Does Hedge Accounting Complexity Influence the Effectiveness of Firms' Hedging Activities?

Waqar Ali
INSEAD
waqar.ali@insead.edu

Daniel A. Bens
INSEAD
daniel.bens@insead.edu

Gavin Cassar
INSEAD
gavin.cassar@insead.edu

November 18, 2022

We thank John Campbell, Peter Joos, Sharon Katz, Thomas Keusch, and workshop participants at INSEAD for their helpful comments and suggestions. We also thank Robert Waddington (PricewaterhouseCoopers, London) and Siddarth Basu (Chatham Financial, Philadelphia) for their insights. We gratefully acknowledge the research assistance of Sheilvy Soetanto. All errors are ours.

Does Hedge Accounting Complexity Influence the Effectiveness of Firms' Hedging Activities?

Abstract

Complexity in applying financial accounting standards can have real operational effects if firms alter their actions in the face of increased reporting costs. We examine whether the introduction of new standards (ASU 2017-12) designed to reduce compliance burden and better align hedge accounting rules with risk management practices affected actual derivatives usage, and more importantly, operational outcomes tied to hedging. Using difference-in-differences tests we show that firms that adopt the ASU designate more of their derivatives as hedges, while also exhibiting less exposure to firm level risks. In addition, firms' cash flow volatility, earnings volatility, and bid-ask spreads decline upon ASU adoption. Also, ASU adopting firms increase their use of debt while investing more. Our results suggest, with both statistical and economic significance, that a reduction in complexity in applying financial accounting derivative rules led to greater hedge accounting choice, more actual hedging, and reduced financing and investment frictions.

JEL classification: M41, G32

Keywords:
Hedge accounting
Risk management
Derivatives
Reporting complexity
SFAS 133
SFAS 161
ASU 2017-12
Real effects

Just before she cast her vote to add the project to the FASB agenda, board member Leslie Siedman declared that FAS 133 "is held up as the poster child of complexity and rule based standards. [Therefore] we have to respond."

CFO.com (Leone, 2007)

1. Introduction

In this paper we examine how the complexity of the financial accounting treatment for a transaction can influence the underlying activity being reported. Over the past century, accounting rules have evolved to reflect the increased complexity in firm operations. One significant development that increased complexity in financial reporting was the increased use of transactional risk management tools for hedging. The intent of Accounting Standards Update (ASU) No. 2017-12, *Targeted Improvements to Accounting for Hedging Activities*, was to reduce the complexity involved with reporting on hedging activities. We examine whether the application of the new standard led to greater hedging activity and, importantly, to the operational benefits that hedging can bring, such as less volatile cash flows and increased levels of financing and investment.

In 2017, the FASB issued ASU 2017-12 to revise the accounting treatment of derivatives used by US firms to hedge risk exposures. While the intent of the previous standard, SFAS 133 (*Accounting for Derivative Instruments and Hedging Activities*), was to better reflect a firm's derivative activity in financial statements by focusing on the intended use of the derivatives (FASB 1998), practitioners and academics criticized SFAS 133 for its high complexity and implementation costs (Leone 2007, 2008). Consistent with these concerns, empirical evidence suggested preparers and users faced difficulties in interpreting SFAS 133 (Chang, Donohoe, and Sougiannis 2016; Campbell 2015; Makar, Wang, and Alam 2013), a significant loss in shareholder value on the standard's introduction (Khan, Rajgopal, and Venkatachalam 2018), and little change in SFAS 133 adopters' risk exposure or cash flow volatility (Zhang 2009). Further, survey evidence suggested that in response to SFAS 133 firms reduced their actual use of derivatives to manage risk (Lins, Servaes, and Tamayo 2011). The

FASB issued ASU 2017-12 to address the above concerns by simplifying hedge accounting treatment and providing users with more decision-useful information via better alignment of the firm's hedge accounting with its risk management activities (FASB 2017; Katz 2017). While reducing accounting complexity and encouraging more useful firm disclosures could achieve the FASB's desired outcomes, the updated rules are still complex (PwC 2018). Moreover, it is possible that for firms facing a technically challenging management issue such as defining an appropriate hedging strategy, a complex reporting model is the preferred reporting alternative. Thus, we use this specific setting to address the broader economic question of whether reporting complexity affects underlying business activities.

Hedging by firms can enhance firm value by reducing transaction costs or underinvestment policies arising in the presence of non-frictionless financing or financial distress costs (Smith and Stulz 1985; Froot, Scharfstein, and Stein 1993; DeMarzo and Duffie 1995; Melumad, Weyns, and Ziv 1999; Ryan, Herz, Iannaconni, and Maines 2002). Yet, accounting standards can affect the net benefits of hedging. If reporting rules on hedging activities become more costly, due to greater compliance costs or restatement risk from misapplying the rules (Leone 2008), firms can respond by reducing their actual hedging activity. Further, if the accounting treatment of derivatives results in distorting or exaggerating, rather than truly reflecting risk exposures, firms may decrease hedging or engage in suboptimal hedging activities to avoid costs from overreporting perceived firm risk to investors (Panaretou, Shackleton, and Taylor 2013; Zhang 2009). If ASU 2017-12 increased the net benefits from hedging by reducing accounting complexity, firms should increase this risk management practice thereby reducing cash flow volatility. Further, if this hedging is value creating or ASU 2017-12 provides better information to users regarding the firm's financial performance and risk exposure, this should reduce investor information asymmetries and then enable firms to access external financing at a lower cost and reduce underinvestment.

In contrast to the conjectured benefits described above, and consistent with the FASB's original rationale for prescribing stringent hedge accounting requirements (SFAS 133), firms may exploit the increased latitude offered by the ASU to opportunistically engage in the speculative use of hedging instruments. While ASU 2017-12 relieves management from cumbersome prospective quantitative testing of designated hedging instruments, such tests provide validation of hedging instruments' suitability to hedge accounting and are considered risk relevant by investors (Kawaller 2018; Chen, Liu, Seow, and Xie 2020). The absence of prospective quantitative testing could also compromise the discipline over hedging that management might otherwise be able to exert. Further, the changes ASU 2017-12 prescribed for hedge accounting need to be of sufficient magnitude to influence firm behavior. For example, critics of ASU 2017-12 argue that hedge accounting post-standard remains complex with the compliance relaxations enacted being insufficient (Kawaller 2018). Therefore, it is unclear ex-ante what the net risk exposure and ensuing financing/investing impacts of the ASU will be. Our study provides empirical evidence on the costs of reporting complexity, with the tension that allowing that such complexity might provide better oversight.

We use the mandatory adoption of ASU 2017-12 as it represented a significant shift in accounting procedures regarding hedging and because the FASB permitted early adoption of the standard, allowing us a staggered time series to better identify causal effects. To investigate the effects of ASU 2017-12 we focus our sample on firms that use derivatives, including control firms that do not apply or qualify for hedge accounting treatment yet explicitly state that they are not speculating via these instruments. We hand collect disclosures from quarterly and annual reports about the fair value of derivatives, and whether their usage qualifies and is designated for hedge accounting treatment.[1] Consistent with ASU 2017-12 increasing the net

[1] As discussed further in Section 3, we use fair values rather than notional amounts as the latter are less frequently disclosed, and when they are disclosed the format and information communicated varies considerably across firms. Moreover, fair values are the norm in derivatives research; therefore, we opt for this measurement basis.

benefits of derivatives hedging, we observe an increase in the fair value of derivatives designated for hedge accounting treatment in the year after ASU 2017-12 adoption, both as a percentage of all derivatives used as well as total assets.

As our main research question we ask: does this increase in hedge accounting use from ASU 2017-12 lead to improved operational outcomes for firms? To answer this we apply a difference-in-differences design to a sample spanning 2013 through 2019, with the treatment group comprising 'hedge accounting users' and the control group comprising firms that use derivatives for non-speculative purposes but do not apply hedge accounting ('non-hedge accounting users'). To ensure that the treatment and control observations have similar investment and financing opportunities we match on industry, year, and determinants of financing and investment, such as performance, debt, growth, and liquidity as documented in prior literature (Kausar, Shroff, and White 2017). We also match on the known determinants of hedge accounting use.

Consistent with firms experiencing real operational benefits in response to ASU 2017-12, we find firms that adopt the standard significantly reduce their cash flow and earnings volatilities. Examining changes in specific firm risk exposures, we find significant reductions in firms' foreign exchange risk exposures under ASU 2017-12. Further, we find significant reductions in commodity price risk exposures and foreign exchange risk exposures for the sub-set of firms that initiated the use of hedge accounting treatment after ASU-2017-12 on derivative investments that existed prior to the standard but were not designated as hedges.

Given that ASU 2017-12 increased the prevalence of derivatives hedging and resulted in less volatile cash flows, a natural question to ask is whether ASU 2017-12 had implications for firms' underlying investing and financing activities. We find ASU 2017-12 adopters experience marginally lower bid-ask spreads, issue more debt, and increase investment. These results suggest real benefits of reducing reporting complexity in this setting.

A concern with investigating the effects of the adoption of any regulatory standard is the potential presence of contemporaneous events that may spuriously account for any observed relations. A useful feature of ASU 2017-12 is that firms could early adopt the standard. We find 40% of our treatment sample voluntarily adopted ASU 2017-12 in the two years before it became mandatory, and we utilize this staggered firm adoption in our empirical design to reduce our focus on a single treatment period. Further, to rule out that the above findings are endogenously driven by time related trends, we conduct a falsification test that assumes that treatment firms adopt ASU 2017-12 in years *other* than the actual adoption year. We find that the expected significant effects on our outcome variables are only observed during a firm's true ASU 2017-12 adoption year, casting doubt on the alternative explanation that our results reflect time trends.

We make the following contributions to the literature. First, we extend the literature on firm responses and outcomes from derivatives and hedge accounting standards. Empirical evidence has focused on risk management using derivatives in general (Guay 1999; Wong 2000; Chang et al. 2016), or the valuation aspects of cash flow hedges (Gigler, Kanodia, and Venugopalan 2007; Campbell 2015; Campbell, D'Adduzio, Downes, and Utke 2021). In more standard specific evidence, Zhang (2009) considers the impact of SFAS 133 on risk exposures and firms' cash flow and earnings volatilities. We extend this literature by using the adoption of ASU 2017-12 to investigate the effect of hedge accounting complexity on not only risk outcomes, but also financing and investing activities. By showing that reduced hedge accounting complexity increases hedging activity and reduces financing and investing frictions, we extend the literature on real effects of accounting regulation and choice (Fields, Lys, and Vincent 2001), as well as the outcomes of risk management (Cornaggia 2013; Pérez-González and Yun 2013; Gilje and Taillard 2017).

Second, we provide evidence on the broader issue of how reporting complexity can affect underlying operations. In response to significant concerns about SFAS 133 (Chang et al. 2016; Makar et al. 2013; Khan et al. 2018; Zhang 2009; Lins et al. 2011), the stated intention of FASB for ASU 2017-12 was to substantially simplify hedge accounting rules and better reflect the economics of derivatives hedging in financial statements. A limited amount of academic literature has studied how *investors* deal with accounting complexity. Yet there is even less research in how *reporting firms* deal with accounting complexity.[2] We begin to fill this gap in the literature by asking the question: will firms change their underlying hedging activities when the complexity of hedge accounting changes?

Finally, we assist standard setters with a post-implementation review of their efforts. Our findings show increased adoption of hedging, reduced cash flow and earnings volatilities, and financing and investment benefits for adopting firms, suggesting that ASU 2017-12 achieved FASB's desired outcomes addressing academic and practitioner complexity concerns regarding hedge accounting rules.

The remainder of this paper is organized as follows. The next section develops the hypotheses. Section 3 discusses sample selection. Section 4 outlines the research design. Section 5 presents the results, and Section 6 concludes.

2. Hypothesis development

2.1. The complexity of hedge accounting

Before 2017, accounting for derivatives under US GAAP followed several FASB standards including SFAS 133, SFAS 138, SFAS 149, SFAS 155, SFAS 161. Effective in 2001, SFAS 133 standardized the accounting by (1) requiring all investments in derivatives to be

[2] Blankespoor, deHaan, and Marinovic (2020, p.36) note that "few papers examine the 'real effects' of disclosure processing costs." Roychowdhury, Shroff, and Verdi (2019) provide a discussion of research about how firms might learn valuable information for investment decision making following mandated accounting changes, but they do not cite any research that asks whether the complexity of such rules affects investments.

treated as assets or liabilities on the balance sheet and reported at fair value, and (2) introducing the hedge accounting option for non-speculative derivative users. Under hedge accounting, standalone derivative fair valuing in the income statement is mitigated by being matched to the fair value of the hedged item. There are three ways in which hedge accounting is operationalized: fair value hedges; cash flow hedges; and net investment hedges.

Under fair value hedges whereby an underlying on-balance sheet asset or liability's fair value is being protected, changes in the fair value of both the derivative and underlying hedged item are included in net income together (i.e., offset). Under the more common cash flow hedges, a forecasted cash flow is being hedged. Then, changes in the fair value of the derivative are recorded in "other comprehensive income (OCI)," and later reclassified as income when the forecasted cash flow affects earnings. Similar to a derivative designated as a cash flow hedge, the gain or loss of a derivative designated as a hedge of foreign currency exposure of a net investment in a foreign operation is reported in OCI.

To protect against firms using SFAS 133 opportunistically to misrepresent their earnings, strict requirements were stipulated, making it difficult for firms to warrant the hedge accounting treatment. These requirements were the source of preparers' complaints about the complexity of hedge accounting (Kawaller 2018). First, firms had to validate that their hedges "would be" and in fact "actually were highly effective" in offsetting the risks being hedged. These validation tests were to be quantitatively conducted, with auditors stressing management abide by a strict 80 – 125% effectiveness range for movement in the values of the hedged item and hedging instrument. Strict documentation validating effectiveness tests was to be in place upon inception of the hedge. Second, firms had to report unrealized gains and losses arising from *ineffective* portions of cash flow and net investment hedges in net income as they occur. Third, several valid hedging strategies (such as risk components of certain commodity risks, and certain fair value hedges of interest rate risk) were not accorded hedge accounting treatment. For example, consider a vehicle manufacturer concerned with volatility in prices of tires due to the underlying commodity of rubber used in the product. The manufacturer was unable to assign just the rubber component as the hedged item and instead was forced to designate the entire purchase price of the tires.[3] This inability to separate commodity based components from the rest of the input made it significantly more difficult (if not impossible) to find the appropriate financial instrument to hedge unwanted price volatility of some raw materials *and* receive hedge accounting treatment.

