Do Trading Derivatives Classification Affect Bank Holding Company's Earnings Volatility And Firm Value?

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ABSTRACT

This study examines the differential impact of bank holding companies (BHCs) that consistently report trading gains (successful speculators) and those that consistently report no gain or trading losses (unsuccessful speculators) on earnings volatility and firm value. Under Accounting Standards Codification (ASC) 815 (previously SFAS 133- Accounting for Derivative Instruments and Hedging Activities*), all gains/losses related to trading derivatives are recognized in current earnings; whereas, gains/losses on hedging derivatives are netted with changes in the fair value of the underlying asset/liability with only the ineffective portion of the hedge being reported in current earnings. Given differential accounting recognition and underlying risk factors, we expect and find that current period trading gains/losses lead to greater earnings volatility; however, the relationship becomes insignificant when BHCs consistently report trading gains (successful speculators) or no gains and trading losses (unsuccessful speculation). Further we find that successful speculation is significantly negatively associated with firm value, which implies that market participants perceive trading positions held by BHCs as high-risk investments regardless of the outcome of the trading exposure. The findings of this study should be useful to business professionals, bank regulators, and accounting standard setters in determining the economic impact of current accounting standards on bank performance, investors in evaluating the costs and benefits of bank's derivative risk management policies, and accounting academics in evaluating the impact of current accounting regulation on bank derivative use.*

Keywords: Bank Holding Company; Derivatives; Speculation; Cash Flow Volatility; Earnings Volatility; Firm Value

1. INTRODUCTION

This study examines the differential impact of bank holding companies (BHCs) that consistently report higher levels of trading derivatives with positive fair values (successful speculators) and those that consistently report higher levels of trading derivatives with negative fair values (unsuccessful speculators) on earnings volatility and firm value. Under Accounting Standards Codification (ASC) 815 (previously SFAS 133- *Accounting for Derivative Instruments and Hedging Activities*), firms must classify derivative positions as hedging or trading. All gains/losses related to trading derivatives are recognized in current earnings; whereas, gains/losses on hedging derivatives are netted with changes in the fair value of the underlying asset/liability with only the ineffective portion of the hedge being reported in current earnings. As such, gains and losses related to derivative positions, particularly trading derivatives, may influence both earnings and cash flow volatility; additionally, given the exposure of BHCs to derivatives, these instruments are also likely to influence firm value. However, we do not know how differential accounting recognition aligning with purported underlying firm risk factors, influences the BHCs' earnings volatility and firm values examined in this study, despite the importance of derivatives and the significant volume of BHC derivative trading revenue.

According to the Office of the Comptroller of the Currency (OCC), as of year-end 2017, trading revenues related to derivatives accounted for between 30 and 50 percent of total BHC trading revenue and the notional amount of derivative contracts held by BHCs was $172 trillion (OCC, 2018). BHCs commonly use derivatives to manage their exposure to various risks, such as interest rate risk, foreign exchange risk, price risk, and credit risk (PwC, 2018). However, some BHCs also use derivatives to acquire risk or speculate on potential market movements (PwC, 2018).

Prior literature suggests that at least one of two criteria must be met for firms to believe that speculation will be profitable, (1) a firm has an information advantage related to the prices of the instruments underlying derivatives, or (2) it has economies of scale in transactions costs allowing for profitable arbitrage opportunities (Geczy, Minton & Schrand, 1997; Geczy, Minton & Schrand, 2005; Stulz, 1996). Given their exposure to the derivatives market we would expect BHCs to have informational advantages and economies of scale in trading derivatives, which makes it reasonable to infer that their speculation will result in profit. Although one-off gains/losses are likely to increase earnings volatility and reduce firm value, prior literature does not distinguish between the effect of firms that consistently report trading gains (successful speculators) and those that consistently report no gain or trading losses (unsuccessful speculators) on earnings volatility or firm value, the focus of this study.

Using a sample of BHCs' data collected from the quarterly *Consolidated Financial Statements for Bank Holding Companies* (FR Y-9C) and SEC filings from 2001-2012, this study provides evidence that current period trading gains/losses lead to higher levels of cash flow and earnings volatility; however, we do not find a significant relationship between BHCs consistently reports trading gains (successful speculators) or no gains and trading losses (unsuccessful speculation) and earnings volatility, which is not consistent with earnings volatility differentially affecting successful and unsuccessful speculators. We also find that successful speculation does not translate to higher firm value. Contrary to our expectations we find a negative association between firm value and successful speculation, which implies that market participants perceive trading positions held by BHCs as high-risk investments regardless of the outcome of the trading exposure.

Our study makes several contributions to the existing literature. First, our finding provide preliminary evidence that earnings volatility does not differentially affecting successful and unsuccessful speculators. Specifically, we find that although current period trading gains/losses lead to higher earnings volatility, when BHCs consistently report trading gains (successful speculators) or no gains and trading losses (unsuccessful speculation), the effect becomes less pronounced. Second, we find that although the impact of successful speculation on earnings volatility attenuates over time, it does not translate to higher firm value. This implies that market participants perceive trading positions held by BHCs as high-risk investments regardless of the outcome of the trading exposure. Finally, we provide evidence of a positive relationship between current period trading gains/losses and cash flow volatility, which is consistent with the stream of literature suggesting that banks use derivatives to speculate (Geczy et al. 1997; Geczy, Minton & Schrand, 2001; Geczy et al. 2005; Smith & Stulz, 1985; Stulz, 1996; Venkatachalam, 1996). The findings of this study should be useful to business professionals, bank regulators, and accounting standard setters in determining the economic impact of current accounting standards on bank performance, investors in evaluating the costs and benefits of bank's derivative risk management policies, and accounting academics in evaluating the impact of current accounting regulation on bank derivative use.

