

Why Do Insiders Hedge Their Ownership? An Empirical Examination *

Carr Bettis
Arizona State University and Gradient Analytics

John Bizjak
Portland State University

Swaminathan Kalpathy
Southern Methodist University

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Abstract

We use a novel database to study hedging and diversification strategies used by corporate insiders. There are four particular types of instruments currently used by insiders - zero-cost collars, prepaid variable forwards, exchange funds, and equity swaps. We find that the use of these instruments has increased over time and with some of these securities – collars, swaps and PVFs in particular - insiders hedge almost a third of their ownership. Several different sets of analysis we run suggest strategic timing prior to poor performance in the use of collars and PVFs while our empirical analysis suggests that exchange funds are more likely to be used as a diversification strategy and are not necessarily used to exploit private information. We find that hedging firms typically have less independent boards. Finally, one rationale for the use of these instruments is to encourage otherwise risk-averse executive to bear more firm-specific risk and take on risky yet value-enhancing projects for shareholders. We find no evidence, however, that hedging affects corporate policy or encourages risk taking. Since these securities can significantly alter the incentives of firm executives and can be used to trade on inside information, our study has important implications for both insider trading and incentive contracting.

* The authors thank seminar participants at Arizona State University and Southern Methodist University for helpful comments.

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1. Introduction

We provide detailed analysis of how corporate insiders use derivative securities to hedge their equity holdings in their firm comprising of stock and stock options. The derivative securities most commonly used by insiders include: pre-paid variable forwards (PVFs), zero-cost collars, exchange trusts, and equity swaps. PVFs and zero cost collars are similar instruments that allow insiders to protect themselves from downside movement in the firm's stock price while retaining the opportunity to benefit from significant share price appreciation. Exchange trusts are portfolios of securities formed when insiders from different companies contribute their own shares into the portfolio.¹ Equity swaps allow the insider to trade the return on the stock for the return on another security.

These instruments have attracted significant scrutiny from shareholders, regulators and legislators², because they can allow insiders to trade opportunistically ahead of adverse firm-specific events without the transparency or litigation risk that is typically associated with open market sales.³ For example, in 2005, Maurice "Hank" Greenberg, the former CEO of AIG, used a variable forward contract to hedge and monetize 4.42 million shares of AIG stock worth at the time almost \$300 million. He

¹ We provide more details about the structure of these instruments in the appendix and in Section 2.

² Some shareholder activist groups have adopted corporate governance policies prohibiting the use of hedging instruments by executives and directors (e.g., Council of Institutional Investors). Kenneth Feinberg, the Special Master of the United States Treasury for executive compensation has stipulated that any firm receiving assistance from U.S. government under the Troubled Asset Relief Program (TARP) may not allow their executives to use any form of hedging instruments. Mr. Feinberg stated, "We wanted to make sure they couldn't undercut the links we created between compensation and long-term performance."

³ These transactions are less transparent than a regular sale of stock because they are reported in Table II of form 4 which makes them much harder for shareholders and the market to identify. In addition, these transactions are potentially less likely to raise regulatory and legal issues that surround insider trading using open market sales. Besides being reported on Table II many of these transactions are recorded in footnotes or as attachments to the regular forms. In addition, to date, there is no evidence of any insider trading enforcement actions or litigation directly tied to these instruments. We discuss below how these contracts are reported and the reasons they are harder to track compared to an insider sale.

closed the hedging transaction in 2008 by delivering the same number of shares which had declined in total value to \$8.4 million for a net savings of over \$280 million.⁴ Incidentally, AIG agreed to settle securities fraud charges related to improper accounting with the Securities Exchange Commission (SEC) in February of 2006. An additional concern is that these securities, by reducing the sensitivity of an executive's wealth to firm performance, potentially reduce the incentives of executives to increase shareholder value.

In contrast, it is natural for insiders to want to use a hedging instrument given that they often have significant holdings of stock and options and these securities reduce personal portfolio risk associated with concentrated holdings in one asset.⁵ Following his retirement as Chairman of the Board at Hasbro, Allen Hassenfeld hedged over one million shares of Hasbro stock with the stated intention of "financial planning purposes, including to diversify his investment portfolio, realize liquidity ... and provide funding against charitable pledges." The advantage of these securities relative to an open market sale include maintaining some of the upside gain in share price, maintaining voting rights on the underlying shares hedged, and deferring personal income taxes. Diversification at the personal level could also prevent costly hedging and investment distortions at the firm level (Amihud and Lev (1981), Stulz (1984) and Hu (1995)). Derivative securities might

⁴ With the variable forward contract he was able to monetize the value of 4.42 million shares at \$67 a share and close the deal later by delivering the 4.42 million shares at a price of about \$2.

⁵ Insiders themselves on occasion opine that they are benign and are used for diversification. For example, Jack McCleer, a senior vice president at Krispy Kreme Doughnut, stated that "JP Morgan advised their trust to diversify their holdings in company shares." To illustrate the complex nature of these transactions, however, several executives at Krispy Kreme engaged in a series of hedges in the two years prior to their bankruptcy, earnings restatements and SEC settlement by three executives for security fraud. One of these executives was Mr. McCleer. (Source: Business week article, 'Some CEOs are Selling Their Companies Short, February 25, 2010).

allow an otherwise risk-averse executive to bear more firm-specific risk and thereby take on risky, yet value-enhancing projects for shareholders.

Beginning in 1996 Primark/Disclosure (now part of Thomson Reuters) began collecting all of the hedging transactions that appear in Table II of forms 3, 4, and 5 (most of them revealed in footnotes). We gather information on hedging transactions reported by corporate insiders starting in January of 1996 through December of 2006 from the Thomson Reuters database and augment this with hand- collected data from our own keyword searches of SEC filings. We compile a sample of over 2,000 hedging transactions initiated by over 1,000 insiders at over 900 firms. To date, as far as we are aware, this is the most complete data set gathered of these types of instruments.

With this data our first objective is to provide some basic facts about the types of hedging instruments used, their fundamental characteristics, the frequency of their use, their evolution over time, and the extent to which they cover the insiders' ownership. Currently, there is almost no comprehensive information about the frequency and amount insiders hedge or the types of securities they use. Our second goal is to better understand what motivates insiders to hedge and what this means for shareholders and the firm. On one hand, these instruments may be benign and be used primarily to monetize an equity position and achieve diversification in lieu of an open market sale. On the other hand, because these instruments alter the incentives provided by stock and options they may affect executive and insider behavior. Moreover, as mentioned above these securities potentially allow insiders to take advantage and trade on private information that has not yet been impounded into share prices. Consequently, these securities have implication for both our understanding of insider trading and incentive contracts.

With regard to our first objective, we document a recurrent use of three particular types of transactions - zero cost collars (450), pre-paid variable forwards (983), and exchange trusts (441)⁶. While there are still some transactions involving equity swaps (136) we find they are less frequent.⁷ The data reveal that a diverse group of corporate insiders engage in these transactions and include CEOs (375), other senior officers (358), corporate directors (174) and 10% beneficial owners or blockholders (154). We also find that the amount of ownership that is hedged is significant and varies by the type of hedging instrument. The average level of ownership hedged with zero-cost collars (31%), forwards (28%), and swaps (33%) are quite similar. The percentage hedged is economically significant and larger than the average open-market insider sale (Lakonishok and Lee (2001)). These results suggest that on average these transactions significantly alter the sensitivity of executive wealth to changes in stock price. In contrast, we find significantly lower levels of ownership placed in exchange trusts, where the average is 9%. We also find variation in the selection of these instruments by insiders. CEOs tend to use exchange funds more frequently while upper level managers tend to use collars and PVFs more often. Equity swaps appear to be more prevalent among blockholders.⁸

We next turn our attention to an examination of why insiders use these instruments. The first question we address is whether insiders time their trading of these

⁶ Throughout the paper, we use the term “Exchange Fund” and “Exchange Trust” interchangeably.

⁷ Part of this has to do with the 1997 Tax Payer Relief Act, which rendered a swap agreement as a constructive sale removing the tax deferral advantage it had earlier.

⁸ We speculate that the lower fraction of ownership hedged with exchange trusts and the fact that CEOs use these more often is due to their institutional features. Exchange funds are portfolios of securities contributed by an assortment of corporate insiders from different firms and the entities that form the trust, primarily investment banks, often place limitations on the size of each individual contribution. Moreover, since smaller amounts of ownership are typically contributed to an exchange fund this could mean that boards are less reluctant to allow CEOs to hedge their ownership with that instrument. We discuss this in further detail below.

instruments based on inside information. Several different sets of analysis we run suggest strategic timing in the use of collars and PVFs. Both collars and PVFs experience positive abnormal returns, relative to a size industry match sample, of 40% and 17% respectively, the year prior to the transactions which are then followed by negative abnormal returns of 22.42% and 7.93% respectively the year following the transactions.⁹ Moreover, using the methodology of Rhodes-Kropf, Robinson, and Viswanathan (2005) we find that prior to a collar or PVF, a significant fraction of the firm's market-to-book value of equity is due to firm-specific overvaluation which decreases following these hedges (and is not due to industry overvaluation or higher market-to-book values due to growth opportunities). Further bolstering the timing story is our evidence that firms where the executives engaged in a zero-cost collar or a PVF are more likely to face shareholder securities-based litigation and to restate earnings following the hedge.¹⁰

In sharp contrast, while exchange funds are also preceded by a run-up in stock price the year prior to the transaction (37%) the abnormal stock price performance the year following the transaction is a *positive* 11%. Insiders may find it more difficult to use an exchange fund to trade prior to anticipation of poor performance because the investment banks that establish these funds collect fees associated with the funds and attracting participants into the fund likely depend on the trusts' performance. Also, executives who contribute to these funds may have personal reputations at stake when contributing securities of their own firms to the trust. Because collars and PVFs are

⁹ Abnormal returns in this example are calculated relative to a size and industry-matched control sample. For robustness below we use various benchmarks to calculate abnormal performance.

¹⁰ We also find evidence of poor performance following an equity swap but we are cautious about interpreting this finding due to the small sample size.

private agreements between an investment bank and the insider they do not face these same restrictions. Consequently, the evidence suggests that exchange funds are more likely to be used purely as a diversification strategy.

To provide additional evidence on the reasons behind hedging we next examine the association between compensation, governance characteristics, and hedging. We find that hedging firms have higher levels of CEO compensation but also receive larger grants of performance-based pay, i.e. stock and options, compared to CEOs in a size and industry-matched control set of firms prior to hedging. The higher level of performance-based pay could be one reason we see more hedging at these firms and may be consistent with the diversification story. Allowing executives to unilaterally adjust the sensitivity of their wealth to firm performance, however, raises concerns that these transactions alter incentives initially established by the board. Another potential troublesome issue associated with these instruments is our finding that they appear to be more common at firms that have fewer independent directors on the board. Although, we do not find that they are associated with other governance characteristics that reflect entrenchment such as CEO tenure or duality in the role of an insider as both CEO and board chairman.

Finally, we investigate whether firms whose insiders engage in hedging pursue risky investment and financial policies subsequent to the hedging transactions. Specifically we examine changes in R&D, book leverage, total investments, and volatility of stock returns around hedging and find no evidence that firms change corporate policies subsequent to insiders' use of hedging instruments, relative to control firms. While these instruments potentially reduce executives' exposure to firm specific risk and can increase

the incentive to take on risky projects overall our evidence does not support the idea that hedging by insiders affects corporate policies in any meaningful way.

To date we know of no theoretical work that demonstrates how allowing executives to unilaterally alter the incentive structure established by the board of directors with these transactions would lead to optimal incentive contracts.¹¹ The fact that these contracts mute the incentives provided by ownership and compensation, separate cash flows from voting rights, and that at least for some contracts appear to be information driven raises concerns about how at least some of these instruments are used.

On the empirical side, there are two papers that precede our work. Bettis, Bizjak and Lemmon (2000) and Jagolinzer, Matsunaga, and Yeung (2007) both examine whether hedging transactions are used opportunistically by insiders. For their sample of 85 zero-cost collars initiated between 1996 and 1998 Bettis, et al (2000) document significant pre-hedging share price run-up, but no post-hedging abnormal share price decline following these transactions. Jagolinzer, et al (2007) find evidence of pre-PVF abnormal share price appreciation and post-PVF abnormal share price decline in their sample of 200 PVF contracts spanning 100 individuals from 1996 and 2004. We argue that the size and comprehensive nature of our data indicate there are a significant number and types of these transactions left unexplored in prior research and that our work adds to understanding how insiders use these instruments. The other notable features of our study in contrast to the above two papers include: the first study, as far as we are aware, of how exchange funds are used as hedging instruments; an investigation of the role of overvaluation in the decision of insiders to use derivative securities; how compensation is

¹¹ There are some theoretical models of how compensation design is affected by the ability to hedge. For example, Garvey and Milbourne (2003) and Gao (2009). None of these, however, directly address how using a hedging transaction can lead to better compensation or incentive contracts.

related to hedging; and the impact, if any, of insider hedging on corporate policies. In the sections that follow we discuss in more detail how our work complements and extends prior research in this area.