Given the compliance requirements many practitioners and academics criticized SFAS 133 for its high complexity, vagueness, and costs of implementation (Valladares 2014). As noted in our opening quote, FASB board member Leslie Seidman declared SFAS 133 "the poster child of complexity and rules-based standards" (Leone 2007). Empirical evidence suggested that the complexity faced by investors in understanding SFAS 133 disclosures increased the cost of the standard. For example, Makar et al. (2013) suggest that the "mixed attribute problem" of marking an on-balance sheet derivative to market without an offset to an underlying asset or liability leads to stock market mispricing. Campbell (2015) documents that movements in the value of derivatives used as cash flow hedges can be used to predict future changes in firm fundamentals (e.g., cost of goods sold arising from hedged commodities), yet the stock market reacts to such predictability with an inefficient lag. Relatedly, Chang et al. (2016) found that the complexity of derivatives accounting from SFAS 133 was associated with predictable errors in forecasts by analysts.

While the research above suggests *users* suffer from accounting complexity, it does not address the challenges with the standard faced by a *firm*. Yet, survey evidence suggests that firms absorb significant costs from complexity in hedge accounting. For example, shareholder consultancy Glass Lewis reported more than 100 corporate restatements over a two-year period

[3] See: https://www.bdo.com/insights/assurance/fasb/fasb-flash-report-september-2017

resulting from misapplication of SFAS 133 (Leone 2007). Surveys of CFOs found that the requirement to report derivatives at fair value induced firms to significantly reduce their actual use of derivative contracts to actively manage risk, especially for securities with nonlinear payoffs and foreign-exchange hedging (Lins et al. 2011).[4] Consistent with these effects outside the US, Gumb, Dupuy, Baker, and Blum's (2018) survey of French corporate treasurers found that the complexity of applying fair value and hedge accounting for derivatives caused firms to change their pattern of derivative usage and avoid certain transactions that were otherwise judged economically viable.

Overall, the public criticism and empirical evidence suggests hedge accounting was accompanied by complexity, vagueness, and costs of implementation which affected net costs, reported volatility, and ultimately the hedging behavior of firms. Moreover, according to survey evidence, international rules that were similar to SFAS 133 were viewed as overly complex and this affected underlying business activities.

2.2. Reductions in hedge accounting complexity under ASU 2017-12

On August 28, 2017, based on feedback from corporate executives, auditors, users and other stakeholders, the FASB issued ASU 2017-12, effective for fiscal periods starting after December 15, 2018, with an option to early adopt. The FASB commented that the ASU "will more closely align the results of hedge accounting with risk management activities through changes to both the designation and measurement guidance for qualifying hedging relationships," and "this update should ease the operational burden of applying hedge accounting" (FASB 2017). The key features and relaxations afforded by the ASU related to expanding the scope of derivatives transactions eligible for hedge accounting, simplifying the

[4] Lins et al. (2011) surveyed a global set of CFOs (only 10% are based in the US), though IFRS regulations at that time followed much of the same basic framework as SFAS 133.

testing assessment of hedge effectiveness, and eliminating the measurement and presentation of hedge ineffectiveness.

In expanding the transactions eligible for hedge accounting, ASU 2017-12 permits a firm to hedge the variability in cash flows of "a contractually specified component" compared to previously only the variability in overall cash flows of the hedged item.[5] Similarly, for a cash flow hedge of interest rate risk of a variable-rate instrument, the ASU permits designating variability in cash flows of "a contractually specified interest rate" compared to previously just variability from changes in a benchmark interest rate, like LIBOR. Additionally, for fair value hedges of interest rate risk, firms could now choose a broader set of benchmark interest rates, such as the widely used Securities Industry and Financial Markets Association (SIFMA) Municipal Swap Rate. These relaxations removed a major impediment to managing commodity and interest rate risk, which created noise in accounting relationships relating to items in the firm's risk management strategy (Breslin, Basu, and Ziel 2019).

ASU 2017-12 also simplified the accounting by reducing the volume and timeliness of testing. The ASU extends the deadline for when prospective tests may be performed, allowing these tests to be completed as much as three months after the hedge has been initiated. Further, the ASU allows subsequent qualitative effectiveness tests of hedge effectiveness. Quantitative testing has been reduced to an initial prospective test, which if satisfied, removes the need for further quantitative testing if the facts and circumstances of the hedge relationship remain unchanged. Relatedly, to improve hedge effectiveness certain elements of the fair value of the derivative (e.g., option premium, forward points, cross-currency basis spread) can now be excluded from hedge effectiveness testing, as such components are fundamental transaction costs that are not expected to move in a negative correlation with the underlying hedged item.

[5] Continuing the example from the previous section, the vehicle manufacturer could now designate just the rubber component of tires as the item being hedged instead of the entire purchase price.

Moreover, when assessing hedge effectiveness of a group of forecasted transactions a firm may assume the hedging instrument matures "at the same time as the forecasted transactions if both the derivative maturity and the forecasted transactions occur within the same 31-day period or fiscal month" (FASB, 2017), as opposed to requiring a tighter connection between the maturity of the derivative and the underlying in calendar time.

ASU 2017-12 removes the requirement to apply different accounting treatment to "effective" versus "ineffective" hedge results in cash flow hedges — the most widely used category of hedge accounting. Under SFAS 133 ineffective cash flow hedge results were immediately posted to current earnings, while only effective results were first recorded in other comprehensive income and later reclassified to earnings coincident with the earnings impacts of the associated hedged items. Since the ASU now treats both effective and ineffective portions of hedge results uniformly, hedges that are not perfectly effective will no longer have noise from ineffectiveness flowing through to earnings at every reporting date when the derivatives are marked to market (Breslin et al. 2019). The FASB acknowledged that hedge ineffectiveness reporting was difficult for financial statement users to understand and for preparers to explain (see p. 4 of ASU 2017-12).

Note that the ASU did *not* change the two fundamental premises of the FASB's mandates of accounting for derivatives discussed in Section 2.1. Namely, (1) derivatives are to be recognized on the balance sheet at fair value; and (2) hedge accounting can be used to mitigate the effects on the income statement of fair value accounting. Thus, the measurement basis (fair value) did not change and therefore any results we document can be attributed to the operational changes that accompanied FASB's expansion of hedge accounting eligibility and the reduction of complexity of the standard.

In sum, the ASU expands the transactions eligible for hedge accounting, simplifies assessment of hedge effectiveness, provides firms more time to finalize documentation, and eliminates the separate measurement and presentation of hedge ineffectiveness. These changes were designed to reduce the complexity of implementing hedge accounting for preparers.

2.3. Hypotheses regarding the impact of ASU 2017-12

More than 90% of *Fortune* Global 500 companies use financial derivatives to hedge risks that threaten revenues, costs of goods sold, and various expenses (Gilje and Taillard 2017; Chang et al. 2016). Hedging reduces the cost of external financing by narrowing the distribution of firm-value outcomes (Myers and Majluf 1984; Smith and Stulz 1985; Beatty and Weber 2003). By reducing the volatility of cash flows that is positively related to costs of financial distress (Mayers and Smith 1990), hedging reduces incentives to underinvest (Froot et al. 1993; Geczy et al. 1997). Hedging lowers the sensitivity of debt claims to the value of incremental investment, thus allowing equity holders to capture a larger portion of the incremental benefit from new investment. Since hedging allows firms to credibly commit to meet obligations in states where it otherwise could not, it improves contract terms the firm can negotiate with customers, creditors, and managers (Bessembinder 1991).

The ASU makes tests of effectiveness between derivatives and hedged exposures significantly easier to satisfy and makes additional exposures eligible for hedge accounting. Given effectiveness was narrowly defined in the past, and survey evidence suggests risk management strategies deviated from sound economic hedging when firms are faced with complex accounting, the ASU is expected to incentivize previously foregone risk management activity. We thus expect firms to reduce their risk exposures via increased hedging when they adopt the ASU. Changes in cash flow volatility reflect changes in firms' real actions including risk-management activities (Zhang 2009), therefore we expect cash flow volatility to decrease when risk exposures are reduced with more effective hedging.

However, several scenarios exist that make an "adverse effect" or a null hypothesis of "no effect" of the ASU credible. First, it is possible that by exploiting the increased latitude offered by the ASU, firms will increase their speculative use of derivatives and use hedge accounting choice opportunistically, resulting in an increase in firm performance volatility and risk exposures. Indeed, the FASB's original motives in SFAS 133 for prescribing stringent hedge accounting requirements were concerns that firms may exploit latitude in hedge accounting rules to opportunistically engage in the speculative use of hedging instruments.

Second, there are potential adverse implications of the relaxation of hedge testing requirements. Critics of ASU 2017-12 argued the pre-ASU quantitative testing served as a useful control function for management to monitor hedging activity (Kawaller 2018). Failing a quantitative test forces scrutiny of the hedging relationship in question. Without such testing, management could run the risk of executing inappropriate hedging strategies.

Third, accounting for derivatives and hedging remains complex. As a standalone document ASU 2017-12 runs to 400 pages, with critics arguing that the compliance relaxations made were insufficient (Kawaller 2018). If the compliance reductions prescribed by ASU 2017-12 are not of practical relevance it will not induce changes in firms' hedging behavior.

Fourth, it is possible that the costs involved with not adhering to hedge accounting were marginal in the pre-ASU period, such that effective hedging still occurred when derivatives were used irrespective of the accounting treatment. This is especially true if firms effectively substituted hedge-accounting-relevant strategies with economic hedges, to which hedge accounting is inapplicable, and in the post-ASU period continue to do so. Consistent with this possibility, the choice of whether to adopt hedge accounting may result in firms not valuing the financial reporting benefits arising from the new guidance.

Therefore, if opportunistic excessive speculation, improper hedging strategies ensuing from relaxation of qualitative effectiveness testing, an insufficient reduction in accounting complexity, or the unimportance of the hedge accounting designation are dominant effects, then we will either observe higher or no change in cash flow volatility following ASU adoption. These possibilities notwithstanding, we state our hypothesis in the alternative form below.

H1: Hedge accounting firms that adopt ASU 2017-12 lower their risk exposures and cash flow volatility.

Capital providers pay attention to firms' accounting choices and their resulting numbers to infer a firm's private information (Dye 2001). If hedge accounting is properly implemented and understood by outsiders, then investors can distinguish production profits from hedging profits (Melumad et al. 1999) as fair value changes of derivatives are offset by the exposure they are hedging (Gigler et al. 2007). Consistent with these arguments, Panaretou et al. (2013) report higher analyst forecast accuracy and lower bid-ask spreads for UK firms that adopt hedge accounting under IAS 39 (SFAS 133's international counterpart). This suggests that if an optimal level of hedge accounting is induced by the ASU, and investors can better perceive the results of hedging relationships, then this will improve the firms' information environment. Given information asymmetry has a positive relation with firms' cost of capital when capital markets are imperfect (Armstrong et al. 2001), the ASU can help firms reduce their financing frictions. Overall, given the ASU is expected to enhance hedge accounting and hedging ability, likely resulting in reductions in risk exposures, cash flow volatility, cost of external financing, and potential underinvestment, we expect adopting firms to raise more capital and invest more when they adopt the ASU.

As with H1, tension exists with our prediction. If investors either perceive the new rules as allowing for more speculation with derivatives, or they fail to perceive any reduction in the complexity of hedge accounting, then firm investment will not increase following ASU adoption. Further, recent evidence suggests that quantitative accounting measures of hedge ineffectiveness provides risk-relevant information (Chen, Liu, Seow, and Xie 2020). If qualitative testing is an inferior substitute for quantitative hedge ineffectiveness information, this would lead to decreased firm financing and investing. Finally, if firms were optimally hedging and subsequently raising and deploying their requisite capital irrespective of using hedge accounting or not, then there would be no effect from the ASU. These possibilities notwithstanding, we state our hypothesis in the alternative form.

H2: Hedge accounting firms that adopt ASU 2017-12 will have a lower bid-ask spread, raise more external capital, and increase investment levels.

3. Data and sample

Table 1, Panel A documents our sample construction. We identify firms' derivative use using machine readable data, and their use of hedge accounting with subsequent hand collection and manual review of 10-Ks. We begin with the intersection of Compustat, I/B/E/S, and CSRP firm-years 2013-2019 for US domiciled publicly traded non-financial firms, which coincides with when Compustat began reporting derivative line items. We drop firms without observations in both the pre- and post-ASU period to ensure a robust sample composition. We classify firm-years in which derivatives are not used if the following eight Compustat items equal zero or are missing:

derac	Derivative assets (current)
deralt	Derivative assets (long-term)
derlc	Derivative liabilities (current)
derllt	Derivative liabilities (long-term)
cidergl	Comprehensive income (derivative gains/losses)
derhedgl	Gains/losses on derivatives and hedging
hedgegl	Gain/loss on ineffective hedges
aocidergl	Accumulated other comprehensive income (derivatives unrealized gain/loss)

We manually classify NH (non-hedge accounting user) firm-years in which derivatives are employed *without* the use of hedge accounting; and H (hedge accounting user) firm-years in which derivatives are employed *with* the use of hedge accounting by hand collecting quarterly measures of derivative and designated use based on SFAS No. 161's tabular disclosures. SFAS No. 161 requires firms to disclose the fair value amount of derivative assets and liabilities on the balance sheet separated by risk type (e.g., commodity, interest rate, foreign currency, etc.) and accounting designation (i.e., designated for hedge accounting or not) in a tabular format. Further, rather than netting their derivative positions into one amount, under SFAS No. 161 firms must disclose derivative assets and liabilities separately. From these disclosures we can obtain the precise magnitude, in fair value terms, of derivatives that are used and designated as hedging vs. non-hedging instruments.[6] Before classifying the NH firms for our control group, we also require that they explicitly state that the derivatives are used for risk management and not speculation, despite the absence of hedge accounting. Based on our manual classification we obtain our pre-matching sample comprising 497 NH, and 2,040 H firm-years.

Table 1, Panel B presents the temporal distribution of each sample category. A significant proportion of firms early adopted the ASU, suggesting the presence of strong incentives to benefit from improved hedge accounting.[7] Table 1, Panel C presents the industry distribution of each sample category. We observe variation across industries that utilize hedge accounting, therefore we include industry and year fixed effects throughout our empirical tests.

---

[6] As an alternative to using fair value to capture the scale of derivative usage, we considered using notional amounts – a measure of the underlying exposure. However, notional amounts are not consistently reported (about 50% of the time in our sample) as the latest pre-ASU updated standard (SFAS 161) only mandated fair value disclosures (Campbell, Mauler and Pierce 2019). Moreover, when disclosed notional amounts are not always separated by hedge vs. non-hedge accounting use, and sometimes expressed in physical quantities (e.g., barrels of oil) or a foreign currency rather than in US dollars. These weaknesses in the use of notional amounts are noted in several prior studies (Schrand and Elliott 1998; Géczy, Minton and Schrand 1997; Wong 2000; and Choi, Mao and Upadhyay 2015), therefore we only use fair values.