The remainder of this paper is organized as follows: section 2 presents background and hypothesis development, section 3 presents the research design and empirical models, section 4 presents the empirical results, section 5 presents our robustness tests, and section 6 concludes.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Accounting for Derivatives

A derivative is a financial contract that includes an underlying variable such as a stock market index or a referenced interest rate that, along with a notional amount or a payment provision, determine the net settlement amount of the contract (FASB, 1998). Under current accounting regulation, firms are required to recognize all derivative instruments at fair value on the balance sheet as either assets or liabilities, and all derivative instruments are to be classified either as held for hedging or trading purposes. However, only derivatives that meet certain complex accounting criteria qualify for hedge accounting treatment.

Under current regulation hedge accounting can be applied to two basic types of risk exposure: changes in the fair value of an asset or liability (fair value hedge) or changes in cash flows related to a future transaction (cash flow hedge) (Easton, Halsey, McNally, Hartgraves & Morse, 2013). If the derivative qualifies as a fair value hedge, firms report the derivative and the underlying hedged asset (or liability) at fair value on the balance sheet and report the net of any

related gains or losses in current earnings. If the hedge is effective, then decreases (increases) in the value of the hedged asset (liability) and the resulting gains and losses on the derivative instrument should net to zero. If the derivative qualifies as a cash-flow hedge, then the firm reports any related gains or losses as part of accumulated other comprehensive income (AOCI) in shareholder's equity until the future transaction occurs, netting the realized gain or loss against the unrealized gain or loss that the firm had accumulated in shareholders' equity. However, if the derivative does not qualify for hedge accounting, then firm must classify it as trading (i.e. speculative) all gains, or losses related to trading derivative are reported in current earnings (FASB, 1998; FASB, 2008). Since the accounting treatment of hedging and trading derivatives differs substantially, the two classifications of derivatives may differentially affect reported financial performance and likely have differential effects on firm value.

2.2 Derivative Use in the Banking Industry

Although the use of derivatives for risk management is well documented in accounting literature, there is also a significant body of literature suggesting that firms may use derivative instruments to take on additional risk (Ljungquist, 1994; Stulz 1996; Guay & Kothari, 2003; Fadal & McAleer, 2005; Geczy et al. 2005; Instefjord, 2005; Adam & Fernando, 2006; Instefjord, 2006; Schondube-Pirchegger, 2006; Ahmed et al. 2011). This additional risk is commonly referred to as speculation because firm managers actively take what they believe will be profitable positions in the derivatives market based on unsubstantiated market views (Geczy et al. 2005). Prior literature also suggests that at least one of two criteria must be met for firms to believe that speculation will be profitable, (1) a firm has an information advantage related to the prices of the instruments underlying derivatives, or (2) it has economies of scale in transactions costs allowing for profitable arbitrage opportunities (Geczy et al. 1997; Geczy et al. 2005; Stulz 1996).

We focus our study on the banking industry. The banking industry is commonly perceived to have informational advantages and economies of scale in transactions costs that provide arbitrage opportunities as a result of their dealing operations in the derivatives market (Stulz, 1996; Venkatachalam, 1996). Banks' dual role in the derivatives market as dealers and/or end-users of derivative instruments may create an incentive to speculate. Boukrami (2002) suggests that banks can re-use information they receive from their dealing operations in their investment strategies. This again indicates both a perceived information advantage and economies of scale for banks trading in the derivatives market. In addition, prior literature that examines the use of derivatives by commercial banks provides evidence consistent with firms using derivative instruments to hedge and/or speculate (Ahmed et al. 2011; Instefjord, 2005; Venkatachalam 1996). Ahmed et al. (2011) provides evidence that is consistent with banks using derivative instruments to hedge interest rate risk, as bond spreads are more negatively associated with interest rate derivatives classified as hedging and trading after implementation of ASC 815. However, Venkatachalam (1996) provides evidence that over 50 percent of his sample of banks use derivatives to assume additional interest and exchange rate risk, as evidenced by a significant number of banks' changes in the fair values of derivatives moving in the same direction as changes in the fair values of net on-balance sheet items. Thus, the empirical literature suggests that BHCs use derivative instruments to manage and take on additional risk.

Given their considerable exposure to financial risk and extensive use of derivatives, the commercial banking industry has the potential to provide insight in examining the impact of trading derivative positions on firm performance and firm value. Further in a sample of 335 commercial banks, Cyree, Huang & Lindley (2012) does not detect a systematic effect on bank values from derivatives use in either the high growth period of 2003–2005 or the low growth period of 2007–2009. Given the importance of risk management, we build on this work by specifically considering the financial statement classification of trading or speculative derivative on cash and earnings volatility and ultimately the bank's value. We expect that financial statement classification that illustrates to investors how trading or speculative derivatives influence earnings volatility (linked to the capital markets) will be more likely to influence the bank's firm value.

2.3 Trading Derivatives and Earnings Volatility

Prior research provides evidence that hedging derivatives decrease earnings volatility, and that trading derivatives increases such volatility (Barton, 2001; Zhang, 2009; Hughen, 2010). However, these studies focus on the classification of derivative instruments as opposed to the outcomes (gains/losses) of the derivative positions that are likely to directly contribute to earnings volatility. Kilic, Lobo, Ranasinghe, and Sivaramakrishnan (2013) find that

BHCs reporting higher levels of hedge ineffectiveness use discretionary accruals, specifically loan loss provisions, to report smoother income. In addition, prior literature also suggests that unrealized cash flow hedging gains and losses negatively influence future earnings (Campbell, 2015; Campbell, Downes & Schwartz, 2015). This literature demonstrates that the outcomes of hedging positions affect both current and future firm performance; however, there is little empirical evidence on the impact trading position outcomes on firm performance.

Although trading positions may not be speculative and serve as economic hedges, firms are required to report all trading gains/losses, whether realized or unrealized, in their current earnings. As such, unlike hedging derivatives, that only require reporting hedge ineffectiveness in current earnings, firms cannot offset their trading gains and losses even if trading derivatives are used as economic hedges. As a result, regardless of their intended use, we expect current period trading gains/losses to result in increased earnings volatility.

