DOES HEDGE ACCOUNTING REFLECT FIRMS' RISK MANAGEMENT ACTIVITIES?

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ABSTRACT

Elicia Parker Cowins: Does Hedge Accounting Reflect Firms' Risk Management Activities?
(Under the direction of Wayne R. Landsman)

In this study, I examine the hedge accounting disclosures required under ASC Topic 815, i.e., SFAS 133 (as amended), to investigate whether existing hedge accounting criteria reflect the risk management activities of a set of non-financial firms. I begin by partitioning a sample of firms into conventional hedgers and speculative hedgers based on a quantitative measure designed to summarize the criteria that must be met for the fair value gains and losses from a firm's derivative contracts to be recognized under the hedge accounting exception. This quantitative measure is subsequently augmented to include qualitative factors in an effort to further refine it. I then conduct a series of tests to evaluate whether the partitions exhibit characteristics associated with risk management or speculation.

I find descriptive evidence that (1) speculative hedgers are riskier than conventional hedgers; (2) there is no association between residual exposure to macroeconomic risk and total firm risk for conventional hedgers; (3) there is a positive association between residual exposure to commodities prices and total firm risk for speculative hedgers; (4) speculative hedgers operate in more opaque information environments relative to those of conventional hedgers; and, (5) speculative hedgers have more short-term shareholders. In the aggregate, these results suggest hedge accounting criteria does reflect risk management activities.

To my sister Anita. Your relentless pursuit of life on your own terms was, and still is, my greatest inspiration. I miss you everyday.

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LIST OF ABBREVIATIONS

AH	Accounting Hedger
ASC	Accounting Standards Codification
CDS	Credit Default Swap
CIO	Chief Investment Office
ED	Exposure Draft
EDGAR	Electronic Data Gathering, Analysis and Retrieval
EH	Economic Hedger
FASB	Financial Accounting Standards Board
GAAP	Generally Accepted Accounting Principles
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
OCI	Other Comprehensive Income
SCP	Synthetic Credit Portfolio
SEC	Securities Exchange Commission
SFAS	Statement of Financial Accounting Standards
SH	Speculative Hedger

1. INTRODUCTION

On May 10, 2012, J.P. Morgan Chase announced that its London-based Chief Investment Office (CIO) suffered trading losses of a little over $2 billion related to its positions in credit derivatives. By July 13th, 2012, these losses had escalated to $5.8 billion and ultimately reached $6.2 billion. On the after-hours conference call held to announce the initial loss, Jamie Dimon, Chase's Chairman and CEO said:

> Regarding what happened, the synthetic credit portfolio was a *strategy to hedge the Firm's overall credit exposure* [emphasis added], which is our largest risk overall in its trust credit environment.[1] We're reducing that hedge. But in hindsight, the new strategy was flawed, complex, poorly reviewed, poorly executed and poorly monitored. The portfolio has proven to be riskier, more volatile and less effective an economic hedge than we thought.

Was J.P. Morgan's position in this particular case truly a strategy to hedge against its exposure to credit risk or was it a speculative position?[2] Is it even possible to make a clear distinction between the two? In this study, I examine the disclosures required under ASC Topic 815 to investigate whether hedge accounting criteria provides information about a firm's risk

[1] In prepared testimony read before the Senate Committee on Banking in the weeks following the loss disclosure, Dimon asserts more specifically that the CIO's losses on the hedge were the result of a modification to the firm's synthetic credit portfolio (SCP) made to reduce risk-weighted assets. The strategy essentially called for the addition of what traders believed would be offsetting positions, i.e., the CIO began selling CDSs to offset the risk exposure from the CDSs it had purchased.

[2] Initial comments provided by Dimon and others representing the bank claimed that the losses were associated with a hedge position. However, considering (1) the SCP had previously been a profitable venture held by the CIO, a fact that could in and of itself suggest risk management was not the motivation; (2) the results of an investigation by the Senate Committee on Homeland Security and Governmental Affairs that found evidence of an increasing appetite for risk in the CIO, i.e., the implementation of a new Value-at-Risk model that facilitated the build-up of risky positions in the portfolio; and (3) recent Justice Department charges of conspiracy to hide losses in the portfolio that were levied on former JP Morgan traders, mounting evidence suggests the strategy was more indicative of a speculative position.

management practices.[3] My particular interest is in determining whether the external financial statement user can make the distinction between firms using derivatives to hedge risk and those using them to speculate under current guidance or if there is evidence to suggest that the standard is not useful for this purpose.

At an elementary level, a hedger should have (1) an exposure to a particular risk as a result of its normal business operations, e.g., cash flow volatility, and (2) the desire to insure against that risk. Conversely a speculator is the party who assumes the risk that the hedger wishes to transfer (Johnson, 1960). Several issues complicate the application of these rather rudimentary definitions of hedgers and speculators in practice. First, derivatives expose the firm to different types of risk directly related to the contracts themselves.[4] A successful risk management program must consider how these incremental risks contribute to the overall risk profile of the firm and manage them accordingly. Second, the manner in which a firm chooses to hedge against its risk exposure can result in an overall increase in exposure to the very risk the firm was attempting to reduce.[5] In other words, firms may ultimately be speculating, i.e., taking a view, under the guise of risk management. Survey evidence, e.g., Bodner, Hayt and

[3] Although financial reporting outcomes that are reflective of a firm's risk management practices are not an explicit objective of hedge accounting under ASC Topic 815, language in the basis for conclusions suggests risk management and speculation should nonetheless yield different reporting outcomes under the existing standard. This issue will be discussed in greater detail in a subsequent section.

[4] Unsettled derivative positions expose firms to different types of risks including counterparty credit risk and liquidity risk. Counterparty credit risk is associated with derivative contracts with a positive fair value and is the risk that the derivative counterparty will fail to meet its obligations under the contract. Exposure to this risk is greater when derivative contracts are traded over-the-counter as opposed to on organized exchanges. Liquidity risk exposure is associated with derivative contracts with a negative fair value and is the result of contract terms that require a firm to post increasing amounts of collateral as prices move in favor of the derivatives counterparty.

[5] This can occur when a risk management strategy is only successful in hedging exposure under certain market conditions. One example of such a strategy is the "stack and roll" strategy implemented by Metallgesellschaft (MG) in the early 90's. MG was exposed to price risk as a result of entering into long-term forward contracts, with maturities of 5 to10 years, obligating the firm to deliver heating oil to its customers at a fixed price. The firm hedged against this risk by entering into short-term futures contracts that it closed out immediately before expiration, say monthly or quarterly, and replaced with a new set of short-term contracts. This strategy is effective as long as the forward price of the relevant commodity, oil in this case, is lower than the spot price. However, if the forward price exceeds the spot price, the short-term futures contracts are being rolled-over with losses. The interested reader is directed to Edwards and Canter (1995) for further detail on the topic.

Marston (1996), suggests that this does indeed occur. As a result, one can conclude that expressed intent is not a sufficient condition for determining whether a firm's derivative positions are in effect reducing or increasing exposure to risk.

In an effort to increase transparency regarding a firm's derivative use, the Financial Accounting Standards Board (FASB) issued SFAS 133, *Accounting for Derivative Instruments and Hedging Activities,* which requires recognition of all derivative contracts on the face of the statement of financial position. The associated fair value gains and losses are reported as a component of earnings unless the derivative instrument meets the criteria for hedge accounting treatment. The hedge accounting exception mitigates the earnings volatility associated with fair value recognition of derivative instruments by allowing firms to either (1) bypass the income statement and recognize the gains and losses on derivatives designated as cash flow hedges in comprehensive income until such time as the gain or loss associated with the hedged transaction affects earnings or (2) recognize the hedged item in a fair value hedging relationship at fair value thereby appropriately matching the fair value gains and losses on the derivative with the gains and losses on the hedged item.

The criteria that must be met to obtain hedge accounting treatment have been characterized as overly restrictive and overly burdensome resulting in reporting outcomes inconsistent with the risk management activities of the firm (Comiskey and Mulford, 2008). However, it is possible that the restrictive nature of the criteria for hedge accounting treatment serves a purpose. Prior literature, e.g., Hodder, Hopkins and Wahlen (2006), has shown that the incremental volatility associated with the recognition of fair value gains and losses from derivative financial instruments provides risk-relevant information. By restricting hedge accounting treatment to a small set of derivative activities that demonstrate the capacity to reduce a firm's exposure to risk, it is possible the moderation of incremental earnings volatility associated with derivatives reported under the hedge accounting exception serves to provide information to the market about the relative risks of certain derivative positions. More

specifically, derivatives that do not substantially increase earnings volatility, e.g., those that meet hedge accounting criteria, are potentially less risky than those that do. This is not to say that the derivative activities that fail to meet the hedge accounting standard are absolutely riskier or more speculative in nature, only that their effects on the exposure profile of the firm are potentially more difficult to discern.

To investigate whether hedge accounting reflects firms' risk management activities, I partition a set of quarterly observations for non-financial firms that employ derivatives in their risk management programs into quintiles using a quantitative, accounting based measure designed to summarize the criteria that must be met for the fair value gains and losses from a firm's derivative contracts to be recognized under the hedge accounting exception.[6] If these criteria are in alignment with a firm's risk management activities, the observations that score the highest should exhibit characteristics of conventional hedgers while the observations that score the lowest should exhibit characteristics of speculative hedgers.[7] [8] If, however, these criteria are out of alignment with a firm's risk management activities, characteristics of the firms in each partition should be more ambiguous with either or both groups exhibiting the traits of conventional and speculative hedging strategies.

[6] I do not use financial services firms in this study primarily because of my concern regarding the feasibility of obtaining a sample of firms with sufficient cross-sectional variation in the proportion of derivatives designated as accounting hedges. Through casual observation of the 50 largest U.S. financial firms, I find that over half of them hold the vast majority of their derivatives in their trading book for market making as opposed to being held for use by the firm itself. These positions are not eligible for hedge accounting treatment, rendering the metric I propose to use as a partitioning mechanism meaningless in this setting.

[7] Conventional hedgers are firms whose risk management objective is variance minimization, i.e., the equal attenuation of exposure to downside risk and upside potential. Speculative hedgers are firms whose risk management objective is focused on reducing downside risk while preserving as much of the upside as possible. The interested reader is directed to Stulz (1996) for more background on this notion of selective hedging techniques.

[8] I use the terms conventional hedger and hedger as well as speculative hedger and speculator interchangeably throughout the paper. The more formal classifications, conventional and speculative hedgers, are more precise terms as I posit that speculation in this setting is occurring within firms' hedge portfolios.

Guidance regarding empirical proxies or tests that could be used to distinguish between hedging and speculation is scarce. One archival study that attempts to make the distinction between the two, Zhang (2009), does so by documenting a change in a firm's risk exposure after the implementation of a derivatives risk management program. Firms that exhibit a decrease in exposure to a particular risk are classified as hedgers or effective risk managers while those that exhibit an increase in exposure to a particular risk are classified as speculators or ineffective risk managers. My use of a sample of firms with established derivatives risk management programs precludes the use of a change in risk exposures as a means to validate or invalidate the accounting based measure employed to partition firms into their respective groups. Instead, I conduct a series of tests motivated by theory and intuition to investigate whether the resulting partitions exhibit characteristics associated with risk management or speculation as intended.

First, I examine the difference in risk profiles across partitions. If hedge accounting reflects firms' risk management activities, I expect firms classified as conventional hedgers based on my partitioning measure will on average exhibit a lower risk profile relative to those classified as speculative hedgers. Using several proxies for risk, including accounting-based measures, market-based measures, and measures of exposure to macroeconomic risks, i.e., exposure to interest rates, foreign exchange rates and commodities prices, I find that conventional hedgers are on average less risky than speculative hedgers.

Next, I estimate the relation between firms' residual exposures to macroeconomic risk, i.e., their exposures to interest rates, foreign exchanges and commodities prices after hedging, and total firm risk via ordinary least squares regression. I predict the residual exposure to macroeconomic risk will exhibit no relation to total firm risk for conventional hedgers because these firms will have successfully hedged against those risks. Conversely, I predict the residual exposure to macroeconomic risk will exhibit a positive association with total firm risk for speculative hedgers because their objective is to preserve exposure to upside potential while reducing or eliminating exposure to downside risk.