[7] We analyzed the early adopters separately, as this choice is endogenous and could cloud our interpretations. However, when we estimated a comprehensive model with several explanatory variables on the choice to early adopt, we achieved modest explanatory power (i.e., adjusted R-squared of 3%). Moreover, when we conduct our main tests in Tables 5 and 6 separately for the early vs. on-time mandatory adopters, no clear pattern of significant differences emerges. Therefore, we exploit the time staggered ASU adoption for better empirical identification without major concerns of endogeneity. All results noted above are available upon request.

In Table 2 we present descriptive statistics for the hedge accounting users (H) vs. those firms using derivatives for non-speculative purposes but not with hedge accounting (NH). Some of our tests involve this larger sample of firms before matching, while our difference-in-differences tests rely on a smaller sample where observations are matched on firm fundamentals. In Panel A, focusing on the H firms that use hedge accounting, we see that firms increase the percentage of derivatives they use that are designated as hedges for accounting purposes (ha_use) following the ASU from 73.1% to 80.8%. Similarly, hedging designated derivatives as a percentage of totals assets of the firm (designated_use) rises from 0.396% to 0.420%. For the H firms the change in *overall derivatives use* (both hedging designated and non-hedging designated) as a percentage of total assets (derivatives_use) is dependent on the mean or median value. The mean overall derivatives use falls from 0.657% to 0.595%, while the median increases from 0.306% to 0.341%. For the non-hedge accounting users (NH), the decline in the use of derivatives is clear as the mean (median) declines from 1.381% (0.528%) to 1.161% (0.410%) of total assets. Overall, these statistics suggest that firms designate a greater proportion of their derivatives as hedges after ASU adoption. Whether this leads to more effective risk management outcomes and further investment is the research question we address in the remainder of the paper.

4. Research design

4.1. Hedge accounting choice and ASU 2017-12

For descriptive purposes, we first assess the impact of the ASU on the decision to hedge account. We conduct this analysis to ensure that ASU 2017-12 did actually ease accounting complexity and encourage greater use of hedge accounting – a maintained assumption in our hypothesis tests. We estimate the OLS panel regressions (standard errors clustered at firm-year level) below for the unmatched sample (2013 – 2019).

$$ha\_use_{i,t} = \alpha_0 + \beta_1\, asu\_2017_{i,t} + \beta_2\, libor\_exp_{i,t} + \beta_3\, comm\_exp_{i,t} + \beta_4\, fx\_exp_{i,t} + \beta_5\, cashflow\_vol_{i,t} + \beta_6\, earnings\_vol_{i,t} + \beta_7\, firm\_risk_{i,t} + \beta_{10}\, size_{i,t} + \beta_{11}\, roa_{i,t} + \beta_{12}\, debt_{i,t} + \beta_{13}\, equity\_issuance_{i,t} + \beta_{14}\, BigN_{i,t} + \beta_8\, bid\_ask_{i,t} + \beta_9\, BM\_ratio_{i,t} + \beta_{15}\, tax_{i,t} + \beta_{16}\, investment_{i,t} + \beta_{17}\, leverage_{i,t} + \beta_{18}\, interest\_burden_{i,t} + \beta_{19}\, liquidity_{i,t} + \beta_{20}\, number\_of\_estimates_{i,t} + \beta_{21}\, fe\_error_{i,t} + \beta_{22}\, fe\_dispersion_{i,t} + \varepsilon_{i,t}$$

$$designated\_use_{i,t} = \alpha_0 + \beta_1\, asu\_2017_{i,t} + \beta_2\, libor\_exp_{i,t} + \beta_3\, comm\_exp_{i,t} + \beta_4\, fx\_exp_{i,t} + \beta_5\, cashflow\_vol_{i,t} + \beta_6\, earnings\_vol_{i,t} + \beta_7\, firm\_risk_{i,t} + \beta_{10}\, size_{i,t} + \beta_{11}\, roa_{i,t} + \beta_{12}\, debt_{i,t} + \beta_{13}\, equity\_issuance_{i,t} + \beta_{14}\, BigN_{i,t} + \beta_8\, bid\_ask_{i,t} + \beta_9\, BM\_ratio_{i,t} + \beta_{15}\, tax_{i,t} + \beta_{16}\, investment_{i,t} + \beta_{17}\, leverage_{i,t} + \beta_{18}\, interest\_burden_{i,t} + \beta_{19}\, liquidity_{i,t} + \beta_{20}\, number\_of\_estimates_{i,t} + \beta_{21}\, fe\_error_{i,t} + \beta_{22}\, fe\_dispersion_{i,t} + \varepsilon_{i,t}$$

In the equations above, the dependent variable is either the fair value of derivatives used and designated for hedge accounting as a percentage of all derivative investments (ha_use), or the fair value of derivatives designated for hedge accounting as a percentage of total assets (designated_use). The dummy variable asu_2017 takes on the value of one if the firm has adopted the new standard (including via early adoption), and zero otherwise. The terms *libor_exp, comm_exp, and fx_exp* denote interest rate exposure, commodity price exposure, and foreign exchange exposure, respectively. Academic (Bodnar et al. 2003; Zhang 2009) and practitioner (FASB, 2017; IASB, 2008; KPMG, 2017) literatures suggest that these are the risks most often managed with derivatives. We control for other variables shown by past research to affect firms' derivatives usage and hedge accounting choice (Guay 1999; Zhang 2009; Panaretou et al. 2013; Chang et al. 2016; Pierce 2020). The variable definitions and their construction are described in Appendix A.

4.2. Difference-in-differences design

To test our formal hypotheses regarding ASU 2017-12's effect on real outcomes we conduct difference-in-differences tests using the following model:

$$\text{Dependent variable}_{i,t} = \alpha_0 + \beta_1\text{*designated\_use}_{i,t} + \beta_2\text{*asu\_2017}_{i,t} + \beta_3\text{*designated\_use}_{i,t}\text{*asu\_2017}_{i,t} + \boldsymbol{\beta}\text{`controls}_{i,t} + \sum\psi\ \text{industry\_dummies} + \sum\lambda\ \text{year\_dummies} + \varepsilon_{i,t}$$

Our coefficient of interest is β_3, which captures the marginal effect on the dependent variable of hedge accounting under the ASU that is incremental to that of the intensity with which hedge accounting is used under the former standard (SFAS 133). For control firms the asu_2017 variable equals that of the treatment firms they are matched to. If multiple treatment firms are matched to the same control firm, we ensure that the control firm enters the sample only once, but we ensure that each observation of this firm with a different pseudo-ASU adoption date is included in the sample to ensure the difference-in-differences estimator is appropriately determined. We cluster standard errors at the firm-year level.

Traditional difference-in-difference designs use an indicator treatment variable (i.e., Treat) that equals one for those in the treatment group and is zero otherwise. Such a model relies on a binary treatment effect and Treat*Post would compare changes in examined outcomes before and after the Post event. In our sample it would compare ASU 2017-12 adopting (H) firms to NH firms that are unaffected by ASU 2017-12 as they never apply hedge accounting to their derivatives. However, this approach is problematic for two reasons.

First, both the firm's decision to apply hedge accounting to their derivatives, and their adoption of ASU 2017-12 may not be random. As discussed in more detail in Section 5.2, we mitigate this problem by propensity score matching H firms with NH firms on the basis of several fundamental variables that reflect the demand for hedging. Second, ASU 2017-12 was designed to ease hedge accounting implementation and hence its use. However, the binary treatment does not account for the cross-sectional variation in or the extent to which firms' hedge accounting use is eased by the new requirements. Conceptually, the magnitude of risk exposures, performance volatility and financial outcomes induced by ASU 2017-12 should be greater for firms that make more changes to their designated derivative use.

To address these problems, we employ a modified difference-in-difference approach to allow for a continuous intensity treatment measure captured by designated_use. While a non-random binary H/NH assignment or signed fair values (positive for derivative assets, and negative for liabilities) may pose omitted variable bias, the sum of absolute fair values of designated derivatives instruments is a more precise quantification of hedge accounting use. By replacing the treatment dummy with a continuous measure, we allow each firm-year a continuum of possible treatment, thus further mitigating the problem of non-random sampling beyond the matched sample approach.

H1 predicts that the less complex rules of ASU 2017-12 will be associated with a reduction in firm risk exposures, as hedging transactions can now more effectively be put in place with less complicated procedures. We use firm_risk, libor_exp, comm_exp, fx_exp, cash flow_vol, and earnings_vol as proxies for risk exposure and thus our dependent variables for H1. In tests where the outcome variables are risk exposures, cash flow, and earnings volatility, we include the same controls as those used in Zhang (2009).

H2 predicts that less complex hedge accounting will reduce a firm's financing frictions and encourage greater external financing and investment. We use debt, investment, bid-ask spread, and equity_issuance as dependent variables for these tests. In tests where the outcome variable is bid-ask spread, we include the same controls as those used in Panaretou et. al (2013). In tests where the outcome variables relate to financing and investing, we use the same controls as Kausar, Shroff and White (2017).

5. Results

5.1 Hedge accounting choice and ASU 2017-12

Table 3 presents our model of the determinants of hedge accounting choice at the firm-year level. Panel A presents our regressions where the dependent variable is either the fair value of derivatives designated for hedge accounting as a percentage of all derivatives used (ha_use) or as a percentage of total assets (designated_use). After controlling for firm characteristics, the asu_2017 variable is positive and significant, consistent with the change in hedge accounting rules via the ASU increasing firms' intensity with which they use hedge accounting. As a percentage of their total derivatives, firms designate around 15% more with hedge accounting treatment upon adopting ASU 2017-12; this is directly observed from the magnitude of the coefficient. When derivatives designated for hedge accounting treatment are measured as a percent of assets, this fraction increases by 32% from its mean pre-ASU level.[8]

In Panel B of Table 3 we regress the *total* (both hedge accounting designated and non-hedge accounting designated) fair value of derivatives used as a percentage of total assets (derivative_use) on the time dummy for ASU adoption as well as the designation of whether the firm used hedge accounting (H). Interestingly, those firms using hedge accounting in the pre-ASU period actually invest less in derivatives than those firms not opting for hedge accounting, as evidenced by the negative coefficient on H. However, the positive coefficient on H*asu_2017 suggests this relationship is reversed following ASU adoption. In terms of magnitude, derivative use by firms that follow hedging accounting increases by 62% (0.408/0.657) when these firms adopt the ASU, compared to derivative use by non-users of hedge accounting.

[8] Calculated as 0.099/0.314, where the denominator is the average of all sampled firms' designated derivatives as a fraction of assets in the pre-ASU 2017-12 period and the numerator reflects the coefficient from the regression.

Overall, the analyses in Table 3 confirm our maintained assumption that the reduction in hedge accounting complexity after the ASU lowered the reporting costs that deterred derivatives use. Firms were more likely to use derivatives in a manner that qualified for hedge accounting. Whether that led to more effective *real hedging*, and thus more favorable operational outcomes, is the issue we address with our hypothesis tests in the next section.

5.2 The effect of hedge accounting on risk exposures and cash flow volatility

To mitigate the endogeneity problem that the use of derivatives and hedge accounting designation are choice variables, we match our treatment sample of firms using hedge accounting to a similar set of derivatives using firms that do not utilize hedge accounting. We match each treatment (H) firm-year with a (NH) control firm, based on their growth opportunities and access to finance. We match on the following variables within each industry and year, in the pre-ASU period: return on assets, debt, sales growth, book-to-market ratio, and annual stock return. Additionally, we match on cashflow volatility, size, investment, and tax, as these variables significantly influence hedge accounting use, as shown by our determinants tests. These variables are also controls in our difference-in-differences tests, yet we match on them to ensure reasonable covariate balance in the treatment and control sample in the pre-ASU years. We use propensity score matching, with a nearest neighbor match with a caliper distance of 0.01 (1% times the standard deviation of the variable). Since our control sample is smaller than the treatment sample, we match with replacement to ensure a reasonable majority of treatment firms coupled with a suitable covariate balance in the pre-ASU period. We require all matched treatment and control firms in the pre-ASU period to have observations in the post-ASU period. Given staggered adoption of the ASU by treatment firms, we construct pseudo pre/post-ASU periods for control firms (NH) based on when the matched treatment firm (H) adopts the ASU. Our final sample comprises 1,737 treatment (H) and 336 control (NH) firm-years. Table 4 compares the mean values of the matching variables for the treatment sample with those for the control sample, each year before the ASU adoption. The table indicates that the matching procedure overall results in statistically insignificant differences between the treatment firms and control firms for the matched variables in the pre-treatment years.[9]

Table 5 presents the results of hedge accounting adoption on total firm risk as well as the three specific types of risk exposures. In the first four columns we present results for our entire sample, and then in the right four columns we present the results for the sample including only those treatment and control firm years that can be matched via the propensity score matching procedures. The estimated coefficient on the interaction term designated_use*asu_2017 represents the difference between the change in risk outcomes for hedge-accounting users vs. non-hedge accounting users when the ASU is adopted, with hedge accounting use captured as a continuous variable reflecting the fair value of derivatives used for hedging divided by firm assets. The results suggest a negative relation between the firm risk outcomes and hedging accounting intensity only in the post-ASU period.[10]

In the full sample there are significant reductions in overall firm risk, interest exposure, and foreign exchange (FX) exposure; there is also an effect on commodity risk exposure that is negative albeit insignifcant at traditional levels. In the matched sample the overall firm risk and FX exposures are mitigated by derivatives accounted for under hedge accounting in the post-period. In terms of economic magnitude, if a non-hedge accounting firm designated the sample mean amount of derivatives as a percentage of assets in the post-ASU period this would

[9] We conduct all of our tests using an entropy balanced matched sample and all of our statistical inferences and conclusions are unchanged. Results are available upon request.

[10] When developing predictions we did not focus on the effectiveness of the classification of hedge accounting in the pre-ASU period in capturing successful risk management strategies. These results suggest that when derivatives were used in the earlier period and accounted for with hedge accounting this revealed very little about risk management strategies through our proxies. Perhaps the costs of compliance were so high and the accounting so complex that they not only lessened but completely deterred effective hedging strategies. Exploration of this is beyond the scope of this paper, as we are interested in the *change* in behavior following the reduction in complexity rather than modelling all of the forces at work in these relations in the earlier period.

lead to a roughly 4% reduction in overall risk exposure of the firm and a 5% reduction in FX risk, respectively.[11]

Table 6 reports the effect of changes in hedge accounting on cash flow and earnings volatility. Changes in cash flow volatility embody real effects of changed risk-management activity as suggested in the previous table. We observe that cash flow volatility for hedge-accounting user firms decline significantly following ASU adoption, in both the full and restricted matched samples.

