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Hedge accounting and firms' future investment spending

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ABSTRACT

Finance theory suggests that effective hedging reduces cash flow volatility, enabling firms to invest in profitable projects they might otherwise avoid. We argue that this association holds only for derivatives designated for hedge accounting, which requires the fulfillment of strict effectiveness criteria. Our evidence shows that only designated derivatives are positively associated with future investments, indicating that hedge accounting serves as a helpful signaling device for stakeholders regarding the success of firms' hedging programs. However, firms using complex hedging strategies seem unable to designate some of their successful derivatives due to the often-criticized strict criteria for hedge accounting.

1. Introduction

We are currently experiencing a period of heightened global economic uncertainty and market volatility exacerbated by crises, such as the COVID-19 pandemic, geopolitical tensions, and climate-related events. During these turbulent times, companies increasingly rely on hedging strategies to mitigate financial risks and stabilize returns (Ji and Wei, 2023). Given the significance of hedging as a financial strategy, it is essential that these activities are appropriately reflected in financial statements, making transparent accounting rules for these complex financial contracts crucial. However, hedge accounting standards are frequently criticized and remain a topic of ongoing debate among financial standard-setters (Ryan et al., 2002; Glaum and Klöcker, 2011; Hairston and Brooks, 2019).¹ This study investigates whether hedge accounting regulations provide financial statement users with useful information on the effectiveness of firms' hedging programs.

When common accounting principles are applied, the gains and losses from the two components of a financial hedging relationship – the hedged item and the hedging instrument – may affect firms' profit/loss in different time periods or by different amounts, resulting in misrepresentation of the hedging relationship in firms' net income. This generates volatility in firms' net income, which is not economically justified as it does not reflect a firm's risk management perspective. This contradicts the objective of faithfully

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¹ The FASB is currently discussing minor amendments to improve hedge accounting regulation (ASC 815); see the board decisions as of June 4, 2024 here: <https://www.fasb.org/page/ShowPdf?path=TBDs%20to%20Date%20Jun%204,%202024.pdf&title=Topic%20815%E2%80%93Hedge%20Accounting%20Improvements%E2%80%94Tentative%20Board%20Decisions%20to%20Date>

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representing a firm's underlying economics (Ryan, 2012). For this reason, the Financial Accounting Standards Board (FASB), through Accounting Standards Codification (ASC) 815, allows for a special type of accounting treatment known as hedge accounting. This treatment enables firms to recognize gains and losses from designated derivative instruments and hedged items in net income for the same period. However, to have the possibility of applying hedge accounting, firms must fulfil certain criteria (ASC 815-20-25-1 (a-d)). Key among those criteria is firms' requirement to provide evidence that the designated derivative instruments are highly effective in offsetting changes in the fair value or cash flows of hedged items at initiation and on an ongoing basis (ASC 815-20-25-75).²

Against this regulatory background, particularly hedges designated for hedge accounting should be effective in offsetting financial risks, making hedge accounting designation status crucial information for financial statement users. To examine whether designated hedges are indeed (more) effective, we investigate the association between hedge accounting designation status and firms' future investments as a proxy for underinvestment problems. Froot et al. (1993) provide analytical evidence that financial hedging increases a firm's future investment spending. The basis for their contention is that underinvestment problems arise from risk exposures that affect firms' ability to function normally, that is, to operate efficiently and pursue all investments with positive net present value (Stulz, 2013). Specifically, in situations where internal funds fall to levels where cash flows are insufficient to invest in value-enhancing projects, firms need to reduce attractive investment opportunities. Indeed, Minton and Schrand (1999) provide empirical evidence that firms do not fully rely on external capital markets to cover liquidity shortfalls but rather permanently cut back on investment opportunities. Effective financial hedging reduces uncertainty about future cash flow variations. Consequently, hedging prevents left-tail outcomes and makes firms less dependent on external financing when capital market frictions arise, which might otherwise force firms to forgo attractive projects. Accordingly, effective hedging should ultimately be positively related to firms' future investments (Aretz and Bartram, 2010; Minton and Schrand, 1999; Graham and Rogers, 2002; Lin et al., 2008).

To the best of our knowledge, Campello et al. (2011) is alone in providing empirical evidence that financial hedging has positive effects on firms' future investment spending. However, Campello et al. (2011) do not differentiate between designated and non-designated derivatives. To draw conclusions about the suitability of hedge accounting rules as an informational tool for helping financial statement users evaluate the effectiveness of firms' hedging activities, we consider the role of hedge accounting. More precisely, we expect that only designated hedges are positively associated with future investments due to regulatory requirements.

However, there is some tension in this assumption, as accounting professionals often criticize the criteria governing hedge accounting. One concern is that the recommended methods for evaluating hedge effectiveness, such as the dollar-offset method, are too vague and allow for discretion, potentially leading to the designation of ineffective hedges for hedge accounting (Chen et al., 2020). Moreover, hedge accounting rules are frequently criticized for being too complex, strict, and costly (Comiskey and Mulford, 2008). Particularly for complex hedging strategies, where firms use derivatives to manage multiple risks and use different types of hedging instruments, documentation requirements, and hedge effectiveness testing are "inherently more difficult to attain" (Ryan, 2012, p. 286). Firms with such strategies might be unable to designate some of their successful derivatives or may choose not to do so due to the associated costs. Accordingly, we also investigate whether designation status provides less useful information for firms with complex hedging strategies.