Consistent with predictions, I find that exposure to foreign exchange rates and commodities prices are not associated with total firm risk for conventional hedgers. I also find a marginally significant negative association between exposure to interest rates and total firm risk for conventional hedgers, but this result is not robust to correction for serial correlation of the residuals. With respect to speculative hedgers, I find a significantly positive association between residual exposure to commodities prices and total firm risk consistent with predictions. I also find no relation between exposure to interest rates and risk and a negative relation between exposure to foreign exchange rates and risk for these firms. However, the negative relation between exposure to foreign exchange rates and risk disappears as expected when the partitioning measure is adjusted to correct for a misclassification of firms using foreign exchange derivatives that will be detailed in a subsequent section.

Finally, I examine the relation between the classification of each firm-quarter observation and the firm's information environment and shareholder base. Specifically, I obtain multinomial logistic regression coefficient estimates for a set of hypothesized predictors where the dependent variable, RANK, is a categorical variable from 1-5 decreasing in the proportion of derivatives designated as accounting hedges. If hedge accounting criteria reflects risk management, this ordering is also decreasing in the likelihood that the hedge portfolio associated with the observation contains a relatively small speculative component. This test is motivated by a theoretical result from Melumad, Weyns and Ziv (1999). Melumad et al. finds that when a manager possesses superior information relative to current and potential shareholders and when the firm's shareholder base is comprised of more short-term shareholders, his hedge position is distorted, i.e., lower relative to the public information case. I use an aggregate measure of firm-level transparency and a single proxy for the investment

horizon of a firm's shareholder base, share turnover, in my primary analysis.[9] I find that the information environment and shareholder base of a firm contribute to the probability of an observation being classified as a speculative hedger in the predicted direction and interpret this result as further evidence in support of using hedge accounting as a means to distinguish hedging from speculation.

This study contributes to the literature that examines the risk-management practices of non-financial firms. Although this literature is vast, particularly in the finance area, I believe I have identified a yet unexplored area with respect to the identification of different risk management behaviors via financial reporting outcomes. Further, while a few studies investigate whether risk management or speculation is *on average* the primary objective of the aggregate derivatives market, e.g., Hentschel and Kothari (2001) and Ciner (2006), this is the first, to the best of my knowledge, to propose a means to distinguish firms using derivatives as hedges from those using derivatives to speculate that could be applied to a broad set of derivatives users.

This research could have policy implications and therefore may be of interest to standard setters, given the FASB is considering relaxing the hedge accounting criteria under ASC Topic 815. The evidence contained herein is more consistent with the notion that the existing hedge accounting rules and associated disclosures might be useful for distinguishing risk management from speculation than the notion that they are overly restrictive and fail to reflect the risk management activities of the firm. Therefore, caution should be employed in attempts to alter hedge accounting criteria as the Board could inadvertently reduce the quality of information supplied to the market regarding a firm's exposure to risk. Researchers could also find these results of interest when addressing research questions predicated on an assumption that derivatives users are using them to manage risk as opposed to using them to speculate.

[9] The aggregate measure I use is very similar to the transparency measure employed by Lang, Lins and Maffett (2012) as it is the average decile rank of seven proxies for a firm's information environment, i.e., two earnings smoothness measures, analyst forecast error, analyst following, forecast dispersion, firm age and bid-ask spread.

The rest of the paper proceeds as follows. Section 2 provides institutional background on the existing hedge accounting standard as well as the related exposure drafts currently under consideration by the FASB and the IASB. Section 3 articulates predictions for the series of tests that follow and Section 4 discusses the selection of the sample and the research design. Empirical results are presented in Section 5 and Section 6 concludes.

2. INSTITUTIONAL DETAIL

2.1. Hedge Accounting

At present, financial reporting for derivative financial instruments is governed by SFAS 133, *Accounting for Derivative Instruments and Hedging Activities*, as amended (ASC Topic 815) which states that all derivative instruments should be recognized in the statement of financial position at fair value. Accounting for changes in the fair value of derivatives, i.e., gains and losses on derivative contracts, is contingent on whether that derivative has been designated as a hedging instrument. Gains and losses on derivative instruments that fail to meet the criteria for hedge accounting treatment, or for which the firm elects not to apply hedge accounting are immediately recognized in earnings. Gains and losses on derivative instruments that qualify for and are designated as hedging instruments are recognized in a manner such that the gains and losses on the hedging instrument, the derivative, are recognized in the same period as the gains and losses on the hedged item. Hedge accounting is an exception to the rule regarding fair value recognition of derivatives and is permitted, in part, to address an artifact of the mixed attribute accounting model.

Generally speaking, an entity may elect to designate a derivative instrument as either: (1) a hedge of the exposure to changes in the fair value of a recognized asset or liability, or of an unrecognized firm commitment, that are attributable to a particular risk (referred to as a fair value hedge) or (2) a hedge of the exposure to variability in the cash flows of a recognized asset or liability, or of a forecasted transaction, that is attributable to a particular risk (referred to as a

cash flow hedge).[10] To qualify for fair value (cash flow) hedging designation, there must be formal documentation of the hedging relationship as well as the firm's risk management objective and strategy for undertaking the hedge.[11] Further, the hedging relationship must be expected to be "highly effective", both at inception and on an ongoing basis.[12] Gains and losses on designated fair value hedging instruments are recognized in earnings as are the offsetting gains and losses on hedged items. Gains and losses on designated cash flow hedging instruments are subject to effectiveness testing with the effective portion recognized as a component of other comprehensive income and reclassified to earnings in the same period(s) during which the hedged transaction affects earnings. The remaining gains and losses on cash flow hedging instruments, i.e. the ineffective portion, are recognized immediately in earnings.

2.2. FASB/IASB Current Projects

Hedge accounting is a current issue on both the IASB's and the FASB's respective agendas. Although the projects were initiated prior to the financial crisis, demand for increased transparency regarding an entity's exposure to derivative financial instruments has grown in its wake. On May 26, 2010, the FASB issued an exposure draft proposing an update to the accounting for derivative instruments and hedging activities. The main features of ASC Topic 815 regarding hedge accounting are retained by the exposure draft including: the types of items and transactions that are eligible for hedge accounting and the types of risks eligible as hedged risks. However, one substantive change relevant to this study is that the hedge effectiveness criterion under the proposed update requires that the hedging relationship be reasonably

[10] Derivative instruments used to hedge against foreign currency exposures are addressed separately in the standard, but generally fall into one of three categories: cash flow hedge, fair value hedge or net investment hedge. Net investment hedges are one of the few exceptions to the rule that non-derivative financial instruments cannot be designated as hedging instruments.

[11] Additional documentation requirements include identification of the hedging instrument and hedged item, the nature of the risk being hedged and how the hedging instrument's effectiveness will be assessed.

[12] A "highly effective" bright line is not explicit in the standard. However, in practice, a highly effective hedging instrument generally offsets no less than 80% and no more than 120-125% of the change in fair value or cash flow of a hedged item.

effective, as opposed to highly effective, in achieving offsetting changes in fair values or cash flows attributable to the hedged risk during the period of the hedging relationship.[13] In effect, this would lower the bar for derivative contracts to qualify for and enjoy the benefits of hedge accounting treatment.

The IASB released a separate exposure draft, ED/2010/13, on December 9, 2010 to propose significant changes to existing IFRS hedge accounting requirements under IAS 39 to provide more useful hedge accounting information. On February 9, 2011, the FASB issued a discussion paper and an invitation to comment on the IASB Exposure Draft as the proposals under the IASB ED could be characterized as further escalating the differences that currently exist between U.S. GAAP and IFRS in the area of hedge accounting.[14] [15] A useful starting point for a discussion on the merits of either proposal is a thorough examination of the financial reporting outcomes of the current standards. My review of the academic literature has revealed precious little empirical research on the topic. With this research, I hope to begin to fill this void.

My review of SFAS 133 does not reveal a concise, explicit set of objectives for hedge accounting. However, in the basis for conclusions of the standard, the FASB states, "Hedge accounting for assets and liabilities initially arose as a means of compensating for situations in which measurement anomalies between a hedged item and hedging instrument result in recognizing offsetting gains and losses in earnings in different periods." (SFAS 133, as amended,

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[13] The Board states that it amended the hedge effectiveness requirements in ASC Topic 815 in an effort to: (1) reduce the complexity associated with qualifying for hedge accounting; (2) make it easier for firms to consistently apply hedge accounting; and (3) provide comparability and consistency in financial statement results (BC218).

[14] Existing differences between ASC Topic 815 and IAS 39 include, but are not limited to, the risk components that may be hedged as well as the way in which hedge effectiveness is assessed and measured.

[15] The IASB Exposure Draft essentially broadens the scope of hedge accounting by: (1) expanding the type of instruments eligible to be designated as hedging instruments; (2) expanding the type of items that may be designated as hedged items; (3) amending the criteria to qualify for hedge accounting; and, (4) permitting the rebalancing of a hedging relationship to be accounted for as a continuation of an existing hedge rather than a discontinuation.

Paragraph 320) This suggests that hedge accounting is merely a tool used to provide resolution for artifacts of the accounting system that result from the mixed attribute accounting model. However, in addressing the criticism that the hedge accounting rules would not reflect the true economics of certain types of hedging and risk management activities, the Board states "…some aspects of 'risk management' are hard to distinguish from speculation or 'position taking' and speculative activities should not be afforded special accounting." (SFAS 133, as amended, Paragraph 352) The assertion that speculative activities should yield different financial reporting outcomes relative to hedging activities suggests another objective of hedge accounting is to distinguish hedgers from speculators. Further, the disclosure amendment to SFAS 133, SFAS 161, states that one of its objectives is "to provide users of financial statements with an enhanced understanding of how and why an entity uses derivatives…" The purpose of this study is to examine whether the standard, in its current form, is useful for determining which firms are using derivatives as a means to reduce exposure (hedging) and which firms are either unsuccessful in their attempt to reduce risk exposure (ineffective hedging) or deliberately using derivatives as a means to increase exposure (speculation).

The hedge accounting rules under ASC Topic 815 could be considered a rather blunt instrument for the purpose of distinguishing risk management from speculation. As of the end of the comment period, the FASB received 71 comment letters in response to its discussion paper and invitation to comment issued to solicit input on the IASB's exposure draft. One of the common themes that emerged from an analysis of the comment letters is support for a more principles-based approach to hedge accounting that would include aligning hedge accounting more closely with risk management strategies.[16] The criticism that the hedge accounting rules

[16] The IASB exposure draft proposes an objective for hedge accounting that attempts to marry two extreme objectives, one that was deemed too broad and the other too narrow in focus. The Board's proposed objective is "to represent in the financial statements the effect of an entity's risk management activities that use financial instruments to manage exposures arising from particular risks that could affect profit or loss."

under ASC Topic 815 do not reflect an entity's risk management activities is not a new one. In fact, the FASB addresses this issue in the basis for conclusions of the original standard.

> However, there is little agreement about just what the economics of hedging and risk management are. Because entities have different and often conflicting views of risk and risk management, a single approach to hedge accounting could not fully reflect the hedging and risk management strategies of all entities…Thus providing hedge accounting to the whole range of activities undertaken by some under the broad heading of risk management would be inconsistent with improving the usefulness and understandability of financial reporting. (SFAS 133, as amended, Paragraph 352)

In addition to the fundamental issue associated with developing a set of standards capable of distinguishing risk management from speculation for a broad set of firms, there are at least two further empirical challenges related to using hedge accounting in an effort to differentiate risk management from speculation. First, hedge accounting is not mandatory. Therefore, it is entirely possible that firms using derivatives to manage risk choose not to designate their derivative instruments as accounting hedges and allow the effect of the mismatch between the fair value gains and losses from derivative hedging instruments and the gains and losses from hedged transactions to remain in their results from operations. This could occur because meeting the requirements for hedge accounting treatment and continually assessing the effectiveness of hedging relationships is not a costless activity. Thus, if the perceived benefits of risk management exceed the costs of the incremental earnings volatility that may result from not using hedge accounting, it is reasonable to expect firms could elect to not designate some or all of their derivatives as accounting hedges.