H1(a): Current period trading gains/losses are positively associated with earnings volatility.

Although one-off gains/losses are likely to increase earnings volatility, prior literature does not distinguish between firms that consistently report trading gains (successful speculators) and those that consistently report no gain or trading losses (unsuccessful speculators). As such, there is no evidence that the impact of successful and unsuccessful speculation on earnings volatility are the same. Hughen (2010) suggests that firms with economic hedges that do not qualify for hedge accounting will drop their derivative positions in order to avoid reporting volatile earnings. This implies that firms that continue derivative programs that fail to qualify for hedge accounting, hold speculative derivative positions that are based on their market views. Additionally, if a trading position is in fact an economic hedge that does not qualify for hedge accounting, it is unlikely that the position would fail to meet hedge requirements over a persistent time period.[1] Prior literature suggests that speculators take advantage of private information, which makes it reasonable to infer that speculation will result in profit. If a firm is consistent in reporting trading gains, it is unlikely to have volatile earnings; as such, there should be differential effects on earnings volatility for successful speculators as compared to others derivative users. This leads us to the following hypothesis:

H1(b): Firms that consistently report trading gains will have less earnings volatility than those that consistently report no trading gains or losses.

2.4 Trading Derivatives and Firm Value

Fauver & Naranjo (2010) find that derivative usage has a negative impact on firm value in firms with greater agency and monitoring problems. Their findings suggest that firms using derivatives should strive to be more transparent in their derivatives disclosures to prevent negative implications on firm value; however, prior research suggests that derivative disclosures are often incomplete and complex, which leads to higher information processing costs for and stock mispricing by investors and analysts (Campbell, 2015). Additionally, Dewally and Shao (2013) show that high levels of derivative use by BHCs results in the revelation of less bank-specific information to the market, which is indicative of higher levels of information asymmetry for derivative users. Taken together these studies imply that derivative use will result in a reduction in firm value given the level of information asymmetry that exists between BHCs and financial statement users. However, if trading exposures prove to be profitable over time, continuous trading gains may mitigate the negative impact of derivative use on firm value because of their positive impact on current and future earnings.

Many accounting studies suggest that engaging in speculation reduces firm value, but when selecting investments with higher risk, managers may be making informed decisions based on private information about firms' risk exposure, which is in the best interest of shareholders (Ljungqvist, 1994). Instefjord (2005) suggests that banks actively manage their risk exposures and incorporate risk management as an integral part of the activities that generate shareholder value.[2] Although speculative derivative transactions involve considerable risk, they also create opportunities for large gains. The gains associated with trading derivatives positively impact firms' current earnings and cash flows and thus

[1] We note that an economic hedge may continuously fail to meet hedge accounting criteria in the event that the hedged relationship falls outside of the Financial Accounting Standards Board (FASB) criteria; however, Hughen (2010) suggest that firms with derivatives that do not qualify for hedge accounting are more likely to discontinue their derivatives program than continue the economic hedge.

[2] This implies that banks speculate because they are frequently changing their positions based on their market perception.

should also affect firm value. As such, we expect to find a positive association between consistent successful speculation and firm value, which leads to the following hypothesis:

H2: Firms that consistently report trading gains will have a higher firm value than those that consistently report no gains or trading losses.

3. RESEARCH METHODS AND SAMPLE SELECTION

3.1 Derivative Use Proxies

Commercial banks are held to more stringent reporting requirements than firms in other industries. For bank holding companies in the US, one of the key required reports is the quarterly *Consolidated Financial Statements for Bank Holding Companies*, generally referred to as a FR Y-9C report.[3] This data is a widely used publicly available source of financial data regarding a bank's financial condition and the results of its operations (FDIC, 2011). Requirements for disclosure in FR Y-9C data are updated quarterly. In 1995, the Federal Reserve required banks to disaggregate derivative data by type and purpose for contract. Disclosures related to derivative use reported in the FR Y-9C are disaggregated by type of contract, purpose of contract, and gains and losses related to contracts. There are two classifications of derivatives in the FR Y-9C, derivative contracts held for trading purposes and derivative contracts held for purposes other than trading. Derivative contracts held for trading purposes include instruments used in dealing, to hedge trading activities, and other trading activities.[4] According to the filing instructions of the FR Y-9C report, derivatives classified as trading deal with only those instruments that are used for purposes other than hedging business risks.

The trading proxy (TRD) is measured as the sum of the differences between the gross positive and negative fair values of interest rate, foreign exchange, equity, and commodity derivatives held for trading reported in each firm's quarterly FR Y-9C Report scaled by total assets. The gross positive fair value of derivatives held for trading purposes represent the total fair value of a BHC contracts in which the BHC is due a balance from the counterparty, and the gross negative fair value of derivatives represent the total fair value of a BHC contracts in which the BHC currently has a balance outstanding to the counterparty. As such, higher values of the TRD variable indicate BHCs with more trading derivatives in a gain position (successful speculators) and lower values indicate BHCs with more trading derivatives in a loss position. This value is then regressed against earnings volatility or firm value using the regression models introduced in the following sections.