For our empirical analysis, we use changes in hedge accounting regulations. Since the Statement of Financial Accounting Standards (SFAS) 161 was introduced in 2008, firms have been required to present fair values of derivatives based on their accounting designation, which allows us to differentiate between designated and non-designated derivatives (Hairston and Brooks, 2019).³ We use disclosures introduced by SFAS 161 and hand-collect the fair value of outstanding (non-)designated derivatives for all non-financial S&P 500 firms from 2010 to 2013 shortly after the enactment of SFAS 161 (with a 2-year gap to avoid initial adoption bias).

On average, we find that only derivatives designated for hedge accounting are positively associated with future investment. This suggests that the designated hedges were effective, and firms, therefore, correctly implemented the applicable hedge accounting rules.

² This effectiveness testing is required on at least a three-monthly basis and must be performed both prospectively and retrospectively (ASC 815-20-25-79). To assess the effectiveness of derivatives, firms commonly rely on the dollar-offset method (Ryan, 2012; Pierce, 2020; Manchiraju et al., 2018). Under this method, derivatives are expected to be effective when the cumulative changes in the fair value of the hedging derivative offsets between 80% and 125% of the cumulative changes in the fair value of the hedged item (Manchiraju et al., 2018; Pierce, 2020; PwC, 2019). Another method proposed by the FASB is the regression analysis. In practice, hedge effectiveness under this method is assumed when the following key metrics are fulfilled: The dependent (independent) variable should be the change in the fair value of the derivative (hedged item); the R-squared should be 80% or higher; the slope coefficient should be statistically significant at least at the 5%-level and be within a range of -0.8 and -1.25 (see in detail: PwC, 2019, Chapter 9.11.4.2). Consequently, effectiveness requirements under the regression analysis are similar to the dollar-offset method.

³ The concept of hedge accounting along with its disclosure requirements for firms' derivative use was firstly introduced by SFAS 133 (effective date: June 2000) (EY, 2019). Under these specific disclosure requirements firms were not required to disclose the fair value or notional amount of their outstanding derivatives. In fact, firms were allowed to net all derivative assets and liabilities on the balance sheet, making it almost impossible to analyze the extent of derivatives designated for hedge accounting (Steffen, 2016; Campbell et al., 2021). Hence, SFAS 133 has been criticized by practitioners and academics for not providing adequate information about derivative instruments and hedging activities (Campbell et al., 2021). In response to this criticism, the FASB reconsidered disclosures under SFAS 133 and issued SFAS 161 (effective date: November 2008). Whilst this standard did not change the accounting concept for derivatives, it did require enhanced derivative disclosures. Under this new standard, firms are required to inform investors about "how and why an entity uses derivatives" (FASB, 2008) and to present in a tabular format fair values of derivative based on their accounting designation, position, and for each risk exposure category (e.g. foreign exchange rate risk, interest rate risk, commodity price risk). The concept of derivative accounting (as issued by SFAS 133) and its disclosure requirements (as issued by SFAS 161) are now codified under ASC 815.

Thus, the FASB installed an effective signaling device with SFAS 161. However, further analyses suggest that this is not the case for firms with complex hedging strategies. Firms with such hedging strategies do not designate some of their most successful hedges due to the often criticized strict and complex criteria for applying hedge accounting under ASC 815.

Beyond academic contributions, such as answering a call for research by Campbell et al. (2019, p. 55) to “use better data now available from SFAS 161”, our results should be of utmost interest to practitioners and standard-setters. Derivative usage is widespread and forms a major part of a firm’s risk management (Bartram et al., 2009; Millo and MacKenzie, 2009; Campbell et al., 2019). However, even for sophisticated users of financial statements, the future performance of derivatives is particularly difficult to forecast (Kawaller, 2004). Our study on the designation status of derivatives and its implications for hedge effectiveness should provide valuable insights for investors and analysts. Additionally, it should guide standard-setters and regulators in evaluating the correct application of hedge accounting rules and in developing high-quality hedge accounting standards.

The remainder of this paper is organized as follows. Section 2 describes the research design of the study. Section 3 presents and discusses the results. Section 4 concludes the study.

2. Data and methodology

We begin our sample selection process (Table 1) with all non-financial firms in the S&P 500. We exclude financial firms because of their highly regulated environments and unique characteristics. S&P 500 firms are considered because they represent a significant portion of the U.S. economy and, due to their size, are more likely to use derivatives (Chang et al., 2016; Anbil et al., 2019; Pierce, 2020). We focus on the period from 2010 to 2013, shortly after the enactment of SFAS 161, which became effective in November 2008. To mitigate any effects due to initial unfamiliarity with the new standard (Kvaal and Nobes, 2012), we apply a lag of two financial years after its enactment. Because data on the fair value of firms’ (non-)designated derivatives is not available in databases, we manually collected this information from 10-K reports. After excluding firms with insufficient disclosure on derivatives and incomplete control data, our final sample consists of 1213 firm-years.

Panel A of Table 2 presents our sample distribution by industry (Fama/French 12-industry classification) and year. Panel B shows the use of hedge accounting in each industry. Hedge accounting seems to be of particular relevance in the manufacturing and consumer goods industry, whereas we find the lowest application rate in the shops and wholesale industry.