Second, SFAS 159 *The Fair Value Option for Financial Assets and Financial Liabilities* allows firms to opt to measure certain financial instruments at fair value. Thus, firms can, under certain circumstances, achieve the same reporting outcomes for undesignated hedging relationships as they can under the hedge accounting exception. In the extreme case that all of a firm's hedged items meet the criteria established under SFAS 159 and are measured at fair value, hedge accounting is unnecessary. As will be discussed in the research design section below, I attempt to address these challenges by augmenting my partitioning measure to include

both quantitative and qualitative characteristics of firms in my sample. More specifically, I incorporate qualitative data with respect to those firm-quarter observations with a high proportion of undesignated derivatives, as it is these observations for which the alternative explanations are particularly relevant.

3. PREDICTIONS

To investigate whether the partitioning metrics developed on the basis of the reporting outcomes and disclosures provided under the existing hedge accounting standard yield partitions that exhibit characteristics associated with risk management or speculation, I conduct a series of tests motivated by both theory and intuition.[17] I employ the use of three sets of tests in an attempt to validate a partitioning mechanism developed based on the criteria that must be met under the existing hedge accounting standard. The objective is to find consistent evidence for or against the use of the measure as a means to distinguish hedging from speculation across the analyses. Consistent evidence in support of its use would suggest that the hedge accounting criteria do reflect the risk management activities of the firm while evidence against would suggest that it does not.

3.1. Risk Exposure

3.1.1. Firm-Specific Risk Characteristics

If hedge accounting reflects firms' risk management activities, I expect that firms classified as conventional hedgers will on average appear to be less risky than firms classified as speculative hedgers. However, it is entirely possible that by partitioning on the proportion of derivatives designated as accounting hedges, I am distinguishing accounting hedgers from

[17] All tests that follow as described in the research design section are in fact joint tests of my predictions and my ability to classify firms as conventional hedgers and speculative hedgers. It is my view that potential misclassification bias, in this case, works against me. Misclassification is the result of either (1) derivative contracts that meet hedge accounting criteria but represent speculative activity or (2) derivative contracts that fail hedge accounting criteria but represent risk management activity. Either case would result in a bias against predictions.

economic hedgers as opposed to conventional hedgers from speculative hedgers.[18] If this is the case, the relative risk characteristics of the two partitions will vary as a function of the risk proxy examined. In order to allow for this possibility, I use two accounting-based risk measures (earnings and cash flow volatility), three market-based risk measures (beta, idiosyncratic volatility and equity volatility) and three macroeconomic risk measures (exposure to interest rates, foreign exchange rates and commodities prices). If my partitioning measure is capturing the differences between accounting hedgers and economic hedgers, I expect firms with a high proportion of derivatives designated as accounting hedges will exhibit smaller earnings and cash flow volatilities but greater equity and idiosyncratic volatilities as well as market betas and exposure to macroeconomic risk relative to firms with a lower proportion of derivatives designated as accounting hedges.

3.1.2. Macroeconomic Exposure and Total Firm Risk

Without exception, the primary purpose of holding derivative contracts for sample firms is to hedge against exposure to one or more macroeconomic risks. Because my sample is comprised of firms that actively use derivatives as part of their risk management programs, I cannot observe their risk exposures prior to their hedge position and therefore cannot use a change in exposure to validate my partitioning measure. However, I can make predictions about whether and how firms' residual exposures to macroeconomic risk should be related to total firm risk and how those associations should vary across partitions. If a firm has effectively hedged its exposure to a particular macroeconomic risk, then total firm-wide risk should not vary with residual exposure to that same macroeconomic risk, i.e., that risk should not

[18] The divergent outcomes that result from a focus on accounting earnings versus a focus on economic earnings in this context were examined in Hughen (2010) with a study of the behavior of a sample of firms that had previously been subject to a restatement as a result of the misapplication of the hedge accounting standard. Hughen classifies firms as accounting hedgers (AH) and economic hedgers (EH) based on whether the firm chooses to take the steps necessary to ensure its hedging derivatives qualify for hedge accounting treatment (AH) or to continue with the economic hedge regardless of its effects on earnings volatility (EH) in order to investigate the conditions under which a firm would focus on accounting earnings over economic earnings. She finds that firms that were able to meet earnings targets in the period before the restatement are more likely to focus on accounting earnings.

contribute to the overall risk profile of the firm. Conversely, if the firm has been ineffective in hedging macroeconomic risk, then total firm-wide risk should be increasing in the residual exposure to that same macroeconomic risk. Thus, if hedge accounting reflects firms' risk management activities, the residual macroeconomic risk exposures of firms classified as conventional hedgers should exhibit no association with total risk while those of firms classified as speculative hedgers should exhibit a positive association with total risk.

3.2. Information Environment and Shareholder Base

Melumad, Weyns and Ziv (1999) examines, in an analytical framework, the effects of alternative approaches to hedge accounting on managerial hedging decisions and shareholder wealth. Melumad et al. begins by deriving the optimal hedge position based on a full information environment and subsequently investigates how the manger's hedge decision differs from the optimal in an environment where the manager has superior information relative to current and potential shareholders. Melumad et al. finds that when the manager possesses superior information relative to current and potential shareholders, and shareholders must infer the valuation relevant information, quantity exposure and the hedge decision, from the financial reports, the manager's hedge decision is contingent on the reporting environment. In a hedge accounting regime similar to the one that exists under ASC Topic 815, the manager's hedge decision is distorted relative to the public information case. Specifically, the speculative portion of the hedge position is increasing in the uncertainty about the firm's exposure as well as the proportion of short-term shareholders.

The intuition behind this result is that because the firm's risk exposure is unobservable to the market, new investors are exposed to greater (information) risk which in turn reduces their willingness to invest in the firm. Consequently, for a given hedge position, share price is lower purely as a result of a difference in the information environment as opposed to the risk characteristics of the firm. In other words, the capital market benefits of hedging are reduced; thus, the manager responds by reducing his hedge position, i.e., the costs of hedging, in an effort

to reduce the negative effect of hedging on firm value.[19] [20] Thus, if hedge accounting reflects risk management, I predict that the probability the firm will have a high proportion of speculative derivatives, i.e., undesignated derivative contracts, is increasing in the opacity of a firm's information environment and decreasing in the investment horizon of the firm's shareholders.

4. DATA, SAMPLE SELECTION AND RESEARCH DESIGN

4.1. Data and sample selection

The data used for this study come from three sources. The first is a unique set of manually collected quarterly footnote data related to a firm's derivative gains and losses for the first fiscal quarter of 2009 through the last calendar quarter of 2012.[21] [22] SFAS 161 requires enhanced disclosures about an entity's derivative and hedging activities including: (1) gross fair value amounts segregated between derivatives that are designated as hedging instruments and those that are not, with subcategories by type of contract, i.e., interest rate, foreign exchange, commodity, etc.; (2) the location and amount of the derivative gains and losses reported in the

[19] Assuming markets are imperfect, the primary capital market benefit of risk management is the reduction in capital costs achieved via management's efforts to avoid the adverse affects of financial distress on shareholder value. In other words, by reducing the volatility of cash flows, management can preserve shareholder value by minimizing the costs of financial distress, i.e., bankruptcy costs or opportunity costs associated with declined positive NPV projects. In return, shareholders will require a lower rate of return (Fatemi and Luft, 2002). The costs of risk management include the direct costs associated with initiating the hedge itself as well as indirect costs associated with administration of the hedge (Fatemi and Luft, 2002). The extent to which management engages in risk management activity is contingent on the relation between these and other costs and benefits.

[20] The focus of this study is risk management via the use of derivative contracts. It is entirely possible, however, that firms use other, possibly less costly, means to minimize the adverse affects of their risk exposure. The extent to which alternative risk management tools are employed by the firms in my sample is unclear. However, because the sample is limited to firms that manage at least a portion of their risk with derivatives and because the relation being tested is that between the type of derivative held by a firm and its information environment as opposed to the relation between a firm's residual risk, after risk management, and its information environment, I expect cross-sectional variation in the use of such techniques will have a minimal affect on the inferences drawn from the results.

[21] Footnote data are acquired from 10-Q and 10-K reports submitted to the SEC and available via the Commission's electronic data gathering, analysis and retrieval system, EDGAR.

[22] The standard requiring expanded disclosures for derivative instruments and hedging activities, SFAS 161, is effective for fiscal years and interim periods beginning after November 15, 2008. Although early application was encouraged, the firms in my sample implemented expanded disclosures beginning in the first fiscal quarter of 2009. In order to preserve the maximum number of observations, I do not omit firms whose fiscal year is not a calendar year. As a result, I have an unbalance panel with observations per firm ranging from 13 to 16.

statement of financial performance or statement of financial position presented separately for hedging instruments and hedged items in a fair value hedge; (3) the effective portion of gains and losses on derivative instruments designated as cash flow and net investment hedges recognized in OCI during the current period; (4) the effective portion of gains and losses reclassified into earnings during the current period; (5) the amount of hedge ineffectiveness as well as the amount excluded from the assessment of hedge effectiveness; and, (6) the gains and losses on derivative instruments not designated as hedging instruments. These quantitative disclosures are required for every annual and interim reporting period for which the statements of financial position and performance are presented and must be presented in tabular format. To be included in the sample, a firm must have had a non-zero balance on the statement of financial position for derivative assets or liabilities for all four fiscal years 2009 – 2012. I acquire all other accounting data from Compustat and monthly and quarterly firm and market returns from the Center for Research in Security Prices (CRSP).

4.2. Research Design

I posit that whether a firm is hedging or speculating with respect to its derivative positions is difficult to determine, at times even for the firm itself. Therefore, as an external user of financial information, management's assertions as to the nature of the firm's derivative use are insufficient to determine whether those positions are actually increasing or decreasing risk exposure. The objective of this research is to evaluate whether hedge accounting and associated disclosures can be used as a tool to distinguish derivative activity that is more consistent with hedging risk from derivative activity that is more consistent with speculation. In that spirit, I begin by identifying a sample of firms self-identified as those who use derivatives for risk management purposes based on their footnote disclosures.

The initial sample was obtained by generating a list of non-financial firms from Compustat sorted from largest to smallest based on total assets reported as of the 4th calendar quarter of 2009. I then examined the footnote disclosures related to hedge accounting for all

quarterly periods from the first fiscal quarter of 2009 through the fourth calendar quarter of 2012 to determine whether the firm held derivatives for risk management purposes and to retrieve the relevant quantitative disclosure data. The manually collected data include amounts for the first 270 unique firms that had non-zero quarterly balances for derivative assets/liabilities on the statement of financial position, approximately 4,300 firm-quarter observations. The analyses that follow, however, are based on fewer observations as a result of the data requirements for the remaining variables and, in some cases, the omission of the middle quintile of firms ranked based on the partitioning metric.

4.2.1. Partitioning Variable

The baseline partitioning metric I employ in this study is the ratio of derivative assets and liabilities designated as hedges to derivative assets and liabilities not designated as hedges. If hedge accounting criteria is a useful tool for distinguishing hedgers from speculators, firms with a greater proportion of derivatives designated as hedges should be engaged in derivative activities that are more consistent with risk management relative to the derivative activities of those with a greater proportion of undesignated hedges. I do not consider the firm's net position in derivatives, i.e. the difference between its asset and liability positions, as I am attempting to capture a summary measure of the firm's derivative activity as a whole. For this metric, firms in the 1st quintile are those whose entire derivatives portfolio meets the criteria for hedge accounting while firms in the 5th quintile are either those whose entire derivatives portfolio fails to meet the criteria for hedge accounting or those who elect not to account for some or all of their derivatives as accounting hedges.