The paper is organized as follows. Section 2 provides a description of these securities and the data. Section 3 provides a background for the different motivations for use of derivative contracts by insiders. Section 4 contains the examination of stock price performance and corporate events surrounding hedging transactions. Section 5 provides evidence on the determinants of the use of hedging contracts. Section 6 contains an examination of compensation contracts for CEOs that use hedging instruments and how these instruments affect corporate policy. Section 7 concludes.

2. Sample Collection and Summary Statistics

2.1 Common Hedging Instruments

We identify four basic types of securities that insiders can use to either hedge or diversify their equity position in the firm. We briefly describe these transactions here and leave a more detailed discussion to the appendix. Zero cost collars involve using the proceeds from the sale of a call on the stock to buy a put on the stock. PVFs are a forward sale of the firm's stock. While collars and PVFs are technically different types of securities for hedging purposes they share some of the same characteristics. They both provide downside protection in stock price, a floor, while sacrificing some of the upside return, a ceiling. Also each has a set maturity that determines the contract length and both are Over-the-Counter transactions. The major difference between these two instruments is that it is much easier to monetize a PVF and receive a cash advance against

the shares compared to a collar. Exchange funds are less like a hedging instrument compared to the above securities and are more akin to a diversification strategy. In an exchange fund a group of insiders individually place their shares in a limited partnership or limited liability company. By pooling shares into a single entity the participants in the fund are able to create a diversified portfolio of securities and receive a return based on the performance of the portfolio. In equity swap agreements investors exchange the future returns on their stock position for the cash flows of another financial instrument. While the Autotote swap highlighted in the introduction traded the return on the firm's stock for a debt instrument, equity swaps can also involve the exchange of the firm's returns for the returns on any other financial instrument such as the S&P 500.

2.2 Identifying Hedges.

Beginning in 1996 Primark/Disclosure (now part of Thomson Reuters) via its Lancer Analytics strategic partnership with Gradient Analytics began collecting all of the hedging transactions that appear in Table II of Forms 4 and 5.¹² Our data is composed of transactions collected by Thomson-Reuters, supplemented by additional filings identified by Gradient Analytics Inc and by our own investigation of identified filings. The quality of reporting for hedging transactions varies widely. Information about the specifics of the contracts varies from specific details to generic references and in almost all cases is provided in the footnotes to the filings. Not all filings contain all the details associated with the transaction, however. When the data are available we collect the type of instrument reported, the transaction date, the number of shares hedged in the transaction,

¹² Prior to 1994 the SEC viewed hedging transaction, at the time mainly swaps and collars, as private deals and not open-market transactions, and therefore did not require insiders to report these transactions (Norris, 1994). In 1996 the SEC formalized their position regarding hedging transactions in release No. 34-347260 (1996) and mandated that these instruments be reported in Forms 4 or 5. Details of these transactions are primarily reported in Table II of those forms.

and the length of the contract. For collars and PVFs when reported we also gather information on the floor and ceiling price and for PVFs the cash payment received from monetization of the hedging contract.¹³

It is important to note that prior to June 2003 companies were not required to file the SEC forms electronically. Consequently, any hedging transactions prior to June 2003 that were not filed electronically would not be identified through keyword searches using the typical vendors who provide Table II data. As an example of this issue, Jagolinzer et al (2007) used keyword searches of Forms 4 and 5 to identify PVF transactions between 1996 and 2004. Between 1996 and 2002 they identify a total of 74 PVF transactions. In contrast, we identify 444 PVF transactions over that same time period. The primary reason for the discrepancy is that prior to 2003 Jagolinzer et al have access only to transactions filed electronically, which were a small minority of all filings. In contrast, pursuant to their strategic partnership with Gradient Analytics via Lancer Analytics, Thomson manually examined all the Table II filings prior to 2003 in order to identify the various types of hedging transactions.

We recognize that while we have attempted to identify all hedging transactions our sample may underestimate the total amount of hedging by corporate insiders. At least early on there was some ambiguity as to whether it was necessary to report these transactions to the SEC. In addition, while the SEC and other service providers give guidance on how insiders should report hedging transactions there remains variation in both how these transactions are recorded on Forms 4 and 5 and the level of detail of information that is provided. Over time, however, the SEC has continually clarified its

¹³ For collars the amount of cash received if the transaction is monetized is almost never reported in the filing.

position regarding derivative securities and has unequivocally stated that insiders are required to report transactions in derivative instruments.

For the sample of firms with hedging transactions we gather data on individual position and individual ownership from corporate proxy statements or Forms 3 or 4. We also gather information on board structure along with insider ownership and blockholder data from corporate proxy statements. Stock price and financial data come from CRSP and COMPUSTAT. We also use data on corporate governance from the IRRC and insider trading data from Thomson Reuters. We provide more detail on the data being used and its particular source below.

2.3 Sample Statistics.

Table 1 Panels A, B and C provide a description of the frequency of the different types of hedging transactions in our sample. Between 1996 and 2006 there were 2,010 unique transactions by 1,181 unique individuals that hedged their ownership positions at 911 different firms. We are able to identify four unique types of instruments that are reported which were described above – zero-cost collars, pre paid variable forwards, exchange funds, and equity swaps. It is useful to compare our data and these numbers to the samples in Bettis et al (2001) and Jagolinzer et al (2007). Bettis et al (2001) examine 85 zero-cost collars initiated at 65 different firms between January 1st 1996 and December 31st 1998. Jagolinzer et al (2007) examine 203 prepaid variable forward contracts at 100 different firms initiated between August 8th 1996 and June 30th 2004. We suggest that the size and comprehensive nature of our data allow us to explore a number of issues unaddressed in previous work and to provide insight into how these instruments are used.

Table 1 shows variation over time in the use of the different types of instruments. In general the frequency of these securities has increased over time with the majority of hedging transactions occurring on and right after 2000. A possible reason for the large number of transactions occurring around 2000 could be because insiders anticipated the stock market downturn that began in that year. We also see that collars were initially the most popular type of transaction with a steady growth in their use through 2000. Starting in 2000 PVFs began to replace collars as the most popular hedging instrument. One of the potential reasons that PVFs have become more popular than collars is because they are easier to monetize which allows insiders to raise cash with the transaction. The majority of investments in exchange funds appear to be clustered in 1999 and 2000 with a significant reduction in subsequent years. Part of the reason for the clustering could be because these hedging instruments are structured by the investment banks and are not likely to be offered every year. Finally, Panels B and C show similar patterns when looking at the use of derivatives at both the individual and firm level.¹⁴

Table 2 provides summary statistics on the amount of ownership hedged by each type of instrument. In reporting the details in Table 2, we aggregate the transactions used by a certain insider in a given year. We do this because it is common for insiders to engage in multiple transactions in a calendar year. Since we are interested in examining the economic magnitude of transactions used, the aggregation during a year for an insider provides the most reasonable measure of economic magnitude. Panel A shows the percentage of ownership hedged and the dollar value hedged. According to Table 2 on

¹⁴ Of course we do not know if these patterns are a result of changes in the use of these instruments or are more a function of attitudes regarding the reporting of these securities. We speculate, however, that even if reporting is incomplete there should be a strong correlation between reporting and the use of these securities.

average insiders hedge a significant amount of ownership when they engage in a collar or forward transaction. For both collar and forward transactions insiders hedge about 30% of their ownership position in the firm. Swaps also have a similar percentage of ownership hedged. All three have a significantly larger percentage of ownership hedged than exchange trusts, where on average insiders hedge approximately 9% of their ownership. As discussed previously, among other reasons the smaller amount associated with exchange trusts may be attributed to investment banks limiting the amount of equity an insider can place in these instruments.

Panel B of Table 2 provides evidence on the position of the individual who initiates the hedging transaction. All the transactions appear to be used to some degree or another by a diverse group of insiders although there are some interesting patterns. Exchange funds are used by a higher proportion of CEOs/ Chairmen of the Board (41%) while collars tend to be more concentrated in lower level firm executives (40%). Variable forwards appear to be spread fairly evenly across the different insider groups. The use of equity swaps appears to be more frequent with outside 10% blockholders (58%).

Table 3 contains statistics on the structure of collar and PVF agreements that illustrate some distinct differences. On average, collars provide insiders with more upside share price gain than forwards. The average (median) stock price appreciation the investor retains with a collar is 58% (41%), compared to 33% (29%) for forwards. In contrast, insiders sacrifice more downside share price loss before the collar hedge takes effect. Specifically for collars the stock price would have to fall an average (median) of 14% (10%) before receiving downside protection from the agreement. For forwards the

downside hedge is very close to (or the same as) the stock price at the PVF contract date with a median downside floor of just 1% of the stock price on the transaction date. In general, collars and forwards have very similar contractual lengths. Table 3 also provides data on the dollar amount monetized by the forward transactions. On average, insiders receive \$13 million in cash associated with the agreement while the median amount of cash associated with the transaction is \$3.4 million.

Overall the data indicate that insiders hedge a significant fraction of their ownership position, especially with collars and forwards. When using a collar and forward agreement they also maintain a significant amount of upside in potential future share price appreciation. Given the average contracts are approximately three years in length and the average appreciation they maintain is around 30% this means that the stock price would have to rise by about 10% a year over the life of the contract in order for the insiders to sacrifice any of the upside gain in the stock price of the firm. At the same time both collars and forwards provide the insiders with the potential to hedge a substantial amount of downward movement in the stock price.

3. Insiders' Motivation to Hedge

3.1 Why hedge?

3.1.2 Hedging, diversification, and incentive contracting.

Most boards establish incentive schemes for executives and board members in order to align the financial interests of insiders with shareholders. By their nature, however, hedging instruments alter these established incentives. To date, at least as far as we are aware, there is no theoretical research that provides a justification for allowing

hedging by executives of their stock and options that would improve the incentive structure already established by the board of directors.¹⁵ While there does not appear to be any formal theory for allowing executives to unilaterally alter incentives in this manner there are reasons insiders would want to hedge that are not necessarily problematic for shareholders.

Since corporate insiders are typically risk averse and often have a significant amount of undiversified firm specific financial and human capital it is natural for them to want to reduce their exposure to firm risk.¹⁶ As highlighted by the example in the introduction, the often stated purpose by insiders for engaging in these transactions is for diversification. Moreover, much of the literature produced by financial planners and investment banks stresses the advantages these securities give to insiders as a way to hedge or diversify their concentrated equity positions. For example, information literature produced by JP Morgan, William Blair and Company, and Bernstein Wealth Management, to name just a few, push the diversification aspect of collars, PVFs, exchange trusts and swaps to insiders and others with concentrated equity holdings. Consequently, hedging may take place for pure diversification reasons without affecting incentives or behavior.

¹⁵ Jin (2002) and Garvey and Milbourn (2003) find that the pay performance sensitivity of compensation contracts is invariant to market risk but falls with idiosyncratic risk. They argue these results are consistent when there are restrictions in hedging firm specific risk but no restrictions for managers in hedging market risk. Gao (2009) finds evidence that the more liquid the option markets for a firm the greater pay performance sensitivity in compensation. He argues that boards are aware that managers may be hedging and increase the incentives in compensation contracts to compensate for hedging activity. Acharya and Bisin (2009) show that if managers can hedge aggregate risk but not firm specific risk they have incentive to pass up firm-specific projects in favor of projects that have more aggregate risk. While these studies demonstrate how contracts can be altered if managers have the ability to hedge we are not aware of any particular research in the economics or finance literature that would suggest why it is optimal to allow insiders, in particular CEOs or other executives, to unilaterally change their ownership position with a hedging transaction.

¹⁶ Hall and Murphy (2002), Carpenter (2000) and Muelbroek (2000) show that executives value their equity positions in the firm below their market value because they cannot hedge the risk associated with these positions.

Certain types of hedging transactions also provide an opportunity for insiders to “cash out” part of their equity position. Ofek and Yermack (2000) provide evidence that managers tend to sell previously held shares of stock following a new option grant. Hedging would provide another avenue to monetize their equity in the firm. These transactions have an advantage over an outright sale because they allow managers to avoid or at least defer the tax liability that would be associated with an outright sale of stock and in most cases the insiders maintain the voting rights associated with the hedged shares.¹⁷

If hedging is done for purely diversification or monetization purposes we would expect to see an increased demand for hedging following a large stock or option grant or if the value of their equity position increases (e.g., following a significant run up in stock price). Moreover, we would expect these transactions to be more common at younger firms or firms that have just gone public because many insiders in these firms have large ownership positions and are often subject to lockup provisions (Field and Hanka (2001)) and face difficulty in “cashing out” their ownership. We also expect insiders are more likely to hedge for diversification purposes if there is a change in the risk profile of the firm. Consequently, we anticipate that an insider is more likely to hedge if there is an increase in stock price volatility or if there is an increase in investment activity such as R&D or capital expenditures. Younger firms or firms that have just gone public may also face greater uncertainty regarding their performance which would provide an incentive to hedge in these firms. If hedging is done to reduce uncertainty it may also take place

¹⁷ This is true for three of the four hedging instruments we study. Equity swaps do not provide the tax benefits of the other three instruments.

following a change in upper level management for example following the departure of the CEO or changes in other executive positions.

