies have documented that hedging brings various benefits, we show that hedging also induces costs such

²³ We have also run these tests using *IR Hedge* and *FX Hedge* separately (untabulated). For *MISSTATE*, the coefficients are not significant: *FX Hedge* (coefficient = -0.015, p>0.1), *IR Hedge* (coefficient = -0.027, p>0.1). For *MEET/BEAT*, the coefficient on *FX Hedge* is negative and significant (coefficient = -0.104, p<0.05) while the coefficient on *IR Hedge* is negative but insignificant (coefficient = -0.041, p>0.1).

²⁴ In untabulated analyses we add *MISSTATE* and *MEET/BEAT* as additional control variables in our primary analyses. No inferences are affected.

as increased financial reporting complexity and higher audit fees that can arguably be considered as a cost to shareholders. While the trade-off between benefits and costs of hedging is beyond the scope of this study, our findings provide empirical evidence pertaining to the consequences of firms' risk-management activities.²⁵

²⁵ Although we employ *multiple* research-design features to reduce the effects of potential correlated omitted variables, it is of course still conceivable that our findings suffer from unknown endogeneity issues. Consequently, our findings should be interpreted with caution.

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Appendix: Variable Definitions

Variables	Definitions
FX Hedge	= an indicator variable equals 1 if a firm uses foreign currency-exchange-rate hedging, and 0 otherwise
IR Hedge	= an indicator variable equals 1 if a firm uses interest-rate hedging, and 0 otherwise
FX/IR Hedge	= an indicator variable equals 1 if a firm uses either foreign Currency-exchange-rate hedging or interest-rate hedging, and 0 otherwise
FX Hedge Numbers	= the number of different derivatives used for hedging foreign currency-exchange-rate risk
IR Hedge Numbers	= the number of different derivatives used for hedging foreign interest-rate risk
FX/IR Hedge Numbers	= the total number of different derivatives used for hedging both foreign currency-exchange-rate risk and interest-rate risk
Audit Fees	= natural logarithm of AF, AF refers to the raw number of audit fees
Complexity	= financial report complexity, measured as the natural logarithm of the number of complex words used in 10-K filings
MISSTATE	= an indicator variable equals 1 if a firm's financial statements contain material misstatements and are subsequently restated, and 0 otherwise
MEET/BEAT	= an indicator variable equals 1 if a firm's earnings per share just meet or beat the most recent consensus analysts' earnings forecast by one cent or less, and 0 otherwise.
<i>KeepUsing</i>	= equals one if a firm continues to be a hedger from the previous year to the current year, and zero otherwise
<i>TurnUsing</i>	= equals one if a firm turns from a non-hedger to a hedger from the previous year to the current year, and zero otherwise
<i>QuitUsing</i>	= equals one if a firm turns from a hedger to a non-hedger from the previous year to the current year, and zero otherwise
Control Variables	
Log of Assets	= natural logarithm of total assets
Log of Sales	= natural logarithm of total sales
Receivable/Inventory Intensity	= sum of total accounts receivable and total inventories divided by total assets
ROA	= return on assets, calculated as net income divided by total assets
Loss	= an indicator variable equals 1 if net income is less than zero, and 0 otherwise zero
Leverage	= leverage ratio calculated as total long-term debt divided by total assets
Big4	= an indicator variable equals 1 if a client's auditor is a Big 4 audit firm, and 0 otherwise
Going Concern	= an indicator variable equals 1 if a firm receives a going-concern opinion, and 0 otherwise
Business Segments	= the number of business segments
Foreign Segments	= the number of foreign geographic segments
Litigation Industry	= an indicator variable equals 1 if a firm's SIC code is 2833-2836, 3570-3577, 3600-3674, 5200-5961, or 7370-7374, and 0 otherwise
Busy Season	= an indicator variable equals 1 if a client's fiscal year-end month is December, and 0 otherwise
MTB	= market-to-book ratio, calculated as total year-end market value

Audit Report Lag	divided by total book value of common equity = number of days between a client's fiscal year-end date and the audit report date
Return	= raw buy-and-hold stock return during the fiscal year
GETR	= GAAP effective tax rate, calculated as total income tax expense divided by pre-tax book income less special items
R&D	= R&D intensity, calculated as R&D expenses divided by total assets
FOROPS	= an indicator variable equals 1 if a firm reports foreign currency adjustments, and 0 otherwise
M&A	= an indicator variable equals 1 if a firm was involved in a merger or acquisition, and 0 otherwise

Variables in the Hedging Determinant Model

Tax Convexity	= tax convexity calculated following Graham and Smith (1999)
Institutional Holding	= percentage of the outstanding shares held by institutional investors
Analyst Coverage	= nature logarithm of one plus the total number of analysts covering the firm
Foreign Income Ratio	= absolute value of foreign income divided by the sum of absolute value of net income and the absolute value of foreign income
No Foreign Income	= an indicator variable equals 1 if the firm has no foreign income, and 0 otherwise
Floating Debt Ratio	= total the ratio of floating-rate debt to divided by total debt
Rated	= an indicator variable equals 1 if the firm has rated debts, and 0 Otherwise

Cross-Sectional Variables

Dispersion	= analyst earnings forecast dispersion, defined as the standard deviation of annual earnings forecasts divided by stock price
Expertise	= the proportion of auditor firm's clients with hedging activities

Table 1: Sample Distribution**Panel A: Sample Distribution by Year**

<i>Year</i>	Non-Hedgers	Hedgers	Full sample	% of Hedgers
2000	393	440	833	52.8%
2001	518	713	1,231	57.9%
2002	534	726	1,260	57.6%
2003	1,881	1,283	3,164	40.5%
2004	1,763	1,340	3,103	43.2%
2005	1,674	1,251	2,925	42.8%
2006	1,552	1,212	2,764	43.8%
2007	1,599	1,240	2,839	43.7%
2008	1,446	1,322	2,768	47.8%
2009	1,529	1,220	2,749	44.4%
2010	1,511	1,030	2,541	40.5%
2011	1,458	1,017	2,475	41.1%
2012	1,453	978	2,431	40.2%
2013	1,462	935	2,397	39.0%
2014	1,346	769	2,115	36.4%
<i>Total</i>	20,119	15,476	35,595	43.5%

Panel B: Sample Distribution by Fama and French 12-Industry Classification

Industry	Non-Hedgers	Hedgers	Full sample	% of Hedgers
Consumer NonDurables	1,102	1,224	2,326	52.6%
Consumer Durables	535	628	1,163	54.0%
Manufacturing	1,965	2,942	4,907	60.0%
Oil, Gas, and Coal Extraction and Products	1,177	824	2,001	41.2%
Chemicals and Allied Products	370	804	1,174	68.5%
Business Equipment	5,216	3,104	8,320	37.3%
Telephone and Television Transmission	561	595	1,156	51.5%
Wholesale, Retail, and Some Services	2,385	1,905	4,290	44.4%
Healthcare, Medical Equipment, and Drugs	3,770	1,206	4,976	24.2%
Other	3,038	2,244	5,282	42.5%
Total	20,119	15,476	35,595	43.5%

Note: This table describes the distribution of hedging firms versus non-hedging firms. Panel A presents the distribution across years, and Panel B presents the distribution across industries based on Fama and French 12 industry classification.