To investigate the relationship between derivative designation status and firms’ future investments, we estimate the following empirical model (1), based on Campello et al. (2011):

$$F_INVEST_{i,t+1} = b_0 + b_1DES_DER_{i,t} + b_2NDES_DER_{i,t} + Controls_{i,t} + Industryfixedeffects_{i,t} + YearFixedeffects_{i,t} + e_{i,t} \quad (1)$$

The dependent variable is a firm’s total future investment ($F_INVEST_{i,t+1}$), as measured in previous studies (Biddle et al., 2009; Cheng et al., 2013; Garcia Lara et al., 2016).⁴ To examine the role of derivative designation, we follow Pierce (2020) and calculate the sum of absolute values from the fair values of non-designated ($NDES_DER_{i,t}$) and designated derivative ($DES_DER_{i,t}$) assets and liabilities, scaled by total assets.

$$F_INVEST_{i,t+1} = b_0 + b_1DES_DER_{i,t} + b_2NDES_DER_{i,t} + b_3DES_DER_{i,t} * COMPLEX_t + b_4NDES_DER_{i,t} * COMPLEX_t + Controls_{i,t} + Industryfixedeffects_{i,t} + YearFixedeffects_{i,t} + e_{i,t} \quad (2)$$

To investigate the role of the complexity of firms’ hedging strategies, we add interaction terms with our variables of interest and a measure of complexity (Model (2)). We rely on Chang et al. (2016) and classify a firm as using a complex hedging strategy ($COMPLEX$) when it: (1) hedges at least two types of risk exposures (foreign exchange risk, interest rate risk, commodity price risk, other), and (2) uses at least two types of instruments (swaps, future/forwards, options, and others).

We include several firm-specific controls that the literature has shown to be associated with firms’ future investment spending or risk management (Kaplan and Zingales, 1997; Biddle et al., 2009; Campello et al., 2011; Pierce, 2020). Finally, we add industry (Fama/French 48-industry classification) and year-fixed effects.⁵

3. Results

3.1. Descriptive statistics

Table 3 presents the descriptive statistics of the variables used in our analyses. We find that the fair value of outstanding designated derivatives ($DES_DER_{i,t}$) is, on average, equivalent to 0.4 % of total assets, whereas the fair value of non-designated derivatives ($NDES_DER_{i,t}$) is slightly higher, representing 0.6 % of total assets for our sample firms.

Table 4 presents the correlations between the main variables. Designated derivatives ($DES_DER_{i,t}$) are significantly positively associated with firms’ future investments, while non-designated derivatives ($NDES_DER_{i,t}$) are not significantly related to future investments. This finding suggests that designated derivatives are more effective in offsetting risks, in line with the effectiveness criterion required by hedge accounting standards.

⁴ All variables are defined in the Appendix.

⁵ Additional information on the research design and additional sensitivity tests are presented in the online appendix.

Table 1
Sample selection process.

	# of firm-years
The sample selection process considers as a starting point all non-financial firms included in the S&P 500 (January 2010-December 2013)	1581
Less observations with insufficient derivative disclosure	1339
Less observations with missing firm-specific variables	1213
Final sample (including firms with no outstanding derivatives)	1213 [=354 firms]
Observations, where firms do not have any outstanding derivatives ('no hedging')	225
Observations, where firms have only non-designated derivatives outstanding ('hedging but no hedge accounting')	187
Observations, where firms designated some or all of their outstanding derivatives ('hedging and hedge accounting')	801

Table 2
Sample distribution.

Panel A: Sample distribution by industry (Fama/French 12-industry classification) and year					
Industry	2010	2011	2012	2013	Total
Consumer NonDurables	29	29	28	26	112
Consumer Durables	5	6	7	7	25
Manufacturing	39	35	37	37	148
Energy	22	24	26	28	100
Chemicals	14	15	15	13	57
Business Equipment	55	54	52	52	213
Telecommunication	14	13	12	12	51
Utilities	29	29	31	31	120
Shops	43	44	45	40	172
Healthcare	22	26	29	29	106
Other	25	28	27	29	109
Total	297	303	309	304	1213

Panel B: Sample distribution – hedging activity				
Industry	<i>n</i>	<i>no hedge</i>	<i>hedging but no hedge accounting.</i>	<i>hedging and hedge accounting</i>
Consumer NonDurables	112	13 (12 %)	3 (3 %)	96 (85 %)
Consumer Durables	25	0 (0 %)	0 (0 %)	25 (100 %)
Manufacturing	148	5 (3 %)	19 (13 %)	124 (84 %)
Energy	100	13 (13 %)	43 (43 %)	44 (44 %)
Chemicals	57	4 (7 %)	7 (12 %)	46 (81 %)
Business Equipment	213	44 (21 %)	21 (10 %)	148 (69 %)
Telecommunication	51	8 (16 %)	18 (35 %)	25 (49 %)
Utilities	120	0 (0 %)	33 (28 %)	87 (72 %)
Shops	172	85 (49 %)	17 (10 %)	70 (41 %)
Healthcare	106	7 (7 %)	13 (12 %)	86 (81 %)
Other	109	46 (42 %)	13 (12 %)	50 (46 %)
Total/Mean	1213	225 (19 %)	187 (15 %)	801 (66 %)

3.2. Relationship between derivative designation and future investments

Table 5 presents the multivariate results using different model specifications. column (1) shows a positive and significant estimate for DES_DER (p-value < 0.05; one-tailed test),⁶ and a statistically insignificant estimate for $NDES_DER_{i,t}$. The difference in the coefficients is also statistically significant based on an F-test (p-value < 0.05; one-tailed Wald test). This suggests that designated derivatives are (more) positively associated with firms' future investments, as they seem to be more successful in hedging against possible risks, in line with the effectiveness criterion of ASC 815. This implies that the FASB has installed an effective signaling device with SFAS 161 and that managers, on average, make use of the accounting choice and apply the corresponding hedge accounting regulations correctly.