There are some additional advantages of allowing insiders to hedge. Since hedging reduces exposure to firm specific risk, these securities may encourage managers to take on risky but value enhancing investments. These contracts might also reduce the incentive to hedge at the firm level in cases where hedging at the firm level is not optimal for shareholders. In these cases we would expect more hedging activity prior to investments in R&D or capital expenditures. The potential problem with all the candidate explanations discussed above is that if there are not significant frictions or costs in designing contracts the board should be able to structure incentives in a manner that avoids these problems. So even if these contracts are at best benign there are secondary effects from hedging that are potentially problematic for shareholders. We discuss this issue next.

3.1.2 Informational hedging and changing incentives. While hedging contracts provide an opportunity to reduce exposure to stock price risk they also provide an opportunity for insiders to trade on their private value-relevant information. There are several reasons why hedging instruments may be advantageous over an outright sale of stock if the insider is trading on inside information. First, these transactions appear only on Table II of Form 4 while an open market sale appears on Table 1 of Form 4. Table II data is not as widely disseminated to shareholders through most commercial sources as the data on insider trades derived from Table I. In addition, these transactions typically appear in the footnotes to these filings. Second, these transactions do not affect managerial ownership reported in the proxy statement. Third, unlike an open market sale these transactions

typically allow the insiders to keep both the voting rights and dividends associated with the shares. Finally, case law surrounding the use of derivative securities is less developed than the case law associated with stock dispositions and sales by insiders which provides more opportunity for insiders to use these contracts to trade on inside information.¹⁸ If the use of derivative instruments is associated with inside information we would expect to observe declines in the stock price of the firm following these transactions. Both examples in the introduction illustrate hedges that may have been timed in this manner.¹⁹

Another aspect of these securities is they reduce the sensitivity of the value of equity holdings to changes in stock price and alter incentive contracts. Because of this feature some academics (e.g., Bebchuk and Fried (2009)) have argued the use of these should be banned by insiders. Another feature of these instruments is they separate cash flows from voting rights which may further exacerbate the agency problem between insiders and stockholders (Lease, McConnell, and Mikkelson (1983)). If derivative use reduces incentives, in particular for the managers of the firm, it is more likely that these instruments will be used by insiders in firms with weaker corporate governance such as fewer independent directors on the board, when CEO is board chair, when there is lower blockownership etc. If the cost of the reduction in the sensitivity of executive wealth to firm performance outweighs the potential benefit of reduction in investment distortion due to executive risk aversion for a firm, we could expect to observe a decline in firm performance following these contracts. In contrast if the use of hedging instruments by

¹⁸ To date we are unaware of any enforcement actions by either the SEC or other agency that is directly related to an insider using a derivative instrument to trade on inside information that was not tangential to other issues that were the target of the enforcement action.

¹⁹ Another interesting aspect of this transaction which suggests a lack of transparency with these instruments is that Greenberg's PVF was done through C.V. Star & Co. which is an investment fund run by Greenberg.

insiders does not affect incentives of the executive to take on risky NPV projects, then we would not expect that their use would be associated with the governance structure of the firm or that there would be any relation between the use of hedging instruments and future stock price performance.

4. Stock Price Performance and Corporate Events Surrounding Hedging by Insiders

In this section we begin our analysis to try and understand the motivation behind hedging. We start with an examination to what degree hedging may be used by insiders to trade on nonpublic information about future firm performance by looking at the stock price performance following the initiation of a hedge. There is some evidence in the literature that open market sales precede negative stock returns.²⁰ To provide further evidence if the hedge transaction is information based we use the methodology in Rhodes-Kropf, Robinson, and Viswanathan (2005) and decompose the market to book ratio into three different components to see to what degree hedging is associated with overvaluation. Finally, we examine if these transactions are associated with corporate events that are likely to lead to poor performance or increased uncertainty about future profitability.

4.1 Stock price changes surrounding hedging transactions

To analyze the stock price performance surrounding a hedging transaction we use several benchmarks to evaluate abnormal returns. We compare returns for hedging firms with the equally-weighted and value-weighted CRSP indexes, and a size and industry matched sample. We also use firms similar in size and industry that have an open market

²⁰ For example, see Givoly and Palmon (1985), Seyhun (1986) and Lakonishok and Lee, (2001).

sale of stock by insiders similar in size to the hedge transaction. We use open market sales as an additional match firm control since hedging transactions in our sample firms could be viewed in some ways as similar to a large open market sale. In addition, we present stock price returns without reference to a benchmark since ultimately the construction of these instruments is directly related to raw stock price performance. We report the return patterns surrounding these contracts separately for each type of hedging contract since the motivation to use each of these hedging instruments may vary. We consider multiple transactions at the same firm in the same month for the same insider as an individual observation.

Table 4 present the results of the performance analysis. We only present our findings for returns the year prior and year after the hedge, 250 trading days. We have also run several other windows with similar results. As the table illustrates all four hedging transactions experience significant stock price runups prior to the hedge with slightly weaker results for swaps. Using the size and industry controls as a benchmark for purposes of discussion we see average abnormal returns prior to the transactions of 40% for collars, 17% for forwards, 37% for exchange trusts, and 25% for swaps. These are all both statistically and economically significant and consistent with the findings in Bettis et al (2001) for collars and Jagolinzer et al (2007) for forwards.

While the results on prior performance are similar across hedging type, there is variation in performance following the hedging transactions. For both collars and forwards we see poor performance up to a year following the transaction compared to both the size and industry control (-22% for collars and -8% of forwards) and the size, industry, open market sales control (-8% for collars and -9% for forwards). Collar firms

also experience statistically significant negative returns compared to the equal and value-weighted index while forwards experience negative returns relative to the equally-weighted index but statistically insignificant returns relative to the value-weighted index. Collars on average have negative raw returns of almost 8% following the transaction while the raw returns for PVFs are positive but not statistically significant. There is some evidence that on average the small sample of equity swap firms also experience poor performance following these transactions. The negative returns, however, are not statistically significant across all benchmarks.

In general the above results provide evidence that at least to some degree for collars and PVFs the use of these transactions precede poor stock price performance and suggest that a number of these trades are potentially based on insider information. The post hedge results stands in some contrast to the findings of Bettis et al (2001) who did not find significant abnormal share price decline following for collars in their sample. Jagolinzer et al (2007) also investigate post hedge performance for their sample of PVFs and find that with the exception of abnormal returns relative to the CRSP equally-weighted index, stock returns following the use of PVFs are not statistically different from zero. Our results provide additional evidence that PVFs may precede poor stock-price performance.

In contrast to the post performance results for collars, PVFs and to some degree equity swaps, we find positive stock price performance following exchange trust transactions. Shares that are contributed by insiders into an exchange trust experience average positive abnormal returns of 11% relative to a size and industry matched control and 9% compared to a size, industry, and open market sales matched control. Results are

also consistent for the equally-weighted and value-weighted index benchmarks. These finding suggests that these transactions are not used opportunistically prior to poor performance. The difference in performance for exchange funds compared to the other hedging instruments could be explained by structural differences discussed in Section 2 above. Since exchange funds are monitored by the institutions running the funds this makes opportunistic behavior more unlikely. In addition, these institutions have incentives to select better performing firms into the fund. Moreover, these transactions are less like a pure hedge and are primarily a diversification strategy.

4.2 Overvaluation of hedging firms

To better understand if hedges are timed we use the methodology in Rhodes-Kropf et al (2005) and decompose the firms market to book ratio into a misvaluation (or overvaluation) component and a growth option component. Rhodes-Kropf et al (2005) refer to the overvaluation component of market to book as the *firm specific error* of market value to long run value to book and is meant to capture the extent to which the firm is overvalued relative to its industry peers. If similar to firms in M&A transactions (as in Rhodes-Kropf et al (2005)) if hedging or diversification strategies are used based on insiders perception that a firm is overvalued we anticipate the firm specific error to be larger at hedging firms relative to a control sample of firms.²¹

Table 5 presents the results of this analysis. Similar to Rhodes-Kropf et al (and using their terminology) we calculate for both hedging firms and control firms the market to book ratio decomposed into three components: 1) the firm-specific error which

²¹ For more information on the specific calculations of the market to book components presented in Table 5 see Rhodes-Kropf et al (2005). This methodology is also used by Hoberg and Phillips (2008) and Hertzell and Li (2009).

represent misvaluation (or overvaluation of the firm by the market); 2) the time series sector error which measures whether the industry sector is misvalued and; 3) the long-run market to book value which is used as a proxy for the fundamental value to book ratio and is the benchmark for potential growth opportunities for the firm. Our primary focus is on the firm specific error or misvaluation. We look at these different components the year prior to the transaction ($Year_{-1}$), the year of the transaction ($Year_0$) and the year following the transaction ($Year_1$).

Per Table 5 we find that for all four hedging transactions the firm specific error the year prior to the transaction (what we refer to as overvaluation) is higher relative to the control samples. For collars (forwards) the firm specific error falls by 48% (27%) between the year prior to the transaction and the year following the transaction. Interestingly, both collar and PVF firms exhibit no difference in either sector specific error or differences in long-run value to book relative to the control firms either before or after the transaction. Overall these findings suggest that insiders engage in these transactions because they believe the firm is overvalued and the overvaluation appears to be firm specific. These results are consistent with the stock price analysis above.

Similar to both collars and PVFs, exchange funds exhibit greater firm specific error the year prior to the transaction relative to the control sample which decreases the year following the transaction. For exchange funds we also see a sector (industry) wide deviation of market value to long run value and some evidence that these firms also have greater growth opportunities (deviation of long run market value to book value) compared to control firms. The higher level of growth opportunities could be one reason that insiders at these firms are eligible to contribute shares into an exchange fund.

Investment banks are likely to screen firms based on future growth potential or profitability. The higher firm specific error also suggests that insiders at these firms are eager to contribute their shares into the funds because some of the value of the firm is driven firm specific mispricing. Consistent with a component of the firm's value driven by firm specific mispricing we find that the firm specific error falls the year following the transaction.

Finally, we find that equity swaps also exhibit greater firm specific error the year prior to the hedge which declines the year following the hedge. Similar to collars and forwards there is no deviation between the sector specific component or the long run value relative to a control sample either before or after the hedge. The results for equity swaps also suggest that these transactions are to some extent information driven.

4.3 Hedging prior to corporate events

To further explore the degree hedging transactions are timed we examine the frequency with which a number of different value-relevant corporate events follow these hedging transactions. Specifically we investigate the incidence of shareholder litigation, earnings restatements, and equity issuances. Prior literature has shown that these corporate events are associated with economically large stock price declines around announcements.

We gather data on litigation from the Securities Class Action Clearinghouse (SCAC) data maintained by Stanford University. The database contains information on federal class action securities fraud lawsuits.²² We obtain data on equity issuances from Securities Data Corporation (SDC) and data on earnings restatements compiled by the

²² More detailed information on this database can be found at <http://securities.stanford.edu/>.

General Accounting Office (GAO) of the U.S. government. For all the tests we form a size and industry control sample of firms that do not file a hedging transaction identical to the size and industry matched firms we used for the performance analysis and examine the frequency of these events the year prior and the year subsequent to the hedging transaction.

Table 6 presents the results on the frequency of shareholder litigation, earnings restatements, and equity issuances for all four types of transactions. Focusing first on collars we find no differences in the frequency of shareholder litigation or earnings restatements prior to the collar transaction but collar firms experience more shareholder litigation and earnings restatements in the year of the transaction and the year following the transaction. For the most part these results are similar for PVFs. PVF firms experience more shareholder suits in the year prior to the transaction and for the year of the transaction and the following year. Additionally the evidence suggests that firms with PVF transactions are more likely to restate earnings the year following the transactions. For both collars and PVFs we find that the year of the transaction they are more likely to raise equity compared to the control sample but no more likely to raise equity subsequent to the collar or PVF. For the most part the results suggest that insiders engage in a zero cost collar or PVF prior to corporate events that are likely to lead to future uncertainty about firm performance and are likely to reduce the value of the firm.