We use earnings volatility as a dependent variable as well in Table 6 to substantiate whether the income statement also reflected less volatility with a change in hedge accounting treatment. This is a necessary condition if the ASU accounting change was enacted in such a way as to remove volatility of earnings via reporting lower hedge ineffectiveness charges. At the same time, the change in cash flow volatility should also be manifest in a change in earnings volatility. In each column we see a negative coefficient when hedge accounting firms have adopted ASU 2017. In terms of economic magnitude, if a non-hedge accounting firm designated the sample mean amount of derivatives as a percentage of assets in the post-ASU period this would lead to a roughly 7% reduction (0.420 x -0.006/0.037) in cashflow volatility and a 6% reduction (0.420 x -0.003/0.022) in earnings volatility. In sum, the results in Tables 5 and 6 support our H1 prediction that the decline in cost and complexity of hedge accounting associated with the ASU led to a reduction in firm risk and cash flow volatility.

5.3 The effect of hedge accounting on financing and investment

Table 7 documents the impact of the change in hedge accounting rules on the firm's debt, investment, bid-ask spread, and equity issued. Since hedging can mitigate operational risk and volatility for only a finite period (i.e., the duration of the hedge) we expect a more

[11] The 4% figure is calculated by multiplying the post-ASU mean amount of designated use (0.420) by the reduction in firm risk as a percentage of the pre-ASU mean level of non-users' firm risk (0.420 x -0.002/0.024). The -0.002 represents the regression coefficient, and 0.024 the non-user firm risk measure pre-ASU per Table 4, Panel B. Similarly, the 5% FX risk reduction is calculated as (0.420 x -0.163/1.269).

significant effect on debt which carries a fixed term with required principal and interest payments during the hedged period vs. equity which does not mandate dividend payouts. For completeness we examine the effect of hedging on debt and equity capital sources, as well as information asymmetry in the equity market as captured by the bid-ask spread.

We find a significant increase in the association between hedging intensity and debt financing in the post-ASU period in both the matched and unmatched samples. We also observe an increase in the association between hedging intensity and firm investment in the post-ASU period. In terms of economic magnitude, if a non-hedge accounting firm designated the sample mean amount of derivatives as a percentage of assets in the post-ASU period this would lead to a roughly 6% increase (0.420 x 0.053/0.361) in debt, and a 17% increase (0.420 x 0.040/0.097) in investment. From an equity market standpoint, we observe a reduction in information asymmetry as captured by the stock's bid-ask spread, for hedge accounting firms in the post-ASU period. However, we do not observe significant differences in equity issued by hedging firms. Taken together, the analyses support our predictions in H2 that hedge accounting firms experience an increase in the association between hedging intensity and investing outcomes following the ASU.

5.4 Placebo tests using pseudo-adoption years

The difference-in-differences design above assumes that if the ASU treatment were absent, average outcomes for treatment (H) and control (NH) groups would have followed parallel paths over time. We conduct placebo tests by falsely assuming that the treatment firms adopt the ASU in each of the years 2014 through 2016. We find insignificant coefficients for the difference-in-differences estimators for the key outcome variables' tests, suggesting that the parallel paths assumption holds. We present the coefficients with their confidence intervals over the sample period in Figure 1.

5.5 Financial effects for new users of hedge accounting

Our pooled sample includes all derivative users with at least one observation in both the pre- and post-ASU periods. In Table 8 we restrict our focus to the group of firms that *newly initiate* hedge accounting at any time after the issuance of ASU 2017-12, while still interacting the intensity of designated derivatives (designated_use) with the ASU adoption indicator variable (asu_2017). We single out three types of firms from our treatment sample to capture several forms of unprecedented hedge accounting use.

The first type includes firms that started designating (to hedge accounting treatment) their already-in-place derivatives after the ASU is issued in 2017. The second type includes firms that in the pre-ASU issuance period had designated derivatives related to some exposure(s) but started newly designating already-in-place derivatives related to a different exposure. The third type includes firms that initiate a derivative program with hedge accounting for a previously uncovered exposure after the ASU is issued, while still having derivatives in place for other exposures in the pre-ASU issuance period. We do this 'new user' test as an additional test to emphasize that firms freshly opted for hedge accounting after the ASU was issued, and that our intended effects can be seen in this sub-sample. We identify 74 new user firms, which is 20% of our total treatment firms.

The designated_use*asu_2017 coefficient signs are consistent with the larger sample of firms, with all of them having a greater magnitude in the predicted sign than the initial sample regressions. However, the reduction in sample and larger standard errors for these new user tests results in several of these coefficients no longer being significantly different from zero. We find that both cash flow volatility and earnings volatility are significantly lower for ASU 2017-12 adopting firms, with these firms specifically experiencing significantly lower commodity price risk and foreign currency exchange risk exposure. For example, the decline in commodity price risk and foreign currency exchange risk exposure for newly initiating firms is 22% and 11% respectively. For the investment and financing regressions we observe the correct signs, but these are not statistically significant at conventional levels.

5.6 Compliance costs (ROA) partition

We partition the sample to examine the influence of implementation costs and compliance burden of hedge accounting on our findings. Since the FASB intended that the ASU would reduce a compliance burden, we expect firms that previously did not have the administrative resources to sustain more extensive accounting expertise to benefit more from ASU adoption. Consistent with previous research, we use ROA to proxy for available resources to support financial reporting compliance costs (Doyle, Ge, and McVay 2007). Table 9 presents the split sample cross-sectional tests for firms above and below the median ROA.

Table 9, Panel B shows that ASU adopting H firms that are *ex-ante* less profitable, experience significant reductions in foreign exchange exposure, cash flow volatility, and overall firm risk. Further, less profitable firms using hedge accounting experience lower spreads and higher levels of debt, equity issuance, and investment upon adoption of the ASU. Adopting firms that are more profitable in the pre-ASU period (Panel A) experience reductions in cash flow volatility, earnings volatility, and overall firm risk. However, these more profitable firms do not experience significant impacts on the firm debt, equity, investment, or bid-ask spreads. Considered together, these results suggest that those firms more subject to compliance burdens had greater implications from ASU 2017-12 adoption, consistent with our prediction.

5.7 Specific Risk Exposure Targets Partition

In our review of the detailed disclosures we observed that firms do not always disaggregate their hedge accounting use according to the intended risk exposure being addressed. Therefore, to reduce measurement error, our main tests focus on total firm-level designated use. However, as an exploratory analysis we attempt to assign designated use to the intended risk exposures. We form three non-mutually exclusive subsamples in Table 10, Panels

A, B, and C focusing on FX risk exposure, interest rate risk exposure, and commodity risk exposure, respectively. We then examine the effect of risk-specific designations on their respective risk exposures.

Assigning an intended risk exposure to derivative designations requires judgment, and we infer underlying risk exposures connected with hedging instruments by reviewing in detail the nature of derivatives securities footnoted in 10Qs and 10Ks. Table 10 shows that generally, post-ASU designations of derivatives targeted at specific risks reduce the intended exposure. Although commodity price risk exposure remains insignificant at conventional levels in Panel C, we see that FX and interest rate risk exposure spillovers result from post-ASU 2017-12 commodity hedges.

Overall, the results in Table 10 provide support for using total designated use as treatment in our main tests, by showing that the risk exposure reductions arise from both, hedging instruments that target specific risks and from hedging instruments that mitigate multiple risk exposures.

6. Conclusion

We examine whether the complexity associated with hedge accounting standards impacts firms' real outcomes. The ASU substantially reduced complexity compared to its predecessor SFAS 133, under which hedge accounting was subject to high implementation costs and compliance burdens. We use a difference-in-differences design that exploits the staggered adoption of ASU 2017-12 by firms that choose hedge accounting, with the control group being firms that use derivatives but do not follow hedge accounting.

We find that ASU adoption leads to a statistically and economically significant increase in the derivatives designated with hedge accounting. This increase in hedge accounting usage is then accompanied by significant reductions in overall risk exposure, foreign exchange exposure, cash flow volatility, and earnings volatility. ASU adopting firms also experience a decline in bid-ask spread, issue more debt, and make more investments. Overall, these results establish that hedge accounting, when made less complex, enhances economic hedging, thereby reducing financing and investing frictions.

We contribute to the literature on accounting choice and its real effects by establishing how the complexity in accounting for risk management using derivatives influences firms' hedging actions. We also add to the literature on derivatives reporting by evaluating the hedge accounting choice, on which there is limited empirical research.

Our findings are important for standard setters as they reveal an undesirable negative effect of a reporting standard on the underlying economic activity of reporting firms caused by the standard's complexity. Such effects can hinder firms from generating value. In our setting, the FASB achieved its intended result of reducing the negative reporting externalities. Yet, regulators should be aware of such possible negative effects in other settings where reporting is complex.

References

Armstrong, C.S., Core, J.E., Taylor, D.J. and Verrecchia, R.E., 2011. When does information asymmetry affect the cost of capital? *Journal of Accounting Research*, 49(1), 1-40.

Beatty, A. and Weber, J., 2003. The effects of debt contracting on voluntary accounting method changes. *The Accounting Review*, 78(1), 119-142.

Bessembinder, H., 1991. Forward contracts and firm value: Investment incentive and contracting effects. *Journal of Financial and Quantitative Analysis*, 26(4), 519-532.

Blankespoor, E., deHaan, E. and Marinovic, I., 2020. Disclosure processing costs, investors' information choice, and equity market outcomes: A review. *Journal of Accounting and Economics*, 70(2-3), 101344.

Bodnar, G.M., Jong, A.D. and Macrae, V., 2003. The impact of institutional differences on derivatives usage: A comparative study of US and Dutch firms. *European Financial Management*, 9(3), 271-297.

Breslin, A., Basu, S., Ziel. N., 2019. The state of financial risk management. *Chatham Financial*. 1–24.

Campbell, J.L 2015. The fair value of cash flow hedges, future profitability, and stock returns. *Contemporary Accounting Research*, 32(1): 243-279.

Campbell, J.L., D'Adduzio, J., Downes, J.F. and Utke, S., 2021. Do debt investors adjust financial statement ratios when financial statements fail to reflect economic substance? Evidence from cash flow hedges. *Contemporary Accounting Research*, 38(3), 2302-2350.

Campbell, J.L., Mauler, L.M. and Pierce, S.R., 2019. A review of derivatives research in accounting and suggestions for future work. *Journal of Accounting Literature* 42: 44-60.

Carter, M.E., Lynch, L.J. and Tuna, I.R., 2007. The role of accounting in the design of CEO equity compensation. *The Accounting Review*, 82(2), 327-357.

Chang, H.S., Donohoe, M. and Sougiannis, T., 2016. Do analysts understand the economic and reporting complexities of derivatives? *Journal of Accounting and Economics*, 61(2-3), 584-604.

Chen, Z., Liu, A.Z., Seow, G.S., and Xie, H. 2020. Does mandatory retrospective hedge effectiveness assessment under ASC 815 provide risk-relevant information? *Accounting Horizons*, 34 (3), 61-85.

Choi, J.J., Mao, C.X., and Upadhyay, A.D. 2015. Earnings management and derivative hedging with fair valuation: Evidence from the effects of FAS 133. *The Accounting Review*, 90 (4): 1437-1467.

Cornaggia, J. 2013. Does risk management matter? Evidence from the U.S. agricultural industry. *Journal of Financial Economics*, 109, 419–40.

DeMarzo, P.M. and Duffie, D., 1995. Corporate incentives for hedging and hedge accounting. *Review of Financial Studies*, 8(3), 743-771.

Donohoe, M., 2015a. Financial derivatives in corporate tax avoidance: a conceptual perspective. *Journal of the American Taxation Association*, 37, 37–68.

Donohoe, M., 2015b. The economic effects of financial derivatives on corporate tax avoidance. *Journal of Accounting and Economics* 59(1), 1–24.

Doyle, J., Ge, W. and McVay, S., 2007. Determinants of weaknesses in internal control over financial reporting. *Journal of Accounting and Economics*, 44(1-2), 193-223.

Dye, R. A. 2001. An evaluation of ''essays on disclosure'' and the disclosure literature in accounting. *Journal of Accounting and Economics*, 32(1-3): 181–235.

Fields, T.D., Lys, T.Z. and Vincent, L., 2001. Empirical research on accounting choice. *Journal of Accounting and Economics*, *31*(1-3), 255-307.

Financial Accounting Standards Board (FASB), 1994. Disclosure about Derivative Financial Instruments and Fair Value of Financial Instruments. Statement of Financial Accounting Standard No. 119. FASB, Norwalk, CT.

Financial Accounting Standards Board (FASB), 1998. Accounting for Derivative Instruments and Hedging Activities. Statement of Financial Accounting Standard No. 133. FASB, Norwalk, CT.

Financial Accounting Standards Board (FASB), 2000. Accounting for Certain Derivative Instruments and Certain Hedging Activities. Statement of Financial Accounting Standard No. 138. FASB, Norwalk, CT.

Financial Accounting Standards Board (FASB), 2003. Amendment of Statement 133 on Derivative Instruments and Hedging Activities. Statement of Financial Accounting Standard No. 149. FASB, Norwalk, CT.

Financial Accounting Standards Board (FASB), 2006. Accounting for Certain Hybrid Financial Instruments. Statement of Financial Accounting Standard No. 155. FASB, Norwalk, CT.

Financial Accounting Standards Board (FASB), 2008. Disclosures about Derivative Instruments and Hedging Activities. Statement of Financial Accounting Standard No. 161. FASB, Norwalk, CT.

Financial Accounting Standards Board (FASB), 2017. Derivatives and Hedging (Topic 815). Targeted Improvements to Accounting for Hedging Activities: Accounting Standards Update No. 2017-12. FASB, Norwalk, CT.

Financial Accounting Standards Board (FASB), 2013. Remarks of Russell G. Golden, Chairman, FASB, AICPA Conference on Current SEC and PCAOB Developments, Washington, DC. http://www.fasb.org/cs/ContentServer?c=Document_C&pagename=FASB%2FDocument_C%2FDocumentPage&cid=1176163675405.

Financial Accounting Standards Board (FASB), 2013. Remarks of Russell G. Golden, Chairman, Financial Accounting Standards Board, AICPA Conference on Current SEC and PCAOB Developments, Washington, DC.

http://www.fasb.org/cs/ContentServer?c=Document_C&pagename=FASB%2FDocument_C%2FDocumentPage&cid=1176163675405.

Froot, K., D. Scharfstein, and J. Stein. 1993. Risk management: Coordinating corporate investment and financing policies. *Journal of Finance*, 48, 1629-58.

Géczy, C., Minton, B.A. and Schrand, C., 1997. Why firms use currency derivatives. *Journal of Finance*, 52(4), 1323-1354.

Gigler, F., Kanodia, C. and Venugopalan, R., 2007. Assessing the information content of Mark-to-Market accounting with mixed attributes: The case of cash flow hedges. *Journal of Accounting Research*, 45(2), 257-276.

Gilje, E.P. and Taillard, J.P., 2017. Does hedging affect firm value? Evidence from a natural experiment. *Review of Financial Studies*, 30(12), 4083-4132.