The positive relationship between designated derivatives and future investments holds when we exclude firms that use derivatives not only for hedging but also for trading purposes (column (2)) (Pierce, 2020; Anbil et al., 2019),⁷ and when we include current years' investments ($INVEST_{i,t}$) as an additional control (column (3)) (Cook et al., 2019). Furthermore, these results remain unchanged if we use a sample that excludes firms without any outstanding derivatives (columns (4)–(6)).

⁶ Since we make a directional prediction for our main variables of interest, a one-tailed test is used, which is in line with prior literature (e.g., Cheng et al., 2013; Campbell, 2015; Chen et al., 2020; Quah et al., 2021).

⁷ ASC 815 requires firms to disclose their objective for using derivatives, which allowed us to identify firms which employed derivatives speculatively.

Table 3
Descriptive statistics.

	N	Mean	St.Dev	Min	Median	Max
$F_INVEST_{i,t+1}$	1213	0.105	0.085	0.008	0.082	0.485
$DES_DER_{i,t}$	1213	0.004	0.007	0.000	0.001	0.046
$NDES_DER_{i,t}$	1213	0.006	0.021	0.000	0.000	0.148
$NET_CASH_{i,t}$	1213	-0.121	0.119	-0.482	-0.110	0.174
$LEVERAGE_{i,t}$	1213	0.224	0.144	0.000	0.212	0.744
$ROA_{i,t}$	1213	0.136	0.085	-0.010	0.116	0.449
$SIZE_{i,t}$	1213	9.582	1.008	7.233	9.417	13.348
$OCF_SALES_{i,t}$	1213	0.185	0.125	-0.001	0.159	0.615
$SALES_GROWTH_{i,t}$	1213	0.088	0.151	-0.303	0.065	0.741
$DIV_{i,t}$	1213	0.793	0.405	0.000	1.000	1.000
$LOSS_{i,t}$	1213	0.045	0.208	0.000	0.000	1.000
$REV_VOLA_{i,t-1}$	1213	0.094	0.098	0.005	0.064	0.525
$OCF_VOLA_{i,t-1}$	1213	0.026	0.022	0.002	0.020	0.112
$INVEST_VOLA_{i,t-1}$	1213	0.045	0.067	0.001	0.020	0.392
$RET_VOLA_{i,t-1}$	1213	0.017	0.006	0.008	0.016	0.036
$ANALYSTS_{i,t}$	1213	3.022	0.546	0.000	3.091	4.043
$AGE_{i,t}$	1213	9.108	0.617	6.016	9.391	9.624
$CLOSELY_{i,t}$	1213	0.049	0.092	0.000	0.007	0.473
$FORGN_{i,t}$	1213	0.761	0.427	0.000	1.000	1.000
$CDEBT_{i,t}$	1213	0.007	0.027	0.000	0.000	0.172
$COMPLEX_{i,t}$	1213	0.403	0.491	0.000	0.000	1.000
$TRADER_{i,t}$	1213	0.082	0.274	0.000	0.000	1.000
$HEDGE_{i,t}$	1213	0.815	0.389	0.000	1.000	1.000

Notes: We winsorize all continuous variables at the 1 % level on both tails of the distribution. All variables used in our main analyses are described including their sources in the [Appendix](#).

3.3. Role of the strict and complex hedge accounting criteria

With our next test, we address the criticism that, particularly for firms with complex hedging strategies, the differential effect of designation status on future investments might be less pronounced. When comparing hedging strategies in a descriptive manner (untabulated), we find non-designated derivatives to be around 13-times higher for firms applying complex hedging strategies, suggesting that managers are less likely to designate (effective) derivatives when they pursue more complex hedging strategies.

Table 6 shows that the interaction term with $DES_DER_{i,t}$ and $COMPLEX_{i,t}$ is not statistically different from zero. However, the interaction effect between $NDES_DER_{i,t}$ and $COMPLEX_{i,t}$ is positive and significant for both the full and hedging sample, suggesting that non-designated derivatives are significantly more effective for firms with complex hedging strategies. These firms seemingly cannot designate some of their most successful hedges due to the strict criteria for applying hedge accounting under ASC 815, or they do not decide to do so due to the corresponding costs.

4. Concluding remarks

Finance theory suggests that effective hedging reduces cash flow volatility, enabling firms to invest in profitable projects they might otherwise avoid (Froot et al., 1993). This study investigates whether the hedge accounting designation of derivatives can be regarded as a signaling device for financial statement users regarding the success of firms' hedging programs. This is done by analyzing the relationship between (un-)designated derivatives and firms' future investment spending. Using hand-collected disclosures for derivatives, we find that only derivatives designated for hedge accounting are positively associated with firms' future investments. However, our results also indicate that this relationship only applies to firms without complex hedging strategies.