Table 6 also reports the results for exchange funds. Similar to collars and PVFs we find evidence that firms where insiders contribute to an exchange fund are more likely to experience a shareholder lawsuit following the transaction. Unlike collars and PVFs, however, we do not find any evidence that firm with exchange fund transactions are more

likely to restate earnings following the transaction. Similar to collars and PVFs we also find that firms with exchange fund transactions are more likely to raise equity prior to the transaction and in the following year. For the most part, however, the evidence is weaker that exchange funds are associated with value-reducing corporate events. Although there is evidence that insiders engage in these transactions when there are corporate events that increase uncertainty concerning future firm performance. We argue that this evidence considered with the performance results for exchange funds suggests that these transactions, while not necessarily associated with corporate events that reduce stock price, may take place with events that increase uncertainty about future firm performance. The results also suggest, again when juxtaposed with the performance analysis, that these transactions are primarily used for diversification.

Finally Table 6 also presents the same analysis for equity swaps. For the most part we find little evidence that these transactions are associated with shareholder litigation, earnings restatements or equity issuances. Part of the reason for the lack of findings could be sample size. Equity swap transactions are much less frequent than the other types of hedges which could significantly reduce the power of our tests. In addition, since these transactions are more likely, especially recently, to be done by large blockholders they are less likely to be based on inside information about future corporate events.

4.4 The frequency that collar and PVFs are in the money

To provide some additional evidence on the extent some of the hedging transactions precede abnormally poor firm performance we examine the frequency with which collars and forward transactions hit the contractual floor price associated with

these securities. From details within a subset of the filings in our sample we were able to determine the put price floor for 259 collar transactions and the floor price for 362 forward transactions.²³ These are transactions where we aggregate data for each insider across all transactions during a particular month. If hedging transactions precede poor performance we would expect the share price of hedging firms to be below the contractual floor price more frequently than the control sample of firms. Table 7 provides the empirical evidence.

For comparison purposes we use a size and industry matched control and a size, industry and open market sales control identical to the benchmarks used in Table 4. In constructing the control sample we place a hypothetical floor for the control group that is similar to the floor of the actual contract of the hedge sample firm. Because the average contract length for both collars and forwards is three years we extend the analysis of the frequency with which these contracts end up with stock price below the floor out to three years. Since this requires us to analyze long-term performance we also form a third control group using the methodology of Barber and Lyon (1997), matching on size and book-to-market in the year prior to the hedging transaction.

The data in Panel A of Table 7 demonstrates that compared to a size and industry control sample and the Barber and Lyon (1997) matched sample, collar firms are more likely to end up below the contractual floor (that triggers the put) more frequently than the control firms. On average 58% of the collar firms end up “in-the-money” while only 39% of the size and industry control firms have stock price performance that would

²³ Information on the specific contractual features such as the ceilings and floors for collars and forwards varies in the Form 3, 4, and 5 filings. Some filings give explicit details on these features while other filings provide little information beyond the fact that the insider engaged in one of these transactions.

hypothetically put them below the put floor at contract expiration. Similarly only 31% of the Barber and Lyon (1997) matched firms would end up with a stock price below the contractual floor at contract expiration. The evidence is weaker when using the size, industry, and open market sales control firms. Overall, however, these results are consistent with the performance results above and suggest that insiders on average initiate a collar prior to anticipation of poor performance.

Panel B of Table 7 presents similar analysis for PVFs. We find some weak evidence that PVFs are more likely to be in the money compared to the control sample. Looking at the size industry control match both in the first two years and at contract expiration we find that PVF firms are more likely to be in the money following the transaction. The results, however, are not significant at traditional levels – p-values are 0.15, 0.11 and 0.12 respectively. The results for the first two years following the transaction are similar using the size, industry, and insider sales controls except for at contract expiration – p-values are 0.13 and 0.065 and 0.65. While not overwhelming the evidence here is consistent with the stock performance analysis and does provide some weak support for our early contention that these PVFs do appear to precede poor performance.

4.5 Cross sectional analysis of post stock price performance

Finally, in Table 8 we examine the cross sectional characteristics of abnormal returns following hedging transactions. In all the regressions we included firm and year fixed effects and correct the standard errors for heteroskedasticity and clustering at the firm level. The dependent variable is the abnormal returns relative to the CRSP Value-Weighted index for the 250 trading days following each transaction. For independent

variables we include firm size, the market to book ratio prior to the transaction (which we break up into the three components analyzed above), characteristics of the insiders (e.g., CEOs, board members, beneficial owners etc), the value of the transaction, the fraction of ownership hedged, whether the firm did an IPO in the prior two years, the stock price run up prior to the transaction and the stock return volatility after the transaction. We also include the type of transaction in one specification and then run different specifications for the different hedges. The primary reason for selection of right hand side variables is to provide some basic facts about what might drive performance following the hedge with the primary goal of identifying characteristics we expect to be associated with opportunistic behavior (or that might also indicate these transactions are benign). We also attempt to include variables that might suggest hedging is done for risk reduction or diversification. For example, we might expect that large transactions or transactions by upper management would experience the largest run down in share price if these are timed opportunistically. These types of transactions, however, may also attract more attention by the market and be less likely to be opportunistic. Consequently, to a large degree the purpose of this analysis is informative with the intent on providing useful information about the intent behind the use of these instruments.

As Table 8 indicates using the entire sample of transactions firm size is not associated with poor performance following hedging. We find that the component of market to book associated with firm error or overvaluation is associated with poor performance following a hedge. As we discussed above this is consistent with firm hedging because insiders are concerned the firm is overvalued. Neither the sector error nor the long run market value to book value is associated with poor performance

following the hedge. Also, consistent with the analysis above we find that exchange funds experience better performance following the transaction. We do not find that insider characteristics have any effect on post stock price performance nor does the fraction of ownership hedged. We do find that larger transactions have better post performance. One possible explanation for this finding is that large transactions might attract more attention by the market and regulators and so insiders are less likely to initiate a large hedge prior to poor performance. We do not find that firms that have recently done an IPO have worse performance.

Focusing on specific types of transactions, for collars the only characteristic that appears to be associated with poor performance is the performance of hedges by top executives, other than the CEO, compared to board members. The relative post stock price performance is slightly better for non CEO executives compared to board members following a collar transaction. For PVFs, exchange funds, and swaps we find that the higher firm specific error of the market to book ratio prior to the hedge the worst stock price performance following the hedge. For forwards there is also some evidence that the higher the sector error the worst post performance. In terms of other characteristics, we do not find that the transaction characteristics or the type of insider affect abnormal returns following the transaction. For exchange funds we do not find any evidence that performance is associated with any other independent variables besides market to book. Finally, for equity swaps we find some weak evidence that performance is worse for firms that have recently gone public. The results on swaps should be interpreted with caution, however, because of the small sample size.

In general we find little evidence that the individual characteristics or size of the transaction affects the performance of the firm following the hedge. One potential reason for these findings could be the costs and benefits of different individual hedging for different individuals or different types of transactions. For example, CEOs may have more incentive to hedge prior to poor performance but are reluctant to do so because their actions are more visible. The same could be said for larger transactions.

5. The Characteristics of Firms that Hedge

In this section we examine the firm and governance characteristics associated with hedging firms. In order to focus on differences in financial characteristics we form a size-industry control matched sample (identical to the one we use for the performance analysis) where we match sample firms with firms in the CRSP/Compustat universe. In order to expand the analysis to consider governance characteristics we form a second control group based on size and industry but restricted to firms in the IRRC database.

The purpose of the multivariate logistical regressions is to provide additional analysis for why insiders use these instruments. With this in mind our goal is to choose as independent variables characteristics of the individual and the firm that provide insight into the different motivations for hedging. We are mindful, however, that the results for some independent variables do not necessarily allow us to distinguish between contrasting motivations. So to some degree the analysis below is intended to provide basic facts about the characteristics of individuals and firms where hedging takes place.

There are several firm and governance characteristics we expect to observe if hedging is primarily a diversification strategy. As discussed previously a significant run-up in stock price increases the amount of financial capital that insiders have tied up with the firm and may further motivate the need to hedge in order to reduce the exposure to firm risk. We anticipate these transactions to take place following positive abnormal stock price performance compared to control firms. We also expect there will be a greater propensity to hedge for risk reduction or diversification reasons when there is more uncertainty about firm value. It follows that we would expect a greater frequency of hedging transactions the greater stock price volatility and the higher the market-to-book ratio – the latter would indicate more of the firm’s value is made up by intangible assets. If hedging takes place purely for risk reduction or diversification reasons, however, would expect that the firm specific error component of market to book would not be higher relative to the other components but that the long run value to book ratio would be higher. Higher levels of R&D may also reflect more uncertainty about future firm value and increase the desire to hedge.²⁴ Insiders at newly public firms are often subject to lockup provisions which restrict their ability to sell shares following the IPO and may increase their desire to hedge for diversification purposes. Finally, if hedging is a diversification or risk reduction strategy we would not necessarily expect there to be any association between hedging and corporate governance (or at least with governance characteristics that reflect entrenchment).

In contrast, if hedging is done opportunistically either because of insider information or as an entrenchment device we would expect certain firm or governance

²⁴ It is also possible that executives are more willing to undertake risky R&D projects or projects whose value is made up of intangible assets if they can hedge some of the risk. We discuss this issue in the next section.

characteristics to be associated with these transactions. For example, we would anticipate poor performance following the hedge relative to the control sample. We also expect that hedging would take place when the firm specific error of market to book is higher (but not necessarily any difference in the long run market to book that reflects growth options) because this would suggest the firm is overvalued. In addition, if hedging is used opportunistically we would expect that firms that hedge would have weaker corporate governance characteristics such as having more insiders on the board and the firm would also be less likely to separate the CEO and board chair position.

5.1 Financial characteristics of hedging firms

Table 9 presents multivariate logistic analyses of firm characteristics between the firms with hedging transactions relative to a size-industry matched control sample taken from the universe of CRSP/Compustat firms. The dependent variable is one if the firm had a hedging transaction and zero otherwise. The independent variables are constructed to measure financial characteristics of the firm and include firm size, firm performance, the market-to-book ratio (again decomposed into its three components), R&D expenditures, and stock price volatility. We measure firm size as the book value of total assets, performance is measured as the abnormal stock price performance of the firm relative to the CRSP value-weighted market index, and stock price volatility is measured as the annualized standard deviation of daily stock returns. We measure both stock price performance and volatility over the 250 trading days both prior and subsequent to the hedging transaction.²⁵ Also included in each specification is a dummy that equals one if the firm went public in the last two years. We estimate the model for all hedging

²⁵ We get similar results when using a shorter window of 120 trading days.

transactions but also provide separate models for collars, PVFs, exchange trusts and equity swaps. We correct the standard errors for heteroskedasticity and clustering at the firm level.

In terms of the characteristics that indicate hedging is a risk reduction strategy Table 9 indicates for the full sample hedging is more likely to occur following a runup in stock price and there is some weak evidence that hedging is more frequent when stock price volatility ($p = 0.13$) is higher the year prior to the transaction. There is some weaker evidence that hedging occurs after a recent IPO ($p = 0.15$). These results are consistent with insiders using hedging for risk reduction/diversification reasons.

A number of the results in Table 9 also suggest that hedging is done for opportunistic or entrenchment reasons. Consistent with prior results in section 4 above we find that hedging firms are more likely to have a higher firm specific error in the market to book ratio but not in the long run market value to book value which suggests the firms are overvalued prior to a hedge. We also find that firms that hedge tend to perform poorly after the hedge although this result is not significant at traditional levels ($p = 0.16$). The weak result on performance could be because post performance varies by transaction type (e.g., exchange funds).

Table 9 also presents the logit analysis for each individual hedging security. For collars and PVFs we find that hedging is associated with a higher firm specific error in the market to book ratio. We also find that stock price declines the year following the transaction but the p-value for PVFs is not significant at traditional levels ($p = 0.12$). For collars we find that R&D expenditures are lower and stock price volatility higher prior to the transaction but this does not hold for PVF firms. We do not find that either collar or

PVF firms are more likely to have done an IPO the year prior to the transaction. For the most part for both collars and PVFs the results suggest that hedging tends to be associated with firm characteristics consistent with timing.

Finally, Table 9 presents the results for exchange fund transactions and equity swaps. Similar to collars and PVFs we find that the firm specific component of market to book is higher for both exchange funds and equity swaps which suggest high valuations. None of the other independent variables are statistically significant for exchange funds. We find some evidence that the industry specific error in market to book is higher of equity swaps and that swap firms have lower long run market to book value. Both findings suggest overvaluation for swap firms.

5.2 Firm and governance characteristics of hedging firms

Table 10 extends the analysis in Table 9 to include governance characteristics. We include the same independent variables as Table 9 along with the fraction of independent directors on the board, the size of the board of directors, and a dummy equal to one for firms where the CEO is also the Chairman of the board (and zero otherwise). We correct the standard errors for heteroskedasticity and clustering at the firm level. For this set of tests we use a size-industry control group but require the match firms to be in the IRRC database. For purposes of a comparative or control sample we use the IRRC database of firms for the period from 1996 through 2006 since it provides detailed information on firm and governance characteristics at a set of firms that do not have insiders who report hedging transactions. In addition, the firms in the IRRC database consist of firms of similar size across a broad range of industries over the same time period as firms in our hedging sample.