Because hedge accounting is not required, it is entirely possible that a firm has elected not to designate its derivatives as accounting hedges for one reason or another. This represents a considerable research design issue because my objective is to investigate whether the criteria that must be met in order to obtain hedge accounting treatment is effective at distinguishing risk management activities from speculative activities. If firms with a higher proportion of

derivatives not designated as accounting hedges are bypassing the criteria altogether by choosing not to use hedge accounting, the inferences that could be drawn from the results of my tests are questionable. In an attempt to address this issue, I augment my baseline partitioning measure to include qualitative information. This qualitative information either captures likely reasons the relative costs and benefits of implementing hedge accounting could result in a decision by management to forgo the hedge accounting exception or it serves to provide some intuitive refinement to the baseline quantitative partitioning measure. [23]

The first piece of qualitative information I incorporate into the baseline measure is the decision to use the fair value option. SFAS 159, *The Fair Value Option for Financial Assets and Liabilities*, allows firms to measure eligible items at fair value thus eliminating the accounting mismatch between hedging instruments and certain hedged items, and the associated earnings volatility, without applying complex hedge accounting provisions. In the limit, a firm that is able to exercise the fair value option for all of its hedged items would not need to designate any derivatives as accounting hedges in order to obtain similar financial reporting outcomes as those achieved under the hedge accounting exception. Using the baseline partitioning measure, such a firm would be classified as a speculative hedger observation when the opposite may be true. Under SFAS 159, firms that exercise the fair value option are required to provide information to facilitate the comparison between firms that choose alternative measurement attributes for similar assets and liabilities.[24] For the purposes of this study, the only information I capture and use regarding the fair value option is whether the firm has made the election at any point during the sample period and I eliminate firm-quarter observations from the speculative hedger group, i.e., those in quintiles 4 and 5, that have done so.

[23] In my tests, I consider the inclusion of each of these qualitative refinements individually because including them in a more comprehensive manner would result in a prohibitively small sample of speculative hedger observations for comparison.

[24] Disclosure requirements under SFAS 159 include management's reasons for electing the fair value option, the difference between aggregate fair value and aggregate unpaid principal balance of loans, receivables and payables for which the fair value option was elected as well as methods and assumptions used to estimate fair values.

Next, I consider cross-sectional variation in the reporting of comprehensive income. Prior literature (Hirst & Hopkins, 1998; Maines and McDaniel, 2000) suggests that the manner in which comprehensive income is presented, i.e., in a performance statement or as a component of shareholders' equity, affects how the capital markets interpret the information provided. Maines and McDaniel (2000) finds that a group of nonprofessional investors assign more weight to the volatility of comprehensive income components when they are reported in a performance statement, such as a statement of comprehensive income. This becomes important when one considers how hedge accounting, with respect to cash flow hedges, reduces earnings volatility. By recognizing the fair value gains and losses on cash flow hedging instruments in comprehensive income until the hedged transaction affects earnings, the fair value volatility is essentially shifted from regular income to comprehensive income. If the results of Maines and McDaniel (2000) hold more generally, the benefits of cash flow hedge accounting for firms that report comprehensive income in a performance statement are reduced. This could explain why some firms opt not to use hedge accounting and provides an alternative explanation for why a firm has a higher proportion of undesignated derivative contracts. To address this issue, I eliminate firm-quarter observations from the speculative hedger group, i.e., quintiles 4 and 5, when the firm reports comprehensive income in a performance statement.[25]

Next I consider whether a firm's derivative contracts fail to meet the hedge accounting criteria or whether the firm elects not to use the hedge accounting provisions. Including only those observations where derivatives are not designated as accounting hedges because they fail the criteria should result in a refinement of my baseline partitioning measure because it is more consistent with the focus of this study, which is to examine the criteria under the existing hedge accounting standard and its usefulness for distinguishing risk management from speculation. I have attempted to glean this information from the footnotes and eliminate from the speculative

[25] This variation ceases to be an issue for fiscal years and interim periods beginning after December 15, 2011, the effective date of ASU 2011-05, Presentation of Comprehensive Income. This amendment to the standards essentially requires all firms to report comprehensive income in a performance statement as opposed to a component of shareholder's equity.

hedger group, i.e., quintiles 4 and 5, firm-quarter observations where the firm explicitly states they elected not to use hedge accounting for any reason. Although this should be the most ideal refinement, the manner in which this information is disclosed makes it difficult to obtain a clear separation. Specifically, many firms state that they have undesignated derivatives that fail the criteria as well as those for which they have elected not to apply hedge accounting without providing information on the relative proportion of each. Therefore, I eliminate all firm-quarter observations from the speculative hedger group where the firm has stated that it elects not to apply hedge accounting to any degree.

The next piece of qualitative information I consider is the use of speculative or trading derivatives. A relatively small number of firms admit to using some of their derivative contracts for other than risk management purposes. An intuitive refinement of my baseline partitioning measure is to eliminate those firms that explicitly state that their derivatives are held solely for risk-management purposes. However, there are at least two potential issues with this particular refinement. First, it results in a relatively small speculative hedger sample for comparison purposes. Considering a minimum of 13 observations per firm, in some instances the resulting sample is only comprised of 4 or 5 unique firms. Second, it is entirely possible that a firm employs the use of selective hedging techniques that may technically fall under the category of risk management but practically look more like speculation (Stulz, 1996). This refinement would eliminate such firms from consideration. Nonetheless, I eliminate from the speculative hedger group, i.e., quintiles 4 and 5, firms that state in their disclosure that derivatives are only held for hedging purposes.

Next, I consider those firms that use foreign exchange derivatives to hedge against remeasurement gains and losses on recognized assets and liabilities denominated in a foreign currency. Foreign currency denominated assets and liabilities are remeasured at the end of each reporting period based on the currency rate at that point in time. Therefore the fair value change on the hedging instrument will be offset by the remeasurement gain or loss reported in

the same period eliminating the need for hedge accounting designation. This provides an alternative explanation for a higher proportion of undesignated derivative contracts. Thus, I eliminate all firm-quarter observations from the speculative hedger group where the firm explicitly states they are using foreign exchange derivatives for this purpose.

Finally, I consider the cost of restatement. It is possible that firms elect to forgo the provisions under the hedge accounting standard because of the related complexity and potential for restatement (Comiskey and Mulford, 2008). As opposed to trying to estimate the risk of or absolute costs associated with a restatement, I consider the relative cost of a restatement and assume that if a firm has experienced a restatement in a prior period, that firm would be less likely to use hedge accounting. This provides an alternative explanation for a higher proportion of undesignated contracts. Therefore, I eliminate all firm-quarter observations from the speculative hedger group where the firm has had a restatement for any reason.

4.2.2. Risk Exposure Analyses

The first test I employ is a univariate test of means to investigate (1) whether the firm-specific risk characteristics between the conventional and speculative hedger partitions differ and (2) whether the augmented partitioning measures result in a greater distinction between conventional and speculative hedger observations relative to the baseline partitioning measure. In this test, I use accounting-based risk measures (earnings and cash flow volatilities, *EARN_VOL* and *CFO_VOL*), market-based risk measures (beta, *BETA*, idiosyncratic volatility, *FIRMRSK*, and equity volatility, *VOLE*) and macroeconomic risk measures (exposure to interest rates, foreign exchange rates and commodities prices, *IREXP*, *FXEXP* and *COMMEXP*) to allow for the possibility that my partitioning measure is capturing the distinction between accounting hedgers and economic hedgers. Lower estimates across all eight risk proxies for conventional hedger firms vis-à-vis speculative hedger firms would provide evidence consistent with my predictions and the notion that the partitioning measure is capturing differences between risk management and speculation. Conversely, lower (higher) estimates for accounting-based

(market-based and macroeconomic) risk measures for firms with a high proportion of derivatives designated as accounting hedges would provide evidence consistent with the notion that the partitioning measure is capturing differences between accounting hedgers and economic hedgers.

Next, I use multivariate analysis to investigate whether the relation between total firm risk and the residual exposure to macroeconomic risk varies across partitions in a predictable manner. To test my predictions, I estimate the following equation via ordinary least squares:

$$(1) \qquad VOLE_{i,t} = \theta_0 + \theta_1 EXPOSURE_{i,t} + \Sigma\theta_{2\text{-}k} CONTROLS_{i,t} + \varepsilon.$$

VOLE is a measure of total firm risk. *EXPOSURE* is a firm-specific variable intended to capture a firm's exposure to interest rates, foreign exchange rates or commodities prices. The set of control variables included in the regressions are those that have been shown in prior literature to vary with equity volatility and include leverage, *LEV*, book-to-market ratio, *BTM*, return on equity volatility, *ROE_VOL*, firm age, *AGE*, sales growth volatility, *SGR_VOL*, institutional investors, *INST*, and inverse price, *INVPRC*.

To investigate how the relation between residual exposure to macroeconomic risk and total firm risk differs across partitions, I estimate equation (1) separately for *SH* = 1 and 0. With respect to this analysis, *SH* is an indicator variable equal to 1 for firms with 50% or more of their firm-quarter observations in the 4th or 5th quintile of observations ranked by the ratio of derivative assets and liabilities designated as accounting hedges. In effect, the firms themselves are classified as conventional hedgers or speculative hedgers as opposed to the individual firm-quarter observations as is the case for the univariate test above and the information environment analysis below. This modification to the classification scheme is necessary because the macroeconomic risk exposure estimates employed in the analysis require a longer time-series of data to estimate.

The sample used to estimate equation (1) varies with the macroeconomic variable used as *EXPOSURE*. Specifically, I restrict the sample to only those firms that have a nonzero

balance in derivative contracts related to the macroeconomic variable, i.e., when *EXPOSURE* is a proxy for exposure to interest rates, the sample is restricted to those firms that have interest rate derivative contracts. A zero coefficient estimate on *EXPOSURE,* $\theta_1 = 0$, for conventional hedgers and a positive coefficient estimate on *EXPOSURE*, $\theta_1 > 0$, for speculative hedgers would provide evidence consistent with predictions and suggest that hedge accounting is useful for distinguishing risk management from speculation.

4.2.3. Information Environment and Shareholder Base Analysis

To test my predictions regarding the likelihood a firm would have a higher proportion of speculative derivatives given the degree of opacity in its information environment and the average investment horizon of its shareholder base, I estimate the following via multinomial logistic regression:

(2) $RANK = \Psi_0 + \Psi_1 TRANS_{i,t} + \Psi_2 TURNOVER_{i,t} + \Psi_3 SIZE_{i,t} + \Psi_4 LEVERAGE_{i,t} + \Psi_5 INTCOV_{i,t} + \Psi_6 MTB_{i,t} + \varepsilon.$

RANK is a categorical variable that takes on a value from 1 to 5 based on the ratio of derivatives designated as accounting hedges to derivatives not designated as hedges. *TRANS* is an aggregate measure of a firm's information environment calculated as the average decile rank of two earnings smoothness measures, analyst forecast error, analyst following, dispersion in analyst forecasts, firm age and bid-ask spread . A positive multinomial logistic coefficient estimate on *TRANS,* $\Psi_1 > 0$, would provide evidence consistent with the prediction that the probability a firm will have a low proportion of speculative derivatives is increasing in transparency. Following Ang and Cheng (2006), I use *TURNOVER* as the proxy for the investment horizon of a firm's shareholder base. A negative multinomial logistic coefficient estimate on *TURNOVER,* $\Psi_2 < 0$, would provide evidence consistent with the prediction that the probability a firm will have a low proportion of speculative derivatives is decreasing in the frequency of share turnover, i.e., increasing in the average investment horizon of the firm's shareholders.

I also include several variables that should predict whether a firm is engaged in risk management or speculative activities based on theories of hedging by value-maximizing corporations, e.g. Smith and Stulz (1985).[26] I include size to capture the notion that large firms are more likely to self-insure their exposure to risk (Stulz, 1996). In other words, larger firms should be more likely to have a large speculative component to their hedge portfolio relative to their smaller counterparts. Evidence consistent with this intuition would yield a logit estimate on size that is less than zero, $\psi_3 < 0$. I include leverage and interest coverage ratio to capture the notion that firms hedge to reduce the costs of financial distress (Smith and Stulz, 1985). Put differently, firms with relatively low levels of debt financing are more likely to have a large speculative component to their hedge portfolio relative to those with higher levels of debt. Evidence consistent with this theory would yield a coefficient estimate on leverage that is greater than zero, $\psi_4 > 0$, and one on interest coverage ratio that is less than zero, $\psi_5 < 0$. Finally, I include the equity market-to-book ratio to capture the notion that firms hedge in an effort to curb inefficient investment (Froot, Scharfstein and Stein, 1993). Assuming external capital is more costly than internal funds, firms with relatively large growth opportunities are more likely to hedge to ensure that internally generated cash flows do not fall below required levels (Glaum, 2002). Evidence consistent with this theory would yield a coefficient estimate on market-to-book that is greater than zero, $\psi_5 > 0$.