Our findings have important implications for financial statement users, suggesting that designated derivatives can be considered (more) effective. Thus, the designation status may provide relevant information about the effectiveness of firms' hedging strategies. However, since this does not necessarily apply to firms with more complex hedging strategies, financial statement users should carefully consider the additionally disclosed information on the hedging strategies employed when evaluating a firm's risk management.

Our results should also have important implications for legislators and standard-setters. Our results generally suggest that hedge accounting rules are applied correctly. Hence, frequently expressed concerns that hedge accounting designation does not properly identify the truly effective hedges because some criteria, such as the effectiveness criterion and underlying identification methods (such as dollar-offset method) might be regarded as vague and allow for discretion (Chen et al., 2020), are not supported by our results.

However, our results support the public criticism that the rules under ASC 815 are too strict and complex. Accordingly, it may be necessary to alleviate the criteria for hedge accounting. For instance, the FASB might reconsider its position to limit hedge accounting to hedges at the transaction level (that is, hedge accounting can be applied only to hedges in which one derivative instrument is used to hedge the specific risk arising from one precisely specified hedged item (Ahmed et al., 2011; Manchiraju et al., 2018; Ryan, 2012)). Another option might be to simplify the effectiveness assessment in that the retrospective assessment is repealed, as recently done by the International Accounting Standards Board (IASB) in the development of the International Financial Reporting Standard (IFRS) 9.

Table 4
Pearson's correlation coefficient's.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) $F_INVEST_{i,t-1}$	1											
(2) $DES_DER_{i,t}$	0.064**	1										
(3) $NDES_DER_{i,t}$	0.011	0.174***	1									
(4) $NET_CASH_{i,t}$	0.223***	0.011	-0.029	1								
(5) $LEVERAGE_{i,t}$	0.046	0.026	-0.199***	0.113***	1							
(6) $ROA_{i,t}$	0.050*	0.043	-0.001	-0.015	-0.129***	1						
(7) $SIZE_{i,t}$	0.345***	0.063**	0.073**	0.431***	0.037	0.168**	1					
(8) $OCF_SALES_{i,t}$	0.177***	0.032	-0.011	0.097***	-0.127***	0.233**	0.059**	1				
(9) $SALES_GROWTH_{i,t}$	-0.231***	-0.015	0.081***	-0.082***	0.147***	-0.103***	0.136***	-0.063**	1			
(10) $DIV_{i,t}$	0.01	-0.014	-0.005	-0.041	0.091***	-0.243***	-0.162**	-0.073**	-0.230***	1		
(11) $LOSS_{i,t}$	-0.029	-0.073**	0.008	-0.106***	-0.111***	0.123***	-0.095***	-0.304***	0.208***	-0.123***	1	
(12) $REV_VOL_{i,t-1}$	0.132***	-0.006	0.033	0.098***	-0.098***	0.165***	-0.086**	0.037	0.222***	-0.146***	0.046	1
(13) $OCF_VOL_{i,t-1}$	0.157***	0.060**	-0.026	0.153***	-0.007	0.022	0.022	0.127***	0.172***	-0.144***	0.021	0.104***
(14) $INVEST_VOL_{i,t-1}$	0.171***	-0.017	-0.046	0.065**	-0.182***	-0.037	-0.361***	-0.009	0.262***	-0.328***	0.284***	0.275***
(15) $REV_VOL_{i,t}$	0.179***	-0.019	-0.087***	0.101***	-0.185***	0.047	0.347***	0.244***	0.114***	-0.177***	0.034	-0.025
(16) $AGE_{i,t}$	-0.032	0.014	0.087***	-0.115***	-0.048*	0.102**	-0.071**	-0.080***	-0.170***	0.325***	-0.031	-0.097***
(17) $ANALYSTS_{i,t}$	-0.016	-0.025	-0.042	-0.014	-0.03	0.102**	-0.071**	-0.080***	0.055*	-0.001	-0.008	0.006
(18) $CLOSELY_{i,t}$	0.094***	-0.038	-0.218***	0.046	-0.247**	0.139***	0.105***	-0.116***	0.056*	-0.076***	0.02	0.100***
(19) $FORGN_{i,t}$	0.129***	-0.017	0.047	0.080***	0.034	0.057**	-0.083***	0.089***	-0.170***	-0.168***	0.057**	0.026
(20) $CDEBT_{i,t}$	0.003	0.264***	0.220***	-0.091***	0.093***	-0.127***	0.210***	-0.026	-0.04	0.221***	-0.034	-0.011
(21) $COMPLEX_{i,t}$	0.024	0.005	0.583***	0.016	0.109***	-0.222***	0.110***	0.135***	-0.018	0.152***	0.007	0.019
(22) $TRADER_{i,t}$	-0.017	0.253***	0.147***	0.038	0.205***	-0.161***	0.134***	0.099***	-0.050*	0.154***	0.033	-0.095***
(23) $HEDGE_{i,t}$												
(13) $OCF_VOL_{i,t-1}$	1											
(14) $INVEST_VOL_{i,t-1}$	0.147***	1										
(15) $RET_VOL_{i,t-1}$	0.348***	0.123***	1									
(16) $ANALYSTS_{i,t}$	0.033	0.029	0.099***	1								
(17) $AGE_{i,t}$	-0.113**	-0.094***	-0.215***	-0.052*	1							
(18) $CLOSELY_{i,t}$	0.035	-0.050*	0.068**	-0.033	-0.109***	1						
(19) $FORGN_{i,t}$	0.109***	0.113***	0.158***	-0.022	0.028	0.02	1					
(20) $CDEBT_{i,t}$	0.142***	0.049*	0.176***	0.035	-0.03	0.018	0.100***	1				
(21) $COMPLEX_{i,t}$	-0.031	-0.018	-0.143***	-0.114***	0.130***	-0.065**	0.134***	-0.068**	1			
(22) $TRADER_{i,t}$	-0.028	-0.047	-0.112***	-0.046	0.085***	-0.115***	-0.271***	-0.032	0.160***	1		
(23) $HEDGE_{i,t}$	-0.028	0.065**	-0.072**	-0.122***	0.011	-0.098***	0.125***	0.004	0.392***	0.142*	1	