Table 2: Summary Statistics**Panel A: Descriptive Statistics**

<i>Variables</i>	N	Mean	SD	Q1	Q2	Q3
<i>AF (\$)</i>	35,595	1.812M	3.806M	0.322M	0.784M	1.769M
<i>Audit Fees</i>	35,595	13.570	1.261	12.680	13.570	14.390
<i>FX Hedge</i>	35,595	0.218	0.413	0.000	0.000	0.000
<i>IR Hedge</i>	35,595	0.329	0.470	0.000	0.000	1.000
<i>FX/IR Hedge</i>	35,595	0.435	0.496	0.000	0.000	1.000
<i>Log of Assets</i>	35,595	6.107	2.020	4.669	6.076	7.480
<i>Log of Sales</i>	35,595	5.882	2.244	4.447	6.009	7.414
<i>Receivable/Inventory Intensity</i>	35,595	0.259	0.187	0.108	0.229	0.368
<i>ROA</i>	35,595	-0.037	0.249	-0.039	0.033	0.075
<i>Loss</i>	35,595	0.338	0.473	0.000	0.000	1.000
<i>Leverage</i>	35,595	0.211	0.215	0.009	0.167	0.330
<i>Big4</i>	35,595	0.750	0.433	0.000	1.000	1.000
<i>Going Concern</i>	35,595	0.033	0.178	0.000	0.000	0.000
<i>Business Segments</i>	35,595	1.918	1.231	1.000	1.000	3.000
<i>Foreign Segments</i>	35,595	2.632	1.714	1.500	2.263	3.000
<i>Litigation Industry</i>	35,595	0.351	0.477	0.000	0.000	1.000
<i>Busy Season</i>	35,595	0.688	0.463	0.000	1.000	1.000
<i>MTB</i>	35,595	2.931	4.586	1.212	2.042	3.533
<i>Audit Report Lag</i>	35,595	3.565	1.432	3.829	4.094	4.304
<i>Return</i>	35,595	0.172	0.646	-0.217	0.072	0.396
<i>GETR</i>	35,595	0.289	0.136	0.233	0.290	0.358
<i>R&D</i>	35,595	0.058	0.126	0.000	0.005	0.064
<i>FOROPS</i>	35,595	0.298	0.457	0.000	0.000	1.000
<i>M&A</i>	35,595	0.426	0.495	0.000	0.000	1.000

Panel B: Univariate Test Comparing Hedgers and Non-Hedgers

<i>Variables</i>	(1) Non-Hedgers		(2) Hedgers		Mean Diff (1) - (2)
	Mean	Median	Mean	Median	
<i>AF (\$)</i>	0.977M	0.489M	2.899M	1.446M	-1.922M***
<i>Audit Fees</i>	13.090	13.100	14.183	14.184	-1.090***
<i>Log of Assets</i>	5.274	5.190	7.189	7.163	-1.916***
<i>Log of Sales</i>	4.970	5.027	7.066	7.055	-2.095***
<i>Receivable/Inventory Intensity</i>	0.253	0.212	0.267	0.248	-0.015***
<i>ROA</i>	-0.081	0.021	0.021	0.042	-0.102***
<i>Loss</i>	0.418	0.000	0.234	0.000	0.185***
<i>Leverage</i>	0.163	0.075	0.273	0.247	-0.109***
<i>Big4</i>	0.657	1.000	0.871	1.000	-0.214***
<i>Going Concern</i>	0.050	0.000	0.010	0.000	0.039***
<i>Business Segments</i>	1.698	1.000	2.203	2.000	-0.506***
<i>Foreign Segments</i>	2.511	2.308	2.790	2.167	-0.279***
<i>Litigation Industry</i>	0.418	0.000	0.264	0.000	0.154***
<i>Busy Season</i>	0.687	1.000	0.689	1.000	-0.002
<i>MTB</i>	3.110	2.065	2.698	2.021	0.411***
<i>Audit Report Lag</i>	3.610	4.143	3.505	4.060	0.105***
<i>Return</i>	0.176	0.048	0.166	0.098	0.010
<i>GETR</i>	0.280	0.274	0.301	0.302	-0.020***
<i>R&D</i>	0.081	0.008	0.029	0.002	0.051***
<i>FOROPS</i>	0.224	0.000	0.394	0.000	-0.169***
<i>M&A</i>	0.338	0.000	0.541	1.000	-0.203***
<i>No. of Observations</i>	20,119		15,476		