Guay, W.R., 1999. The impact of derivatives on firm risk: An empirical examination of new derivative users. *Journal of Accounting and Economics*, 26(1-3), 319-351.

Gumb, B., Dupuy, P., Baker, C.R. and Blum, V., 2018. The impact of accounting standards on hedging decisions. *Accounting, Auditing & Accountability Journal*, 31(1), 193-213.

IASB, 2008: Discussion Paper Complexity in Reporting Financial Instruments. https://www.ifrs.org/-/media/project/fi-impairment/discussion-paper/published-documents/dp-reducing-complexity-reporting.pdf

Kaplan, S. N., and L. Zingales. 1997. Do investment-cash flow sensitivities provide useful measures of financing constraints? *Quarterly Journal of Economics*, 112, 169-215.

Kausar, A., Shroff, N. and White, H., 2016. Real effects of the audit choice. *Journal of Accounting and Economics*, 62(1), 157-181.

Kawaller, I. G. 2018. Update on Hedge Accounting Rules. Retrieved from www.cpajournal.com: https://www.cpajournal.com/2018/04/11/update-on-hedge-accounting-rules/

Katz, D, 2017. New Hedging Rules Will Cut Reporting Costs: FASB. CFO.com (August 29)

Khan, U., Li, B., Rajgopal, S. and Venkatachalam, M., 2018. Do the FASB's standards add shareholder value? *The Accounting Review*, 93(2), 209-247.

KPMG, 2017: IFRS Perspectives: IFRS and US GAAP long awaited changes to hedge accounting. https://advisory.kpmg.us/articles/2017/ifrs-9-hedge-accounting-impacts.html

Leone, M., 2007. Hedge Accounting: A Matchless Future? CFO.com (May 24).

Leone, M, 2008. Why CFOs Still Don't Like Hedge Accounting. CFO.com (September 5).

Lins, K.V., Servaes, H. and Tamayo, A., 2011. Does fair value reporting affect risk management? International survey evidence. *Financial Management*, 40(3), 525-551.

Makar, S., Wang, L. and Alam, P., 2013. The mixed attribute model in SFAS 133 cash flow hedge accounting: implications for market pricing. *Review of Accounting Studies*, 18(1), 66-94.

Mayers, D. and Smith Jr, C.W., 1990. On the corporate demand for insurance: evidence from the reinsurance market. *Journal of Business*, 63(1), 19-40.

Melumad, N.D., Weyns, G. and Ziv, A., 1999. Comparing alternative hedge accounting standards: Shareholders' perspective. *Review of Accounting Studies*, 4(3-4), 265-292.

Myers, S. C. 1977. Determinants of corporate borrowing. Journal of Financial Economics, 5, 147-75.

Myers, S.C. and Majluf, N.S., 1984. Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187-221.

Panaretou, A., Shackleton, M.B. and Taylor, P.A., 2013. Corporate risk management and hedge accounting. *Contemporary Accounting Research*, 30(1), 116-139.

Pierce, S., 2020. Determinants and consequences of firms' derivative accounting decisions. *Journal of Financial Reporting*, 5(1), 81-114.

Pérez-González, F., and H. Yun., 2013. Risk management and firm value: Evidence from weather derivatives. *Journal of Finance*, 68, 2143-76.

PwC. 2018. In depth, a look at current financial reporting issues: Hedge accounting – contrasting US GAAP and IFRS. https://www.pwc.com/hu/en/szolgaltatasok/konyvvizsgalat/treasury_advisory/publications/hedge_accounting_contrasting_us_gaap_and_ifrs.pdf

Roychowdhury, S., Shroff, N. and Verdi, R.S., 2019. The effects of financial reporting and disclosure on corporate investment: A review. *Journal of Accounting and Economics*, 68(2-3), 101246.

Ryan, S.G., Herz, R.H., Iannaconni, T.E., Maines, L.A., Palepu, K.G., Schrand, C.M., Skinner, D.J. and Vincent, L., 2002. Recommendations on hedge accounting and accounting for transfers of financial instruments. *Accounting Horizons*, 16(1), 81-93.

Schrand, C.M. and Elliott, J.A., 1998. Risk and financial reporting: A summary of the discussion at the 1997 AAA/FASB conference. *Accounting Horizons*, 12 (3): 271-282.

Smith, C.W. and Stulz, R.M., 1985. The determinants of firms' hedging policies. *Journal of Financial and Quantitative Analysis*, 20(4), 391-405.

Valladares, M., 2014. Derivatives Transparency Is Essential to End TBTF. *The New York Times* (May 13).

Wong, M.F., 2000. The association between SFAS No. 119 derivatives disclosures and the foreign exchange risk exposure of manufacturing firms. *Journal of Accounting Research*, 38(2), 387-417.

Zhang, H., 2009. Effect of derivative accounting rules on corporate risk-management behavior. *Journal of Accounting and Economics*, 47(3), 244-264.

Appendix A: Variable definitions

Dependent variables

bid_ask	Natural log of bid–ask spread calculated as the yearly average quoted spread (i.e., difference between the best bid and ask divided by the midpoint as measured at the end of each trading day). See Panaretou, Shackleton and Taylor (2013).
cashflow_vol	Cash flow volatility, defined as the standard deviation of quarterly operating cash flows during the most recent two years. See Zhang (2009), and, Chang, Donohoe and Sougiannis (2016).
comm_exp	Commodity price risk exposure, defined as the absolute value of the estimated coefficient from a regression of firms' monthly holding period stock returns on the monthly percentage change in the Producer Price Index for 36 months prior to fiscal-year end. See Guay (1999), Zhang (2009), Donohoe (2015b), and Chang, Donohoe and Sougiannis (2016).
debt	Sum of long-term and short-term debt, scaled by lagged total assets.
earnings_vol	Earnings volatility, defined as the standard deviation of quarterly earnings before extraordinary items during the most recent two years. See Zhang (2009), and, Chang, Donohoe and Sougiannis (2016).
fx_exp	Foreign currency exchange rate risk exposure, defined as the absolute value of the estimated coefficient from a regression of firms' monthly holding period stock returns on the monthly percentage change in the Federal Reserve Board trade-weighted U.S. dollar index for 36 months prior to fiscal-year end. See Guay (1999), Zhang (2009), Donohoe (2015b), Chang, Donohoe and Sougiannis (2016).
firm_risk	Firm risk, defined as the annual standard deviation of the residuals from a market model regression of daily returns on the CRSP value-weighted index. See Guay (1999).
equity_issuance	Annual increase in the total of common / ordinary stock + capital surplus / share premium reserve + preferred / preference stock (capital) - treasury stock, scaled by total assets. See Carter, Lynch and Tuna (2007).

investment	Change in fixed (non-current) assets, scaled by lagged total assets.
libor_exp	Interest rate risk exposure, defined as the absolute value of the estimated coefficient from a regression of firms' monthly holding period stock returns on the monthly percentage change in the London Interbank Offered Rate (LIBOR) for 36 months prior to fiscal-year end. See Guay (1999), Zhang (2009), Donohoe (2015b), Chang, Donohoe, and Sougiannis (2016).
Variables of interest	
asu_2017	Indicator variable equal to 1 for a treatment (H) firm when it adopts ASU 2017-12 and subsequently; and equal to 1 for a control (NH) firm when its respective matched firm adopts ASU 2017-12 and subsequently. (When using the unmatched sample, the asu_2017 variable equals 1 for a treatment (H) firm when it adopts ASU 2017-12 and subsequently; and equals 1 for a control (NH) firm when ASU 2017-12 becomes mandatory i.e., fiscal years beginning 15th December 2018, and subsequently.)
H	Indicator equal to 1 if hedge accounting augments a firm's use of derivatives (hedge accounting users [H]) and 0 if hedge accounting does not augment a firm's use of derivatives (non-hedge accounting users of derivatives [NH]).
ha_use	Annual average based on quarterly hedge accounting use defined as the sum of the absolute values of the fair value of derivative assets and liabilities designated for hedge accounting divided by the sum of the absolute values of the fair value of all derivative assets and liabilities, multiplied by 100. See Pierce (2020).
designated_use	Annual average based on quarterly designated use defined as the sum of the absolute values of the fair value of derivative assets and liabilities designated for hedge accounting, scaled by total assets multiplied by 100. See Pierce (2020).
derivative_use	Annual average based on quarterly derivative use defined as the sum of the absolute values of the fair value of all derivative assets and liabilities, scaled by total assets multiplied by 100. See Pierce (2020).
Control variables	
annual_return	Annualized daily stock returns of a firm.

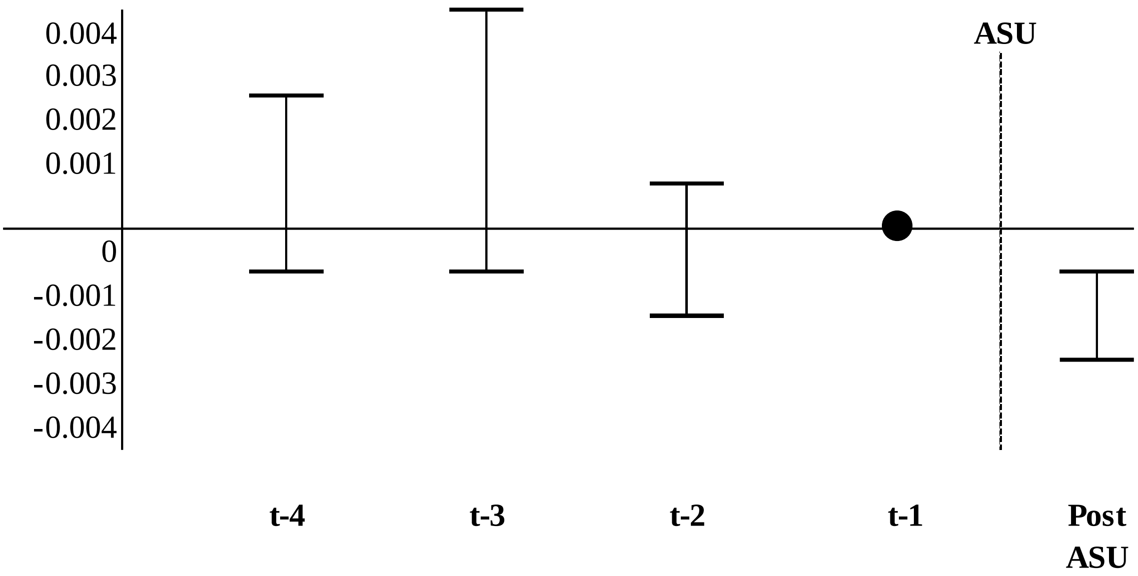
BigN	Indicator equal to 1 if firm is audited by a Big N audit firm.
BM_ratio	Book value of equity divided by market value of equity.
cash	Cash scaled by total assets.
fe_dispersion	Analyst earnings forecast dispersion, defined as the inter-analyst standard deviation of annual earnings forecasts (obtained from the I/B/E/S summary file) deflated by opening stock price (at beginning of year). See Panaretou, Shackleton and Taylor (2013).
fe_error	Analyst earnings forecast error, defined as the absolute value of the difference between the consensus annual earnings forecast and the actual earnings (obtained from the I/B/E/S summary file) scaled by opening stock price (at beginning of year). See Panaretou, Shackleton and Taylor (2013).
foreign_sales	Foreign sales (from Compustat segment file) scaled by total revenue.
ind_cashflow_vol	Median industry-level (3-digit SIC code) cash flow volatility of the non-hedge accounting (derivative-only) users.
ind_comm	Median industry-level (3-digit SIC code) comm_exp (defined above) of the non-hedge accounting (derivative-only) users.
ind_earnings_vol	Median industry-level (3-digit SIC code) earnings volatility of the non-hedge accounting (derivative-only) users.
ind_fx	Median industry-level (3-digit SIC code) fx_exp (defined above) of the non-hedge accounting (derivative-only) users.
ind_libor	Median industry-level (3-digit SIC code) libor_exp (defined above) of the non-hedge accounting (derivative-only) users.
interest_burden	Interest expense divided by operating income before interest.
inventory	Inventory scaled by total assets.
level_of_earnings	Actual earnings per share (I/B/E/S summary file) divided by the stock price at the beginning of the reporting year.
leverage	Total liabilities scaled by lagged total assets.

liquidity	Current assets divided by current liabilities.
loss	Indicator equal to 1 if the firm had negative EPS for the last reporting year and 0 otherwise.
number_of_estimates	Analyst following, defined as the total number of analysts following a firm each year (I/B/E/S detail file).
ppe	Property, plant, and equipment scaled by total assets.
roa	Return on assets, defined as income before extraordinary items, divided by lagged total assets.
sales_growth	Year-on-year percentage change in total revenue.
sd_returns	Annual standard deviation of a firm's daily stock returns.
size	Natural logarithm of the sum of market value of equity, total liabilities, and preferred stock.
stinvestments	Short-term investments scaled by total assets.
tangible_assets	Natural logarithm of the sum of property, plant and equipment, and inventory.
tax	Tax expense scaled by total assets.