Notes: *, **, and *** indicate significance at the 0.10, 0.05 and 0.01 levels (two-tailed), respectively.

Table 5
The effect of derivatives' designation on future investments.

	Full Sample			Hedging firms only		
	(1) Base Model	(2) Prior year's investment	(3) No trading firms	(4) Base Model	(5) Prior year's investment	(6) No trading firms
<i>DES_DER_{i,t}</i>	0.550** (1.72)	0.467** (1.67)	0.432* (1.36)	0.606** (1.86)	0.522** (1.78)	0.484* (1.48)
<i>NDES_DER_{i,t}</i>	-0.128 (-0.92)	-0.122 (-1.11)	-0.210 (-0.73)	-0.125 (-0.93)	-0.113 (-1.03)	-0.182 (-0.70)
<i>INVEST_{i,t}</i>		0.226*** (4.60)			0.210*** (4.10)	
<i>NET_CASH_{i,t}</i>	0.036 (1.11)	0.051* (1.81)	0.035 (1.05)	0.040 (0.99)	0.059* (1.66)	0.039 (0.92)
<i>LEVERAGE_{i,t}</i>	-0.042* (-1.89)	-0.055*** (-2.63)	-0.042* (-1.89)	-0.034 (-1.53)	-0.022 (-0.92)	-0.015 (-0.55)
<i>ROA_{i,t}</i>	0.024 (0.46)	0.007 (0.16)	0.019 (0.36)	0.025 (0.39)	0.005 (0.09)	0.017 (0.25)
<i>SIZE_{i,t}</i>	0.002 (0.39)	0.001 (0.29)	0.004 (0.79)	-0.001 (-0.16)	0.000 (-0.06)	0.002 (0.47)
<i>OCF_SALES_{i,t}</i>	0.152*** (3.90)	0.121*** (3.59)	0.151*** (3.42)	0.175*** (4.12)	0.141*** (3.81)	0.176*** (3.47)
<i>SALES_GROWTH_{i,t}</i>	0.034 (1.60)	0.000 (0.01)	0.042* (1.83)	0.044** (2.05)	0.013 (0.68)	0.055** (2.30)
<i>DIV_{i,t}</i>	-0.035*** (-3.64)	-0.028*** (-3.48)	-0.034*** (-3.49)	-0.032*** (-3.22)	-0.025*** (-2.87)	-0.032*** (-3.06)
<i>LOSS_{i,t}</i>	0.007 (0.55)	0.009 (0.76)	0.005 (0.38)	-0.005 (-0.42)	-0.001 (-0.09)	-0.008 (-0.66)
<i>REV_VOLA_{i,t-1}</i>	0.001 (0.04)	0.000 (0.01)	0.013 (0.41)	0.012 (0.35)	0.018 (0.59)	0.033 (0.90)
<i>OCF_VOLA_{i,t-1}</i>	0.088 (0.56)	0.104 (0.77)	0.032 (0.20)	0.078 (0.47)	0.084 (0.57)	0.005 (0.03)
<i>INVEST_VOLA_{i,t-1}</i>	0.007 (0.16)	-0.005 (-0.10)	0.001 (0.03)	0.006 (0.15)	0.005 (0.12)	0.001 (0.02)
<i>RET_VOLA_{i,t-1}</i>	0.942 (1.24)	0.548 (0.75)	1.103 (1.40)	0.788 (0.97)	0.531 (0.65)	0.987 (1.17)
<i>ANALYSTS_{i,t}</i>	0.004 (0.56)	0.002 (0.22)	0.004 (0.43)	0.000 (0.00)	-0.002 (-0.26)	-0.001 (-0.15)
<i>AGE_{i,t}</i>	0.006 (1.10)	0.007 (1.56)	0.007 (1.19)	0.010* (1.77)	0.010** (2.26)	0.012* (1.92)
<i>CLOSELY_{i,t}</i>	0.036 (1.25)	0.024 (0.93)	0.037 (1.26)	0.023 (0.76)	0.010 (0.35)	0.023 (0.75)
<i>FORGN_{i,t}</i>	0.008 (0.78)	0.006 (0.64)	0.006 (1.26)	0.011 (0.92)	0.010 (1.05)	0.008 (0.70)
<i>CDEBT_{i,t}</i>	0.057 (0.39)	0.055 (0.46)	0.055 (0.37)	0.031 (0.18)	0.037 (0.27)	0.025 (0.14)
<i>COMPLEX_{i,t}</i>	0.008 (1.25)	0.008 (1.34)	0.008 (1.19)	0.010 (1.53)	0.009 (1.53)	0.011 (1.55)
<i>TRADER_{i,t}</i>	0.004 (1.25)	0.004 (0.40)		0.003 (0.21)	0.002 (0.24)	
<i>HEDGE_{i,t}</i>	-0.017 (-1.61)	-0.012 (-1.46)	-0.013 (-1.23)			
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
p-value for difference in coefficients between <i>DES_DER_{i,t}</i> and <i>NDES_DER_{i,t}</i>	0.04	0.09	0.04	0.03	0.08	0.03
Observations	1213	1213	1114	988	988	889
Adjusted R2	0.26	0.31	0.26	0.26	0.30	0.26
F	3.56	5.76	3.23	3.53	5.13	3.42