[26] Classical finance theory suggests risk management is not a value maximizing activity. However, in an attempt to explain the prevalence of risk management programs observed in reality, theories of value maximizing risk management have emerged and usually hinge on the identification of one form of market imperfection or another. Empirical tests of these theories have not yielded compelling evidence in support of these theories. Some have suggested, e.g., Glaum (2002) that the problem lies with the implicit assumption that all firms using derivatives are hedging. Survey evidence suggests that firms engage in a spectrum of derivative activities that include "full-cover" hedging as well as "selective" hedging, the latter involving managers incorporating their views on the future movement of interest rates, exchange rates and commodity prices to ultimately affect their hedge ratios (Stulz, 1996). Selective hedging would be more consistent with a speculative activity relative to full-cover hedging.

5. RESULTS

5.1. Risk Exposure Results

5.1.1. Firm-Specific Risk Characteristics

Table 1 presents the risk characteristics of firms across partitions before and after the inclusion of qualitative information. For all seven sets of results, the SH = 0 group consists of the firm-quarter observations where the ratio of derivatives designated as accounting hedges to derivatives not designated as accounting hedges is high. For the baseline results, the SH = 1 group consists of the firm-quarter observations where the ratio of derivatives designated as accounting hedges to derivatives not designated as accounting hedges is low. For the remaining six sets of results, the SH = 1 group consists of the firm-quarter observations where the ratio of derivatives designated as accounting hedges to derivatives not designated is low and alternative types of firms are systematically excluded as described above.

Consistent with my predictions, conventional hedgers are on average less risky than speculative hedgers and in most cases the difference is statistically significant at conventional levels. The one exception in tests using the baseline measure is the exposure to commodities price risk which is slightly greater for conventional hedgers. Further, the augmentation of the baseline quantitative partitioning measure is best improved either by excluding those firms that use foreign currency derivatives to hedge against remeasurment gains and losses on recognized assets and liabilities denominated in a foreign currency or by excluding those firms that report comprehensive income in a performance statement. This conclusion is based on two factors. First, the risk profile across all eight risk metrics is lower for the SH = 0 group relative to the SH = 1 group under these two alternative scenarios. Second, the difference between partitions across all eight risk metrics is significant at the 1% level under these two scenarios. The baseline partitioning measure is also marginally improved by excluding those firms that exercised the fair value option. The remaining proposed augmentations result in a more ambiguous split between the two groups.

5.1.2. Macroeconomic Exposure and Total Firm Risk

Table 2 presents the descriptive statistics for the aggregate macroeconomic risk exposure samples separately for interest rate, foreign exchange rate and commodities price exposures (Panel A) as well as Pearson/Spearman correlations for the same (Panel B). A cursory glance at the descriptive statistics reveals that on average, firms across all three samples are roughly the same size and age. The foreign exchange rate exposure sample is slightly less levered than the other two samples and has fewer opportunities for growth, particularly relative to the interest rate exposure sample. Pearson/Spearman correlations reveal that residual exposures to interest rates and foreign exchange rates for the aggregate sample are negatively related to risk, which suggests that these instruments are not being used to speculate, regardless of a firm's identification as a hedger or speculator. The correlation between residual exposure to commodities prices and risk, however, is insignificant but positive which suggests there is some potential for variation across partitions.

Table 3 presents the results of tests of the relation between residual exposure to macroeconomic risk and total firm risk using the baseline partitioning measure as well as the three augmented measures that yielded the greatest incremental increase in distinction between partitions, i.e. the exclusion of firms that exercise the fair value option, report comprehensive income in a performance statement and use derivatives to hedge gains and losses on recognized assets and liabilities denominated in a foreign currency. For conventional hedgers, SH = 0, I find that residual exposure to foreign exchange rates and commodities prices exhibits no relation to total firm risk. Residual exposure to interest rates exhibits a slight negative association with total firm risk; however, this result is not robust to correction for serial correlation of the residuals. The results regarding the conventional hedger partition are consistent with my prediction and suggest that these firms were on average successful in hedging their exposures to macroeconomic risk.

Turning to the results for speculative hedgers, SH = 1, I find that residual exposure to interest rates exhibits no relation to total risk and residual exposure to foreign exchange rates exhibits a negative association. The negative association between foreign exchange rates and total firm risk disappears, however, once the partitioning measure is augmented to exclude firms using derivatives to hedge gains and losses on recognized assets and liabilities denominated in a foreign currency (Model 4). This result provides some support for this particular augmentation of the baseline partitioning measure. The multivariate results regarding the relation between residual exposures to interest and foreign exchange rates and total risk for the speculative hedger group confirm inferences from previous examination of the correlations of these variables. Specifically, interest rate and foreign exchange contracts are not being used, by the firms in this sample, to speculate. However, the residual exposure to commodities prices is positively associated with total firm risk for the speculative hedger group, which is consistent with my prediction and suggests that sample firms are using commodities contracts for more speculative activities.

5.2. Information Environment and Shareholder Base Results

Table 4 presents the descriptive statistics for the aggregate sample used to test predictions regarding how a firm's information environment and shareholder base relate to the proportion of speculative derivatives, i.e. undesignated derivatives, held (Panel A) as well as sample means by *RANK* (Panel B). Although the information environment (share turnover) variables do not decrease (increase) monotonically from RANK = 1 to RANK = 5, a comparison of the two extremes generally paints the picture of a more transparent information environment for firms in the conventional hedger category relative to that for firms in the speculative hedger category. Further, the share turnover variable suggests that the shareholder base of firms in the conventional hedger category has a longer investment horizon relative to that of the shareholder base of firms in the speculative hedger category. Panel C of Table 4 presents the Pearson/Spearman correlations of the variables used in the information environment and share

turnover analysis and is provided primarily to demonstrate that the aggregate *TRANS* variable exhibits a significant positive correlation with its components.

Table 5 presents the results of the information environment and share turnover analysis using the baseline partitioning measure as well as the three augmented measures presented in Table 3. As implemented, the multinomial logistic regression models estimate the probability of a firm appearing in categories 1 – 4 relative to the reference category 5. Models 1 through 4 provide evidence consistent with my predictions. Specifically, the multinomial logistic coefficient estimates associated with the TRANS (TURNOVER) variable are positive (negative) and significant across models. These results are robust to correction for serial correlation of the residuals with the exception of the coefficient estimate on share turnover for RANK = 4 relative to RANK = 5 which loses significance. These result are consistent with the notion that the more transparent the firm's information environment (the more short-term shareholders a firm has), the smaller (greater) the speculative portion of is hedge portfolio.

6. **CONCLUSION**

The objective of this study is to investigate whether the criteria that must be met in order for the fair value gains and losses from a firm's derivative contracts to be recognized under the hedge accounting exception reflect firms' risk management activities. Toward that end, I used the quantitative disclosures from annual and interim reporting periods for a set of non-financial firms to develop a partitioning measure meant to summarize the criteria. I subsequently augment the quantitative measure with information from the qualitative disclosures in an effort to refine it. I then conduct a series of tests to evaluate whether the partitions exhibit characteristics associated with risk management or speculation. I find descriptive evidence that (1) speculative hedgers are riskier than conventional hedgers; (2) there is no association between residual exposure to macroeconomic risk and total firm risk for conventional hedgers; (3) there is a positive association between residual exposure to commodities prices and total firm risk for speculative hedgers; (4) speculative hedgers operate in more opaque information

environments relative to those of conventional hedgers; and, (5) speculative hedgers have a shareholder base with a relatively short investment horizon. These results suggest hedge accounting criteria does reflect risk management activities.

My interpretation of the results is subject to a number of caveats. Because a firm's risk and the details regarding the strategy for managing that risk is unobservable to financial statement users, I necessarily rely on intuition and theory regarding the determinants of hedging versus speculative activities as well as firm-specific characteristics that could distinguish one from the other. Further, I use empirical proxies to represent higher order constructs. Thus, the analyses contained herein are essentially joint tests of the intuition and theory that motivate them and the validity of the constructs employed.

TABLE 1: Firm-Specific Risk Characteristics

*This table presents information on how the risk characteristics differ across the conventional hedger and speculative hedger partitions. For comparison purposes, the baseline partitioning measure, the ratio of derivatives designated as accounting hedges to undesignated derivatives, is presented as well as all augmented partitioning schemes. In all cases, the SH = 0 group consists of firm-quarter observations where the ratio of derivatives designated as accounting hedges to derivatives not designated is greatest. For the baseline results, the SH = 1 group consists of firm-quarter observations where the ratio of derivatives designated as accounting hedges to derivatives not designated is lowest. For the Fair Value Option results, the SH = 1 group excludes those firms that state they have used the fair value option. For the Performance Statement results, the SH = 1 group excludes those firms that present comprehensive income in a performance statement. For the Fail results, the SH = 1 group excludes firms that explicitly state that they elect not to use hedge accounting for any reason. For the Speculation/Trading results, the SH = 1 excludes those firms that explicitly state they only use derivatives for risk management. For the Remeasure results, the SH = 1 group excludes those firms that use foreign exchange derivatives to hedge against remeasurement gains and losses on recognized assets and liabilities denominated in a foreign currency. For the Restate results, the SH = 1 group excludes firms that have had a previous restatement. The significance of the difference in means is based on the Wilcoxon-Mann-Whitney test. ***, ** and * represent significance at the 1%, 5% and 10% level respectively.*

Baseline

	SH = 0		***SH = 1***			
Firm Characteristics	**Mean**	**N**	**Mean**	**N**	**Diff**	**Diff in Mean**
Cash Flow Volatility	0.0377	1701	0.0471	1412	-0.0094	***
Earnings Volatility	0.0195	1751	0.0312	1485	-0.0117	***
Interest Rate Exposure	0.1128	1667	0.1402	378	-0.0274	*
Foreign Exchange Exposure	1.1256	1235	1.4208	1152	-0.2952	***
Commodities Exposure	1.2551	982	1.2111	837	0.0440	*
Market Risk	1.0962	1614	1.2963	1343	-0.2001	***
Firm-Specific Risk	0.0200	1614	0.0219	1343	-0.0019	***
Total Risk	0.4429	1614	0.5012	1343	-0.0583	***

Fair Value Option

	SH = 0		***SH = 1***			
Firm Characteristics	**Mean**	**N**	**Mean**	**N**	**Diff**	**Diff in Mean**
Cash Flow Volatility	0.0377	1701	0.0468	1337	-0.0091	***
Earnings Volatility	0.0195	1751	0.0321	1395	-0.0126	***
Interest Rate Exposure	0.1128	1667	0.1457	346	-0.0329	**
Foreign Exchange Exposure	1.1256	1235	1.4183	1086	-0.2927	***
Commodities Exposure	1.2551	982	1.2105	812	0.0446	*
Market Risk	1.0962	1614	1.3142	1255	-0.2180	***
Firm-Specific Risk	0.0200	1614	0.0219	1255	-0.0019	***
Total Risk	0.4429	1614	0.5045	1255	-0.0616	***

TABLE 1: Firm-Specific Risk Characteristics (Cont.)