3.2 Earnings Volatility Model

Following Zhang (2009), a linear regression model is used to predict the effects of successful speculation on earnings volatility. The following linear regression model is used to measure the relation between successful speculation and earnings volatility in testing H1(a) and H1(b):

$$EARN_{VOL_{it}} = \beta_0 + \beta_1 TRD_{it} + \beta_2 HEDGE_{DUM_{it}} + \beta_3 RET_{VOL_{it}} + \beta_4 CASH_{VOL_{it}} + \beta_5 BM_{it} + \beta_6 SIZE_{it} + \beta_7 ROA_{it} + \beta_8 LEVERAGE_{it} + \beta_9 Z\_SCORE_{IT} + \varepsilon_{it} \quad (1)$$

All variables used in our regression model are defined in Appendix A. In this model we measure earnings (EARN_VOL) over rolling two (eight quarter), three (12 quarter) and five-year (20 quarter) periods. The regression

[3] "The report was initiated as the FR Y-9 in 1978. In 1985, the report was revised to parallel the Reports of Condition and Income (Call Report) for commercial banks, and in June 1986, it was extensively revised and split into two reports: FR Y-9C (consolidated statements) and FR Y-9LP (parent-company-only statements). In September 1990, several schedules were added to allow the calculation of risk based capital measures. Inflation, industry consolidation, and normal asset growth of BHCs led to an increase in the asset-size threshold for filing the FR Y-9C from 150 million dollars to 500 million dollars, effective with the March 2006, report date. Consistent with the Call Report, the content and structure of this report are frequently revised in consideration of developments in the banking industry and changes in supervisory, regulatory, and analytical needs. This report is required under Regulation Y and the Bank Holding Company Act of 1956 as amended (FDIC 2011)."

[4] Trading activities are specifically defined in the FR Y-9C instruction manual to include: regularly dealing in interest rate contracts, foreign exchange contracts, equity derivative contracts, and other off-balance sheet commodity contracts, acquiring or taking positions in such items principally for the purpose of selling in the near term or otherwise with the intent to resell (or repurchase) in order to profit from short-term price movements, and acquiring or taking positions in such items as an accommodation to customers.

models control for other factors that may affect earnings volatility. Following Zhang (2009) we control for return volatility, growth opportunities, firm size, leverage, and bankruptcy risk. All continuous variables are truncated at the 1 and 99 percent levels to mitigate the influence of outliers. Year-Quarter fixed effects are included in all of the regressions to account for variations across time. In addition, all test statistics and significance levels are estimated with firm and year clustered errors.

3.3 Firm Value Model

Following Fauver & Naranjo (2010), the following model is used to specify the relation between the firm value and trading derivatives in testing H2:

$$TOBINQ_{it} + \beta_0 + \beta_1 TRD_{it} + \beta_2 DIV\_DUM_{it} + \beta_3 OTOA_{it} + \beta_4 CTOA_{it} + \beta_5 SIZE_{it} + \beta_6 LEVERAGE_{it} + \varepsilon_{i,t} \quad (2)$$

All variables used in this model are defined in Appendix A. We use Tobin's Q as our proxy for firm value. Our model also controls for factors that may also affect firm value including industry and geographic diversification, firm size, and leverage. All continuous variables are truncated at the 1 and 99 percent levels to mitigate the influence of outliers. Year-Quarter fixed effects are included in our model to account for variations across time. In addition, all test statistics and significance levels are estimated with firm and year clustered errors.

3.4 Sample Selection

Firm selection is limited to FDIC insured U.S. bank holding companies (BHCs) that file quarterly FR Y-9C reports with the Federal Reserve and are traded on the NYSE, NASDAQ, or AMEX. Derivative usage data is obtained from FR Y-9C reports and the footnotes of quarterly SEC filings over the sample period from 2001-2012. Firms are included in the sample if they have interest rate, foreign exchange, equity, and/or commodity derivatives designated as trading under ASC 815. Firms are excluded if they are missing financial data necessary to calculate the control variables used in the regression models over the sample period. These criteria yield a sample of 76 BHCs and 1,107 firm-quarter observations for the earnings and cash flow volatility regressions, and 71 firms and 1,073 firm-quarter observations for the firm value regression.

4. EMPIRICAL RESULTS

4.1 Descriptive Statistics and Correlations for Sample Firms

Table 1 reports descriptive statistics for the full sample over the sample period from 2001 to 2012. The average of the TRD variable is 0.001 and the average net fair value of trading derivatives in our sample is $785.7 million, which suggests that on average BHCs in the sample have more trading derivatives in a gain than loss position. We also note that the standard deviation of the TRD variable and net fair value variables are 0.008 and $4.9 billion, which suggests that there is significant variation in the use of trading derivatives between BHCs. Additionally, 92.1 percent of BHCs in our sample also use hedging derivatives as indicated by the HEDGE_DUM variable, which is indicative of banks using derivatives for risk management. We also find evidence of overall lower volatility in our sample with average cash flow and earnings volatility of −5.751 and −5.230; finally, the average BHC's Tobin Q in our sample is 1.043.

Table 1 reports descriptive statistics for all variables used in our regression models. The sample period is from 2001−2012, contains 76 banks holding companies (BHCs). All variables are defined in Appendix A.

Table 2 presents the Pearson and Spearman correlations for the variables used in the earnings volatility and firm value models. We find that trading derivative gains and losses (TRD) are positively and significantly associated with earnings volatility which provides preliminary support for H1(a). We also note that there is a significant negative correlation between TRD and firm value, which is contrary to our expectations in H2.

Table 1. Descriptive statistics.

	Mean	SD	P25	P50	P75
CASH_VOL	−5.751	0.654	−6.052	−5.725	−5.444
EARN_VOL	−5.230	0.453	−5.508	−5.272	−4.992
TOBINQ	1.043	0.078	0.984	1.031	1.093
TRD	0.001	0.008	−0.000	0.000	0.003
NET FAIR VALUE ($ in millions)	785.682	4942.722	−2.021	0.000	65.079
HEDGE_DUM	0.921	0.271	1.000	1.000	1.000
RET_VOL	−2.624	0.638	−3.106	−2.688	−2.176
BM	−1.403	3.009	−0.853	−0.311	0.180
CAPTOS	0.044	0.061	0.016	0.032	0.053
DIV_DUM	0.909	0.288	1.000	1.000	1.000
ITOS	0.296	0.293	0.185	0.324	0.449
SIZE	17.333	1.617	16.155	17.210	18.462
ROA	0.008	0.009	0.004	0.007	0.013
LEVERAGE	17.226	1.618	16.041	17.108	18.378
Z_SCORE	2.791	0.464	2.606	2.836	3.089

Table 2. Correlations.