Panel C: Pearson Correlations between Variables used in Regressions

1	Audit Fees	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
2	FX Hedge	0.41																					
3	IR Hedge	0.34	0.21																				
4	FX/IR Hedge	0.43	0.60	0.80																			
5	Log of Assets	0.84	0.35	0.42	0.47																		
6	Log of Sales	0.78	0.34	0.42	0.46	0.91																	
7	Receivable/Inventory Intensity	-0.07	0.07	0.01	0.04	-0.13	0.13																
8	ROA	0.24	0.13	0.17	0.20	0.40	0.51	0.15															
9	Loss	-0.22	-0.12	-0.17	-0.19	-0.35	-0.43	-0.12	-0.62														
10	Lev	0.17	0.02	0.33	0.25	0.26	0.20	-0.10	-0.08	0.09													
11	Big4	0.49	0.19	0.19	0.25	0.49	0.44	-0.12	0.16	-0.15	0.08												
12	Going Concern	-0.13	-0.07	-0.09	-0.11	-0.21	-0.24	-0.03	-0.42	0.23	0.11	-0.12											
13	Business Segment	0.28	0.15	0.21	0.20	0.30	0.32	0.10	0.15	-0.15	0.09	0.09	-0.06										
14	Foreign Segment	0.15	0.16	0.00	0.08	0.09	0.05	0.01	0.02	-0.01	-0.04	0.01	0.00	0.07									
15	Litigation Industry	-0.07	-0.03	-0.20	-0.16	-0.15	-0.18	-0.12	-0.16	0.14	-0.20	0.00	0.02	-0.24	-0.04								
16	Busy season	0.07	-0.03	0.03	0.00	0.07	-0.01	-0.18	-0.06	0.06	0.12	0.05	0.02	0.01	0.04	-0.11							
17	MTB	0.02	0.00	-0.05	-0.04	-0.01	-0.04	-0.10	-0.02	-0.01	-0.07	0.03	-0.02	-0.06	-0.02	0.08	0.05						
18	Audit Report Lag	-0.02	-0.02	-0.02	-0.04	-0.07	-0.13	-0.12	-0.10	0.09	0.07	-0.04	0.07	0.02	0.05	-0.13	0.47	0.02					
19	Return	-0.04	-0.01	-0.01	-0.01	0.00	0.01	0.01	0.16	-0.15	-0.05	0.04	-0.12	0.00	-0.01	0.01	0.02	0.15	-0.02				
20	GETR	0.05	-0.01	0.10	0.07	0.12	0.16	0.09	0.09	-0.05	0.04	0.05	-0.05	0.06	-0.08	-0.13	-0.04	-0.03	-0.06	-0.04			
21	R&D	-0.17	-0.06	-0.23	-0.20	-0.34	-0.45	-0.19	-0.61	0.35	-0.13	-0.03	0.23	-0.21	0.05	0.36	0.05	0.13	0.07	-0.05	-0.18		
22	FOROPS	0.28	0.32	0.05	0.18	0.17	0.15	0.05	0.07	-0.05	-0.05	0.10	-0.03	0.06	0.17	-0.02	0.01	0.00	0.03	0.00	-0.04	-0.01	
23	M&A	0.35	0.16	0.17	0.20	0.33	0.32	-0.02	0.17	-0.18	0.07	0.17	-0.09	0.18	0.03	-0.05	0.01	-0.01	0.01	-0.02	0.07	-0.15	0.11

Note: This table summarizes descriptive statistics of the variables used in our main analysis. Panel A presents the summary statistics for the entire sample. Panel B presents descriptive statistics for hedgers and non-hedgers separately, and compares the mean differences across the two groups. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively. Panel C presents the Pearson correlation matrix for the variables used in our main analysis. Correlations that are significant at 10% or better are denoted in bold text.

Table 3: The Impact of Hedging on Audit Fees. Full-Sample Analyses

	(1)	(2)	(3)
	Audit Fees	Audit Fees	Audit Fees
<i>FX Hedge</i>	0.183*** [11.74]		
<i>IR Hedge</i>		0.046*** [3.52]	
<i>FX/IR Hedge</i>			0.078*** [6.12]
<i>Log of Assets</i>	0.324*** [31.25]	0.335*** [32.23]	0.331*** [31.89]
<i>Log of Sales</i>	0.175*** [18.43]	0.175*** [18.33]	0.174*** [18.32]
<i>Receivable/Inventory Intensity</i>	0.043 [0.89]	0.068 [1.39]	0.063 [1.30]
<i>ROA</i>	-0.451*** [-16.84]	-0.456*** [-16.92]	-0.456*** [-16.91]
<i>Loss</i>	0.145*** [12.97]	0.148*** [13.18]	0.149*** [13.26]
<i>Leverage</i>	-0.060* [-1.94]	-0.093*** [-2.93]	-0.100*** [-3.19]
<i>Big4</i>	0.332*** [20.74]	0.333*** [20.56]	0.331*** [20.48]
<i>Going Concern</i>	0.139*** [6.16]	0.142*** [6.22]	0.145*** [6.40]
<i>Business Segments</i>	0.049*** [8.49]	0.048*** [8.26]	0.049*** [8.35]
<i>Foreign Segments</i>	0.018*** [4.79]	0.021*** [5.53]	0.020*** [5.33]
<i>Litigation Industry</i>	0.019 [1.05]	0.018 [1.00]	0.021 [1.13]
<i>Busy Season</i>	0.074*** [4.50]	0.068*** [4.10]	0.070*** [4.20]
<i>MTB</i>	0.004*** [4.10]	0.004*** [4.26]	0.004*** [4.34]
<i>Audit Report Lag</i>	-0.000 [-0.06]	0.000 [0.05]	0.000 [0.05]
<i>Return</i>	0.008* [1.92]	0.007* [1.70]	0.007* [1.73]
<i>GETR</i>	-0.093*** [-2.91]	-0.107*** [-3.30]	-0.106*** [-3.28]
<i>R&D</i>	0.387*** [7.01]	0.407*** [7.33]	0.403*** [7.24]
<i>FOROPS</i>	0.192*** [13.79]	0.225*** [16.02]	0.217*** [15.45]
<i>M&A</i>	0.120*** [11.31]	0.121*** [11.27]	0.119*** [11.14]
Observations	35,595	35,595	35,595
Adjusted R ²	0.833	0.831	0.831

Note: This table presents the regression results based on pooled full sample. We measure a firm's hedging activities by three indicator variables FX Hedge, IR Hedge, and FX/IR Hedge, and the results are reported in Column (1), (2) and (3), respectively. T-statistics are reported in brackets. Year and industry fixed effects are included, and standard errors are clustered at firm-level. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 4: The Impact of Hedging on Audit Fees. Change-Level Analyses