Performance Statement

	SH = 0		*SH = 1*			
Firm Characteristics	**Mean**	**N**	**Mean**	**N**	**Diff**	**Diff in Mean**
Cash Flow Volatility	0.0377	1701	0.0502	805	-0.0125	***
Earnings Volatility	0.0195	1751	0.0337	824	-0.0142	***
Interest Rate Exposure	0.1128	1667	0.1200	183	-0.0072	***
Foreign Exchange Exposure	1.1256	1235	1.5224	702	-0.3968	***
Commodities Exposure	1.2551	982	1.3216	483	-0.0665	***
Market Risk	1.0962	1614	1.2873	761	-0.1911	***
Firm-Specific Risk	0.0200	1614	0.0235	761	-0.0035	***
Total Risk	0.4429	1614	0.5356	761	-0.0927	***

Fail

	SH = 0		*SH = 1*			
Firm Characteristics	**Mean**	**N**	**Mean**	**N**	**Diff**	**Diff in Mean**
Cash Flow Volatility	0.0377	1701	0.0451	871	-0.0074	***
Earnings Volatility	0.0195	1751	0.0268	928	-0.0073	***
Interest Rate Exposure	0.1128	1667	0.1597	255	-0.0469	**
Foreign Exchange Exposure	1.1256	1235	1.4128	743	-0.2872	*
Commodities Exposure	1.2551	982	1.2279	558	0.0272	*
Market Risk	1.0962	1614	1.2792	821	-0.1830	***
Firm-Specific Risk	0.0200	1614	0.0215	821	-0.0015	***
Total Risk	0.4429	1614	0.4930	821	-0.0501	***

Speculation/Trading

	SH = 0		*SH = 1*			
Firm Characteristics	**Mean**	**N**	**Mean**	**N**	**Diff**	**Diff in Mean**
Cash Flow Volatility	0.0377	1701	0.0505	257	-0.0128	***
Earnings Volatility	0.0195	1751	0.0303	288	-0.0108	***
Interest Rate Exposure	0.1128	1667	0.1299	55	-0.0171	***
Foreign Exchange Exposure	1.1256	1235	1.0804	96	0.0452	
Commodities Exposure	1.2551	982	1.0416	175	0.2135	
Market Risk	1.0962	1614	1.3418	254	-0.2456	***
Firm-Specific Risk	0.0200	1614	0.0206	254	-0.0006	**
Total Risk	0.4429	1614	0.4970	254	-0.0541	***

TABLE 1: Firm-Specific Risk Characteristics (Cont.)

Remeasure

	SH = 0		*SH = 1*			
Firm Characteristics	**Mean**	**N**	**Mean**	**N**	**Diff**	**Diff in Mean**
Cash Flow Volatility	0.0377	1701	0.0495	723	-0.0118	***
Earnings Volatility	0.0195	1751	0.0375	753	-0.0180	***
Interest Rate Exposure	0.1128	1667	0.1742	194	-0.0614	***
Foreign Exchange Exposure	1.1256	1235	2.1278	214	-1.0022	***
Commodities Exposure	1.2551	982	1.3016	556	-0.0465	***
Market Risk	1.0962	1614	1.3657	671	-0.2695	***
Firm-Specific Risk	0.0200	1614	0.0230	671	-0.0030	***
Total Risk	0.4429	1614	0.5318	671	-0.0889	***

Restate

	SH = 0		*SH = 1*			
Firm Characteristics	**Mean**	**N**	**Mean**	**N**	**Diff**	**Diff in Mean**
Cash Flow Volatility	0.0377	1701	0.0491	1155	-0.0114	***
Earnings Volatility	0.0195	1751	0.0337	1212	-0.0142	***
Interest Rate Exposure	0.1128	1667	0.1392	298	-0.0264	
Foreign Exchange Exposure	1.1256	1235	1.4063	914	-0.2807	
Commodities Exposure	1.2551	982	1.2092	694	0.0459	*
Market Risk	1.0962	1614	1.2773	1074	-0.1811	***
Firm-Specific Risk	0.0200	1614	0.0217	1074	-0.0017	***
Total Risk	0.4429	1614	0.4960	1074	-0.0531	***

TABLE 2: Descriptive Statistics and Correlations – Macroeconomic Exposure and Total Firm Risk Analysis

The descriptive statistics presented below are related to the risk exposure analysis. Statistics are presented for the aggregate sample in Panel A. In Panel B, Pearson (Spearman) correlations appear above (below) the diagonal for the aggregate samples, by risk exposure variable. Correlations significant at the 5% level appear in bold.

Panel A – Descriptive Statistics

Interest Rate Exposure Sample

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
VOLE	1927	0.4356	0.2028	0.3875	0.1562	1.0946
IREXP	1783	-0.0115	0.1421	-0.0109	-0.4728	0.3857
SIZE	2049	9.1883	1.3718	9.0959	4.4183	12.5097
LEV	2164	0.6564	0.1870	0.6298	0.2143	1.3627
BTM	2049	0.3450	2.5976	0.4123	-60.5997	4.0176
ROE_VOL	2164	0.1699	0.5632	0.0280	0.0053	3.6222
AGE	1951	36.1445	19.8240	37.0000	4.0000	63.0000
SGR_VOL	2164	0.1771	0.1893	0.1152	0.0320	1.1457
INST	1631	0.7431	0.1976	0.7876	0.2043	1.0466
INVPRC	2049	0.0453	0.0797	0.0264	0.0060	1.1494

Foreign Exchange Rate Exposure Sample

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
VOLE	2245	0.4547	0.2029	0.4090	0.1562	1.0946
FXEXP	2223	-0.0178	1.5618	-0.0660	-4.0866	4.5080
SIZE	2346	9.0063	1.1916	8.9845	4.5786	13.2367
LEV	2418	0.6170	0.2036	0.5972	0.2143	1.3627
BTM	2346	0.4803	0.3875	0.3994	-2.1925	4.2324
ROE_VOL	2418	0.1901	0.6286	0.0296	0.0053	3.6222
AGE	2277	38.2956	19.7631	41.0000	5.0000	63.0000
SGR_VOL	2418	0.1706	0.1861	0.1151	0.0320	1.1457
INST	1774	0.7939	0.1351	0.8133	0.2043	1.0466
INVPRC	2346	0.0395	0.0567	0.0258	0.0060	1.1494

Commodities Price Exposure Sample

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
VOLE	1763	0.4926	0.2237	0.4436	0.1562	1.0946
COMMEXP	1724	-0.1570	1.5786	-0.0966	-4.6475	4.3010
SIZE	1820	8.9159	1.2852	8.8304	4.7651	12.5097
LEV	1876	0.6448	0.1837	0.6105	0.2436	1.3627
BTM	1820	0.4349	2.7976	0.4947	-60.5997	4.2324
ROE_VOL	1876	0.1879	0.5587	0.0414	0.0053	3.6222
AGE	1780	36.9663	20.2335	37.0000	4.0000	63.0000
SGR_VOL	1876	0.2058	0.2037	0.1398	0.0367	1.1457
INST	1477	0.7777	0.1723	0.8015	0.2043	1.0466
INVPRC	1820	0.0491	0.1307	0.0269	0.0060	2.8571

TABLE 2: Descriptive Statistics and Correlations – Macroeconomic Exposure and Total Firm Risk (Cont.)

Panel B - Correlations

Interest Rate Exposure Sample

	VOLE	*IREXP*	*SIZE*	*LEV*	*BTM*	*ROE_VOL*	*AGE*	*SGR_VOL*	*INST*	*INVPRC*
VOLE	1.0000	**-0.1239**	**-0.4904**	**0.1434**	**0.3098**	**0.1313**	**-0.2281**	**0.1351**	**0.2207**	**0.3810**
IREXP	**-0.1096**	1.0000	**0.1012**	0.0358	**-0.1115**	**-0.0687**	**0.1062**	**-0.1028**	**-0.0601**	**-0.0733**
SIZE	**-0.4996**	**0.1062**	1.0000	**-0.2309**	**0.1257**	0.0009	**0.3319**	**-0.1277**	**-0.2193**	**-0.3158**
LEV	**0.0939**	**0.0461**	**-0.2099**	1.0000	**-0.3320**	**0.3852**	**0.1230**	**-0.0635**	-0.0377	**0.3421**
BTM	**0.3796**	**-0.0464**	**-0.4186**	**-0.2745**	1.0000	-0.0277	**-0.1764**	**0.0688**	**0.2377**	**-0.3485**
ROE_VOL	**0.3372**	**-0.0602**	**-0.1839**	**0.5070**	**-0.1996**	1.0000	0.0145	**0.0481**	0.0142	**0.2863**
AGE	**-0.2856**	**0.1080**	**0.3613**	**0.0927**	**-0.2341**	**-0.0712**	1.0000	**-0.2030**	-0.0320	**-0.0636**
SGR_VOL	**0.2386**	-0.0361	**-0.1672**	**-0.0579**	**0.2201**	**0.3787**	**-0.2375**	1.0000	-0.0028	-0.0206
INST	**0.2939**	**-0.0967**	**-0.3722**	0.0407	**0.2208**	**0.1178**	**-0.1629**	-0.0241	1.0000	**-0.0752**
INVPRC	**0.4162**	**0.0893**	**-0.3831**	**0.3200**	**0.3434**	**0.1996**	**-0.0963**	0.0334	**0.1258**	1.0000

Foreign Exchange Rate Exposure Sample

	VOLE	*FXEXP*	*SIZE*	*LEV*	*BTM*	*ROE_VOL*	*AGE*	*SGR_VOL*	*INST*	*INVPRC*
VOLE	1.0000	**-0.0751**	**-0.4715**	**0.2061**	**0.2205**	**0.1094**	**-0.0960**	**0.1505**	**0.0745**	**0.3629**
FXEXP	**-0.0465**	1.0000	**-0.0636**	**0.0792**	**-0.0926**	0.0048	0.0302	-0.0279	**-0.0876**	**0.1207**
SIZE	**-0.4736**	**-0.0585**	1.0000	**-0.2484**	**-0.3163**	**-0.0922**	**0.0811**	**-0.1447**	**-0.1918**	**-0.3892**
LEV	**0.1360**	**0.0607**	**-0.2357**	1.0000	**-0.2954**	**0.4273**	**0.2535**	**0.0681**	0.0063	**0.2953**
BTM	**0.2847**	**-0.0611**	**-0.3651**	**-0.2937**	1.0000	**-0.2936**	**-0.1086**	**0.1065**	**-0.0868**	**0.1812**
ROE_VOL	**0.3613**	0.0019	**-0.2137**	**0.5456**	**-0.2665**	1.0000	0.0387	**0.1974**	-0.0409	**0.2351**
AGE	**-0.1639**	**0.0507**	**0.1126**	**0.2534**	**-0.0935**	**0.1006**	1.0000	-0.0244	**-0.1494**	0.0228
SGR_VOL	**0.2908**	-0.0056	**-0.1920**	**0.0426**	**0.1923**	**0.4035**	0.0243	1.0000	-0.0450	**0.2046**
INST	**0.1546**	**-0.0586**	**-0.2566**	-0.0136	-0.0315	-0.0439	**-0.2106**	**-0.0757**	1.0000	**-0.1009**
INVPRC	**0.4319**	**0.1520**	**-0.4770**	**0.3980**	**0.2411**	**0.3067**	**0.0534**	**0.1495**	0.0434	1.0000

Commodities Price Exposure Sample

	VOLE	*COMMEXP*	*SIZE*	*LEV*	*BTM*	*ROE_VOL*	*AGE*	*SGR_VOL*	*INST*	*INVPRC*
VOLE	1.0000	0.0045	**-0.4349**	**0.2175**	**0.0598**	0.0439	**-0.1318**	**0.0766**	**0.1870**	**0.3606**
COMMEXP	0.0120	1.0000	-0.0068	**-0.0533**	**0.1586**	-0.0194	**-0.0489**	**0.0927**	**0.1042**	**-0.0922**
SIZE	**-0.4221**	-0.0335	1.0000	**-0.2989**	**0.1021**	-0.0012	**0.2586**	-0.0023	**-0.2146**	**-0.3356**
LEV	**0.1210**	-0.0037	**-0.2844**	1.0000	**-0.2745**	**0.4506**	**0.2759**	**-0.1856**	**0.0732**	**0.3192**
BTM	**0.2163**	**0.0984**	**-0.3450**	**-0.3248**	1.0000	**-0.0653**	**-0.0844**	**0.0997**	0.0484	**-0.8351**
ROE_VOL	**0.3350**	0.0031	**-0.0777**	**0.3954**	**-0.1987**	1.0000	**0.2277**	-0.0384	-0.0370	**0.0486**
AGE	**-0.2027**	-0.0213	**0.2759**	**0.2265**	**-0.3586**	0.0407	1.0000	**-0.2568**	**-0.0689**	-0.0324
SGR_VOL	**0.1978**	0.0442	**0.0717**	**-0.2500**	**0.3046**	**0.3986**	**-0.3084**	1.0000	-0.0291	-0.0432
INST	**0.2279**	**0.1196**	**-0.3046**	**0.0627**	**0.0501**	**0.1229**	**-0.1772**	**0.0992**	1.0000	**-0.0544**
INVPRC	**0.3937**	-0.0017	**-0.5316**	**0.4025**	**0.2620**	**0.2229**	**-0.0841**	-0.0201	0.0218	1.0000