For the most part the results above on financial characteristics are consistent with the analysis above. For example, collars and PVFs exhibit poor performance relative following the hedge but exchange funds do not. Consequently, we focus on the governance variables. In terms of governance characteristics, in general hedging firms are more likely to have fewer independent directors on the board relative to the matched sample. As it turns out this holds for three types of transactions (collars, PVFs and exchange funds) and suggests that firms with more insider control over the board are more likely to allow these types of transactions. We do not find that hedging is associated with the board size or when the CEO is also board chair. We find some evidence that contribution into an exchange fund are more likely to occur following CEO turnover. If hedging was done for risk reduction reasons we anticipated that insiders might be more likely to hedge following a change in the CEO. In general it appears that executives are more likely to hedge when the board is friendlier towards this activity.

6. Hedging, Equity Incentives and Changes in Financial and Investment Policy

In this section we examine two issues. The first is if hedging is perhaps a response to already high levels of equity incentives or if hedging is in response to new stock or option grants that significantly increase the sensitivity of executives' wealth to firm performance. The second is if hedging is a reaction to incentives established and if so does hedging by the executive then affect decision making. We focus our analysis on CEOs since they are the primary decision makers at the firm.

6.1 Executive Compensation and Hedging.

It is perhaps not too surprising that executives with large holdings of stock and options and who have significant exposure of both their financial and human capital to firm specific risk would want to hedge this exposure. Hedging with a collar or a PVF provides the executive with the opportunity to “cash out” their equity for liquidity or diversification needs in lieu of selling the shares. Ofek and Yermack (2000) demonstrate that CEOs sell shares in response to new grants which is not too surprising since at some level these grants are compensation that the CEO will eventually want to make liquid. If an executive is purely interested in diversification they can monetize a collar or PVF and reinvest or put shares into an exchange fund.

In this section we perform a simple analysis of whether the amount of exposure to stock price risks affects the incentives to hedge. We realize a hedge changes the incentive structure and so in the next section we examine if altering incentives through hedging affects incentives and managerial behavior. For now we want to focus on how the incentive structure affects the desire to hedge. To capture whether hedging is done as a response to firm specific risk we perform two sets of analysis. We first examine if the sensitivity of the overall level of stock and option holdings to changes in stock price affects the incentive to hedge. We then examine if hedging is a response to new grants of stock or options.

Table 11 presents analysis of whether the portfolio of stock and options held by the CEO is associated with a hedging transaction. The dependent variable is the portfolio pay performance sensitivity (PPS) of the CEO which is defined as the change in dollar

value of stock and option holdings of the CEO for a 1% change in the stock price.²⁶ This variable captures how sensitive the CEOs wealth (at least in terms of stock and options) is to performance. For purposes of analysis we contrast CEOs of hedging firms to CEOs of size and industry-matched control firms. The size and industry control comes from the CRSP/Compustat/Execucomp universe.²⁷

Table 11 indicates that hedging firm CEOs have significantly higher portfolio PPS compared to control firms. The coefficient on *Hedge* is positive and significant at the 1% level in both the year prior, year of and the year following the hedge (we also extended the window out to two years prior and post). These results are interesting because they do suggest that hedging is potentially a response to higher levels of exposure to firm specific risk that CEOs of hedging firms face. There is also some evidence that CEOs get larger grants in the year they hedge which again suggests that hedging is a response to exposure to firm specific risk.

6.2 Changes in investment and financial policy associated with the use of p-v provisions

The analysis on hedging and compensation suggest that hedging occurs with high pay for performance sensitivity that was established by the board of directors. But the evidence also suggests that hedging alters the sensitivity of managerial wealth to firm performance. In this section, we examine if by changing the incentives that are established by the board affects the actions taken by the CEO. There are alternative

²⁶ We follow the Core and Guay (2002) methodology for approximating PPS from stock and option holdings using one year of proxy data. We define portfolio PPS as the change in the value of stock and option holdings for a 1% change in stock price, and grant PPS as the change in the value of stock and option grants in the current year. We follow prior literature and control for other important determinants of PPS.

²⁷ We also performed the analysis compared to a size, industry, and insider sales matched sample that was used to compare stock price performance in Table 4 above. The results are similar to what is presented here.

effects hedging can have executive behavior. On one hand, hedging lowers the incentives for executives to exert effort to increase stock price. In this case we would expect this to potentially affect the financial and investment policy at the firm. For example if hedging reduces incentives we may expect to observe lower levels of R&D or investment in other productive assets. In addition, we might expect that the executives would increase leverage since this could serve as an entrenchment device. Also, hedging would protect the CEO from increased stock price risk with higher leverage. In contrast, hedging can reduce the exposure executives have to stock price risk and may increase the incentives for the CEO to take on value enhancing but risky projects. In this case we would expect to observe greater investment in R&D and in other productive but risky firm assets. It is also possible that leverage could increase if the firm is using debt to make investments in R&D or other productive assets.

For statistical tests, we run a difference in difference regression to capture if any differences in financial or investment policy between firms that hedge and the control sample in the year prior to the hedging contract are there one and two years subsequent to the hedge. Consequently the variable of interest is the coefficient on *Sample*Post*. For example a positive value on the coefficient for *Sample*Post* where R&D is the dependent variable would indicate that the difference between R&D in the hedge versus control sample increased from the year prior to the year (or two) following the hedge. The control firms from Compustat are based on size and industry.

Table 12 suggests there is little evidence to support the hypothesis that changes in investment and financial policy arise from hedging. Relative to our control firms, expenditure on R&D and total investments (both scaled by total assets) is no different

after the award (years +1 and +2) than before the hedging transaction (year -1). Nor do we find significant differences in leverage or in the standard deviation of the firm following the hedge. Overall the results do not support the contention that hedging affects firm policy.

7. Conclusion

Tying executives wealth to firm performance has been a major goal of shareholders over the last 10 years or so with the economic rationale to motivate managers to exert effort to increase the stock price performance of the firm. Shareholders have been largely successful in achieving this goal through the use of stock and stock option based compensation along with minimum ownership requirements often imposed on management. Because of high levels of ownership and human capital that many executives now have in the firm these individuals have incentive to diversify or hedge their equity position in the firm. The development of various hedging securities has given executives and other insiders the flexibility to alter their ownership position in the firm and to reduce the sensitivity of their ownership to firm performance. While insiders have the motivation and means to hedge there is limited empirical research in this area.

In this paper we use a novel data set to provide an empirical examination on the hedging instruments used by corporate insiders that are reported in SEC filings. We find that the use of these instruments has become more popular over time and that there are predominately four types of securities that insiders use to hedge – zero premium collars, pre-paid variable forwards (PVFs), exchange trusts, and equity swaps. Our data indicate that a diverse group of insiders use these securities including CEOs, board members, non

CEO executives and blockholders. We also find that the average effective ownership hedge is substantial, over 30% for some securities, which indicates these contracts can significantly change the sensitivity of insiders' wealth to firm performance.

Our analysis also indicates that there is heterogeneity in the use of these securities and in the motivation for why insiders hedge with these instruments. Focusing on stock price patterns surrounding the initiation of a hedge we find a considerable run up in the stock price preceding all four types of transactions but differences in stock price patterns following the hedge. For exchange funds we find that the stock price continues to improve after the hedge. This finding, along with the fact that insiders tend to hedge a significantly lower level of ownership with exchange funds, 9% on average, appears to indicate that these securities are primarily used for diversification purposes. In contrast, we find a reversal in firm performance following insiders' transactions in collars and PVFs. The poor stock price performance that follows these transactions, zero cost collars in particular, coupled with the fact that the fraction of ownership hedged with these securities is substantial, suggests that insiders may time the use of these instruments opportunistically to take advantage of their knowledge of future firm performance. Consistent with the timing motivation we find that firms where insiders use collars and PVFs are more likely to be the targets of shareholder litigation and are more likely to restate accounting earnings subsequent to these transactions. We also find evidence that collar/PVF firms are more involved in acquisitions through mergers. While all these different instruments are likely to be used for diversification purposes our findings are consistent with the notion that some of the transactions allow insiders to trade opportunistically.

Further developments of financial instruments that insiders can use to hedge their firm specific wealth are likely to evolve in sophistication and use. Understanding the use of these securities is important to not only to research on corporate governance and managerial incentives but also to the research on insider trading.

APPENDIX

Hedging Instruments

Over the last couple of decades there has been an increased emphasis on tying executive wealth to firm performance both through the use of incentive based pay, which comes primarily through stock options, and increased stock ownership by executives and other insiders.²⁸ Moreover a strong stock market, increased M&A activity, and stock-for-stock mergers during our sample period all contributed to an increase in equity ownership for both individual executives and institutions. Since insiders, in particular corporate executives, tend to have substantial concentration of wealth and human capital in their own firm, they have an incentive to reduce their exposure to firm specific risk. There are a number of ways individuals and institutions can hedge risk associated with concentrated ownership. Executives could, for example, use their personal wealth to trade securities that have a low correlation with the firm's stock. Executives could also use stock index futures, single stock futures and options to hedge their exposures to their firms. Hedging instruments however allow corporate executives to very specifically target their exposure to firm specific risk. Also, by using customized, off-the-exchange contracts an executive can avoid issues related to liquidity and trade anonymity that may accompany the use exchange traded single stock futures or options. We now discuss the key features of the four most common hedging instruments reported and used by corporate insiders.

Equity Swaps

One of the first types of derivative hedging instruments used by insiders were equity swaps which are also referred to as a total return equity swap. In equity swap

²⁸ Murphy (1999) along with Hall and Liebman (1998) document an increase in the use of stock options as part of compensation packages over the last two decades. Holderness, Kroszner, and Sheehan (1999) document an increase in equity ownership by both executives and board members over the last 50 years.

agreements investors exchange the future returns on their stock for the cash flows of another financial instrument, such as the Autotote example used in the introduction where the CEO swapped the returns on the firm's stock over a 5 year period for LIBOR minus 2%. While this swap traded the return on the firm's stock for a debt instrument equity swaps can also involve the exchange of the firm's returns for the returns on any other financial instrument such as the S&P 500.

In the 1997 Tax Payer Relief Act the IRS ruled that an equity swap is equivalent to the sale of the underlying stock that is part of the swap agreement. Because swap transactions are deemed a "constructive sale" and trigger an immediate tax liability most corporate insiders have turned to other hedging securities discussed below that have more favorable tax treatments. Recently, however, swap transactions have seen a recurrence with hedge funds and other large blockholders. An interesting aspect of swap agreements is they allow the separation of economic ownership from voting rights. By separating economic ownership from voting ownership investors can avoid public disclosure of their equity position in the firm and this appears to have been a strategy by a number of hedge funds involved in proxy fights or M&A activity. A recent court case reveals how this type of transaction works. Children's Investment Fund, 3G Capital and a number of other hedge funds used equity swaps which gave them an effective ownership stake greater than 5%, which typically triggers disclosure in the U.S., in CSX railroad prior to launching a proxy contest at the firm. Because the long position in the swap did not have voting rights the hedge funds claimed they did not have to reveal their equity position in the company prior to engaging in a proxy battle. It is noteworthy that investment banks usually hedge the M&A deal - in this case by buying shares in CSX - thus these hedge

funds can easily obtain the shares from the investment banks when they are needed to vote in the proxy fight, but at the same time can delay disclosing their ownership to the market.

Another advantage of equity swaps is that they can also be used to keep voting rights but not an economic interest. This occurs by taking a short position in the swap and also holding shares. The ability to decouple ownership from voting power with a swap transaction has raised concerns by both companies and regulators. In addition, several hedge funds are being investigated for using swaps to hide ownership positions prior to takeovers and proxy fights. See Hu and Black (2007) for more detailed discussion of how insiders and hedge funds (or any institutional investor) can use swap transactions to decouple economic and voting ownership and the recent controversy that surrounds their use. To the best of our understanding, the equity swaps included in our sample involve transactions where the company insiders hold shares in the company and take a short position using an equity swap contract effectively unwinding the economic ownership in the firm, and yet retaining voting power.

Zero-Cost Collars (Collars) and Prepaid Variable Forward Contracts (Forwards or PVFs).

While collars and PVFs are technically different instruments they share some of the same characteristics. Both collars and PVFs have; 1) a floor price which determines the level of downside protection in stock price the investor can hedge against, 2) a ceiling price which determines the level of upside growth in stock price the investor can participate in, 3) a set maturity that determines the contract length, and 4) a cash advance feature (a feature more common with forwards).