	(1)	(2)	(3)
	Δ Audit Fees FX Hedge	Δ Audit Fees IR Hedge	Δ Audit Fees FX/IR Hedge
<i>KeepUsing</i>	0.017** [1.98]	0.002 [0.32]	-0.002 [-0.40]
<i>TurnUsing</i>	0.062*** [2.97]	0.069*** [4.60]	0.048*** [3.50]
<i>QuitUsing</i>	-0.042** [-2.22]	-0.036*** [-2.61]	-0.037*** [-3.06]
<i>Log of Assets</i>	0.060*** [16.72]	0.061*** [16.89]	0.061*** [16.88]
<i>Log of Sales</i>	-0.003 [-1.09]	-0.003 [-1.06]	-0.003 [-1.00]
<i>Receivable/Inventory Intensity</i>	0.062*** [4.37]	0.064*** [4.53]	0.064*** [4.53]
<i>ROA</i>	-0.040*** [-3.01]	-0.042*** [-3.16]	-0.042*** [-3.15]
<i>Loss</i>	0.011 [1.61]	0.011 [1.59]	0.011 [1.60]
<i>Leverage</i>	-0.041*** [-3.71]	-0.047*** [-3.97]	-0.043*** [-3.73]
<i>Big4</i>	-0.028*** [-5.19]	-0.028*** [-5.04]	-0.028*** [-5.10]
<i>Going Concern</i>	0.028** [2.23]	0.029** [2.29]	0.028** [2.25]
<i>Business Segments</i>	0.007*** [2.99]	0.007*** [2.94]	0.007*** [3.00]
<i>Foreign Segments</i>	0.000 [0.26]	0.001 [0.43]	0.001 [0.46]
<i>Litigation Industry</i>	0.004 [0.75]	0.004 [0.70]	0.004 [0.65]
<i>Busy Season</i>	-0.007 [-1.29]	-0.007 [-1.41]	-0.007 [-1.45]
<i>MTB</i>	0.002*** [3.37]	0.002*** [3.37]	0.002*** [3.38]
<i>Audit Report Lag</i>	0.008*** [5.13]	0.009*** [5.16]	0.009*** [5.19]
<i>Return</i>	-0.003 [-0.70]	-0.003 [-0.68]	-0.003 [-0.69]
<i>GETR</i>	-0.010 [-0.44]	-0.011 [-0.51]	-0.011 [-0.49]
<i>R&D</i>	0.063*** [3.32]	0.064*** [3.38]	0.064*** [3.38]
<i>FOROPS</i>	0.004 [0.64]	0.007 [1.24]	0.007 [1.26]
<i>M&A</i>	0.077*** [13.72]	0.076*** [13.63]	0.077*** [13.71]
Observations	34,147	34,147	34,147
Adjusted R ²	0.148	0.148	0.148

Note: This table presents the regression results for audit-fee changes. We measure a firm's hedging activities by three indicator variables FX Hedge, IR Hedge, and FX/IR Hedge, and the results are reported in Column (1), (2) and (3), respectively. The benchmark group used in the regressions consists of firms keeping their status of non-hedging firms from previous year to current year. T-statistics are reported in brackets. Year and industry fixed effects are included, and standard errors are clustered at firm-level. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 5: Results based on Heckman Two-Stage Regression

Panel A: First-Stage Determinant Model of Corporate Hedging

	(1)	(2)	(3)
	FX Hedge	IR Hedge	FX/IR Hedge
<i>Tax Convexity</i>	0.021*** [4.50]	0.012** [2.56]	0.019*** [4.48]
<i>Log of Assets</i>	0.303*** [17.83]	0.160*** [9.15]	0.205*** [13.10]
<i>Log of Sales</i>	0.029* [1.78]	0.126*** [7.42]	0.117*** [7.87]
<i>Receivable/Inventory Intensity</i>	0.900*** [12.89]	0.200*** [3.04]	0.283*** [4.58]
<i>ROA</i>	0.229*** [2.66]	0.173* [1.88]	0.136* [1.82]
<i>Loss</i>	0.064** [2.26]	-0.233*** [-8.16]	-0.146*** [-5.71]
<i>Leverage</i>	-0.185*** [-3.33]	2.566*** [49.53]	1.775*** [37.08]
<i>Big4</i>	0.193*** [6.59]	0.050* [1.88]	0.126*** [5.31]
<i>Going Concern</i>	-0.399*** [-3.89]	-1.230*** [-13.81]	-0.909*** [-10.48]
<i>Business Segments</i>	-0.009 [-1.16]	0.065*** [8.81]	0.024*** [3.18]
<i>Foreign Segments</i>	0.047*** [8.65]	-0.005 [-0.98]	0.026*** [4.85]
<i>Litigation Industry</i>	-0.123*** [-4.40]	-0.280*** [-10.15]	-0.279*** [-11.14]
<i>Busy Season</i>	-0.101*** [-4.53]	-0.071*** [-3.22]	-0.091*** [-4.42]
<i>MTB</i>	0.000 [0.18]	-0.005** [-2.01]	-0.008*** [-3.61]
<i>Audit Report Lag</i>	0.004 [0.51]	0.010 [1.43]	0.005 [0.82]
<i>Return</i>	-0.021 [-1.16]	-0.035** [-2.17]	-0.012 [-0.81]
<i>GETR</i>	-0.148** [-1.99]	0.213*** [3.16]	0.077 [1.20]
<i>R&D</i>	0.914*** [6.70]	-3.181*** [-13.58]	-0.079 [-0.53]
<i>FOROPS</i>	0.680*** [34.47]	0.086*** [4.21]	0.398*** [20.51]
<i>M&A</i>	0.062*** [3.17]	0.084*** [4.46]	0.103*** [5.75]
Observations	30,947	30,947	30,947
Pseudo R ²	0.297	0.297	0.297
Test of Weak IV Chi ² -statistic (p-value)	20.22(p<0.01)	6.56(p=0.01)	20.03(p<0.01)

Panel B: Second-Stage Regression of Audit Fees

	(1)	(2)	(3)
	Audit Fees	Audit Fees	Audit Fees
<i>FX Hedge</i>	0.684*** [8.97]		
<i>IR Hedge</i>		0.211*** [3.38]	
<i>FX/IR Hedge</i>			0.284*** [3.57]
<i>Log of Assets</i>	0.290*** [22.93]	0.327*** [26.91]	0.318*** [24.23]
<i>Log of Sales</i>	0.175*** [16.39]	0.175*** [16.25]	0.173*** [16.09]
<i>Receivable/Inventory Intensity</i>	-0.035 [-0.67]	0.056 [1.05]	0.040 [0.76]
<i>ROA</i>	-0.444*** [-14.39]	-0.446*** [-14.49]	-0.448*** [-14.52]
<i>Loss</i>	0.140*** [11.70]	0.161*** [12.66]	0.162*** [12.69]
<i>Leverage</i>	-0.042 [-1.23]	-0.210*** [-4.24]	-0.217*** [-4.27]
<i>Big4</i>	0.305*** [17.70]	0.311*** [17.92]	0.301*** [17.25]
<i>Going Concern</i>	0.143*** [5.48]	0.167*** [6.05]	0.176*** [6.32]
<i>Business Segments</i>	0.050*** [8.38]	0.047*** [7.37]	0.049*** [7.96]
<i>Foreign Segments</i>	0.007* [1.72]	0.019*** [4.72]	0.016*** [3.98]
<i>Litigation Industry</i>	0.032* [1.65]	0.031 [1.55]	0.039* [1.87]
<i>Busy Season</i>	0.091*** [5.19]	0.074*** [4.21]	0.080*** [4.50]
<i>MTB</i>	0.003*** [2.99]	0.004*** [3.52]	0.004*** [3.83]
<i>Audit Report Lag</i>	-0.001 [-0.22]	0.000 [0.05]	0.000 [0.07]
<i>Return</i>	0.009* [1.93]	0.006 [1.32]	0.006 [1.31]
<i>GETR</i>	-0.117*** [-3.28]	-0.173*** [-4.76]	-0.166*** [-4.60]
<i>R&D</i>	0.359*** [5.70]	0.439*** [6.95]	0.421*** [6.63]
<i>FOROPS</i>	0.089*** [4.38]	0.216*** [14.43]	0.185*** [10.60]
<i>M&A</i>	0.105*** [9.46]	0.110*** [9.66]	0.105*** [9.14]
<i>Mills</i>	-0.296*** [-6.74]	-0.094*** [-2.58]	-0.118** [-2.54]
Observations	30,947	30,947	30,947
Adjusted R ²	0.837	0.833	0.834