TABLE 3: Macroeconomic Exposure and Total Firm Risk

This table presents the results of the estimation of Equation *(1) $VOLE_{i,t} = \theta_0 + \theta_1 EXPOSURE_{i,t} + \Sigma\theta_{2\text{-}k} CONTROLS_{i,t} + \varepsilon$, for SH=0 and SH=1. All variables of interest are as described in Appendix A. SH is an indicator variable equal to 1 for firms with 50% or more of their firm-quarter observations in the 4th or 5th quintile of observations ranked by either the baseline partitioning measure (Model 1) or the baseline measure augmented to exclude from the 4th and 5th quintiles firms that exercise the fair value option (Model 2), firms that report comprehensive income in a performance statement (Model 3) and firms that use FX derivatives to hedge against remeasurement gains and losses on recognized assets and liabilities denominated in a foreign currency (Model 4). P-values (two-sided) are based on heteroscedasticity consistent standard errors. All non-logorithmic variables were winsorized at the 1st and 99th percentiles. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels respectively.*

Panel A – Interest Rate Exposure Sample

	Model 1						Model 2			Model 3			Model 4		
	SH = 0			SH = 1			SH = 1			SH = 1			SH = 1		
Variable	**Estimate**		**Pr > |t|**	**Estimate**		**Pr > |t|**	**Estimate**		**Pr > |t|**	**Estimate**		**Pr > |t|**	**Estimate**		**Pr > |t|**
INTERCEPT	0.8097	***	<.0001	0.7239	***	0.00	1.0893	***	<.0001	1.6260	***	<.0001	0.9702	***	<.0001
IREXP	-0.0631	*	0.09	-0.1513		0.13	-0.1083		0.35	0.0434		0.80	0.0671		0.64
SIZE	-0.0610	***	<.0001	-0.0510	***	<.0001	-0.0682	***	<.0001	-0.0957	***	<.0001	-0.0064		0.72
LEV	0.1321	***	0.01	0.0395		0.80	-0.2424		0.13	0.0331		0.85	-1.0074	***	<.0001
BTM	0.0707	***	<.0001	-0.0856	**	0.05	-0.1803	***	<.0001	-0.2297	***	<.0001	-0.1774	***	0.00
ROE_VOL	-0.0034		0.76	0.0096		0.77	-0.0675		0.44	0.0187		0.84	0.0661		0.58
AGE	0.0003		0.21	-0.0007		0.59	-0.0019		0.11	-0.0056	***	0.00	-0.0021		0.15
SGR_VOL	-0.0202		0.43	0.1157	**	0.02	0.1680	***	0.00	0.3638	***	0.00	0.0853		0.16
INST	0.0325		0.26	0.3029	***	<.0001	0.2835	***	<.0001	-0.1338		0.20	0.2993	***	<.0001
INVPRC	0.5720	***	<.0001	1.7496	***	0.01	3.3529	***	<.0001	3.4844	***	0.00	4.7261	***	0.00
Obs.	1,203			258			228			130			149		
R-Square	0.40			0.36			0.37			0.49			0.35		

Panel B – Foreign Exchange Rate Exposure Sample

	Model 1						Model 2			Model 3			Model 4		
	SH = 0			SH = 1			SH = 1			SH = 1			SH = 1		
Variable	**Estimate**		**Pr > |t|**	**Estimate**		**Pr > |t|**	**Estimate**		**Pr > |t|**	**Estimate**		**Pr > |t|**	**Estimate**		**Pr > |t|**
INTERCEPT	0.7843	***	<.0001	0.8836	***	<.0001	0.9401	***	<.0001	1.0390	***	<.0001	1.0647	***	<.0001
FXEXP	-0.0043		0.36	-0.0232	***	<.0001	-0.0241	***	<.0001	-0.0250	***	<.0001	-0.0123		0.29
SIZE	-0.0503	***	<.0001	-0.0570	***	<.0001	-0.0607	***	<.0001	-0.0691	***	<.0001	-0.0639	***	0.00
LEV	0.0811	**	0.04	0.0745		0.12	0.0240		0.65	-0.0078		0.90	-0.2308		0.28
BTM	0.0675	***	0.01	0.0066		0.70	-0.0006		0.97	-0.0343		0.16	-0.1535	***	0.00
ROE_VOL	0.2036	***	0.00	-0.0067		0.50	-0.0268	***	0.00	-0.0226	*	0.07	-0.0158		0.66
AGE	-0.0010	***	0.00	-0.0004		0.21	-0.0008	**	0.02	-0.0008	*	0.07	0.0024	**	0.03
SGR_VOL	0.0717	**	0.02	0.0396		0.51	0.0433		0.47	0.1051		0.30	0.5316	***	0.01
INST	0.0431		0.53	0.0416		0.31	0.0842	**	0.05	0.0713		0.17	-0.1474	**	0.05
INVPRC	0.4955	**	0.02	0.9293	***	<.0001	0.8929	***	<.0001	1.6768	***	<.0001	5.0329	***	<.0001
Obs.	873			839			782			558			146		
R-Square	0.35			0.25			0.26			0.28			0.36		

TABLE 3: Macroeconomic Exposure and Total Firm Risk (Cont.)

Panel C – Dependent Variable = Economic Risk															
	Model 1						Model 2			Model 3			Model 4		
	SH = 0			SH = 1			SH = 1			SH = 1			SH = 1		
Variable	Estimate		Pr > |t|	Estimate		Pr > |t|	Estimate		Pr > |t|	Estimate		Pr > |t|	Estimate		Pr > |t|
INTERCEPT	1.1414	***	<.0001	0.9540	***	<.0001	0.9362	***	<.0001	1.1268	***	<.0001	1.0183	***	<.0001
COMMEXP	-0.0058		0.21	0.0153	***	0.00	0.0148	***	0.00	0.0251	***	<.0001	0.0265	***	<.0001
SIZE	-0.0953	***	<.0001	-0.0523	***	<.0001	-0.0498	***	<.0001	-0.0609	***	<.0001	-0.0388	***	<.0001
LEV	0.1088	*	0.08	-0.1707	***	0.01	-0.1777	***	0.01	-0.0840		0.37	-0.5129	***	<.0001
BTM	-0.0178		0.42	-0.0735	***	0.00	-0.0690	***	0.00	-0.0764	**	0.02	-0.0470	*	0.10
ROE_VOL	-0.0410	***	<.0001	0.0646	***	0.00	0.1351	**	0.02	0.1727	***	0.01	0.2060	***	0.00
AGE	0.0014	***	0.00	-0.0004		0.26	-0.0004		0.34	-0.0008		0.17	-0.0010	*	0.07
SGR_VOL	0.2598	***	<.0001	-0.0149		0.61	-0.0376		0.21	-0.1991	***	<.0001	-0.0250		0.42
INST	0.0095		0.85	0.2339	***	<.0001	0.2249	***	<.0001	0.1492	***	0.00	0.2045	***	<.0001
INVPRC	0.5817	***	0.01	0.7151	***	<.0001	0.8249	***	<.0001	0.7402	***	0.00	1.0123	**	0.02
Obs.	791			616			586			360			422		
R-Square	0.34			0.26			0.26			0.31			0.25		

TABLE 4: Descriptive Statistics and Correlations – Information Environment and Shareholder Base Analysis

The descriptive statistics presented below are related to the information environment/shareholder base analysis. Statistics are presented for the aggregate sample (Panel A) and sample means are provided by the categorical variable RANK (Panel B). Firm-quarters are classified based on the ratio of derivative assets and liabilities designated as accounting hedges to derivative assets and liabilities not designated as accounting hedges. RANK = 1 when all derivative contracts for that observation are designated as accounting hedges. RANK = 5 when none of the derivative contracts for that observation are designated as accounting hedges. The remaining observations are approximately equally distributed between RANK = 2-4. In Panel C, Pearson (Spearman) Correlations appear above (below) the diagonal for the aggregate sample. Correlations significant at the 5% level are in bold.

Panel A – Aggregate Sample Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
SMOOTH1	1888	-0.5514	0.2912	-0.5211	-1.2624	-0.1024
SMOOTH2	1888	0.7745	0.2574	0.8806	-0.1104	0.9950
FCAST_ERROR	1888	-0.0033	0.0054	-0.0016	-0.0345	0.0000
ANALYST FOLLOW	1888	16.6075	7.4753	16.0000	2.0000	45.0000
FCAST_DISP	1888	-0.0856	0.2714	-0.0500	-1.6667	0.9000
AGE	1888	41.0715	19.0465	48.0000	4.0000	63.0000
SPREAD	1888	-0.0180	0.0152	-0.0127	-0.1145	-0.0095
TRANS	1888	4.4504	1.3955	4.4286	0.5714	7.8571
TURNOVER	1888	13.5737	10.5486	10.3228	2.2590	65.2903
SIZE	1888	9.2463	1.2769	9.1330	5.7176	12.5097
LEV	1888	0.5983	0.1750	0.5860	0.2126	1.0188
INTCOV	1888	25.5520	64.8830	11.0970	-2.5440	536.0000
MB	1888	3.3095	3.4355	2.3491	-1.8073	21.6427

Panel B – Means By Rank

	RANK = 1		***RANK = 2***		***RANK = 3***		***RANK = 4***		***RANK = 5***	
Variable	**N**	**Mean**	**N**	**Mean**	**N**	**Mean**	**N**	**Mean**	**N**	**Mean**
SMOOTH1	379	-0.5710	433	-0.4977	466	-0.4759	412	-0.5666	198	-0.7776
SMOOTH2	379	0.7661	433	0.8327	466	0.8375	412	0.7311	198	0.6058
FCAST_ ERROR	379	-0.0040	433	-0.0023	466	-0.0025	412	-0.0039	198	-0.0054
ANALYST FOLLOW	379	16.4486	433	17.6236	466	16.4936	412	15.1481	198	17.9950
FCAST_DISP	379	-0.0706	433	-0.0632	466	-0.0761	412	-0.1096	198	-0.1361
AGE	379	35.9736	433	44.0139	466	45.9270	412	42.1165	198	30.7929
SPREAD	379	-0.0178	433	-0.0184	466	-0.0178	412	-0.0175	198	-0.0187
TRANS	379	4.1941	433	4.8908	466	4.9013	412	4.2396	198	3.3557
TURNOVER	379	13.5820	433	11.6062	466	10.9150	412	14.9483	198	21.2577
SIZE	379	8.7410	433	9.4704	466	9.6232	412	9.2215	198	8.8885
LEV	379	0.6120	433	0.5941	466	0.6207	412	0.5731	198	0.5811
INTCOV	379	33.2177	433	30.2190	466	25.4890	412	19.3275	198	13.7729
MB	379	3.4858	433	4.0893	466	3.8264	412	2.4871	198	1.7612

TABLE 4: Descriptive Statistics and Correlations – Information Environment and Shareholder Base Analysis (Cont.)