More specifically, a collar transaction involves the simultaneous purchase of a put option and sale of a call option covering the firm's shares. Most collar transactions are "zero cost" because the proceeds from the sale of the written call are used to purchase the put. The put option component of the collar transaction provides insurance for the holder against downward movement in the stock price below the strike price of the put. Any stock price appreciation above the strike price on the call option is forgone profit. One reason for the popularity of collars versus equity swaps for insiders following the change in the tax code in 1997 is that collars, written with sufficient spread, are not considered a constructive sale and subsequently do not trigger a taxable event. This means that insiders can defer capital gains taxes on any appreciation for the life of the collar in addition to hedging against stock price risk.²⁹

A PVF is a strategy that combines features of a forward sale of stock and an equity collar. In a PVF agreement the investor enters into a forward sale agreement, typically with an investment bank, and promises to deliver shares of the firm's stock at some future date in exchange for an up-front cash advance. The amount of stock that must be forfeited upon termination of the contract depends on the value of the stock at that future date. At maturity if the share price has fallen below a pre-specified price (the floor price of the contract) the investor is required to deliver all the shares covered by the contract. Typically the floor price on the forward is the current stock price. Consequently a typical PVF provides full downside protection against depreciation of the underlying stock price. The investor participates fully in any price appreciation in the underlying stock up to a preset level (the upper ceiling on the contract). If the stock price exceeds the upper ceiling the investor receives a predefined percentage of any price

²⁹ For additional information on the specific structure of collars see Bettis et al (2001).

appreciation above the upper ceiling of the contract which means they give up some upside gain. If the share price appreciates the investor is required to deliver only that percentage of the shares necessary to repay the contract amount. It is also possible to structure the agreement so that the investor has the right to cash settle the contract and retain the underlying shares when the contract terminates. By cash settling the contract the investor avoids any capital gains tax that would occur upon disposition of the shares and also retains voting and cash flow rights associated with the shares.³⁰

With both PVF's and collars the insider is protected against a decline in the underlying stock price while retaining a predefined amount of upside in the underlying stock. The insider is also able to defer taxes on the sale of the underlying security while receiving some of the benefits of a sale. One difference between a PVF and a zero- cost collar is how the contracts can be monetized. PVF contracts allow the investor to receive a much larger upfront cash payment in the range of 80% to 90% of the value of the underlying stock. Typically the shorter the contract and the more upside gain sacrificed the more upfront cash payment the insider receives. Monetization of zero-cost collars is more complex. To monetize insiders would receive a loan when the collar is initiated. The loan amount and interest rate charged depend on the stated purpose of the loan. If the proceeds of the loan are being used to purchase marketable securities, what is referred to as a "purpose loan", the insider can typically borrow up to 50% of the market value of the hedged position. If the insider wants to use the loan proceeds for reasons such as to purchase insurance or invest in private equity, then the bank may choose to lend up to 90% of the put strike price. This would be referred to as a "non-purpose" loan.

³⁰ For more detailed information about prepaid variable forwards see Jagolinzer et al (2007).

Both zero-cost collars and PVFs are private bilateral agreements between the corporate insider and a counter party, the latter usually an investment bank. Investment banks receive commissions and spreads in addition to potentially strengthening their relationship with the corporation via the senior executives. With a PVF the investment banks usually factor in the costs of the contract as an additional discount in the cash advance received by the investor. With a zero-cost collar the investment banks often receive commission fees and/or make money on the spread between the call and put contract.

Exchange Funds

Exchange funds, sometimes referred to as exchange trusts or swap funds, are perhaps the oldest type of hedging instrument used by insiders. Exchange funds have existed since the 1960s and while they have evolved in their sophistication and use their basic structure is fundamentally the same. In an exchange fund a group of insiders individually place their shares in a limited partnership or limited liability company. By pooling shares into a single entity the participants in the fund are able to create a diversified portfolio of securities. In addition, the contribution of shares into the fund does not trigger a tax event that would occur if the shares were sold.

In order for the contributions into the fund to not trigger an immediate capital gains tax liability for the participants, the partnership (fund) cannot invest more than 80% of its assets in marketable equities. Twenty percent of its assets must be invested in non-publicly traded securities which are often relatively illiquid real estate investments. Typically the assets must remain in the fund for up to seven years but the length can vary. There are often significant penalties for early withdrawal but redemptions policies also

vary. Upon the dissolution some funds distribute the particular stock contributed back to the insider while others distribute a pro rata portion of the fund's total marketable securities. As long as investors stay in the fund the full seven years they do not pay any taxes until they sell their underlying stock. Finally, the executive contributing the shares can exercise control over the voting of the shares via the manager of the fund.

Most exchange funds are organized and administered by large investment banks and require a minimum investment of \$1 million with an additional requirement that the investor must have a net worth of \$5 million. The size of the funds can vary, but they often have at least 50 investors, even though some can be as large as 500 investors. Fees for investing in exchange funds can be substantial including a front-end load and on-going advisory and servicing fees. The investment purpose of the fund can vary widely. Some funds are structured to benchmark standard indexes such as the S&P 500 while others are more targeted. Because exchange funds are illiquid they are often used for estate planning. In fact, some of these funds are established specifically to attract insiders who want a gift to remain illiquid or inaccessible for a period of time.

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Table 1: Distribution of hedging contracts by year

The table provides the distribution of hedging contracts for the period between 1996 and 2006. The sample consists of 2,010 unique hedging transactions, spread across 1,181 individual filers and 911 unique firms during the period from 1996 to 2006. We sub-divide the sample into four different types of hedging contracts; zero cost collars, variable forwards, exchange funds and equity swaps.

Panel A: Year-wise distribution of unique transactions

Year	Zero Cost Collars	Exchange Funds	Variable Forwards	Equity Swaps	Total by Year
1996	21	0	0	1	22
1997	46	2	0	0	48
1998	55	67	1	1	124
1999	70	121	3	7	201
2000	131	138	48	5	322
2001	78	36	165	2	281
2002	34	20	227	3	284
2003	13	10	193	25	241
2004	0	19	165	3	187
2005	0	18	117	56	191
2006	2	10	64	33	109
Total by Contract	450	441	983	136	

Panel B: Year-wise distribution of unique individuals

Year	Zero Cost Collars	Exchange Funds	Variable Forwards	Equity Swaps	Total by Year
1996	14	0	0	1	15
1997	35	2	0	0	37
1998	37	64	1	1	103
1999	41	112	3	5	161
2000	57	132	25	3	217
2001	49	35	91	1	176
2002	16	20	94	1	131
2003	8	10	96	4	118
2004	0	17	81	3	101
2005	0	15	50	9	74
2006	1	9	33	5	48
Total by Contract	258	416	474	33	

Panel C: Year-wise distribution of unique firms

Year	Zero Cost Collars	Exchange Funds	Variable Forwards	Equity Swaps	Total by Year
1996	13	0	0	1	14
1997	29	2	0	0	31
1998	26	52	1	1	80
1999	26	81	3	5	115
2000	38	99	23	3	163
2001	39	31	76	1	147
2002	13	17	75	1	106
2003	6	5	71	4	86
2004	0	16	52	3	71
2005	0	14	35	8	57
2006	1	8	27	5	41
Total by Contract	191	325	363	32	

Table 2: Ownership characteristics of hedged instruments

This table provides the percentage of ownership hedged with each instrument, the value (in millions of dollars) that is hedged with each hedging observation (panel A), and the distribution of hedged instruments across our classification of “insiders” (panel B) as defined by Section 16 of the Securities Exchange Act of 1934. We begin with 2,010 unique individual hedging transactions from 1996 through 2006. In order to get hedging sample observations, we aggregate hedging transactions for each individual insider in each calendar year. We sub-divide the sample into four different types of hedging contracts; zero cost collars, variable forwards, exchange funds and equity swaps. We classify insiders into two executive categories and two others. Executives are classified as either the CEO/Chairman or “other officer”. The other two classifications are non-officer directors, and beneficial owners (10% or more ownership interest).

Panel A: Percentage of ownership and dollar amount covered by each derivative security.

	Percentage of Ownership Invested			Dollar Value Invested (millions)		
	Number of Observations	Mean	Median	Number of Observations	Mean	Median
Zero Cost Collars	210	31.30	21.95	237	\$36.20	\$5.25
Variable Forwards	441	28.37	18.07	452	\$44.91	\$7.65
Exchange Funds	362	8.99	4.40	363	\$5.20	\$2.20
Equity Swaps	31	32.58	14.89	26	\$16.40	\$3.78

Panel B: Classification of insiders (percentage) for unique hedging observation with available information about the insider’s position.

	Number of Observations	CEO/Chairman	Other Officer	Outside 10% Owner	Non-Officer Director	Other
Zero Cost Collars	243	27.9	40.33	10.29	17.70	3.70
Variable Forwards	469	28.14	29.64	17.91	23.24	1.07
Exchange Funds	410	41.22	29.02	6.34	18.54	4.88
Equity Swaps	33	18.18	6.06	57.58	18.18	0.00

Table 3: Contract life, cash value, and spreads for collar and prepaid variable forward contracts

The table provides summary statistics on contractual terms for collar and prepaid variable forward contracts. We begin with 450 individual zero cost collar transactions and 983 prepaid forward sale contracts for the period 1996 – 2006. Both types of contracts have specific term lengths, and contract ceiling and floors. The details necessary to determine the length/term of the contracts, the ceiling-to-floor and ceiling-to-price ratios are provided in Form 4 filings for a subset of these transactions. A feature of prepaid variable forward contract is that cash is available at the time in which the contract is signed. We use Form 4 footnote disclosures for prepaid variable forward transactions to determine the cash received by the insider (as defined in Section 16 of the Securities Exchange Act of 1934).

	Zero Cost Collars				Variable Forwards					
	Days-to-Expiration	Ceiling-to-Floor Ratio	Ceiling-to-Price Ratio	Price-to-Floor Ratio	Days-to-Expiration	Ceiling-to-Floor Ratio	Ceiling-to-Price Ratio	Price-to-Floor Ratio	Cash received (\$000)	Cash discount
Mean	1067	1.82	1.58	1.16	1025	1.43	1.33	1.07	13,292	21.79 %
Median	1087	1.62	1.41	1.11	1095	1.34	1.29	1.01	3,433	17.27%
<i>N</i>	381	386	386	386	807	612	612	612	558	558

Table 4: Stock returns around initiation of hedging contracts

The table provides stock returns for firms whose insiders engage in hedging transactions during the period 1996 to 2006. We begin with 2,010 unique individual hedging transactions from 1996 through 2006 and aggregate hedging transactions for each individual insider in each calendar month of a year and end up with a total of 1,353 hedging transactions. Cumulative abnormal returns (CARs) are calculated relative to the CRSP Value-Weighted Index, CRSP Equal-Weighted Index and control firms. There are two sets of control firms appearing in the Table. The first control group is size (measured by book value of assets) and industry (2-digit SIC code) matched firms drawn from the intersection of CRSP and Compustat. The second control group is size (measured by book value of assets), industry (2-digit SIC code), and open market sales (measured by the numbers of shares sold by an insider in the open market deflated by the total shares outstanding for the firm) matched firms drawn from the intersection of CRSP, Compustat and Thomson Reuters insider trading database. *P*-values are reported in parentheses.

Panel A: Zero Cost Collars

	Raw Returns	Equally Weighted	Value Weighted	Matched Firm: Size & Industry	Matched Firm: Size, Industry, & Insider Sales
[-250,0]	54.43 (0.000)	30.75 (0.000)	44.88 (0.000)	40.22 (0.000)	2.54 (0.669)
[0,+250]	-7.72 (0.065)	-24.78 (0.000)	-8.01 (0.045)	-22.42 (0.000)	-8.45 (0.076)

Panel B: Variable Forwards

	Raw Returns	Equally Weighted	Value Weighted	Matched Firm: Size & Industry	Matched Firm: Size, Industry, & Insider Sales
[-250,0]	39.50 (0.000)	17.51 (0.000)	38.67 (0.000)	17.34 (0.00)	-0.74 (0.834)
[0,+250]	5.20 (0.027)	-16.18 (0.000)	0.81 (0.708)	-7.93 (0.010)	-8.63 (0.003)

Panel C: Exchange Funds

	Raw Returns	Equally Weighted	Value Weighted	Matched Firm: Size & Industry	Matched Firm: Size, Industry, & Insider Sales
[-250,0]	58.24 (0.000)	32.25 (0.000)	44.74 (0.000)	37.23 (0.000)	15.76 (0.002)
[0,+250]	27.12 (0.000)	3.84 (0.337)	19.03 (0.000)	10.70 (0.026)	8.93 (0.110)

Panel D: Equity Swaps

	Raw Returns	Equally Weighted	Value Weighted	Matched Firm: Size & Industry	Matched Firm: Size, Industry, & Insider Sales
[-250,0]	45.93 (0.000)	21.46 (0.127)	29.83 (0.040)	25.36 (0.076)	0.52 (0.978)
[0,+250]	3.74 (0.671)	-13.95 (0.115)	-7.90 (0.388)	-29.46 (0.075)	11.13 (0.551)

Table 5: Decomposition of market-to-book ratio for hedging firms

The table provides details on the decomposition of market-to-book value of equity for firms whose insiders engage in hedging transactions during the period 1996 to 2006. The decomposition of market-to-book value of equity into three components is based on Rhodes-Kropf et al. (2005). The first component is the firm specific deviation of market-to-book ratio from a valuation implied by the sector. The second component is the sector specific deviation of market-to-book ratio from a valuation implied by long-run multiples. The third component is the portion of the market-to-book ratio that is attributable to the deviation in the valuation implied by long-run multiples from the current book value of equity. Values are reported the year prior to the transaction, the year of the transaction, and the year subsequent to the transaction. Year 0 is the fiscal year of the hedging transaction.