Note: This table presents the regression results based on Heckman two-stage regression using tax convexity as the instrument variable. Panel A presents the first-stage results for corporate hedging determinant model. Panel B presents the second-stage regression of audit fees. T-statistics are reported in brackets. Year and industry fixed effects are included, and standard errors are clustered at firm-level. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 6: Results Based on Difference-in-Differences Design**Panel A: First-Stage Regression**

	Pr (Initiate = 1)
<i>Tax convexity</i>	0.055* [1.70]
<i>Log of Assets</i>	0.580*** [8.67]
<i>MTB</i>	0.018 [1.36]
<i>Leverage</i>	1.701*** [5.95]
<i>Cash Flow</i>	1.090*** [2.62]
<i>Institutional Ownership</i>	-0.221 [-0.94]
<i>Prior Return</i>	0.093 [1.08]
<i>Analyst Coverage</i>	-0.059 [-0.69]
<i>Foreign Income Ratio</i>	0.784* [1.87]
<i>No Foreign Income</i>	-0.269 [-1.36]
<i>Floating-Rate Debt</i>	0.918*** [5.11]
<i>Rated</i>	-0.391* [-1.70]
Observations	5,686
Pseudo R ²	0.209

Panel B: Covariates Balances

<i>Variables</i>	(1) Control Group		(2) Treated Group		Mean Diff (1) - (2)
	Mean	Median	Mean	Median	
<i>Tax Convexity</i>	3.353	3.516	3.29	3.548	0.063
<i>Log Asset</i>	5.955	5.888	5.975	5.912	-0.02
<i>MTB</i>	3.46	2.167	2.948	1.917	0.512
<i>Leverage</i>	0.199	0.143	0.272	0.23	-0.073***
<i>Cash Flow</i>	0.066	0.092	0.065	0.081	0.001
<i>Institutional Holding</i>	0.425	0.385	0.408	0.388	0.017
<i>Prior Return</i>	0.129	0.032	0.12	0.014	0.009
<i>Analyst Coverage</i>	1.16	1.099	1.077	1.099	0.083
<i>Foreign Income Ratio</i>	0.111	0	0.111	0	0
<i>No Foreign Income</i>	0.729	1	0.714	1	0.016
<i>Floating-Rate Debt</i>	0.26	0	0.261	0	-0.002
<i>Rated</i>	0.195	0	0.237	0	-0.042
<i>Observations</i>	384		384		

Panel C: Second-Stage Regression (Difference-in-Differences with PSM)

	(1)	(2)
	Audit Fees	Audit Fees
	Entire Sample	(-5, +5)
<i>Initiate</i>	0.024 [0.45]	0.019 [0.39]
<i>Post</i>	0.026 [0.79]	0.019 [0.69]
<i>Initiate</i> × <i>Post</i>	0.082* [1.81]	0.071** [2.01]
<i>Log of Assets</i>	0.279*** [9.50]	0.282*** [9.22]
<i>Log of Sales</i>	0.176*** [6.72]	0.176*** [6.66]
<i>Receivable/Inventory Intensity</i>	-0.020 [-0.16]	-0.011 [-0.08]
<i>ROA</i>	-0.382*** [-5.09]	-0.364*** [-4.24]
<i>Loss</i>	0.179*** [6.22]	0.193*** [6.29]
<i>Leverage</i>	-0.005 [-0.06]	-0.025 [-0.32]
<i>Big4</i>	0.319*** [7.50]	0.293*** [6.57]
<i>Going Concern</i>	0.102* [1.69]	0.095 [1.27]
<i>Business Segments</i>	0.047*** [2.81]	0.040** [2.21]
<i>Foreign Segments</i>	0.023** [2.33]	0.023** [2.12]
<i>Litigation Industry</i>	0.012 [0.25]	0.003 [0.05]
<i>Busy Season</i>	0.086* [1.75]	0.077 [1.59]
<i>MTB</i>	0.004 [1.58]	0.004 [1.49]
<i>Audit Report Lag</i>	0.009 [0.52]	0.009 [0.55]
<i>Return</i>	0.028** [2.42]	0.025* [1.90]
<i>GETR</i>	-0.183** [-2.14]	-0.159* [-1.77]
<i>R&D</i>	0.442** [2.53]	0.455** [2.49]
<i>FOROPS</i>	0.206*** [5.33]	0.216*** [5.43]
<i>M&A</i>	0.162*** [5.01]	0.149*** [4.48]
Observations	7,197	5,188
Adjusted R ²	0.757	0.728

Note: This table presents the results for a difference-in-differences design. Panel A presents the results for a probit model used to predicting firms' probabilities of initiating hedging. The predicted propensity scores are used to match the first-time hedging users (treated firms) and firms never using hedging (control firms). Panel B compares the covariates between the treated and control groups. Panel C reports the regression results of audit fees using the matched sample. Column (1) of Panel C presents the results using the entire sample period, and Column (2) of Panel C reports the results using a 10-year window around the treated firms' initiation of hedging usage. T-statistics and Z-statistics are reported in brackets. Year and industry fixed effects are included, and standard errors are clustered at firm-level. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 7: The Impact of Hedge on Financial Statement Complexity

