NOTE TO USERS

Industry Hedging Level and Firm Risk Management

Zhen Wang

A Thesis in the John Molson School of Business

Presented in Partial Fulfillment of the Requirements for the Degree

of Master of Science (Administration)-Finance Option at

Concordia University

Montreal, Quebec, Canada

March 2008

Your file Votre référence
ISBN: 978-0-494-40988-6
Our file Notre référence
ISBN: 978-0-494-40988-6

ABSTRACT

Industry Hedging and Firm Risk Management

Zhen Wang

This thesis investigates the effect of the level of competition and the level of hedging within the industry upon individual firms' foreign exchange risk management behavior as well as firm value for a sample of 387 US firms in the S&P 1500. This is addressed by using an extensive set of hand-collected data that measures the extent of industry and firm hedging of exchange rate risk over the three year period from 2003 to 2005 and by constructing variables that capture the effect of competition and industry level hedging. The results suggest that the hedging level of the industry has no effect on firm value. However, the study verifies that a firm's competitive incentive to hedge will increase when most competitors decide to hedge.

ACKNOWLEDGEMENTS

I would like to acknowledge and thank many people who have greatly contributed to or have helped with the development of this thesis in their special ways.

My deepest gratitude goes first and foremost to Dr. Latha Shanker, my supervisor, for her constant encouragement, illuminating instruction, enlightening guidance and incredible patience. She has walked me through all the stages of this thesis by contributing disputable viewpoints and giving me many constructive suggestions during the difficult course of the thesis.

Second, I would like to express my heartfelt gratitude to the members of my thesis committee, Dr. Latha Shanker, Dr. Nilanjan Basu and Dr. Thomas Walker of the John Molson School of Business, Concordia University, whose involvement, dedication, and expertise have been vital during the whole course of my writing.

Last my thanks would go to my beloved family for their endless affection, loving consideration and great confidence. I would also like to take this opportunity to express my deepest thanks to my friends and my fellow classmates.

TABLE OF CONTENTS

List of Tables

Chapter I. Introduction

Risk management has recently gained much attention due to high volatility in the international financial markets. Researchers, analysts, and investors have extensively discussed firm's hedging decisions. As implied by the classic Modigliani and Miller (1987) paper on firm value in perfect capital markets, risk management is irrelevant to firm value. In addition, according to Smith and Stulz (1985), hedging is costly and is unnecessary as in the long run the losses and gains from currency fluctuations would offset.

On the other hand, research on the practical imperfections in capital markets show that hedging strategies should have a positive effect on firm value. Recent studies document that the firm values of non-users of derivatives are lower than those of derivative users (Allayannis and Weston, 2001). Various theories relate the value of hedging to financial distress costs, agency costs, bankruptcy costs, taxes, costly external financing, incomplete contracting and asymmetric information. More specifically, corporate hedging can alleviate many unsystematic risks by reducing the volatility of cash flows, and it can accommodate the risk aversion of undiversified managers. (Aretz K, Bartram S and Dufey G, 2007)

Furthermore, exchange rate risk is generally regarded as unsystematic, and even if it is systematic investors can themselves hedge the risk. (John Dobson, Luc Soenen,

1993) However, there is business risk which is difficult and often impossible to diversify and arises from uncertainties with respect to financial risks. Like, lower volatility of cash flows also leads to lower bankruptcy costs. (Aretz K, Bartram S and Dufey G, 2007) As a result, hedging has some impact on firm value, as investors can not always achieve risk reduction themselves through diversification.

The corporate use of derivatives including forwards and options, as a means of managing risks facing corporations, has increased steadily. In the business world, foreign currency hedging is considered to be a major strategic decision that can considerably affect profitability and risk management. Not only multinationals but also domestic firms are greatly affected by the volatility of foreign exchange rates. In recent years, investors have increasingly started to expect management to be able to identify and to manage their firm's exposure to such market risks. However, mainly due to the lack of public databases that provide information on the risk management activities, no widely-accepted theories have been established until now and it remains unclear whether their choices determine their hedge activities.