Valuation Component		Zero Cost Collars			Variable Forwards			Exchange Funds			Equity Swaps		
		Year ₋₁	Year ₀	Year ₁	Year ₋₁	Year ₀	Year ₁	Year ₋₁	Year ₀	Year ₁	Year ₋₁	Year ₀	Year ₁
Firm Specific Deviation	Derivative Firm	0.911	0.623	0.467	0.816	0.871	0.550	1.144	0.622	0.663	0.767	0.479	0.339
	Control Firm	0.135	0.121	0.246	0.070	-0.096	0.017	-0.055	0.063	-0.046	-0.181	-0.017	0.139
	<i>p-value</i>	<i>0.000</i>	<i>0.000</i>	<i>0.011</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.023</i>	<i>0.368</i>
Sector Specific Deviation	Derivative Firm	0.000	-0.069	-0.154	-0.104	-0.068	-0.000	0.103	-0.045	-0.147	0.162	0.147	0.090
	Control Firm	-0.032	-0.097	-0.130	-0.099	-0.088	0.027	0.043	-0.053	-0.161	0.148	0.094	0.167
	<i>p-value</i>	<i>0.149</i>	<i>0.175</i>	<i>0.323</i>	<i>0.727</i>	<i>0.382</i>	<i>0.064</i>	<i>0.013</i>	<i>0.613</i>	<i>0.473</i>	<i>0.867</i>	<i>0.516</i>	<i>0.225</i>
Long Run Value of Market-to-Book	Derivative Firm	0.537	0.488	0.471	0.432	0.505	0.402	0.587	0.410	0.498	0.812	0.742	0.750
	Control Firm	0.541	0.526	0.488	0.419	0.518	0.400	0.541	0.425	0.511	0.721	0.752	0.671
	<i>p-value</i>	<i>0.900</i>	<i>0.249</i>	<i>0.655</i>	<i>0.643</i>	<i>0.636</i>	<i>0.947</i>	<i>0.096</i>	<i>0.579</i>	<i>0.642</i>	<i>0.429</i>	<i>0.918</i>	<i>0.530</i>

Table 6: Corporate events surrounding hedging transactions

The Table provides the frequency of various corporate events for firms whose insiders engage in hedging transaction during the period 1996 to 2006. The control group is size (measured by book value of assets) and industry (2-digit SIC code) matched firms drawn from the intersection of CRSP and Compustat. The Securities Class Action Lawsuits filing data is obtained from Securities Class Action Clearinghouse website (SCAC) (<http://securities.stanford.edu/>). Earnings restatements data is obtained from the website of General Accounting Office (GAO) office of the U.S. Government. For each firm, we define a pre- and post-event window. For example, Year -1 is defined as a window consisting of 365 calendar days prior to the event. Years subsequent to the event are cumulative calendar days subsequent to the event date (including the event date). Chi-square *p*-values for difference in proportions appear in italics.

Panel A: Shareholder Litigation

	Zero Cost Collars			Variable Forwards			Exchange Funds			Equity Swaps		
	Year ₋₁	Year ₊₁	Year ₊₂	Year ₋₁	Year ₊₁	Year ₊₂	Year ₋₁	Year ₊₁	Year ₊₂	Year ₋₁	Year ₊₁	Year ₊₂
Derivative Firm	4.27	17.41	29.54	6.28	10.95	19.93	3.48	7.75	20.05	8.82	2.94	5.88
Matched Control Firm	5.34	3.91	9.25	3.23	5.57	11.49	2.94	4.01	10.16	0.00	5.88	8.82
p-value for difference	<i>0.5540</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0167</i>	<i>0.0011</i>	<i>0.0001</i>	<i>0.6782</i>	<i>0.0296</i>	<i>0.0002</i>	<i>0.0765</i>	<i>0.5548</i>	<i>0.6422</i>

Panel B: Earnings Restatements

	Zero Cost Collars			Variable Forwards			Exchange Funds			Equity Swaps		
	Year ₋₁	Year ₊₁	Year ₊₂	Year ₋₁	Year ₊₁	Year ₊₂	Year ₋₁	Year ₊₁	Year ₊₂	Year ₋₁	Year ₊₁	Year ₊₂
Derivative Firm	1.07	5.69	10.68	2.69	4.49	12.03	3.48	2.41	6.95	5.88	2.94	8.82
Matched Control Firm	2.14	2.49	6.41	8.08	5.39	8.80	1.87	2.67	7.75	5.88	0.00	0.00
p-value for difference	<i>0.3134</i>	<i>0.0553</i>	<i>0.0701</i>	<i>0.0001</i>	<i>0.4893</i>	<i>0.0774</i>	<i>0.1738</i>	<i>0.8162</i>	<i>0.6743</i>	<i>1.0000</i>	<i>0.3137</i>	<i>0.0765</i>

Panel C: Equity Issues

	Zero Cost Collars			Variable Forwards			Exchange Funds			Equity Swaps		
	Year ₋₁	Year ₊₁	Year ₊₂	Year ₋₁	Year ₊₁	Year ₊₂	Year ₋₁	Year ₊₁	Year ₊₂	Year ₋₁	Year ₊₁	Year ₊₂
Derivative Firm	24.56	8.90	11.03	14.72	9.69	11.67	28.07	12.30	18.18	17.65	5.88	8.82
Matched Control Firm	6.05	8.19	11.74	8.80	7.36	10.77	8.82	4.55	8.29	8.82	2.94	11.76
p-value for difference	<i>0.0000</i>	<i>0.7628</i>	<i>0.7906</i>	<i>0.0021</i>	<i>0.1631</i>	<i>0.6350</i>	<i>0.0000</i>	<i>0.0001</i>	<i>0.0001</i>	<i>0.2830</i>	<i>0.5548</i>	<i>0.6898</i>

Table 7: Frequency that collar and forward contracts end up below stock-price floor

The table provides the frequency with which zero cost collars and prepaid forward contracts end up below the stock-price floor specified in the contract. Sample firms are as described in Table 4. There are three sets of control firms appearing in the Table. The first control group is size (measured by book value of assets) and industry (2-digit SIC code) matched firms drawn from the intersection of CRSP and Compustat. The second control group is size (measured by book value of assets), industry (2-digit SIC code), and open market sales (measured by the numbers of shares sold by an insider in the open market deflated by the total shares outstanding for the firm) matched firms drawn from the intersection of CRSP, Compustat and Thomson Reuters insider trading database. The third control group is formed following the approach in Barber and Lyon (1997). Specifically, for each sample firm, we find a control firm with a market value of equity that lies within 70% to 130% of the sample firm's market value of equity. Within this subset of possible matches, we select a control firm that has the closest book-to-market value of equity. We measure market value of equity at the end of June of the year t , i.e. the year of adoption of performance-vesting provision. We measure book-to-market value of equity at the end of year $t-1$.

Panel A: Zero Cost Collars

	Year 1	Year 2	Year 3	At Contract Expiration
Zero Cost Collar	52.21	59.51	55.56	57.51
Size & Industry Match	42.25	48.17	43.82	38.60
<i>p-value</i>	<i>0.036</i>	<i>0.023</i>	<i>0.024</i>	<i>0.000</i>
Size Industry Insider Sales	47.85	56.18	51.79	49.68
<i>p-value</i>	<i>0.378</i>	<i>0.509</i>	<i>0.475</i>	<i>0.144</i>
Barber & Lyon Match	40.00	38.46	25.97	30.64
<i>p-value</i>	<i>0.011</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>

Panel B: Variable Forwards

	Year 1	Year 2	Year 3	At Contract Expiration
Variable Forwards	39.24	37.33	30.89	34.43
Size & Industry Match	33.66	31.12	25.96	27.73
<i>p-value</i>	<i>0.149</i>	<i>0.113</i>	<i>0.225</i>	<i>0.120</i>
Size Industry Insider Sales	33.21	29.88	29.95	32.38
<i>p-value</i>	<i>0.131</i>	<i>0.065</i>	<i>0.825</i>	<i>0.645</i>
Barber & Lyon Match	32.67	35.03	29.41	32.33
<i>p-value</i>	<i>0.088</i>	<i>0.559</i>	<i>0.715</i>	<i>0.627</i>

Table 8: Cross-sectional regression of cumulative abnormal returns following the initiation of hedging contracts

The table reports estimates from an OLS regression of cumulative abnormal returns following the initiation of a derivative transaction by a corporate insider. The dependent variable is the abnormal return relative to the CRSP Value-Weighted Index over the 250 trading days subsequent to the transaction. Independent variables include firm size, the type of transaction, the position of the insider, the amount of ownership hedged, a dummy variable if the firm went public in the last year, the logarithm of the transactions value. The three components of market-to-book value of equity are described in Table 5. Indicator variables for industries (Fama-French 30 industrial classification) and transaction years are included but not reported in the table. Standard errors are corrected for heteroskedasticity and clustering at the firm level. Absolute values of t -statistics are reported in parentheses. ***, **, and * denote significance at less than 1%, 5%, and 10% levels, two-tailed tests, respectively.

	All Hedging	Zero Cost Collars	Variable Forwards	Exchange Funds	Equity Swaps
Intercept	-0.241* (1.66)	-0.069 (0.20)	-0.071 (0.46)	0.095 (0.30)	9.157** (2.31)
Book Value of Assets	-0.000 (0.83)	-0.000 (0.31)	-0.000*** (2.63)	0.000 (0.97)	-0.000** (2.35)
Firm-Specific Deviation in Market-to-Book	-0.110*** (2.73)	-0.026 (0.41)	-0.091* (1.70)	-0.262** (2.15)	-0.436*** (4.66)
Sector-Specific Deviation in Market-to-Book	-0.099 (0.75)	-0.030 (0.13)	-0.498** (2.19)	-0.060 (0.17)	-0.194 (0.33)
Long Run Value of Market-to-Book	0.015 (0.08)	-0.172 (0.83)	0.018 (0.07)	0.206 (0.66)	
<i>Transaction Type</i>					
Zero Cost Collars	0.003 (0.04)				
Exchange Funds	0.214** (2.01)				
Equity Swaps	0.217 (1.55)				
<i>Insider Characteristics</i>					
Dummy equal to one if insider is CEO or Chairman of the board	0.049 (0.77)	0.125 (0.81)	0.069 (0.73)	0.018 (0.09)	-2.107 (1.53)
Dummy equal to one if insider is any other officer	0.049 (0.85)	0.314* (1.80)	-0.026 (0.40)	-0.016 (0.09)	
Dummy equal to one if insider is beneficial owner	-0.008 (0.09)	0.059 (0.27)	0.030 (0.27)	0.034 (0.09)	-5.537 (1.62)
Ownership by insider engaging in transaction	-0.290 (1.26)	-0.647 (0.96)	-0.192 (0.65)	-0.419 (0.91)	
<i>Transaction Characteristics</i>					
Log of transaction value	0.059*** (2.26)	-0.006 (0.14)	0.050 (1.30)	0.053 (0.93)	0.098 (1.39)
Ownership hedged	0.089 (1.12)	-0.073 (0.44)	0.109 (1.29)	0.658 (1.56)	-2.078 (1.49)
<i>Other Characteristics</i>					
Abnormal returns relative to CRSP Value-Weighted Index over the 250 trading days prior to the transaction	0.042 (0.79)	0.091 (0.82)	-0.001 (0.02)	0.180 (1.07)	0.962** (3.05)
Dummy equal to one for firms that went public in the prior two years	-0.059 (0.61)	-0.216 (1.23)	0.091 (0.92)	-0.244 (1.04)	-2.433*** (3.92)
Adjusted R-square	0.078	0.175	0.150	0.021	0.907
<i>N</i>	927	193	493	218	23

Table 9: Logistic regression of the likelihood of insiders engaged in hedging transaction relative to size-industry matched control firms drawn from the intersection of CRSP and Compustat

The table provides maximum likelihood estimates from a logistic regression of the determinants of the likelihood of insiders engaged in a hedging transaction during the period 1996 to 2006. The dependent variable is one if the insider purchased a derivative instrument and zero otherwise. Derivative instruments include exchange funds, zero-cost collars, equity swaps, and prepaid variable forwards. Control group is size (measured by book value of assets) and industry (2-digit SIC code) matched firms drawn from the intersection of CRSP and Compustat. The three components of market-to-book value of equity are described in Table 5. Abnormal return is defined as the cumulative raw returns for a firm net of the cumulative returns for the CRSP Value-Weighted index. We measure both stock price performance and volatility over the 250 trading days both prior and subsequent to the hedging transaction. Stock return volatility is the (annualized) standard deviation of daily stock returns. Standard errors are corrected for heteroskedasticity and clustering at the firm level. Absolute values of Z-statistics are reported in parentheses. ***, **, and * denote significance at less than 1%, 5%, and 10% levels, two-tailed tests, respectively.