Panel A: OLS Regression using Pooled Full Sample

	(1)	(2)	(3)
	Complexity	Complexity	Complexity
<i>FX Hedge</i>	0.052*** [4.67]		
<i>IR Hedge</i>		0.021** [2.29]	
<i>FX/IR Hedge</i>			0.035*** [3.86]
<i>Log of Assets</i>	0.076*** [12.63]	0.079*** [13.17]	0.077*** [12.90]
<i>Log of Sales</i>	0.012** [2.33]	0.012** [2.32]	0.012** [2.27]
<i>Receivable /Inventory Intensity</i>	-0.288*** [-8.83]	-0.282*** [-8.64]	-0.284*** [-8.72]
<i>ROA</i>	-0.120*** [-6.62]	-0.120*** [-6.67]	-0.120*** [-6.66]
<i>Loss</i>	0.115*** [14.92]	0.117*** [15.11]	0.117*** [15.14]
<i>Leverage</i>	0.196*** [9.17]	0.182*** [8.63]	0.179*** [8.49]
<i>Big4</i>	0.036*** [3.41]	0.037*** [3.44]	0.036*** [3.36]
<i>Going Concern</i>	0.081*** [5.33]	0.083*** [5.46]	0.084*** [5.54]
<i>Business Segments</i>	0.020*** [4.65]	0.020*** [4.55]	0.020*** [4.61]
<i>Foreign Segments</i>	0.008*** [2.88]	0.008*** [3.19]	0.008*** [3.06]
<i>Litigation Industry</i>	0.034** [2.47]	0.034** [2.48]	0.035** [2.56]
<i>Busy Season</i>	0.029** [2.38]	0.028** [2.25]	0.029** [2.31]
<i>MTB</i>	0.001 [1.13]	0.001 [1.24]	0.001 [1.29]
<i>Audit Report Lag</i>	0.015*** [4.13]	0.015*** [4.14]	0.015*** [4.16]
<i>Return</i>	0.018*** [5.91]	0.017*** [5.82]	0.017*** [5.85]
<i>GETR</i>	-0.203*** [-9.02]	-0.207*** [-9.19]	-0.207*** [-9.19]
<i>R&D</i>	0.178*** [4.93]	0.184*** [5.11]	0.182*** [5.05]
<i>FOROPS</i>	0.065*** [6.78]	0.075*** [7.74]	0.071*** [7.33]
<i>M&A</i>	0.040*** [5.36]	0.039*** [5.33]	0.039*** [5.24]
Observations	33,441	33,441	33,441
Adjusted R ²	0.405	0.403	0.404

Pane B: Change-Level Analyses

	(1)	(2)	(3)
	Δ Complexity	Δ Complexity	Δ Complexity
	FX Hedge	IR Hedge	FX/IR Hedge
<i>KeepUsing</i>	0.000 [0.13]	-0.002 [-0.69]	0.001 [0.38]
<i>TurnUsing</i>	0.038** [2.19]	0.028** [2.14]	0.026** [2.18]
<i>QuitUsing</i>	-0.011 [-0.94]	-0.008 [-1.02]	-0.013* [-1.70]
<i>Log of Assets</i>	0.006*** [2.96]	0.006*** [3.15]	0.006*** [3.02]
<i>Log of Sales</i>	-0.004** [-2.25]	-0.004** [-2.23]	-0.004** [-2.24]
<i>Receivable/Inventory Intensity</i>	0.009 [1.13]	0.009 [1.13]	0.009 [1.13]
<i>ROA</i>	-0.013 [-1.32]	-0.014 [-1.38]	-0.013 [-1.36]
<i>Loss</i>	0.004 [0.94]	0.003 [0.88]	0.004 [0.94]
<i>Leverage</i>	0.005 [0.83]	0.005 [0.75]	0.004 [0.65]
<i>Big4</i>	-0.013*** [-4.43]	-0.013*** [-4.39]	-0.013*** [-4.41]
<i>Going Concern</i>	0.026** [2.03]	0.026** [2.04]	0.026** [2.05]
<i>Business Segments</i>	0.002 [1.41]	0.002 [1.43]	0.002 [1.42]
<i>Foreign Segments</i>	-0.001 [-1.39]	-0.001 [-1.32]	-0.001 [-1.33]
<i>Litigation Industry</i>	0.003 [1.14]	0.003 [1.04]	0.003 [1.12]
<i>Busy Season</i>	-0.015*** [-5.61]	-0.015*** [-5.62]	-0.015*** [-5.64]
<i>MTB</i>	0.000 [0.53]	0.000 [0.53]	0.000 [0.53]
<i>Audit Report Lag</i>	0.002** [2.37]	0.002** [2.36]	0.002** [2.38]
<i>Return</i>	-0.004 [-1.34]	-0.003 [-1.32]	-0.003 [-1.33]
<i>GETR</i>	0.007 [0.63]	0.007 [0.61]	0.007 [0.60]
<i>R&D</i>	-0.028** [-2.11]	-0.028** [-2.10]	-0.028** [-2.11]
<i>FOROPS</i>	0.003 [1.04]	0.004 [1.23]	0.003 [1.15]
<i>M&A</i>	0.018*** [5.76]	0.018*** [5.70]	0.018*** [5.72]
Observations	30,987	30,987	30,987
Adjusted R ²	0.027	0.027	0.027

Panel C: Difference-in-Differences Design

	(1)	(2)
	Complexity	Complexity
	Entire Sample	(-5,+5)
<i>Initiate</i>	0.007 [0.21]	0.015 [0.55]
<i>Post</i>	-0.042* [-1.84]	-0.042** [-2.14]
<i>Initiate</i> × <i>Post</i>	0.055* [1.72]	0.064*** [2.91]
<i>Log of Assets</i>	0.077*** [5.05]	0.077*** [5.04]
<i>Log of Sales</i>	0.015 [1.29]	0.013 [1.15]
<i>Receivable/Inventory Intensity</i>	-0.260*** [-3.93]	-0.261*** [-4.18]
<i>ROA</i>	-0.107* [-1.91]	-0.082* [-1.68]
<i>Loss</i>	0.085*** [4.57]	0.082*** [4.07]
<i>Leverage</i>	0.209*** [4.26]	0.200*** [3.86]
<i>Big4</i>	-0.045* [-1.78]	-0.040 [-1.44]
<i>Going Concern</i>	0.171*** [3.42]	0.185*** [3.94]
<i>Business Segments</i>	0.010 [0.93]	0.009 [0.79]
<i>Foreign Segments</i>	0.009* [1.78]	0.015** [2.31]
<i>Litigation Industry</i>	0.028 [0.80]	0.019 [0.58]
<i>Busy Season</i>	0.033 [0.99]	0.038 [1.10]
<i>MTB</i>	0.000 [0.12]	-0.000 [-0.11]
<i>Audit Report Lag</i>	0.011 [0.93]	0.011 [1.02]
<i>Return</i>	0.027*** [3.07]	0.014 [1.06]
<i>GETR</i>	-0.266*** [-5.22]	-0.249*** [-4.50]
<i>R&D</i>	0.385*** [3.24]	0.312** [2.57]
<i>FOROPS</i>	0.060** [2.49]	0.072*** [2.90]
<i>M&A</i>	0.073*** [3.54]	0.068*** [3.19]
Observations	6,774	4,861
Adjusted R ²	0.409	0.403