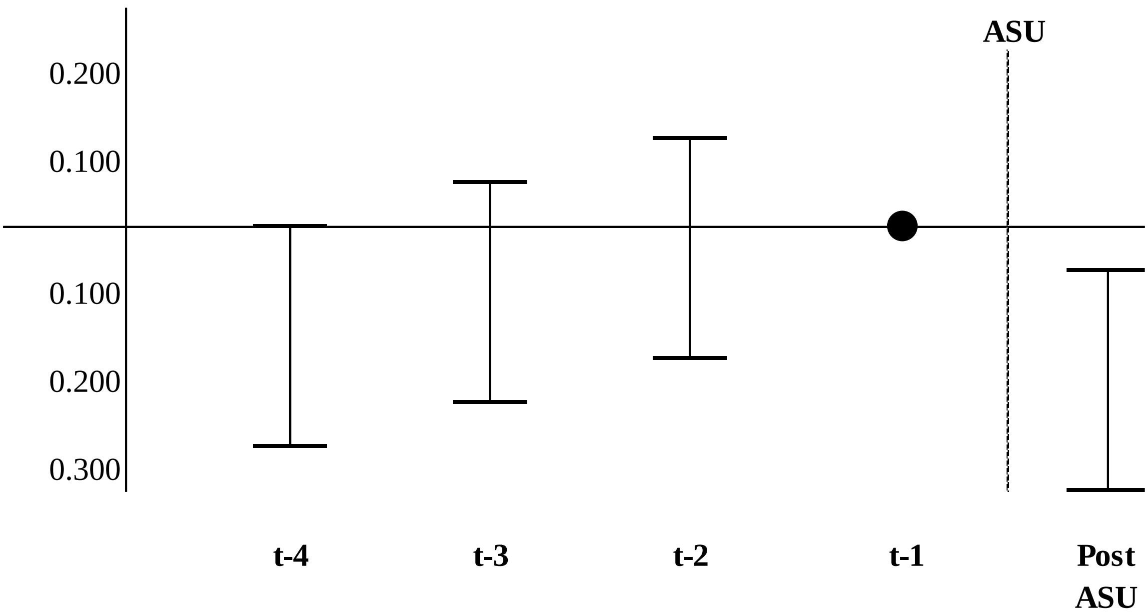
Figure 1

Confidence intervals for coefficient on interaction between *designated_use* and time periods

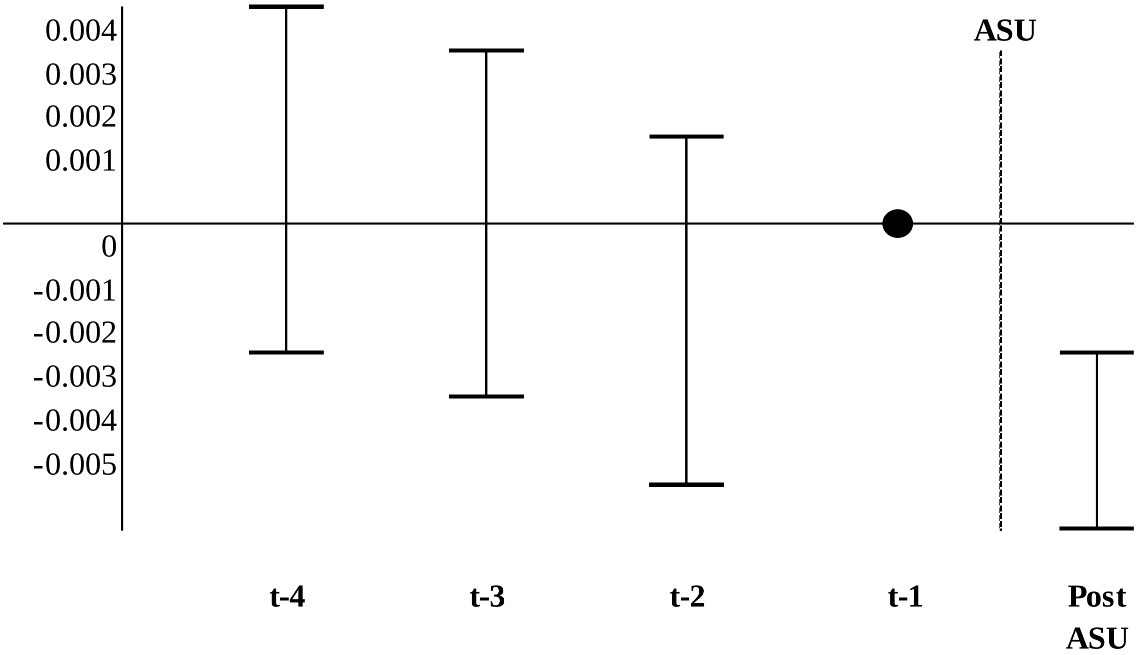
Panel A: *Dependent variable: firm_risk*



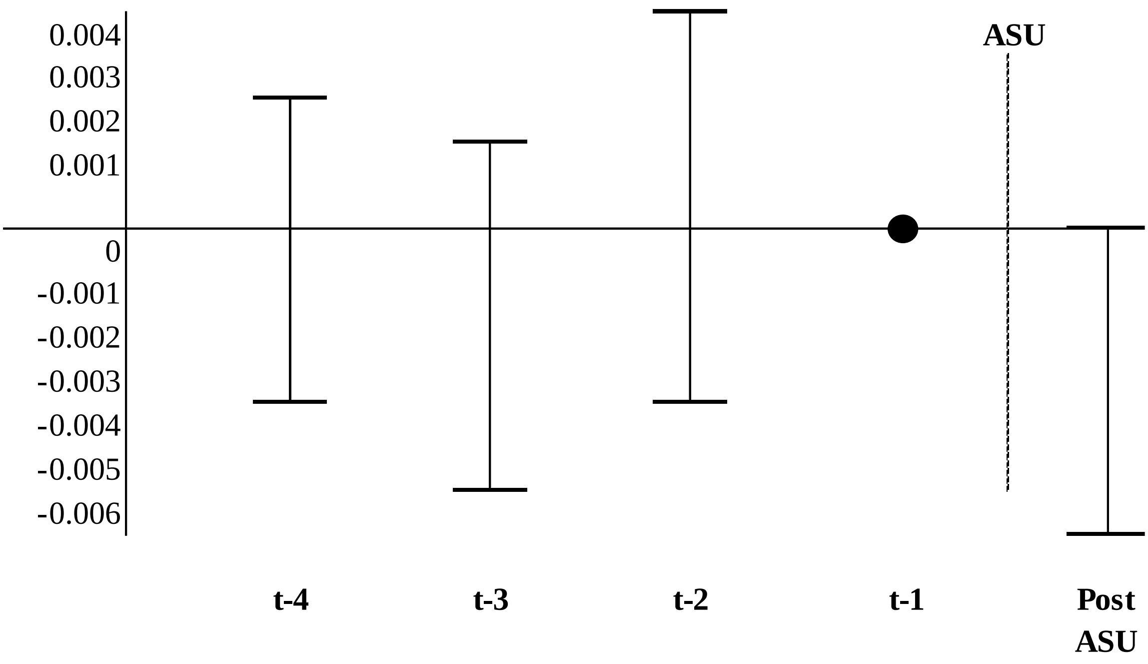
Panel B: *Dependent variable: fx_exp (foreign exchange risk)*



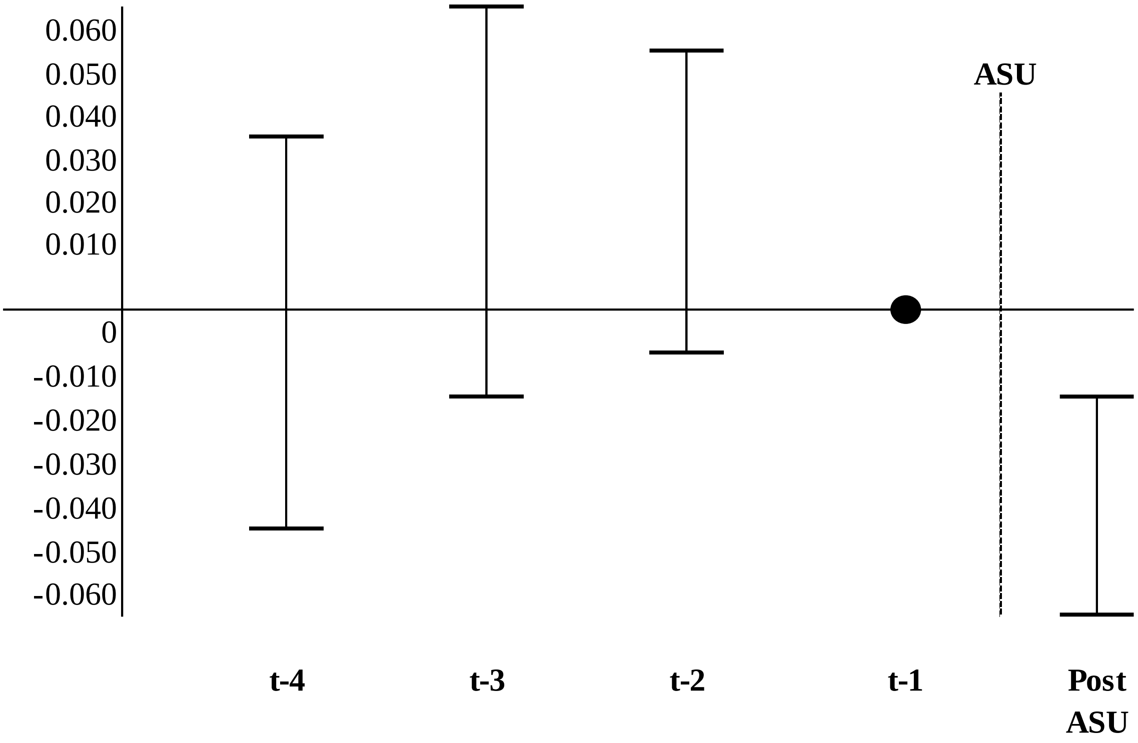
Panel C: *Dependent variable: cashflow_vol (cash flow volatility)*



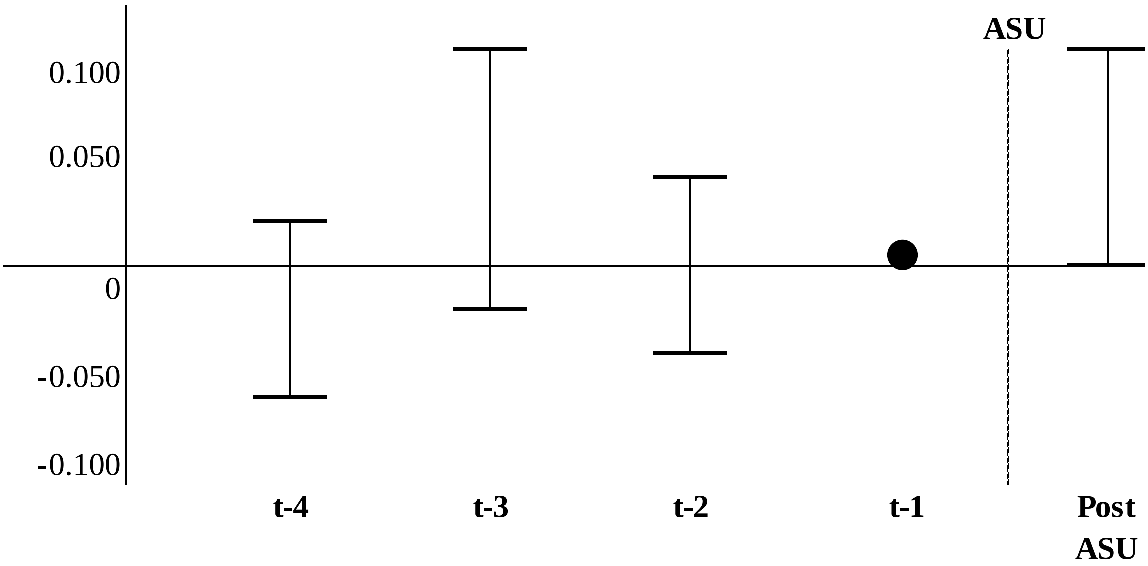
Panel D: *Dependent variable: earnings_vol (earnings volatility)*



Panel E: *Dependent variable: debt*



Panel F: *Dependent variable: investment*



This figure reports confidence intervals of the coefficient on the interaction of *designated_use* with various time dummies spanning t-4 through to the period when ASU 2017-12 is adopted by firms (labelled 'ASU' in the above plots). The confidence intervals are calculated based on a 10% significant level and are obtained by including indicators for every pre-period in the sample except the period before the ASU 2017-12 adoption by firms, which serves as the benchmark period (i.e., the coefficient is constrained to equal zero). All variables are defined in Appendix A.

Table 1
Sample construction and composition

Panel A: *Sample construction*

			Total Derivatives Users
Intersection of Compustat-CRSP-I/B/E/S for derivatives users (2013 - 2019)			4,524
Less: Firm-years without both pre- and post-ASU observations			(1,547)
Sample subject to manual verification and hand collection of quarterly derivatives' positions			2,977
Less: Firm-years without required disclosures			(440)
	Hedge Accounting users (H)	**Non-Hedge Accounting users (NH)**	**Total Sample**
Split obtained after manual verification	2,040	497	2,537
Less: Observations dropped from propensity score matching	(303)	(161)	(464)
Final sample (2013 - 2019)	**1,737**	**336**	**2,073**

Panel B: *Composition of unmatched (constant) sample by year*

Year	**Hedge Accounting use (*ha_use*)**	**% of H that early adopt ASU 2017-12**	**Hedge Accounting users (H)**	**%**	**Non-Hedge Accounting users (NH)**	**%**	**Total Derivatives Users**
2013	70%		227	11%	50	10%	277
2014	72%		244	12%	55	11%	299
2015	73%		263	13%	60	12%	323
2016	74%		290	14%	65	13%	355
2017	75%	2%	320	16%	77	15%	397
2018	78%	43%	344	17%	93	19%	437
2019	81%	44%	352	17%	97	20%	449
			2,040	100%	**497**	100%	**2,537**

Panel C: *Composition of unmatched (constant) sample by industry*

	Hedge Accounting users (H)	%	**Non-Hedge Accounting users (NH)**	%	**Total Derivatives Users**
Industry					
Construction	36	2%	2	0%	38
Manufacturing	1,181	58%	132	27%	1,313
Mining	61	3%	250	50%	311
Retail Trade	86	4%	2	0%	88
Services	327	16%	49	10%	376
Transportation & Public Utilities	261	13%	49	10%	310
Wholesale Trade	84	4%	4	1%	88
Real estate	-	0%	9	2%	9
Non-classifiable Establishments	4	0%	-	0%	4
	2,040	100%	**497**	100%	**2,537**

This table reports sample formation and sample split by year and industry group. 'Non-Hedge Accounting users' denotes firm-years in which derivatives were used without the use of hedge accounting. 'Hedge Accounting users' denotes firm-years in which hedge accounting augmented the use of derivatives. The early adoption rate adjacent to the H column shows the percentage of firms that early adopted ASU-2017 provided their year-ends were eligible for early adopting ASU 2017-12 (i.e., between 28th August 2017 and 14th December 2019, after which the ASU became mandatory). Hedge Accounting (ha_use) use is the average of the quarterly sum of the absolute values of the fair value of derivative assets and liabilities designated for hedge accounting divided by the sum of the absolute values of the fair value of all derivative assets and liabilities.