A. Research Topic

Brown (2001) implies that foreign currency hedging programs mitigate the negative effect of currency fluctuations on competitive markets. In a competitive industry, firms will be better off hedging foreign exchange risk. Therefore, firm value may

depend on the firm's competitive ability. If a firm's profit is more volatile, the firm will have lower competitive ability and firm value will decrease compared to its competitors. It is possible that changes in foreign exchange rates affect the systematic risk of the company. The underlying reason is that investors dislike uncertainty in profitability. Even if changes in foreign exchange rates affect only the unsystematic risk of the company, the company may want to hedge to reduce the possibility that it is unable to make payments on its debt--to avoid the risk of insolvency and resulting financial distress costs. The investor may not be able to eliminate this risk by diversification.

Suppose the industry sells its output to a foreign country and the price is denominated in the foreign currency unit (FCU). Competitive pressures in the industry make a single firm unable to change the prices that it charges without adverse effects. However, the output price may basically be influenced by the majority of competitors behaving similarly and may increase if the FCU decreases in value and decrease if the FCU increases in value. Let Company A represents a firm which belongs to this majority group which does not hedge. It means that most of competitors in its industry facing similar currency risks do not choose to hedge against FCU depreciation, they all will have the same cash flow fluctuations. Company B is a firm which hedges. If the foreign currency goes up in value relative to the domestic currency, the output price goes down. The profit of A will be unchanged but the profit

of B will decrease. If the foreign currency goes down in value, the output price goes up. The profit of A will be unchanged but the profit of B will increase. Therefore, while B hedges to reduce the uncertainty in its profits due to foreign exchange rate fluctuations, because the output price changes with the foreign exchange rate, the effect of hedging is nullified.

In contrast, considering the reverse situation in which Company A, which belongs to the majority group, hedges while Company B does not hedge, the correlation between prices and costs within the industry will be largely discounted. Thus competitiveness and the firm value of Company A is unaffected by currency fluctuation. If that is the case, then Company B, as an un-hedged firm, is exposed to relatively greater profit uncertainty. This higher earnings variability would hurt the firm's value, and would increase the firm's incentive to hedge.

In light of these scenarios, this thesis assumes that competitive considerations affect firm value and hypothesizes that the decision to hedge will be contingent on whether the firm's competitors also face foreign exchange exposure and whether they engage in foreign currency risk management. In other words, we assume that a firm's value and risk management behavior depend not only on its own hedging decisions, but also on the hedging decisions of its competitors. Firms with foreign exchange rate risks will follow the majority of hedge decisions of firms in the industry to reduce the

possibility that it is unable to make payments on its debt--to avoid the risk of insolvency and resulting financial distress costs. To sum up, a firm's incentive to hedge will increase when its competitors decide to hedge.

B. Research Objectives

Among the extant theories concerning the motives for corporate risk management, most concentrate on managerial incentives or market imperfections. Conflicting empirical conclusions are found using cross-sectional evidence, regarding the importance of derivatives portfolios in managing corporations' financial risk. In fact, the competitive structure of an industry is positively related to a firm's exchange rate exposure. However, few studies account for the effect that industry hedging may have on an individual firm's value or on its decision to hedge.

A Cournot-Oligopoly model (Allaz. and Vila, 1993) shows that prices are expected to positively co-vary with exchange related costs in competitive industries. As the degree of currency hedging in an industry rises, prices show less response to foreign exchange rates, producing more random profits. Since uncertainty in profits is undesirable, the decision to stay un-hedged will have an unfavorable impact on expected profits if a higher portion of competitors are hedged. Consequently, firms are more prone to hedge currency risk if a higher fraction of their rivals do so, even after controlling for industry level exposures to currency risk.

Thus, the objective of this study is to provide insight into the impact of hedging activities on firm value, given the level of a firm's foreign sales and the level of industry hedging. It is expected that the greater the degree of hedging in an industry, the greater the benefits of hedging activity to a firm.