Note: This table presents the regression results using financial reporting complexity as dependent variable. Panel A reports the results based on pooled full sample, and Panel B presents the results for the change-level regression. We measure a firm's hedging activities by three indicator variables FX Hedge, IR Hedge, and FX/IR Hedge. The results are reported in Column (1), (2) and (3), respectively. Panel C reports the results based on a difference-in-differences design, with Column (1) presenting the results using the entire sample period and Column (2) presenting the results using the a 10-year window around the treated firms' initiation of hedging usage. T-statistics are reported in brackets. Year and industry fixed effects are included, and standard errors are clustered at firm-level. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 8: Influence of the Degree of Hedging Sophistication

Panel A: Hedging Sophistication and Audit Fees

	(1)	(2)	(3)
	Audit Fees	Audit Fees	Audit Fees
<i>FX Hedge Numbers</i>	0.076*** [11.89]		
<i>IR Hedge Numbers</i>		0.015** [1.98]	
<i>FX/IR Hedge Numbers</i>			0.046*** [10.09]
<i>Log of Assets</i>	0.325*** [31.51]	0.336*** [32.33]	0.327*** [31.59]
<i>Log of Sales</i>	0.175*** [18.50]	0.175*** [18.37]	0.174*** [18.40]
<i>Receivable/Inventory Intensity</i>	0.047 [0.99]	0.068 [1.40]	0.054 [1.13]
<i>ROA</i>	-0.453*** [-16.88]	-0.458*** [-16.99]	-0.453*** [-16.82]
<i>Loss</i>	0.145*** [12.98]	0.147*** [13.03]	0.148*** [13.15]
<i>Leverage</i>	-0.064** [-2.09]	-0.080** [-2.54]	-0.099*** [-3.20]
<i>Big4</i>	0.334*** [20.74]	0.333*** [20.54]	0.334*** [20.67]
<i>Going Concern</i>	0.137*** [6.09]	0.140*** [6.12]	0.143*** [6.31]
<i>Business Segments</i>	0.049*** [8.41]	0.049*** [8.36]	0.048*** [8.29]
<i>Foreign Segments</i>	0.019*** [5.13]	0.021*** [5.51]	0.020*** [5.24]
<i>Litigation Industry</i>	0.018 [0.99]	0.017 [0.91]	0.021 [1.15]
<i>Busy Season</i>	0.070*** [4.28]	0.068*** [4.08]	0.069*** [4.20]
<i>MTB</i>	0.004*** [4.10]	0.004*** [4.26]	0.004*** [4.20]
<i>Audit Report Lag</i>	-0.000 [-0.01]	0.000 [0.04]	-0.000 [-0.07]
<i>Return</i>	0.008* [1.95]	0.007* [1.67]	0.008* [1.79]
<i>GETR</i>	-0.092*** [-2.87]	-0.106*** [-3.28]	-0.101*** [-3.15]
<i>R&D</i>	0.390*** [7.06]	0.406*** [7.31]	0.400*** [7.19]
<i>FOROPS</i>	0.201*** [14.49]	0.226*** [16.03]	0.210*** [15.10]
<i>M&A</i>	0.118*** [11.19]	0.121*** [11.30]	0.117*** [11.08]
Observations	35595	35595	35595
Adjusted R ²	0.833	0.831	0.832

Panel B: Hedging Sophistication and Financial Statement Complexity

	(1)	(2)	(3)
	Complexity	Complexity	Complexity
<i>FX Hedge Numbers</i>	0.020*** [4.63]		
<i>IR Hedge Numbers</i>		0.018*** [3.10]	
<i>FX/IR Hedge Numbers</i>			0.017*** [5.09]
<i>Log of Assets</i>	0.077*** [12.71]	0.079*** [13.18]	0.076*** [12.64]
<i>Log of Sales</i>	0.012** [2.33]	0.012** [2.33]	0.012** [2.29]
<i>Receivable /Inventory Intensity</i>	-0.287*** [-8.79]	-0.282*** [-8.65]	-0.287*** [-8.79]
<i>ROA</i>	-0.120*** [-6.65]	-0.121*** [-6.71]	-0.120*** [-6.63]
<i>Loss</i>	0.115*** [14.94]	0.116*** [15.08]	0.116*** [15.06]
<i>Leverage</i>	0.195*** [9.14]	0.180*** [8.44]	0.182*** [8.58]
<i>Big4</i>	0.037*** [3.46]	0.037*** [3.45]	0.037*** [3.48]
<i>Going Concern</i>	0.081*** [5.31]	0.083*** [5.46]	0.083*** [5.43]
<i>Business Segments</i>	0.020*** [4.62]	0.020*** [4.58]	0.020*** [4.57]
<i>Foreign Segments</i>	0.008*** [3.02]	0.008*** [3.16]	0.008*** [3.03]
<i>Litigation Industry</i>	0.034** [2.45]	0.034** [2.49]	0.035** [2.54]
<i>Busy Season</i>	0.028** [2.29]	0.028** [2.24]	0.028** [2.28]
<i>MTB</i>	0.001 [1.15]	0.001 [1.25]	0.001 [1.19]
<i>Audit Report Lag</i>	0.015*** [4.16]	0.015*** [4.12]	0.015*** [4.12]
<i>Return</i>	0.018*** [5.90]	0.017*** [5.78]	0.017*** [5.85]
<i>GETR</i>	-0.203*** [-9.01]	-0.207*** [-9.22]	-0.205*** [-9.11]
<i>R&D</i>	0.179*** [4.96]	0.185*** [5.12]	0.181*** [5.02]
<i>FOROPS</i>	0.068*** [7.09]	0.075*** [7.74]	0.069*** [7.16]
<i>M&A</i>	0.039*** [5.29]	0.039*** [5.28]	0.038*** [5.19]
Observations	33441	33441	33441
Adjusted R ²	0.404	0.403	0.404

Note: This table presents the regression results regarding the degree of sophistication of hedging activities. We measure the sophistication of a firm's hedging activities by the number of different types of financial derivatives used for the hedging purpose. Panel A reports the results for audit fees and Panel B reports the results for financial

statements complexity. T-statistics are reported in brackets. Year and industry fixed effects are included, and standard errors are clustered at firm-level. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 9: Analyses of Cross-Sectional Variations