	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	CASH_VOL	1.000	**0.494**	0.084	**−0.064**	**0.133**	**−0.084**	−0.048
2	EARN_VOL	**0.390**	1.000	**−0.063**	−0.019	**0.114**	**0.084**	**0.090**
3	TOBINQ	**0.155**	−0.084	1.000	**−0.567**	0.005	**−0.658**	**−0.926**
4	TRD	−0.021	**0.064**	**−0.394**	1.000	0.004	**0.432**	**0.544**
5	HEDGE_DUM	**0.235**	**0.129**	**0.018**	−0.000	1.000	**−0.133**	−0.021
6	RET_VOL	**−0.035**	**0.184**	**−0.623**	**0.286**	**−0.129**	1.000	**0.611**
7	BM	−0.085	0.042	**−0.530**	**0.336**	**−0.092**	**0.445**	1.000
8	CTOS	**0.016**	−0.066	0.379	**−0.159**	0.028	**−0.133**	**−0.016**
9	DIV_DUM	**0.140**	−0.044	**0.070**	−0.057	**0.222**	**−0.226**	**−0.128**
10	ITOA	**0.029**	**−0.304**	**0.534**	**−0.064**	0.112	**−0.602**	**−0.415**
11	SIZE	**0.044**	**0.084**	**0.009**	**0.111**	**0.324**	**−0.093**	**−0.086**
12	ROA	**0.095**	**−0.237**	**0.500**	**−0.140**	0.063	**−0.587**	**−0.377**
13	LEVERAGE	**0.044**	**0.083**	**0.014**	**0.109**	**0.324**	**−0.094**	**−0.090**
14	Z_SCORE	**−0.195**	**−0.749**	0.094	0.019	**−0.087**	**−0.333**	−0.023

	Variable	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	CASH_VOL	−0.133	**0.076**	**0.011**	0.050	**0.072**	0.050	**−0.245**
2	EARN_VOL	−0.084	−0.044	−0.088	**0.096**	**−0.084**	**0.094**	**−0.652**
3	TOBINQ	**0.148**	**0.125**	**0.675**	0.009	**0.573**	0.016	0.012
4	TRD	**−0.049**	−0.095	**−0.213**	0.044	**−0.280**	0.041	**0.089**
5	HEDGE_DUM	0.042	**0.222**	**0.159**	**0.344**	**0.076**	**0.346**	**−0.088**
6	RET_VOL	**−0.105**	**−0.215**	**−0.644**	**−0.140**	**−0.575**	**−0.142**	**−0.234**
7	BM	**−0.145**	**−0.130**	**−0.661**	−0.040	**−0.555**	−0.048	0.027
8	CTOS	1.000	0.058	0.144	**−0.036**	**0.084**	**−0.034**	**0.091**
9	DIV_DUM	**−0.029**	1.000	**0.178**	**0.198**	**0.156**	**0.197**	**0.132**
10	ITOA	**0.141**	**0.203**	1.000	**0.239**	**0.681**	**0.242**	**0.168**
11	SIZE	−0.031	**0.154**	**0.163**	1.000	**0.127**	**1.000**	**−0.167**
12	ROA	0.030	**0.177**	**0.774**	**0.090**	1.000	**0.128**	**0.253**
13	LEVERAGE	−0.030	0.153	**0.165**	**1.000**	**0.091**	1.000	**−0.172**
14	Z_SCORE	**0.126**	**0.170**	**0.425**	**−0.127**	**0.430**	**−0.130**	1.000

Pearson correlations appear below the diagonal, and Spearman correlations appear above the diagonal. Bold values indicate significance at least at the 5 percent level. All variables are defined in Appendix A.

4.2 Trading Derivative Gains and Losses and Earnings Volatility

We present the results of our tests of H1(a) on the effect of current period trading gains and losses on earnings volatility in Table 3. Model (1) presents the results of the regression model estimating earnings volatility over eight quarters, model (2) presents the results estimating earnings volatility over 12 quarters, and model (3) presents the results estimating earnings volatility over five years (20 quarters). We find that TRD is positively related to earnings volatility in each of our models; however, the relationship between TRD and earnings volatility is only significant in two of our three model specifications (Model 1: TRD= 3.608, p=0.156; Model 2: TRD=5.148, p=0.015; Model 3: TRD= 5.857, p= 0.093). Specifically, when estimating earnings volatility over three and five years, we find a significant relationship between earnings volatility and TRD. These results suggest that one-off gains/losses significantly increase earnings volatility. Our findings are consistent with our expectations in H1(a) that current period trading gains and losses will negatively affect earnings volatility. Again, in general, our control variables behave consistently with prior literature. However, the size control is positively associated with earnings volatility, we note that this exception may be due to our sample being comprised of BHCs that tend to take on more risk as size increases.

Table 3 presents the results of regressing earnings volatility on trading derivative gains/losses (TRD). Model (1) presents the results of the regression model estimating earnings volatility over eight quarters, model (2) presents the results estimating earnings volatility over 12 quarters, and model (3) presents the results estimating earnings volatility over five years (20 quarters). All test statistics and significant levels are estimated based on the standard errors adjusted by a two-dimensional cluster at the firm and year/quarter level. Fixed effects are included for year. All variables are defined in Appendix A.

Table 3. The effect of trading gains/losses on earnings volatility.