Notes: Variable are defined in the [Appendix](#). All firm-specific continuous variables have been winsorized at the 1st and 99th percentiles (except *SIZE*, *ANALYSTS* and *AGE* which are expressed as natural logarithm). *, **, and *** indicate significance at the 0.10, 0.05 and 0.01 levels (one-tailed for our variables of interest with predicted signs, and two-tailed otherwise), respectively. t-statistics are presented in parentheses and are based on heteroscedasticity-robust standard errors clustered at the firm level. We test for equality of coefficients between *DES_DER_{i,t}* and *NDES_DER_{i,t}* with a one-tailed Wald-test.

However, it is important to note that such a simplification might bear the threat that ineffective hedges are also designated for hedge accounting, so that the corresponding (dis)advantages need to be carefully weighed up.

We acknowledge that our study is also subject to certain limitations. With our empirical archival approach to derivative disclosures, we cannot observe the actual managerial accounting choice for designated derivatives. Next, since we rely on the theoretical

Table 6
Effect of Complex hedging strategies on the relationship between derivatives and future investments.

	(1) Full Sample	(2) Hedging firms only
<i>DES_DER</i> _{<i>i,t</i>}	0.747** (1.75)	0.776** (1.83)
<i>NDES_DER</i> _{<i>i,t</i>}	-0.354** (-1.68)	-0.392** (-1.84)
<i>DES_DER</i> _{<i>i,t</i>} * <i>COMPLEX</i> _{<i>i,t</i>}	-0.230 (-0.43)	-0.159 (-0.29)
<i>NDES_DER</i> _{<i>i,t</i>} * <i>COMPLEX</i> _{<i>i,t</i>}	0.287* (1.50)	0.334** (1.72)
<i>NET_CASH</i> _{<i>i,t</i>}	0.032 (0.98)	0.035 (0.84)
<i>LEVERAGE</i> _{<i>i,t</i>}	-0.021 (-0.85)	-0.013 (-0.46)
<i>ROA</i> _{<i>i,t</i>}	0.018 (0.34)	0.016 (0.25)
<i>SIZE</i> _{<i>i,t</i>}	0.003 (0.59)	0.001 (0.14)
<i>OCF_SALES</i> _{<i>i,t</i>}	0.154*** (4.00)	0.177*** (4.23)
<i>SALES_GROWTH</i> _{<i>i,t</i>}	0.035 (1.62)	0.045** (2.07)
<i>DIV</i> _{<i>i,t</i>}	-0.033*** (-3.54)	-0.031*** (-3.08)
<i>LOSS</i> _{<i>i,t</i>}	0.006 (0.51)	-0.006 (-0.51)
<i>REV_VOLA</i> _{<i>i,t-1</i>}	0.005 (0.16)	0.018 (0.51)
<i>OCF_VOLA</i> _{<i>i,t-1</i>}	0.095 (0.61)	0.085 (0.51)
<i>INVEST_VOLA</i> _{<i>i,t-1</i>}	0.002 (0.05)	0.001 (0.02)
<i>RET_VOLA</i> _{<i>i,t-1</i>}	0.967 (1.27)	0.815 (1.00)
<i>ANALYSTS</i> _{<i>i,t</i>}	0.004 (0.52)	-0.000 (-0.03)
<i>AGE</i> _{<i>i,t</i>}	0.006 (1.10)	0.010* (1.77)
<i>CLOSELY</i> _{<i>i,t</i>}	0.037 (1.27)	0.024 (0.80)
<i>FORGN</i> _{<i>i,t</i>}	0.009 (0.83)	0.011 (0.98)
<i>CDEBT</i> _{<i>i,t</i>}	0.045 (0.33)	0.018 (0.11)
<i>COMPLEX</i> _{<i>i,t</i>}	0.012* (1.65)	0.013* (1.76)
<i>TRADER</i> _{<i>i,t</i>}	0.004 (0.31)	0.003 (0.20)
<i>HEDGE</i> _{<i>i,t</i>}	-0.015 (-1.41)	
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	1213	988
Adjusted <i>R</i> ²	0.26	0.26
F	3.41	3.41

Notes: Table 6 reports results for testing the effect of the firm's hedging strategy on the relationship between derivatives and future investments. Variable definitions are in the Appendix. All firm-specific continuous variables have been winsorized at the 1st and 99th percentiles (except *SIZE*, *ANALYSTS* and *AGE* which are expressed as natural logarithm). *, **, and *** indicate significance at the 0.10, 0.05 and 0.01 levels (one-tailed for our variables of interest with predicted signs, and two-tailed otherwise), respectively. t-statistics are presented in parentheses and are based on heteroscedasticity-robust standard errors clustered at the firm level.

framework of Froot et al. (1993), we discuss only the effects of financial hedging in the context of internal liquidity. Moreover, we consider fair values of derivative positions, because SFAS 161 requires firms to report fair values only. However, this has been criticized in prior literature because, unlike notional values, they reveal only limited information on the extent of a firm's derivative usage (Graham and Rogers, 2002). Having said that, this should be a less severe concern for our study since our focus is not on the extent of hedging per se, but on differentiation regarding their accounting designation. Despite these limitations, we believe that our study

contributes to the ongoing discussion on hedge accounting and further research in this area is necessary.