Panel C – Pearson (Spearman) Correlations above (below)

	SMOOTH1	*SMOOTH2*	*FCAST_ ERROR*	*ANALYST FOLLOW*	*FCAST_ DISP*	*AGE*	*SPREAD*	*TRANS*	*SHARE T/O*	*SIZE*	*LEV*	*INTCOV*	*MB*
SMOOTH1	1.0000	**0.8950**	**0.1964**	**-0.1992**	-0.0060	**0.2084**	-0.0254	**0.6185**	**-0.2846**	-0.0033	**0.1719**	0.0244	**0.1163**
SMOOTH2	**0.9739**	1.0000	**0.1927**	**-0.1681**	-0.0016	**0.2163**	-0.0236	**0.5752**	**-0.2427**	0.0383	**0.1644**	0.0029	**0.0812**
FCAST_ERROR	**0.1157**	**0.1012**	1.0000	**0.1581**	0.0025	**0.0512**	-0.0082	**0.3789**	**-0.4394**	**0.3467**	**-0.1876**	**0.0770**	**0.1451**
ANALYST FOLLOW	**-0.2385**	**-0.2434**	**0.1851**	1.0000	-0.0069	**-0.2939**	-0.0263	**0.1603**	**0.0558**	**0.4707**	**-0.3467**	**0.2724**	-0.0131
FCAST_DISP	**0.0555**	**0.0531**	**0.2597**	0.0241	1.0000	**0.0771**	0.0060	**0.2218**	**-0.0812**	**0.0709**	0.0189	0.0254	**0.0909**
AGE	**0.1998**	**0.1895**	**0.1587**	**-0.2026**	**0.2039**	1.0000	**0.2156**	**0.4939**	**-0.1544**	**0.2547**	**0.2794**	**-0.0892**	**0.2495**
SPREAD	0.0040	0.0115	0.0260	**0.1116**	**0.0880**	**0.2783**	1.0000	**0.2860**	**-0.0503**	**0.1078**	**0.1628**	**-0.1074**	0.0365
TRANS	**0.6158**	**0.6066**	**0.5330**	**0.1777**	**0.4892**	**0.5227**	**0.4285**	1.0000	**-0.3516**	**0.4283**	**0.1373**	**0.0653**	**0.2700**
SHARE T/O	**-0.2040**	**-0.1920**	**-0.4041**	0.0276	**-0.2972**	**-0.2744**	**-0.0455**	**-0.4108**	1.0000	**-0.3657**	**0.0622**	-0.0229	**-0.1965**
SIZE	-0.0380	-0.0351	**0.3819**	**0.5143**	**0.1892**	**0.2939**	**0.1720**	**0.4310**	**-0.4539**	1.0000	**-0.2130**	**0.1576**	**0.1899**
LEV	**0.2238**	**0.2485**	**-0.1271**	**-0.3139**	**0.0525**	**0.2707**	**0.1463**	**0.1418**	**0.0857**	**-0.2216**	1.0000	**-0.3567**	**0.4224**
INTCOV	0.0068	-0.0223	**0.2971**	**0.3809**	**0.1458**	**0.0563**	**-0.0485**	**0.2544**	**-0.3106**	**0.4945**	**-0.5640**	1.0000	0.0310
MB	**0.1339**	**0.1390**	**0.3477**	**0.1933**	**0.2933**	**0.2220**	-0.0183	**0.3893**	**-0.3310**	**0.4310**	**0.2202**	**0.3300**	1.0000

TABLE 5: Information Environment and Shareholder Base

This table presents the results of the estimation of Equation (2):

$RANK = \Psi_0 + \Psi_1 TRANS_{i,t} + \Psi_2 TURNOVER_{i,t} + \Psi_3 SIZE_{i,t} + \Psi_4 LEVERAGE_{i,t} + \Psi_5 INTCOV_{i,t} + \Psi_6 MB_{i,t} + \varepsilon.$

*All variables are as described in Appendix A. Model 1 provides multinomial logit coefficient estimates obtained from the aggregated baseline partitions. Models 2 through 4 provide multinomial logit coefficient estimates obtained from aggregated partitions excluding from the 4th and 5th quintiles firms that exercise the fair value option (Model 2), firms that report comprehensive income in a performance statement (Model 3), firms that use FX derivatives to hedge against remeasurement gains and losses on recognized assets and liabilities denominated in a foreign currency (Model 4). Estimates of $\psi_2 < 0$ would provide evidence in support of hypothesis 4. All non-logorithmic variables were winsorized at the 1st and 99th percentiles. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels respectively.*

		Model 1			Model 2			Model 3			Model 4		
Var	RANK	Estimate		Pr > ChiSq	Estimate		Pr > ChiSq	Estimate		Pr > ChiSq	Estimate		Pr > ChiSq
TRANS	**1**	0.4866	***	<.0001	0.4798	***	<.0001	0.4606	***	<.0001	0.7803	***	<.0001
TRANS	**2**	0.7648	***	<.0001	0.7597	***	<.0001	0.7259	***	<.0001	1.0847	***	<.0001
TRANS	**3**	0.6847	***	<.0001	0.6829	***	<.0001	0.6423	***	<.0001	1.0186	***	<.0001
TRANS	**4**	0.4724	***	<.0001	0.4571	***	<.0001	0.3959	***	0.00	0.3922	***	0.00
TURNOVER	**1**	-0.0427	***	<.0001	-0.0404	***	<.0001	-0.0585	***	<.0001	-0.0486	***	<.0001
TURNOVER	**2**	-0.0366	***	<.0001	-0.0345	***	<.0001	-0.0538	***	<.0001	-0.0444	***	<.0001
TURNOVER	**3**	-0.0492	***	<.0001	-0.0467	***	<.0001	-0.0665	***	<.0001	-0.0573	***	<.0001
TURNOVER	**4**	-0.0175	***	0.01	-0.0176	***	0.01	-0.0367	***	<.0001	-0.016	*	0.10
SIZE	**1**	-0.6995	***	<.0001	-0.6899	***	<.0001	-0.3742	***	0.00	-0.6881	***	<.0001
SIZE	**2**	-0.3142	***	0.00	-0.3101	***	0.00	-0.0074		0.95	-0.3218	***	0.007
SIZE	**3**	-0.1355		0.15	-0.1343		0.15	0.1710		0.18	-0.1579		0.18
SIZE	**4**	-0.1674	*	0.07	-0.1574	*	0.09	0.0718		0.58	0.1055		0.40
LEV	**1**	-0.3475		0.61	-0.2318		0.74	0.2990		0.72	0.2973		0.74
LEV	**2**	-1.3531	**	0.05	-1.2204	*	0.08	-0.6960		0.41	-0.7344		0.42
LEV	**3**	0.7751		0.26	0.8847		0.20	1.4050	*	0.09	1.3705		0.13
LEV	**4**	-0.8160		0.22	-0.5574		0.41	-0.8632		0.30	-1.6201	*	0.09
INTCOV	**1**	0.0068	**	0.05	0.0068	*	0.06	0.0071		0.14	0.0114	*	0.10
INTCOV	**2**	0.0044		0.21	0.0044		0.22	0.0047		0.32	0.0089		0.20
INTCOV	**3**	0.0049		0.16	0.0049		0.17	0.0052		0.27	0.0095		0.17
INTCOV	**4**	0.0014		0.70	0.0003		0.95	0.0018		0.72	0.0051		0.48

TABLE 5: Information Environment and Shareholder Base – Cont.

		Model 1			Model 2			Model 3			Model 4		
Var	**RANK**	**Est.**		**Pr > ChiSq**	**Est.**		**Pr > ChiSq**	**Est.**		**Pr > ChiSq**	**Est.**		**Pr > ChiSq**
MB	**1**	0.3545	***	<.0001	0.3687	***	<.0001	0.1624	**	0.02	0.3928	***	<.0001
MB	**2**	0.3790	***	<.0001	0.3920	***	<.0001	0.1856	***	0.01	0.4138	***	<.0001
MB	**3**	0.3046	***	<.0001	0.3179	***	<.0001	0.1100		0.13	0.3349	***	0.00
MB	**4**	0.2064	***	0.00	0.2244	***	0.00	0.0468		0.54	-0.3472	***	0.00
Obs.		1888			1852			1687			1580		
Pseudo R^2		0.08			0.08			0.08			0.13		

APPENDIX: VARIABLE DEFINITIONS

Variable Name	***Variable Definition***
SPECULATIVE HEDGER (SH)	*An indicator variable equal to 1 if the firm-quarter observation is in quintile 4 or 5, i.e. firm-quarters with the smallest portion of derivative assets and liabilities designated as accounting hedges, 0 otherwise. For the Risk Exposure analysis, the variable is a fixed firm characteristic and only equals 1 when 50% or more of a firm's quarterly observations fall into the 4th and 5th quintiles of observations with the greatest portion of derivative assets and liabilities designated as accounting hedges.*
RANK	*Categorical variable equal to 1-5 with 1 assigned to firm-quarters with all derivatives designated as accounting hedges and 5 assigned to firm-quarters with no derivatives designated as accounting hedges.*
TRANS	*The average decile rank of SMOOTH1, SMOOTH2, FCAST_ERROR, ANALYST FOLLOW, FCAST_DISP, AGE and SPREAD.*
SMOOTH1	*The standard deviation of net income before extraordinary items scaled by average total assets divided by the standard deviation of cash flow from operations scaled by average total assets multiplied by -1 so larger values represent smoother earnings.*
SMOOTH2	*The correlation between the cash flow from operations scaled by average total assets and total accruals scaled by average total assets with the correlation coefficient multiplied by a -1 so that larger values represent smoother earnings.*
FCAST_ERROR	*The absolute value of the forecast error scaled by the stock price at the end of the prior fiscal quarter multiplied by -1. Forecast error is the I/B/E/S analysts' mean annual earnings forecast less the actual earnings as reported by I/B/E/S.*
ANALYST FOLLOW	*The number of analysts making a forecast for quarter t's earnings.*
FCAST_DISP	*The coefficient of variation of analysts' forecasts, i.e. the standard deviation of forecast for the fiscal quarter scaled by the mean estimate, both reported by I/B/E/S, multiplied by -1 so larger values represent a more transparent information environment.*
AGE	*The number of fiscal years accounting data is available in Compustat*
SPREAD	*The quarterly average of the absolute difference between the closing bid and ask price obtained from CRSP, multiplied by -1 so larger values represent a more transparent information environment.*
TURNOVER	*The quarterly average of share volume scaled by the number of shares outstanding obtained from CRSP*
CFO_VOL	*The standard deviation of operating cash flows scaled by average total assets where standard deviations are calculated using 5 years, 20 quarters, of data. Operating cash flows are calculated as earnings before extraordinary items less total accruals. Total accruals equal ΔCurrent Assets – ΔCurrent Liabilities – ΔCash + ΔShort-Term Debt - Depreciation.*

EARN_VOL	*The standard deviation of earnings before extraordinary items scaled by average total assets where standard deviations are calculated using 5 years, 20 quarters, of data.*
BETA	*The market-model beta estimated using daily returns over quarters t-7 to t.*
FIRMRSK	*The standard deviation of the residuals from the regressions used to estimate beta.*
TOTAL RISK	*The standard deviation of firm returns estimated using daily returns over quarters t-7 to t.*
IREXPOSURE, FXEXPOSURE, COMMEXPOSURE	*Exposure to interest rate, foreign exchange and commodities price risk is estimated for each firm-quarter observation by estimating the following regression via ordinary least squares:* $R_{i,t} = \lambda_{oi} + \lambda_{1i}R_{mt} + \lambda_{2i}Macro_t + \lambda_{i,t}$ *where $R_{i,t}$ is the cumulative raw return for firm i in month t; $R_{m,t}$ is the value-weighted market portfolio return in month t; and $Macro_t$ is one of three macroeconomic variables with serve as proxies for interest rate risk, foreign currency risk and commodity price risk. The interest rate proxy is the monthly percentage change in LIBOR. The foreign currency risk proxy is the monthly percentage change in the Federal Reserve Board trade-weighted index which measures the strength of the U.S. dollar relative to other currencies of the index. The commodity price risk proxy is the monthly percentage change in the consumer price index of all commodities. The absolute value of the coefficient λ_{2i} captures the firm exposure to the risk factor in each period. The exposure variable is a firm-specific variable estimated using month t-23 to month t returns.*
MTB	*Market value of equity divided by book value of equity.*
SIZE	*The natural log of market value of equity*
LEV	*Total liabilities divided by total assets*
INTCOV	*Interest expense divided by operating income before depreciation*

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