	(1)	(2)	(3)
TRD	3.608	5.148**	5.857*
	(1.416)	(2.429)	(1.680)
HEDGE_DUM	0.048	0.051	0.052
	(0.951)	(1.128)	(0.966)
RET_VOL	−0.084	−0.033	−0.026
	(−1.605)	(−0.837)	(−0.625)
CASH_VOL	−0.023	−0.013	0.030**
	(−1.238)	(−0.686)	(2.112)
BM	7.295***	7.574***	6.892***
	(8.564)	(10.231)	(7.095)
SIZE	2.837	5.836*	6.554*
	(0.670)	(1.760)	(1.775)
ROA	−7.308***	−7.593***	−6.911***
	(−8.580)	(−10.267)	(−7.126)
LEVERAGE	5.657	7.898	7.588
	(0.749)	(1.511)	(0.997)
Z_SCORE	−0.76***	−0.917***	−0.896***
	(−8.847)	(−12.929)	(−12.222)
CONSTANT	−4.230***	−3.650***	−3.294***
	(−6.146)	(−7.799)	(−6.335)
No. Obs.	1,107	1,107	1,107
Adj. R-Squared	54.13%	71.31%	70.66%
Time Fixed Effects	Yes	Yes	Yes

*, **, *** Denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

The results of our testing of H1(b) are reported in Table 4. This table presents the results regressing earnings volatility on BHCs that consistently report trading derivative gains/losses. Model (1) presents the results of the regression model with average trading gains/losses over four quarters, model (2) presents the results with average trading gains/losses over eight quarters, and model (3) presents the results with average trading gains/losses over twelve quarters. In this table the dependent variable, earnings volatility, is calculated over rolling five-year intervals. Contrary to our

expectations we find that firms that continuously report trading gains (successful speculators) and no gains and trading losses (unsuccessful speculators) do not experience significant earnings volatility, as evidenced by insignificant results for all of our model specifications (Model 1: TRD4= 5.915, p=0.100; Model 2: TRD8=5.517, p=0.162; Model 3: TRD12= 5.186, p= 0.236). We also find that the relationship between earnings volatility and trading gains/losses becomes less significant as BHCs report trading gains/losses over longer consecutive time periods. Our results imply that over time if a firm consistently has trading exposures, regardless of the outcome, the effect of those gains/losses on earnings volatility become less pronounced. Our results suggest that a differential relationship does not exist between BHCs that report trading gains (successful speculators) and no gains or trading losses (unsuccessful speculators), which is not consistent with our expectations in H2. This exception may occur because BHCs that consistently use trading derivatives, may report similar levels of gains/losses in their financial statements making changes related to derivative positions less pronounced in earnings over time. With respect to the control variables, we find that overall their directions appear to be consistent with prior literature with the exception of our size control (Zhang 2009); however, as noted previously this exception may be due to our sample including only BHCs.

Table 4 presents the results of regressing earnings volatility on continuous trading derivative gains (TRD). Model (1) presents the results of the regression model with average trading gains/losses over four quarters, model (2) presents the results with average trading gains/losses over eight quarters, and model (3) presents the results with average trading gains/losses over twelve quarters. All test statistics and significant levels are estimated based on the standard errors adjusted by a two-dimensional cluster at the firm and year/quarter level. Fixed effects are included for year. All variables are defined in Appendix A.

Table 4. The effect of consistent trading gains/losses on earnings volatility.

	(1)	(2)	(3)
TRD4	5.915		
	(1.642)		
TRD8		5.517	
		(1.400)	
TRD12			5.186
			(1.186)
HEDGE_DUM	0.048	0.042	0.049
	(0.860)	(0.743)	(0.839)
RET_VOL	−0.019	−0.017	−0.015
	(−0.450)	(−0.389)	(−0.349)
CASH_VOL	0.033**	0.034**	0.034**
	(2.172)	(2.124)	(2.031)
BM	6.840***	6.729***	6.716***
	(6.657)	(6.445)	(6.312)
SIZE	7.088*	7.015*	7.043*
	(1.891)	(1.888)	(1.882)
ROA	−6.858***	−6.745***	−6.730***
	(−6.680)	(−6.461)	(−6.323)
LEVERAGE	7.317	7.561	7.964
	(0.971)	(0.996)	(1.036)
Z_SCORE	−0.894***	−0.893***	−0.888***
	(−11.541)	(−11.647)	(−11.501)
CONSTANT	−3.263***	−3.278***	−3.311***
	(−5.949)	(−6.078)	(−5.896)
No. Obs.	1,073	1,080	1,083
Adj. R-Squared	70.02%	70.35%	70.18%
Time Fixed Effects	Yes	Yes	Yes

4.3 Trading Derivative Gains and Losses and Firm Value

Table 5 presents the results of the firm value model using current period trading gains/losses as well as average measure of trading gains/losses over time. Model (1) presents the results of the regression model with trading gains/losses reported in the current period, Model (2) presents the results of the regression model with average trading gains over four quarters, model (3) presents the results with average trading gains over eight quarters, and model (4) presents the results with average trading gains over twelve quarters. Contrary to our expectations we find a significant negative relationship between firm value and TRD in three of our four models. Specifically, we find that current period trading gains/losses (TRD= −0.562; p= 0.073), average trading gains over four quarters (TRD4= −0.562; p= 0.054), and average trading gains over twelve quarters (TRD12= −0.787; p= 0.094) have significant negative coefficients. Although we continue to find a negative relationship between average trading gains over eight quarters (TRD8= −0.608; p= 0.104) the relationship is not significant. Our results suggest that trading gains significantly decrease firm value regardless of the success of trading portfolios. These results imply that market participants perceive trading positions held by BHCs as high risk investments regardless of the outcome of the trading exposure. With respect to the control variables, we find that in general they appear to be consistent with prior literature (Fauver & Naranjo 2010).

Table 5 presents the results of regressing firm value on continuous trading derivative gains (TRD). Model (1) presents the results of regressing firm value on trading gains/losses in the current period, model (2) presents the results of the regression model with average trading gains/losses over four quarters, model (3) presents the results with average trading gains/losses over eight quarters, and model (4) presents the results with average trading gains/losses over twelve quarters. All test statistics and significant levels are estimated based on the standard errors adjusted by a two-dimensional cluster at the firm and year/quarter level. Fixed effects are included for year. All variables are defined in Appendix A.