CRedit authorship contribution statement

Andreas Krefß: Methodology, Formal analysis, Data curation, Conceptualization. **Brigitte Eierle:** Writing – review & editing, Validation, Supervision, Conceptualization. **Sven Hartlieb:** Writing – review & editing, Validation, Project administration, Investigation, Formal analysis. **Francesco Mazzi:** Writing – review & editing, Validation, Supervision, Conceptualization.

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Appendix: Definition of variables

Name	Description	Source
Future investments ($F_INVEST_{i,t+1}$)	The sum of firm i 's R&D expenditure, capital expenditure, and acquisition expenditure, less cash receipts from the sale of PPE (all in year $t+1$) scaled by total assets (in t_0)	Compustat: xrd, capx, aqc, sppe, at
Designated derivatives ($DES_DER_{i,t}$)	Fair value of a firm's outstanding designated derivatives, calculated as the absolute fair values of designated derivative assets and liabilities scaled by total assets	Hand-collected from footnotes in firms' 10K files
Non-designated derivatives ($NDES_DER_{i,t}$)	Fair value of a firm's outstanding non-designated derivatives, calculated as the absolute fair values of non-designated derivative assets and liabilities scaled by total assets	Hand-collected from footnotes in firms' 10K files
Net cash ($NET_CASH_{i,t}$)	Cash minus current liabilities divided by total assets	Compustat: ch, lct, at
Leverage ($LEVERAGE_{i,t}$)	Long-term debt divided by total assets	Compustat: dltd, at
Return on assets ($ROA_{i,t}$)	EBIT divided by lagged total assets	Compustat: ebit, at
Market value of equity ($SIZE_{i,t}$)	Natural logarithm of the product of the stock price at the fiscal-year end date and outstanding shares	Compustat: prcc_f, csho
Operating cash flow ($OCF_SALES_{i,t}$)	Operating cash flow scaled by sales	Compustat: oancf, revt
Sales Growth ($SALES_GROWTH_{i,t}$)	Sales scaled by lagged sales minus 1	Compustat: revt
Dividend issued ($DIV_{i,t}$)	1 if the firm paid a dividend, 0 otherwise	Compustat: dvt
Loss ($LOSS_{i,t}$)	1 if the firm reports negative income, 0 otherwise	Compustat: ib
Revenue volatility ($REV_VOL_{i,t-1}$)	Standard deviation of the ratio of sales and total assets from $t-3$ to $t-1$	Compustat: revt, at
Operating cash flow volatility ($OCF_VOL_{i,t-1}$)	Standard deviation of the ratio of operating cash flow and total assets from $t-3$ to $t-1$	Compustat: oancf, at
Investment volatility ($INVEST_VOL_{i,t-1}$)	Standard deviation of the ratio of investment and lagged total assets from $t-3$ to $t-1$	Compustat: xrd, capx, aqc, sppe, at
Returns volatility ($RET_VOL_{i,t-1}$)	Standard deviation of a firm's daily stock returns over the last fiscal year. Firm's daily stock returns are calculated using Datastream's total return index.	Worldscope: RI
Number of analysts ($ANALYSTS_{i,t}$)	Natural logarithm of the number of sell-side analysts covering the firm as provided by IBES.	EIKON: TR.NumberOfAnalysts
Age ($AGE_{i,t}$)	Firm age measured as the natural logarithm of the difference between the fiscal year and the first year when the firm is included in Datastream	Worldscope: BASEDATE
Closely Held shares ($CLOSELY_{i,t}$)	Shares held by insiders divided by total common shares outstanding	Worldscope: WC05475, WC05301
Foreign income ($FORGN_{i,t}$)	1 if the foreign income or loss is not equal to 0, 0 otherwise	Compustat: pifo
Convertible debt ($CDEBT_{i,t}$)	Convertible debt divided by total assets	Compustat: dcvt, at
Complex hedging strategy ($COMPLEX_{i,t}$)	1 if the firm hedges at least two different types of risk (foreign exchange risk, interest rate risk, commodity price risk, other risk) and uses at least more than two different types of hedging instruments (swap, future/forward, option, other)	Hand-collected from footnotes in firms' 10K files
Trading firm ($TRADER_{i,t}$)	1 if the firm reports in its 10K files that it employs some of its outstanding derivatives for trading purposes, 0 otherwise	Hand-collected from footnotes in firms' 10K files
Financial hedging firm ($HEDGE_{i,t}$)	1 if the firm has outstanding derivative assets or liabilities	Hand-collected from footnotes in firms' 10K files

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.frl.2024.106477](https://doi.org/10.1016/j.frl.2024.106477).

Data availability

Data are available from the public sources cited in the text.

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