	All Hedging	Zero Cost Collars	Variable Forwards	Exchange Funds	Equity Swaps
Intercept	-0.622*** (2.94)	-1.091** (2.30)	-0.589* (1.85)	-0.567* (1.65)	2.254 (1.13)
Book Value of Assets	0.000 (1.08)	0.000 (0.23)	0.000 (1.35)	0.000 (0.37)	-0.000** (2.31)
Firm-Specific Deviation in Market-to-Book	0.947*** (9.20)	0.979*** (4.12)	0.820*** (5.36)	1.235*** (7.45)	2.593*** (3.08)
Sector-Specific Deviation in Market-to-Book	0.204 (0.75)	0.738 (1.19)	-0.057 (0.13)	0.576 (1.33)	3.166* (1.73)
Long Run Value of Market-to-Book	0.103 (0.40)	0.062 (0.10)	0.174 (0.49)	0.127 (0.26)	-4.556* (1.75)
R&D/Assets	-1.764 (1.61)	-9.932*** (3.78)	-1.066 (0.61)	0.120 (0.06)	12.187 (1.50)
Abnormal returns relative to CRSP Value-Weighted Index over the 250 trading days <i>prior</i> to the transaction	0.531*** (3.94)	0.988*** (3.17)	0.424** (2.04)	0.193 (0.71)	2.973 (1.76)
Abnormal returns relative to CRSP Value-Weighted Index over the 250 trading days <i>subsequent</i> to transaction	-0.176 (1.41)	-0.502* (1.91)	-0.219 (1.01)	0.169 (0.72)	-0.225 (0.24)
Stock return volatility 250 trading days <i>prior</i> to the transaction	0.604 (1.50)	2.154** (2.54)	0.541 (0.90)	-0.084 (0.13)	3.121 (0.77)
Stock return volatility 250 trading days <i>subsequent</i> to the transaction	-0.531 (1.60)	-0.820 (0.88)	-0.485 (0.98)	-0.598** (1.15)	-2.933 (0.75)
Dummy equal to one for firms that went public in the prior two years	0.342 (1.42)	0.228 (0.43)	0.297 (0.91)	0.523 (1.21)	1.526 (0.55)
Pseudo R-square	0.154	0.217	0.111	0.230	0.443
Number of observations	2,247	505	1,028	656	58

Table 10: Logistic regression of the likelihood of insiders engaged in hedging transaction relative to size-industry matched control firms drawn from the intersection of CRSP, Compustat and IRRC

The table provides maximum likelihood estimates from a logistic regression of the determinants of the likelihood of insiders engaged in a hedging transaction during the period 1996 to 2006. The dependent variable is one if the insider purchased a derivative instrument and zero otherwise. Derivative instruments include exchange funds, zero-cost collars, equity swaps, and prepaid variable forwards. Control group is size (measured by book value of assets) and industry (2-digit SIC code) matched firms drawn from the intersection of CRSP, Compustat and IRRC. Independent variables (excluding governance characteristics) are as described in Table 9. Standard errors are corrected for heteroskedasticity and clustering at the firm level. Absolute values of Z-statistics are reported in parentheses. ***, **, and * denote significance at less than 1%, 5%, and 10% levels, two-tailed tests, respectively.

	All Hedging	Zero Cost Collars	Variable Forwards	Exchange Funds	Equity Swaps
Intercept	1.526** (2.44)	-1.132 (0.97)	3.570*** (3.81)	0.827 (1.08)	-0.357 (0.04)
Book Value of Assets	0.000 (0.98)	0.000 (0.55)	0.000 (0.97)	0.000 (0.40)	-0.000 (0.25)
Firm-Specific Deviation in Market-to-Book	0.388*** (2.64)	0.401 (1.49)	0.277 (1.34)	0.813*** (3.68)	-0.346 (0.49)
Sector-Specific Deviation in Market-to-Book	0.273 (0.88)	0.846 (1.43)	0.351 (0.72)	0.205 (0.43)	-0.622 (0.35)
Long Run Value of Market-to-Book	0.095 (0.31)	0.344 (0.51)	0.133 (0.32)	0.078 (0.14)	1.091 (0.48)
R&D/Assets	-2.785** (2.11)	-10.986*** (4.02)	-3.127 (1.57)	-0.086 (0.05)	-1.157 (0.15)
Abnormal returns relative to CRSP Value-Weighted Index over the 250 trading days <i>prior</i> to the transaction	0.744*** (4.34)	1.192*** (3.88)	0.694*** (2.62)	0.341 (1.30)	-0.215 (0.20)
Abnormal returns relative to CRSP Value-Weighted Index over the 250 trading days <i>subsequent</i> to the transaction	-0.307** (2.18)	-0.663** (2.21)	-0.512** (2.18)	0.154 (0.68)	0.092 (0.11)
Stock return volatility 250 trading days <i>prior</i> to the transaction	0.390 (0.91)	1.519* (1.70)	-0.012 (0.02)	-0.322 (0.37)	3.442 (1.07)
Stock return volatility 250 trading days <i>subsequent</i> to the transaction	-0.289 (0.88)	0.640 (0.88)	-0.648 (1.59)	-0.021 (0.04)	-1.081 (0.37)
Dummy equal to one for firms that went public in the prior two years	1.319*** (2.72)	1.861** (2.20)	1.402** (2.05)	1.115* (1.71)	2.989 (1.28)
<i>Governance characteristics:</i>					
Fraction of outside directors on the board	-3.320*** (5.66)	-2.116** (2.25)	-4.480*** (5.26)	-3.625*** (4.20)	-5.153 (1.08)
Number of directors on the board	0.000 (0.01)	0.078 (1.05)	-0.081 (1.04)	0.049 (1.22)	0.215 (0.43)
Dummy equal to one for firms where CEO is also Chairman of the board	-0.186 (0.87)	-0.132 (0.39)	-0.288 (0.87)	0.032 (0.10)	0.074 (0.7)
New CEO in Office	0.028 (0.09)	0.236 (0.41)	-0.187 (0.38)	0.893* (1.77)	
Pseudo R-square	0.137	0.226	0.163	0.158	0.201
Number of observations	2,097	466	1,047	531	50

Table 11: Determinants of CEO equity incentives for hedging firms

The table provides estimates from an OLS regression of the determinants of equity incentives for CEOs engaging in hedging transactions during the period 1996 to 2006. Hedge takes the value 1 if the CEO is employed by the hedging firm, and 0 is control firm. We use compensation data for CEO employed by a firm matched with hedging firm by book value of assets and 2-digit SIC code. Portfolio PPS is defined as the change in the dollar value of stock and option holdings of the CEO for a 1% change in the stock price. Grant PPS is defined as the change in the dollar value of stock and option grants for the CEO for a 1% change in the stock price. Asset is the book value of total assets. Volatility is the standard deviation of monthly stock returns using five years of monthly stock returns. Leverage is total long-term debt divided by book value of assets. Market-to-book ratio is the sum of market value of equity and book value of total liabilities divided by the book value of assets. Stock Return is annual raw return. Tenure is the number of years since becoming a CEO. All variables are lagged by a year except $Stock\ Return_t$ which is stock return in the current year, and Tenure. Absolute values of t -statistics are reported in parentheses. ***, **, and * denote significance at less than 1%, 5%, and 10% levels, two-tailed tests, respectively.

Model:	Log (Portfolio PPS)					Log (Grant PPS)				
	(1) Year -2	(2) Year -1	(3) Year 0	(4) Year +1	(5) Year +2	(6) Year -2	(7) Year -1	(8) Year 0	(9) Year +1	(10) Year +2
Intercept	1.091 (1.55)	1.535** (2.19)	2.078*** (3.29)	0.050 (0.08)	0.561 (0.78)	-1.792** (2.19)	-0.447 (0.55)	-1.447** (1.98)	-1.860*** (2.70)	-1.589** (1.98)
Hedge	0.553*** (2.85)	0.794*** (4.05)	0.834*** (4.46)	0.496*** (2.86)	0.488** (2.48)	0.014 (0.07)	0.287 (1.27)	0.464** (2.15)	-0.177 (0.93)	0.260 (1.19)
Log(Asset)	0.475*** (6.45)	0.420*** (5.66)	0.409*** (5.91)	0.542*** (8.11)	0.458*** (5.94)	0.459*** (5.37)	0.434*** (5.04)	0.554*** (6.93)	0.602*** (8.20)	0.440*** (5.15)
Volatility	0.496 (0.84)	-0.516 (0.93)	-0.493 (1.02)	0.609 (1.52)	0.596 (1.37)	0.762 (1.11)	-0.832 (1.29)	0.365 (0.66)	0.566 (1.28)	1.477*** (3.06)
Leverage	-1.412** (2.38)	-0.074 (0.13)	-0.951 (1.64)	-0.055 (0.10)	-0.139 (0.23)	0.133 (0.19)	-0.707 (1.09)	-0.751 (1.12)	-0.370 (0.61)	0.293 (0.43)
Market-to-book	0.271*** (3.92)	0.280*** (5.74)	0.093*** (3.92)	0.178*** (5.49)	0.205*** (4.53)	0.441*** (5.47)	0.242*** (4.29)	0.020 (0.73)	0.155*** (4.36)	0.142*** (2.84)
Stock Return _t	0.342*** (3.42)	0.160** (2.33)	0.497*** (4.37)	0.951*** (7.56)	0.658*** (5.12)	0.464*** (4.00)	0.244*** (3.06)	0.378*** (2.88)	0.240* (1.74)	0.212 (1.49)
Stock Return	0.244 (1.30)	0.040 (0.37)	0.059 (0.94)	0.120 (1.29)	0.439*** (2.83)	-0.715*** (3.27)	-0.195 (1.55)	0.189*** (2.59)	0.017 (0.17)	-0.153 (0.89)
Tenure	0.059*** (4.55)	0.080*** (5.56)	0.072*** (5.09)	0.085*** (7.20)	0.077*** (5.60)	-0.019 (1.25)	-0.022 (1.33)	-0.016 (0.98)	-0.013*** (2.64)	-0.041** (2.74) *
Adj. R-square	0.313	0.306	0.270	0.372	0.295	0.207	0.166	0.158	0.210	0.140
N	252	277	316	325	297	252	277	316	325	297

Table 12: Investment and financial policy surrounding hedging transactions

This table provides details of investment and financial policy surrounding the use of hedging instruments during the period 1996 to 2006. Control firms are selected by matching with hedging firms by book value of assets and 2-digit SIC code. We run a regression of each of the investment and policy measures on: Sample, Post and Sample*Post. Sample takes the value one if the firm's insiders use hedging instruments, and zero otherwise. Post takes the value one if the year follows the hedging transaction (Years +1 or +2), and zero if the year precedes the hedging transaction (Year -1). Year 0 is the fiscal year of the hedging transaction. Leverage is total long-term debt divided by book value of total assets. Investments is the sum of R&D, advertising and capital expenditures. Volatility is defined as the standard deviation of daily stock return. Standard errors are corrected for heteroskedasticity and clustering at the firm level.

		Year -1	Year +1	Year +2
R&D/Total Assets				
Mean	Sample	0.040	0.042	0.048
(Median)		(0)	(0)	(0)
Mean	Control	0.033	0.036	0.038
(Median)		(0)	(0)	(0)
Coefficient on <i>Sample*Post</i>			-0.001	0.002
<i>p-value</i>			0.772	0.519
Leverage				
Mean	Sample	0.193	0.179	0.176
(Median)		(0.130)	(0.121)	(0.124)
Mean	Control	0.198	0.209	0.207
(Median)		(0.149)	(0.169)	(0.164)
Coefficient on <i>Sample*Post</i>			-0.024	-0.026
<i>p-value</i>			0.031	0.037
Investments/Total Assets				
Mean	Sample	0.114	0.113	0.116
(Median)		(0.086)	(0.084)	(0.082)
Mean	Control	0.104	0.097	0.097
(Median)		(0.075)	(0.071)	(0.071)
Coefficient on <i>Sample*Post</i>			0.005	0.009
<i>p-value</i>			0.265	0.171
Standard deviation of daily stock returns				
Mean	Sample	0.036	0.037	0.033
(Median)		(0.033)	(0.028)	(0.026)
Mean	Control	0.035	0.034	0.031
(Median)		(0.030)	(0.028)	(0.026)
Coefficient on <i>Sample*Post</i>			0.001	0.000
<i>p-value</i>			0.456	0.836