Table 5. The effect of continuous trading gains/losses on firm value.

	(1)	(2)	(3)	(4)
TRD	−0.562*			
	(−1.791)			
TRD4		−0.568*		
		(−1.928)		
TRD8			−0.608	
			(−1.624)	
TRD12				−0.787*
				(−1.675)
CAPTOS	0.362	0.359	0.355	0.351
	(1.634)	(1.598)	(1.593)	(1.594)
DIV_DUM	−0.008	−0.007	−0.007	−0.006
	(−0.622)	(−0.549)	(−0.549)	(−0.489)
ITOS	0.101***	0.101***	0.100***	0.100***
	(5.603)	(5.332)	(5.403)	(5.387)
SIZE	−0.465**	−0.481**	−0.475**	−0.469**
	(−2.199)	(−2.206)	(−2.195)	(−2.155)
LEVERAGE	0.461**	0.477**	0.471**	0.464**
	(2.181)	(2.188)	(2.177)	(2.136)
CONSTANT	1.253***	1.255***	1.216**	1.262***
	(20.798)	(19.793)	(19.832)	(20.831)
No. Obs.	1,103	1,069	1,076	1,079
Adj. R-Squared	69.19%	69.22%	69.10%	69.09%
Time Fixed Effects	Yes	Yes	Yes	Yes

*, **, *** Denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

5. ROBUSTNESS TESTS

5.1 Trading Derivatives and Cash Flow Volatility

Although trading derivatives have a more significant impact on earnings volatility than hedging derivatives as a result of their accounting treatment, it is unclear how they will impact cash flow volatility. Under current accounting standards, trading gains/losses are classified as an adjustment to cash flows from operating activities in the statement of cash flows, which implies an increase in cash flow volatility. However, to the extent that trading derivative positions are not purely speculative and serve as economic hedges, gains and losses on these derivatives instruments should be offset by cash flows related to an asset or liability underlying the economic hedge, resulting in less cash flow volatility (Guay, 1999; Zhang, 2009). However, if trading derivatives are used as speculative investments then trading gains and losses reported on the statement of cash flows will not be offset by any other cash flow, resulting in more cash flow volatility.

As such, to the extent that trading derivatives are used as economic hedges, trading gains/losses are expected to be negatively associated with cash flow volatility, and to the extent that the derivatives are used as speculative investments, trading gains/losses are expected to be positively associated with cash flow volatility. Given that trading derivative positions are likely a mixture of economic hedges and speculation, the direction of the relationship between cash flow volatility and trading gains/losses is unclear.

Table 6 presents the results of the cash flow volatility regression. Model (1) presents the results of the regression model estimating cash flow volatility over eight quarters, model (2) presents the results estimating cash flow volatility over 12 quarters, and model (3) presents the results estimating cash flow volatility over five years (20 quarters). We find that TRD coefficient is significant and positively related to cash flow volatility in each model (Model 1: TRD= 16.530, p=0.012; Model 2: TRD=13.150, p=0.044; Model 3: TRD= 10.820, p= 0.094). However, the relationship between TRD and cash flow volatility becomes less significant as the time period over which cash flow volatility is estimated increases; additionally, the size of the coefficient also decreases as cash flow volatility is estimated over longer time periods. This suggest that trading gains and losses have a diminishing effect on cash flow volatility over time. Our findings are consistent with BHCs using trading derivatives as speculative investments as trading gains and losses reported on the statement of cash flows are not offset.

In general, our control variables behave as expected. Among the control variables, we find that ROA and book-to-market are positively related to cash flow volatility and leverage and bankruptcy risk are negatively related to cash flow volatility. However, hedging derivatives (HEDGE_DUM) are significantly and positively related to cash flow volatility in all models, which is counterintuitive. This implies that BHCs may take more aggressive hedging positions that result in hedge ineffectiveness, which is not offset by changes in assets and liabilities on the statement of cash flows.

Table 6 presents the results of regressing cash flow volatility on trading derivative gains/losses (TRD). Model (1) presents the results of the regression model estimating cash flow volatility over eight quarters, model (2) presents the results estimating cash flow volatility over 12 quarters, and model (3) presents the results estimating cash flow volatility over five years (20 quarters). All test statistics and significant levels are estimated based on the standard errors adjusted by a two-dimensional cluster at the firm and year/quarter level. Fixed effects are included for year. All variables are defined in Appendix A.

Table 6. The effect of trading gains/losses on cash flow volatility.

$$CASH_{VOL_{it}} = \beta_0 + \beta_1 TRD_{it} + \beta_2 HEDGE_{DUM_{it}} + \beta_3 RET_{VOL_{it}} + \beta_4 BM_{it} + \beta_5 SIZE_{it} + \beta_6 ROA_{it} + \beta_7 LEVERAGE_{it} + \beta_8 Z\_SCORE_{it} + \varepsilon_{IT}$$

	(1)	(2)	(3)
TRD	16.530**	13.150**	10.820*
	(2.512)	(2.014)	(1.677)
HEDGE_DUM	0.703**	0.578**	0.500*
	(2.555)	(1.965)	(1.695)
RET_VOL	−0.116	−0.043	0.050
	(−0.563)	(−0.215)	(0.265)
BM	0.165***	0.165***	0.172***
	(5.014)	(4.812)	(4.985)
SIZE	2.139	3.775	4.163
	(0.570)	(1.039)	(1.111)
ROA	17.067*	16.192*	23.468***
	(1.898)	(1.786)	(2.943)
LEVERAGE	−2.147	−3.800	−4.211
	(−0.572)	(−1.047)	(−1.124)
Z_SCORE	−0.238	−0.333	−0.450**
	(−1.215)	(−1.645)	(−2.346)
CONSTANT	−2.633*	−1.971	−1.245
	(−1.924)	(−1.470)	(−0.974)
No. Obs.	1,107	1,107	1,107
Adj. R-Squared	27.69%	26.03%	24.48%
Time Fixed Effects	Yes	Yes	Yes