Table 2
Descriptive statistics

Panel A: Hedge accounting users (H)

	Pre ASU 2017-12 (n = 1,529)			Post ASU 2017-12 (n = 511)		
Variables	**Mean**	**St. Dev.**	**Median**	**Mean**	**St. Dev.**	**Median**
Dependent variables						
ha_use	73.144	33.615	90.600	80.844	28.326	96.700
designated_use	0.396	0.558	0.194	0.420	0.478	0.270
derivative_use	0.657	1.054	0.306	0.595	0.895	0.341
firm_risk	0.016	0.007	0.014	0.018	0.009	0.015
comm_exp	0.359	0.383	0.244	0.525	0.526	0.372
libor_exp	0.129	0.169	0.070	0.167	0.162	0.116
fx_exp	0.768	0.774	0.560	0.918	0.791	0.725
cashflow_vol	0.037	0.020	0.034	0.037	0.020	0.034
earnings_vol	0.011	0.014	0.006	0.011	0.016	0.006
bid_ask	-7.874	0.873	-8.098	-7.788	0.835	-7.935
debt	0.365	0.238	0.326	0.430	0.251	0.386
equity_issuance	0.006	0.137	0.001	0.018	0.202	0.001
investment	0.065	0.209	0.017	0.095	0.218	0.036
Control / other variables						
size	9.110	1.531	9.030	9.236	1.527	9.095
BM_ratio	0.375	0.344	0.317	0.394	0.434	0.326
roa	0.051	0.064	0.049	0.050	0.076	0.047
sales_growth	0.068	0.214	0.046	0.058	0.143	0.049
liquidity	1.934	1.115	1.676	1.714	0.896	1.524
annual_return	0.155	0.366	0.126	0.183	0.394	0.169
leverage	0.684	0.295	0.646	0.737	0.314	0.679
BigN	0.944	0.230	1.000	0.935	0.246	1.000
tax	0.021	0.028	0.018	0.013	0.021	0.011
foreign_sales	0.272	0.271	0.200	0.252	0.257	0.200
inventory	0.097	0.096	0.077	0.091	0.090	0.076
tangible_assets	8.085	1.522	7.992	8.168	1.483	8.031
loss	0.129	0.335	0.000	0.135	0.342	0.000
number_of_estimates	2.310	0.730	2.398	2.271	0.722	2.398
interest_burden	0.124	0.206	0.096	0.147	0.234	0.116
fe_error	0.003	0.015	0.001	0.004	0.008	0.001
fe_dispersion	0.002	0.006	0.001	0.003	0.008	0.001
share_turnover	2.110	1.685	1.697	2.343	2.002	1.738
cash	0.086	0.080	0.067	0.075	0.076	0.051

Panel B: Non-Hedge Accounting users (NH)

Variables	Pre ASU 2017-12 (n = 400) Mean	St. Dev.	Median	Post ASU 2017-12 (n = 97) Mean	St. Dev.	Median
Dependent variables						
ha_use	0.000	0.000	0.000	0.000	0.000	0.000
designated_use	0.000	0.000	0.000	0.000	0.000	0.000
derivative_use	1.381	1.931	0.528	1.161	1.774	0.410
firm_risk	0.024	0.013	0.021	0.028	0.015	0.025
comm_exp	0.937	1.002	0.590	1.404	1.128	1.091
libor_exp	0.210	0.278	0.117	0.340	0.325	0.229
fx_exp	1.269	1.152	0.945	1.674	1.794	1.067
cashflow_vol	0.037	0.022	0.033	0.041	0.020	0.037
earnings_vol	0.022	0.031	0.012	0.039	0.052	0.020
bid_ask	-7.477	1.106	-7.744	-6.977	1.186	-7.166
debt	0.361	0.245	0.317	0.390	0.194	0.360
equity_issuance	0.068	0.223	0.006	0.022	0.116	0.004
investment	0.097	0.281	0.027	0.061	0.155	0.051
Control / other variables						
size	8.766	1.498	8.797	8.645	1.618	8.608
BM_ratio	0.634	0.685	0.524	0.930	1.062	0.581
roa	-0.012	0.162	0.024	-0.015	0.129	0.011
sales_growth	0.185	0.539	0.088	0.044	0.261	0.001
liquidity	1.697	1.454	1.265	1.356	1.213	1.027
annual_return	-0.005	0.422	-0.052	0.067	0.399	0.127
leverage	0.628	0.303	0.564	0.636	0.234	0.604
BigN	0.828	0.378	1.000	0.804	0.399	1.000
tax	0.003	0.037	0.005	0.002	0.025	0.003
foreign_sales	0.168	0.249	0.000	0.150	0.234	0.000
inventory	0.045	0.083	0.009	0.047	0.077	0.008
tangible_assets	8.204	1.434	8.236	8.185	1.508	8.174
loss	0.392	0.489	0.000	0.402	0.493	0.000
number_of_estimates	2.398	0.773	2.485	2.218	0.796	2.398
interest_burden	0.141	0.453	0.120	0.148	0.337	0.139
fe_error	0.026	0.159	0.003	0.083	0.439	0.006
fe_dispersion	0.018	0.117	0.002	0.037	0.171	0.004
share_turnover	3.951	3.825	2.723	3.777	4.349	2.203
cash	0.062	0.082	0.037	0.057	0.077	0.024

This table reports descriptive statistics of the main variables. Continuous variables are winsorized at 1st and 99th percentiles. Variables are defined in Appendix A.

Table 3

Hedge accounting use, derivative use and ASU 2017

Panel A: Determinants of hedge accounting use

Dependent variables:	ha_use	designated_use
asu_2017	14.758 ***	0.099 **
	(4.880)	(2.315)
libor_exp	-12.629 **	-0.172 ***
	(-2.468)	(-3.349)
fx_exp	-0.775	-0.018
	(-0.452)	(-0.769)
comm_exp	-11.583 ***	-0.12 ***
	(-6.282)	(-4.080)
cashflow_vol	-112.888	-0.506
	(-1.465)	(-0.572)
earnings_vol	-45.551	0.253
	(-1.015)	(0.275)
roa	49.404 ***	0.394 *
	(2.906)	(1.899)
firm_risk	-311.100	0.854
	(-1.000)	(0.323)
interest_burden	-3.278	-0.029
	(-0.852)	(-0.928)
BM_ratio	-10.014 ***	-0.120 ***
	(-2.764)	(-3.169)
size	-7.070 ***	-0.008
	(-3.753)	(-0.368)
tax	102.530 ***	1.237 **
	(2.593)	(2.170)
bid_ask	-1.853	-0.002
	(-0.630)	(-0.054)
liquidity	0.349	0.021
	(0.233)	(1.611)
investment	-22.053 ***	-0.160
	(-4.673)	(-1.572)
fe_error	17.466 ***	0.031
	(2.745)	(0.353)
fe_dispersion	-48.727 ***	-0.258
	(-3.014)	(-1.559)
number_of_estimates	-0.644	-0.055 *
	(-0.219)	(-1.778)
BigN	4.250	0.161 ***
	(0.734)	(2.795)
debt	26.466 ***	0.246 **
	(3.484)	(2.534)
equity_issuance	4.022	0.001
	(0.736)	(0.021)
derivative_use		0.194 ***
		(6.003)

Panel B: Derivative use and ASU 2017-12

Dependent variable:	derivative_use
asu_2017	-0.620 ***
	(-4.151)
H	-0.346 **
	(-2.248)
H*asu_2017	0.408 ***
	(2.608)
libor_exp	0.387
	(1.499)
fx_exp	0.045
	(0.926)
comm_exp	0.265 ***
	(3.291)
cashflow_vol	4.429 **
	(2.146)
earnings_vol	4.737 **
	(2.444)
roa	-0.100
	(-0.207)
firm_risk	4.614
	(0.724)
interest_burden	0.124
	(0.927)
BM_ratio	0.302 ***
	(2.895)
size	0.118 **
	(2.325)
tax	-0.241
	(-0.193)
bid_ask	-0.027
	(-0.331)
liquidity	-0.107 ***
	(-3.355)
investment	0.724 ***
	(3.251)
fe_error	-0.152
	(-0.306)
fe_dispersion	0.140
	(0.205)
number_of_estimates	-0.020
	(-0.188)
BigN	-0.120
	(-0.621)
debt	0.061
	(0.260)

Constant	115.55 ***	0.196	equity_issuance	-0.263
	(4.783)	(1.146)		(-1.447)
			Constant	-0.568
				(-1.093)
Observations	2,537	2,537	Observations	2,537
Adj. R-squared	0.194	0.268	Adj. R-squared	0.135
F-test (p-value)	0.00	0.00	F-test (p-value)	0.00

T-statistics (OLS) in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Reported OLS statistics are based on robust standard errors and clustering at firm and year levels. Panel A shows the estimated coefficients from panel OLS regressions of hedge accounting designation on asu_2017 and firm characteristics. ha_use is the sum of the absolute values of the fair value of derivative assets and liabilities designated for hedge accounting divided by the sum of the absolute values of the fair value of all derivative assets and liabilities; and designated_use is the sum of the absolute values of the fair value of derivative assets and liabilities designated for hedge accounting, scaled by total assets multiplied by 100. Panel B shows the estimated coefficients from panel OLS regressions of derivative use on asu_2017 and firm characteristics. H is an indicator equal to 1 if hedge accounting augments a firm's use of derivatives (hedge accounting user) and 0 if hedge accounting does not augment a firm's use of derivatives (non-hedge accounting user of derivatives). All variables are defined in Appendix A.

Table 4

Results from propensity score matching

Matching variables	Hedge Accounting Users	Non-Hedge Accounting Users	Diff.	p-value	Matched obs.		Year
	Mean	Mean			H	NH	
roa	0.063	0.050	0.013	0.286			
debt	0.295	0.332	-0.036	0.422			
sales_growth	0.053	0.185	-0.132	0.095			
liquidity	2.176	1.732	0.444	0.072			
BM_ratio	0.358	0.453	-0.095	0.174	182	28	2013
annual_return	0.421	0.481	-0.060	0.498			
cashflow_volatility	0.039	0.037	0.001	0.753			
size	9.208	8.960	0.249	0.411			
investment	0.030	0.141	-0.111	0.082			
tax	0.023	0.023	0.001	0.883			
roa	0.057	0.034	0.023	0.139			
debt	0.341	0.390	-0.050	0.422			
sales_growth	0.070	0.120	-0.050	0.223			
liquidity	2.119	2.326	-0.207	0.565			
BM_ratio	0.351	0.478	-0.127	0.145	199	32	2014
annual_return	0.084	0.051	0.033	0.589			
cashflow_volatility	0.039	0.038	0.001	0.829			
size	9.258	8.822	0.436	0.151			
investment	0.058	0.163	-0.104	0.029			
tax	0.024	0.026	-0.002	0.669			
roa	0.040	-0.006	0.046	0.120			
debt	0.370	0.335	0.034	0.507			
sales_growth	0.012	0.147	-0.136	0.369			
liquidity	2.018	2.097	-0.079	0.813			
BM_ratio	0.380	0.515	-0.134	0.224	221	31	2015
annual_return	-0.020	-0.134	0.114	0.055			
cashflow_volatility	0.038	0.031	0.007	0.026			
size	9.130	8.934	0.196	0.519			
investment	0.072	0.111	-0.039	0.508			
tax	0.020	0.008	0.012	0.113			
roa	0.048	-0.001	0.049	0.000			
debt	0.392	0.326	0.067	0.152	248	35	2016
sales_growth	0.069	0.132	-0.063	0.445			

liquidity	1.956	2.002	-0.046	0.862			
BM_ratio	0.340	0.465	-0.125	0.130			
annual_return	0.240	0.240	0.000	0.999			
cashflow_volatility	0.036	0.032	0.004	0.281			
size	9.201	8.755	0.445	0.126			
investment	0.079	0.082	-0.004	0.943			
tax	0.016	0.005	0.011	0.026			
roa	0.042	0.009	0.033	0.006			
debt	0.393	0.316	0.077	0.006			
sales_growth	0.114	0.182	-0.068	0.148			
liquidity	1.908	1.902	0.006	0.979			
BM_ratio	0.333	0.428	-0.095	0.199	266	45	2017
annual_return	0.250	0.056	0.194	0.001			
cashflow_volatility	0.034	0.033	0.002	0.586			
size	9.273	8.953	0.319	0.227			
investment	0.082	0.011	0.071	0.000			
tax	0.023	0.006	0.016	0.004			
roa	0.047	0.030	0.017	0.309			
debt	0.365	0.367	-0.003	0.944			
sales_growth	0.111	0.136	-0.025	0.550			
liquidity	1.891	1.866	0.025	0.911			
BM_ratio	0.506	0.527	-0.021	0.830	175	52	2018
annual_return	-0.108	-0.114	0.005	0.910			
cashflow_volatility	0.037	0.042	-0.005	0.285			
size	8.960	8.733	0.227	0.393			
investment	0.045	0.076	-0.030	0.390			
tax	0.011	0.006	0.005	0.153			
Pre-ASU observations					1,291	223	
Post-ASU observations					446	113	
Total matched sample					1,737	336	

This table reports the outcomes of matching with replacement applied to the pre-ASU sample. The pre-ASU period comprises treatment firms (hedge accounting users) before they adopted ASU 2017-12, and these firms' matched control (non-users of hedge accounting) firms. The mean values of the matching variables for the treatment sample are compared to the mean values of the matching variables for the control sample in the pre-ASU period by year. All variables are defined in Appendix A.

Table 5
Effect of hedge accounting under ASU 2017 on risk exposures

	Tests without matching				Tests with matching			
Dependent variable:	**firm_risk**	**libor_exp**	**comm_exp**	**fx_exp**	**firm_risk**	**libor_exp**	**comm_exp**	**fx_exp**
designated_use*asu_2017	-0.002 ***	-0.032 **	-0.045	-0.187 ***	-0.002 ***	-0.012	-0.020	-0.163 **
	(-4.353)	(-2.515)	(-1.018)	(-3.841)	(-5.387)	(-0.865)	(-0.317)	(-2.740)
designated_use	-0.0001	0.004	0.005	-0.031	0.0001	0.002	-0.002	-0.058
	(-0.117)	(0.426)	(0.269)	(-0.661)	(0.144)	(0.213)	(-0.118)	(-1.209)
asu_2017	0.001 **	0.001	-0.048	0.125 ***	0.001 ***	-0.021	0.013	0.067 *
	(3.438)	(0.057)	(-1.737)	(5.522)	(8.785)	(-1.373)	(0.427)	(2.197)
ind_libor		0.059 ***				0.045 ***		
		(3.742)				(3.552)		
ind_comm			0.111				0.118 *	
			(1.810)				(2.177)	
ind_fx				0.084				0.052
				(1.415)				(1.155)
size	-0.003 ***	-0.008	0.000	-0.050	-0.003 ***	-0.005	-0.005	-0.038
	(-11.515)	(-1.706)	(0.003)	(-1.711)	(-9.873)	(-1.133)	(-0.590)	(-1.538)
roa		0.114 *	0.326	0.696 **		0.17 **	0.391 **	0.488 *
		(2.019)	(1.167)	(2.723)		(2.820)	0.391	(2.314)
interest_burden		-0.027				-0.022		
		(-1.567)				(-0.772)		
stinvestments		0.047		0.184		0.02		0.091
		(0.982)		-0.52		(0.504)		(0.246)
leverage	0.005 ***	0.055 **		-0.009	0.005 ***	0.046 **		-0.016
	(5.247)	(2.695)		(-0.168)	(4.191)	(2.927)		(-0.333)
cash			-0.092				0.030	
			(-0.471)				(0.153)	

inventory			0.096				0.085	
			(0.727)				(0.559)	
foreign_sales				-0.068				0.021
				(-0.695)				(0.206)
BM_ratio	0.003*	0.032	0.027	-0.156 *	0.004 **	0.027	0.031	-0.236 ***
	(2.261)	(1.548)	(0.538)	(-2.272)	(3.208)	(1.133)	(0.699)	(-3.856)
sd_returns		7.272 ***	29.656 ***	41.185 ***		8.784 ***	25.965 ***	42.37 ***
		(4.066)	(8.365)	(7.527)		(5.613)	(11.263)	(6.326)
Fixed effects		Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year
Observations	2,537	2,537	2,537	2,537	2,073	2,073	2,073	2,073
R-squared	0.515	0.336	0.545	0.297	0.459	0.344	0.459	0.258
Adj. R-squared	0.503	0.318	0.533	0.278	0.447	0.328	0.446	0.240
F-test (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

T-statistics in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Reported statistics are based on robust standard errors and clustering at firm and year levels. The table shows the estimated coefficients from difference-in-differences regressions of risk outcomes on the hedge accounting choice under ASU 2017-12 and controls for each risk exposure category. The sample period is 2013 - 2019 and includes firms that used derivatives, with or without hedge accounting. designated_use*asu_2017 is the main variable of interest. All variables are defined in Appendix A.