Panel A: Client Information Environment

	(1)	(2)
	Low Dispersion=1	Low Dispersion=0
	Audit Fees	Audit Fees
<i>FX/IR Hedge</i>	0.043** [2.07]	0.083*** [4.06]
Test of Coefficient Difference (<i>p-value</i>)		-0.040** (0.04)
<i>Log of Assets</i>	0.284*** [10.15]	0.303*** [17.57]
<i>Log of Sales</i>	0.234*** [8.73]	0.169*** [12.10]
<i>Receivable/Inventory Intensity</i>	0.177* [1.73]	0.091 [0.95]
<i>ROA</i>	-0.503*** [-3.47]	-0.418*** [-7.51]
<i>Loss</i>	0.119*** [3.89]	0.121*** [6.65]
<i>Leverage</i>	-0.029 [-0.40]	-0.178*** [-3.67]
<i>Big4</i>	0.138*** [3.78]	0.290*** [10.61]
<i>Going Concern</i>	-0.264** [-2.08]	0.184*** [3.09]
<i>Business Segments</i>	0.062*** [5.97]	0.041*** [4.11]
<i>Foreign Segments</i>	0.016** [2.47]	0.022*** [3.75]
<i>Litigation Industry</i>	-0.052 [-1.46]	0.010 [0.33]
<i>Busy Season</i>	0.116*** [3.89]	0.046 [1.61]
<i>MTB</i>	0.004 [1.40]	0.001 [0.44]
<i>Audit Report Lag</i>	-0.013 [-1.49]	0.004 [0.50]
<i>Return</i>	0.001 [0.10]	0.010 [1.21]
<i>GETR</i>	-0.257*** [-4.28]	0.031 [0.58]
<i>R&D</i>	0.770*** [3.36]	0.337*** [3.86]
<i>FOROPS</i>	0.236*** [9.98]	0.202*** [9.70]
<i>M&A</i>	0.095*** [4.79]	0.151*** [8.84]
Observations	7,939	7,940
R ²	0.754	0.745

Panel B: Auditor Expertise

	(1)	(2)
	High Expertise=1	High Expertise=0
	Audit Fees	Audit Fees
<i>FX/IR Hedge</i>	0.069*** [4.34]	0.089*** [5.67]
Test of Coefficient Difference (<i>p-value</i>)		-0.021** (0.02)
<i>Log of Assets</i>	0.339*** [22.40]	0.328*** [27.60]
<i>Log of Sales</i>	0.161*** [11.26]	0.188*** [17.48]
<i>Receivable/Inventory Intensity</i>	0.228*** [3.30]	-0.071 [-1.35]
<i>ROA</i>	-0.461*** [-10.81]	-0.448*** [-13.72]
<i>Loss</i>	0.128*** [8.94]	0.166*** [10.92]
<i>Leverage</i>	-0.003 [-0.08]	-0.213*** [-5.86]
<i>Big4</i>	0.235*** [9.21]	0.319*** [16.82]
<i>Going Concern</i>	0.094*** [2.69]	0.160*** [5.46]
<i>Business Segments</i>	0.045*** [6.14]	0.049*** [7.18]
<i>Foreign Segments</i>	0.019*** [4.15]	0.021*** [4.61]
<i>Litigation Industry</i>	-0.017 [-0.70]	0.044** [2.00]
<i>Busy Season</i>	0.032 [1.46]	0.111*** [5.67]
<i>MTB</i>	0.004*** [3.30]	0.002** [2.12]
<i>Audit Report Lag</i>	0.009 [1.42]	-0.012** [-1.98]
<i>Return</i>	0.008 [1.21]	-0.005 [-0.72]
<i>GETR</i>	-0.036 [-0.83]	-0.134*** [-3.16]
<i>R&D</i>	0.462*** [5.83]	0.399*** [5.63]
<i>FOROPS</i>	0.208*** [11.85]	0.217*** [12.37]
<i>M&A</i>	0.121*** [8.70]	0.110*** [8.55]
Observations	16,120	16,435
R ²	0.807	0.824

Note: This table presents the regression results for cross-sectional variation. We report the results when FX/IR Hedge is used to indicate the usage of hedging activities. Panel A reports the results concerning client firms' information environment, with Column (1) reporting the results when analyst forecast dispersion is low and Column (2) reporting the results when analyst forecast dispersion is high. Panel B reports the results concerning auditors' expertise and experience in hedge accounting, with Column (1) reporting the results when auditors' expertise is high and Column (2) reporting the results when auditors' expertise is low. T-statistics are reported in brackets. Year and industry fixed effects are included, and standard errors are clustered at firm-level. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 10: Analyses of Audit Quality

	(1)	(2)
	MISSTATE	MEET/BEAT
<i>FX/IR Hedge</i>	-0.014 [-0.24]	-0.087** [-2.41]
<i>Log of Assets</i>	0.049 [1.30]	-0.115*** [-3.93]
<i>Log of Sales</i>	-0.040 [-1.19]	-0.031 [-1.22]
<i>Receivable/Inventory Intensity</i>	-0.239 [-1.37]	0.046 [0.35]
<i>ROA</i>	-0.223* [-1.82]	0.252** [2.48]
<i>Loss</i>	0.217*** [4.19]	-0.234*** [-5.06]
<i>Lev</i>	0.439*** [3.70]	-0.145 [-1.42]
<i>Big4</i>	0.140** [2.18]	-0.078* [-1.77]
<i>Going concern</i>	-0.098 [-0.89]	-0.053 [-0.43]
<i>Business Segment</i>	0.013 [0.55]	0.025 [1.39]
<i>Foreign segment</i>	0.007 [0.43]	0.006 [0.52]
<i>Litigation risk</i>	0.234*** [3.13]	-0.006 [-0.13]
<i>Busy season</i>	-0.343*** [-5.39]	0.026 [0.61]
<i>MTB</i>	-0.003 [-0.65]	0.008** [2.12]
<i>Audit Report Lag</i>	0.041** [2.16]	0.007 [0.47]
<i>Return</i>	-0.021 [-0.90]	-0.000 [-0.00]
<i>GETR</i>	-0.171 [-1.13]	0.362*** [3.30]
<i>R&D</i>	-1.486*** [-4.67]	0.229 [1.31]
<i>FOROPS</i>	0.120** [2.12]	-0.055 [-1.37]
<i>M&A</i>	0.088** [2.00]	-0.030 [-0.88]
Observations	35,595	22,855
Pseudo R ²	0.049	0.048

Note: This table presents the regression results for the analyses of audit quality. We report the results when FX/IR Hedge is used to indicate the usage of hedging activities. Column (1) reports the results when audit quality is measured by the likelihood of financial statements misstatements. Column (2) reports the results when audit quality is measured by the likelihood of meeting or beating analyst earnings forecasts. Z-statistics are reported in brackets. Year and industry fixed effects are included, and standard errors are clustered at firm-level. *, **, and *** indicate significance at the 10%, 5% and 1% level, respectively.