*, **, *** Denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

5.2 Alternative Scaling Variables

In order to test the robustness of our results we re-perform our main analysis using alternative scaling variables for the derivative trading variables. In this additional analysis we scale the trading (TRD) variable by the market value of equity and book value of equity. In untabulated results we continue to find a significant positive relationship between cash flow volatility and trading gains/losses. When scaling the TRD variable by the market value of equity, we continue to find significant relationships between earnings volatility over three- and five-year periods; however, when TRD is scaled by the book value of equity, we find significant relationships in all model specifications. When re-performing our firm value analysis we find a significant negative association between TRD and firm value for current period and average four quarter trading gains; however, we find that average trading gains/losses measured over eight and twelve quarters is significantly and positively associated with firm value. When using the book value of equity as our scalar, we find a negative but insignificant relationship between TRD and firm value in all specifications. This suggests that our firm value results may be sensitive to the measurement of trading gains and losses, or that the relationship between trading derivatives and firm value is more tenuous than that between hedging positions and firm value.

5.2.1 Global Financial Crisis

To control for possible bias in our sample related to the global financial crisis, we reran our main analysis including an indicator variable marking the height of the financial crisis (CRISIS). The financial crisis variable (CRISIS) takes on a value of one if the observation year is 2008, and zero otherwise. After controlling for the financial crisis, we find that our inferences in our main analysis remain the same. We continue to find significant positive relationships between earnings and cash flow volatility and current period trading gains/losses, an insignificant relationship between consecutive trading gains/losses and earnings volatility over time, and a significant negative relationship between trading gains and firm value.

6. CONCLUSION

In this study, we examine the differential impact of BHCs that consistently report trading gains (successful speculators) and those that consistently report no gain or trading losses (unsuccessful speculators) on earnings volatility and firm value. Using a sample of BHCs' data collected from the quarterly *Consolidated Financial Statements for Bank Holding Companies* (FR Y-9C) and SEC filings from 2001-2012, this study provides evidence that current period trading gains/losses lead to higher levels of cash flow and earnings volatility; however, we do not find a significant relationship between BHCs consistently reports trading gains (successful speculators) or no gains and trading losses (unsuccessful speculation) and earnings volatility, which is not consistent with earnings volatility differentially affecting successful and unsuccessful speculators. We also find that successful speculation does not translate to higher firm value. Contrary to our expectations we find a negative association between firm value and successful speculation, which implies that market participants perceive trading positions held by BHCs as high-risk investments regardless of the outcome of the trading exposure.

Our study makes several contributions to the existing literature. First, our finding provides preliminary evidence that earnings volatility does not differentially affecting successful and unsuccessful speculators. Specifically, we find that although current period trading gains/losses lead to higher earnings volatility, when BHCs consistently report trading gains (successful speculators) or no gains and trading losses (unsuccessful speculation), the effect becomes less pronounced. Second, we find that although the impact of successful speculation on earnings volatility attenuates over time, it does not translate to higher firm value. This implies that market participants perceive trading positions held by BHCs as high-risk investments regardless of the outcome of the trading exposure. Finally, we provide evidence of a positive relationship between current period trading gains/losses and cash flow volatility, which is consistent with the stream of literature suggesting that banks use derivatives to speculate (Geczy et al. 1997; Geczy 2001; Geczy et al. 2005; Smith & Stulz, 1985; Stulz, 1996; Venkatachalam, 1996).

The findings of this study should be useful to business professionals, bank regulators, and accounting standard setters in determining the economic impact of current accounting standards on bank performance, investors in evaluating the costs and benefits of bank's derivative risk management policies, and accounting academics in evaluating the impact of current accounting regulation on bank derivative use.

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APPENDIX

Variable definitions

Variable	Definition
Volatility Measures	
EARN_VOL	The average of the standard deviation of quarterly income before taxes and loan loss provisions (EBITDA) scaled by total assets.
CASH_VOL	The standard deviation of quarterly operating cash flows scaled by total assets for firm *i* in period *t.*
Firm Value Measure	
TOBINQ	The market value of equity plus the book value of assets minus the book value of equity divided by the book value of assets.
Derivative Measure	
TRD	The difference between the gross positive and negative fair values of derivatives held for trading reported in each firm's quarterly FR Y-9C Report scaled by total assets.
TRDN	The average of the differences between the gross positive and negative fair values of derivatives held for trading reported in each firm's quarterly FR Y-9C Report over *n* quarters scaled by average total assets over *n* quarters.
Control Variables	
HEDGE_DUM	An indicator variable equal to one if the notional value of derivatives held for purposes other than trading reported in firms' quarterly Y-9C is greater than zero, and zero otherwise.
RET_VOL	The annualized daily returns volatility log transformed.
BM	The ratio of the book value of equity to the market value of equity log transformed.
SIZE	The natural log of firm *i*'s total assets in period *t*.
ROA	The return on assets for firm *i* in period *t*, calculated as net income scaled by average total assets.
LEVERAGE	The natural log of total liabilities for firm *i* in period *t*.
Z_SCORE	The natural log of the sum of return on assets and the ratio of equity to assets divided by an estimate of the standard deviation of asset returns, where lower values indicate higher levels of risk. The standard deviation of asset returns is estimated over the sample period from 2001-2013.
DIV_DUM	An indicator variable equal to one if firm *i* reports paying a dividend at time *t*, and zero otherwise.
OTOS	Quarterly income before taxes and loan loss provisions (EBITDA) scaled by total revenue.
CAPTOS	Capital expenditures scaled by total revenue.

NOTES