Table 6
Effect of hedge accounting under ASU 2017 on performance volatility

	Tests without matching		*Tests with matching*	
Dependent variable:	**cashflow_vol**	**earnings_vol**	**cashflow_vol**	**earnings_vol**
designated_use*asu_2017	-0.007 ***	-0.003 *	-0.006 ***	-0.003 **
	(-3.542)	(-2.072)	(-4.508)	(-2.909)
designated_use	0.002	0.002	0.001	0.001
	(1.416)	(1.741)	(1.150)	(1.520)
asu_2017	0.001	0.001 *	0.002	0.001 ***
	(1.190)	(2.003)	(1.877)	(4.130)
cashflow_vol				
ind_cashflow_vol	0.049		0.056	
	(1.008)		(1.053)	
ind_earnings_vol		0.168 **		0.120 **
		(3.343)		(2.977)
sd_returns	-0.028	0.384 **	0.083	0.435 ***
	(-0.167)	(2.993)	(0.644)	(3.988)
BM_ratio	-0.010 ***	0.000	-0.010 ***	-0.001
	(-4.889)	(0.088)	(-5.449)	(-0.657)
ppe	0.008 *	-0.004	0.014 **	-0.005
	(2.126)	(-1.312)	(2.711)	(-1.680)
size	-0.001	0.000	-0.001	0.000
	(-0.936)	(0.729)	(-1.085)	(0.608)
roa	0.059 **	-0.095 ***	0.108 ***	-0.067 **
	(2.551)	(-5.594)	(7.200)	(-2.756)
leverage	-0.009 ***	-0.003	-0.009 ***	-0.003 *
	(-3.640)	(-1.361)	(-4.641)	(-2.270)
Fixed effects	Industry Year	Industry Year	Industry Year	Industry Year
Observations	2,537	2,537	2,073	2,073
R-squared	0.307	0.388	0.350	0.279
Adjusted R-squared	0.288	0.371	0.334	0.261
F-test (p-value)	0.00	0.00	0.00	0.00

T-statistics in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Reported statistics are based on robust standard errors and clustering at firm and year levels. The table shows the estimated coefficients from difference-in-differences regressions of measures of cash flow and earnings volatility on the hedge accounting choice under ASU 2017-12 and related controls. The sample period is 2013 - 2019 and includes firms that used derivatives, with or without hedge accounting. designated_use*asu_2017 is the main variable of interest. All variables are defined in Appendix A.

Table 7

Effect of hedge accounting under ASU 2017 on financing / investing outcomes

	Tests without matching				*Tests with matching*			
Dependent variable:	**debt**	**investment**	**bid_ask**	**equity_ issuance**	**debt**	**investment**	**bid_ask**	**equity_ issuance**
designated_use*asu_2017	0.068 ***	0.034 **	-0.115 **	0.011	0.053 ***	0.040 **	-0.104 **	0.009
	(5.622)	(3.220)	(-3.063)	(0.742)	(3.561)	(2.896)	(-3.133)	(0.368)
designated_use	0.025 *	0.016	0.031	0.003	0.023	0.018	0.035	0.005
	(2.039)	(1.558)	(0.682)	(0.423)	(1.608)	(1.543)	(0.741)	(0.790)
asu_2017	0.01	0.008	0.045	0.012 *	0.009	0.004	0.103 ***	0.007
	(1.079)	(0.742)	(0.628)	(2.200)	(0.838)	(0.466)	(3.693)	(0.982)
size	-0.006	-0.003	-0.426 ***	0.005	-0.003	0.001	-0.405 ***	0.007
	(-0.305)	(-1.019)	(-15.939)	(1.342)	(-0.141)	(0.375)	(-13.042)	(1.415)
liquidity	-0.026 **	-0.007	-0.014	0.016 **	-0.031 ***	-0.005	-0.002	0.015 **
	(-3.044)	(-1.410)	(-0.678)	(3.005)	(-3.977)	(-1.222)	(-0.083)	(3.067)
sales_growth	0.174 ***	0.33 ***	0.098 *	0.179 ***	0.218 ***	0.4 ***	0.156 **	0.235 ***
	(4.946)	(9.120)	(2.264)	(6.588)	(4.620)	(12.097)	(3.148)	(7.802)
tangible_assets	0.011				0.013			
	(0.543)				(0.590)			
roa	-0.185	0.153 *	-1.501 ***	-0.371 ***	-0.367 **	-0.066	-1.956 ***	-0.538 ***
	(-1.759)	(2.00)	(-4.057)	(-4.594)	(-2.833)	(-0.784)	(-6.644)	(-7.881)
annual_return	-0.027	0.001	0.057	0.039 **	-0.019	-0.002	0.081	0.041 **
	(-1.198)	(0.079)	(0.770)	(2.578)	(-0.825)	(-0.122)	(1.061)	(2.672)
BM_ratio	-0.104 **	0.012	0.153	0.023 **	-0.111 **	0.009	0.152	0.015 *
	(-3.383)	(0.991)	(1.890)	(3.030)	(-3.245)	(0.506)	(1.774)	(2.028)
share_turnover			-0.008				-0.002	
			(-0.731)				(-0.130)	

Fixed effects	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year
Observations	2,537	2,537	2,537	2,537	2,073	2,073	2,073	2,073
R-squared	0.295	0.224	0.639	0.153	0.285	0.230	0.623	0.175
Adjusted R-squared	0.276	0.204	0.629	0.131	0.268	0.212	0.614	0.155
F-test (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

T-statistics in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Reported statistics are based on robust standard errors and clustering at firm and year levels. The table shows the estimated coefficients from difference-in-differences regressions of bid-ask spread, and measures of external financing, and investing on the hedge accounting choice under ASU 2017-12 and related controls. The sample period is 2013 - 2019 and includes firms that used derivatives, with or without hedge accounting. designated_use*asu_2017 is the main variable of interest. All variables are defined in Appendix A.

Table 8

New users of hedge accounting and ASU 2017-12

Dependent variable:	**firm_risk**	**libor_exp**	**comm_exp**	**fx_exp**	**cashflow_ vol**	**earnings_ vol**	**debt**	**investment**	**bid_ask**	**equity_issuance**
designated_use*asu_2017	-0.003	-0.061	-0.480 **	-0.341 **	-0.008 ***	-0.012 **	0.090	0.036	-0.278	0.058
	(-1.761)	(-1.579)	(-2.719)	(-2.556)	(-5.527)	(-3.069)	(1.289)	(0.434)	(-1.652)	(0.521)
designated_use	0.000	0.008	0.320 **	-0.050	-0.002	0.002	0.043	0.064 *	0.215	0.049 *
	(0.119)	(0.287)	(2.705)	(-0.566)	(-0.967)	(0.545)	(1.719)	(2.290)	(1.637)	(2.186)
asu_2017	0.001	0.005	0.096	0.289 ***	-0.005 ***	0.004	0.062 *	-0.002	0.071 *	-0.015
	(1.290)	(0.179)	(0.711)	(4.602)	(-6.732)	(1.232)	(2.007)	(-0.045)	(2.334)	(-0.419)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year
Observations	918	918	452	918	918	918	918	918	918	918
Adjusted R-squared	0.569	0.319	0.597	0.342	0.25	0.451	0.217	0.233	0.66	0.139

T-statistics in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Reported statistics are based on robust standard errors and clustering at firm and year levels. The table focuses on the sub-sample of firms that newly adopt hedge accounting under ASU 2017-12. New users of hedge accounting are defined as those that newly start designating existing derivatives in the period when ASU-2017-12 becomes available for adoption. The new user subsample includes both, firms that newly apply hedge accounting to exisiting derivatives and those that expand hedge accounting to an exposure whose derivatives were not previously designated. The table shows the estimated coefficients from difference-in-differences regressions of all outcome variables on the hedge accounting choice under ASU 2017-12 and related controls. The sample period is 2013 - 2019 and includes firms that used derivatives, with or without hedge accounting. designated_use*asu_2017 is the main variable of interest. All variables are defined in Appendix A.

Table 9

Cross-sectional tests based on samples formed using pre-ASU level of profitability

Panel A: *Sub-sample of firms with high (above median) roa in the pre-ASU period.*

Dependent variable:	**firm_risk**	**libor_exp**	**comm_exp**	**fx_exp**	**cashflow_ vol**	**earnings_ vol**	**debt**	**investment**	**bid_ask**	**equity_issuance**
designated_use*asu_2017	-0.001 *	-0.023	-0.110	-0.080	-0.007 **	-0.005 **	0.029	0.014	0.021	0.013
	(-2.403)	(-1.104)	(-1.853)	(-0.987)	(-3.051)	(-2.980)	(1.476)	(0.419)	(0.507)	(0.269)
designated_use	0.001	-0.002	-0.028	-0.103	0.001	0.0003	0.022	0.01	0.032	0.005
	(1.116)	(-0.133)	(-1.291)	(-1.878)	(0.668)	(0.334)	(1.573)	(1.876)	(0.759)	(0.794)
asu_2017	0.000	-0.045*	-0.021	-0.020	0.003	0.003 *	0.038	0.012	0.052	0.001
	(0.776)	(-2.250)	(-1.033)	(-0.406)	(1.880)	(2.383)	(1.446)	(0.494)	(1.407)	(0.050)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year
Observations	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038	1,038
Adjusted R-squared	0.434	0.361	0.495	0.208	0.366	0.194	0.335	0.140	0.643	0.109

Panel B: *Sub-sample of firms with low (below median) roa in the pre-ASU period.*

Dependent variable:	**firm_risk**	**libor_exp**	**comm_exp**	**fx_exp**	**cashflow_ vol**	**earnings_ vol**	**debt**	**investment**	**bid_ask**	**equity_issuance**
designated_use*asu_2017	-0.002 ***	-0.006	0.077	-0.274 **	-0.004 ***	0.001	0.065 **	0.044 *	-0.085 **	-0.010
	(-3.954)	(-0.258)	(1.233)	(-3.101)	(-7.107)	(0.150)	(2.417)	(1.926)	(-2.482)	(-1.174)
designated_use	0.001	0.009	0.015	-0.002	0.001	0.001	0.027	0.035	-0.063	0.014
	(0.838)	(0.459)	(0.415)	(-0.027)	(0.697)	(1.241)	(1.145)	(1.343)	(-1.144)	(1.144)
asu_2017	0.002 ***	0.001	0.050	0.095	0.002 **	0.000	0.008	0.001	0.046	0.017
	(4.447)	(0.027)	(1.469)	(1.734)	(2.671)	(0.263)	(0.375)	(0.055)	(0.883)	(1.851)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year	Industry Year
Observations	1,035	1,035	1,035	1,035	1,035	1,035	1,035	1,035	1,035	1,035
Adjusted R-squared	0.477	0.318	0.450	0.254	0.212	0.435	0.238	0.258	0.699	0.176

T-statistics in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Reported statistics are based on robust standard errors and clustering at firm and year levels. The table shows the results of cross-sectional difference-in-differences regressions. Panel A shows results based on the subsample formed using firms that on average have pre-ASU return on assets greater than the median pre-ASU return on assets. Panel B shows results based on the subsample formed using firms that on average have pre-ASU return on assets less than the median pre-ASU return on assets. designated_use*asu_2017 is the main variable of interest. The variable asu_2017 equals 1 when a firm adopts ASU 2017-12. All variables are defined in Appendix A.

Table 10

Robustness tests based on samples formed using risk exposure specific designations

Panel A: *Designated use specific to interest rate risk exposure.*

Dependent variable:	**libor_exp**	**fx_exp**	**comm_exp**
libor_designated_use*asu_2017	-0.071**	0.016	-0.057
	(-2.855)	(0.104)	(-1.103)
libor_designated_use	0.007	-0.270	0.042
	(0.227)	(-1.798)	(0.745)
asu_2017	-0.001	-0.027	-0.082*
	(-0.037)	(-0.881)	(-1.967)
Controls	Yes	Yes	Yes
Fixed effects	Industry Year	Industry Year	Industry Year
Observations	1,685	1,685	1,685
Adjusted R-squared	0.318	0.286	0.567

Panel B: *Designated use specific to FX risk exposure.*

Dependent variable:	**fx_exp**	**libor_exp**	**comm_exp**
FX_designated_use*asu_2017	-0.194**	-0.004	-0.148
	(-2.555)	(-0.155)	(-1.678)
FX_designated_use	-0.037	-0.009	-0.026
	(-0.754)	(-0.726)	(-1.045)
asu_2017	0.208***	-0.011	-0.114*
	(5.177)	(-0.399)	(-2.330)
Controls	Yes	Yes	Yes
Fixed effects	Industry Year	Industry Year	Industry Year
Observations	1,702	1,702	1,702
Adjusted R-squared	0.335	0.337	0.584

Panel C: *Designated use specific to commodity risk exposure.*

Dependent variable:	**comm_exp**	**libor_exp**	**fx_exp**
comm_designated_use*asu_2017	-0.096	-0.053**	-0.550***
	(-1.322)	(-3.202)	(-5.121)
comm_designated_use	0.064*	0.015	0.045
	(1.927)	(0.940)	(0.664)
asu_2017	0.036	0.022	0.298***
	(0.453)	(0.838)	(5.531)
Controls	Yes	Yes	Yes
Fixed effects	Industry Year	Industry Year	Industry Year
Observations	826	826	826
Adjusted R-squared	0.567	0.313	0.335

T-statistics in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Reported statistics are based on robust standard errors and clustering at firm and year levels. The table shows the results of cross-sectional difference-in-differences regressions. Panel A shows results based on the subsample formed using designated_use that is specific to reducing interest rate risk exposure. Panel B shows results using designated_use that is specific to reducing FX risk exposure. Panel C shows results using designated_use that is specific to reducing commodity price risk exposure. In all subsamples a common control group of non-hedge accounting users is included. All variables are defined in Appendix A.