Another objective is to check whether the hedging decisions of a firm's rivals contribute to its decision to hedge, if necessity for hedging arises. It is predicted that a firm's derivatives usage relies not only on its own risk exposure and its decision to hedge, but also on the level of hedging activities by other firms in the same industry.

C. Expected Contribution

Contribution 1

Until now there is only limited empirical evidence on how a firm's risk management choice and its value are affected by the hedging decisions of other firms in the same industry, as the recent finance literature focuses mostly on firm specific motives and the potential value derived from corporate hedging. Therefore, the study will contribute to the literature by showing the effect of competition on the value of a firm as well as its risk management choice. More specifically, we show that a firm's incentive to hedge increases as its main competitors hedge, and that its incentive decreases as its competitors choose not to hedge. Our empirical model generates potentially testable implications and provides meaningful empirical results regarding

the competitive motives of risk management.

Contribution 2

In addition, this paper adds value to the existing empirical research in that area by simultaneously examining both the hedging need of a firm and the degree to which the firm actually hedges. Nain (2005) focuses on the effect of hedging on firm value given the hedging level in the industry. Nevertheless, the impact of the degree of hedging on a firm's value and the need for that firm to hedge are ignored. Why these factors are essential to this model can be explained by a simple example whose sales include 5% in foreign sales. The impact of the industry hedging level is small compared to a firm whose foreign sales account for 95% of its total sales. In this paper, the impact of hedging on firm value given the hedging level in an industry is tested empirically. Our results are expected to show that the value of a firm that has a high level of foreign exchange risk exposure and operates in an industry with a high level of hedging, is adversely affected if it does not hedge. A further test will determine whether the hedging decisions of its competitors has any effect on a firm's decision to hedge if there is a need for hedging.

Contribution 3

A further contribution is that the methodology of this study will take into account both hedging practices and the level of competition in various industries. Geczy,

Minton and Schrand (1997) study a sample of Fortune 500 non-financial firms. Allayannis and Weston (2001) focus their research on non-financial firms with total assets of more than 500 million. Up to now most empirical tests of hedging behavior only explain a small fraction of the within-industry deviation in hedging practices. The problem comes from studying a single industry or using a small sample size. Therefore, the paper adds to the literature by examining the hedging activities of firms listed in the Standard & Poor's 1500 Composite Index, and by separately examining large cap, medium cap and small cap firms.

a. Implications for Managers and Investors

This paper presents an analytical description of the competitive motives for hedging, seeks to measure the impact of industry hedging levels on firm value and provides some insight into appropriateness of certain risk management decisions for managers. Managers should act on behalf of the company and investors. Our findings suggest that it is vital for managers to make decisions based not only on the company's own conditions and needs, but also to pay close attention to hedging activities by the firm's competitors in the same industry. A firm's failure to consider the actions taken by its competitors will likely cause it to lose value. Specifically, if a firm ignores its competitors' activities, its investors will require a higher rate of return to compensate them for the higher variability in the firm's cash flows and earnings, resulting in a lower stock price.

b. Implications for Researchers

This paper will accumulate existing theoretical and empirical literature in a system that allows for a consistent analysis of how a firm's value is affected by the level of hedging within its industry. Researchers can also use this model when considering the design and implementation of empirical studies. Managers' decisions have a direct and indirect effect on the profitability of the company, which, together with the investors' expected rate of return, determines firm value. If a firm is un-hedged in an industry which otherwise exhibits a high level of hedging activity, the company's value will likely be adversely affected. Researchers interested in the outcome of hedging within a given industry should consider how to measure the relationship between firm value and industry effect.

Chapter II. Literature Review

A. The Link between Hedging and Firm Value

A new measure of risk management activity - the delta percentage is developed by Tufano (1996). His results suggest that firms engage in hedging activities not only to boost firms' value but also to increase the manager's utility. However, the sample size used in Tufano's paper is comparatively small, so that the paper's empirical findings may be biased. Allayannis and Weston (2001) first observe the possible effects of foreign currency derivatives use on firm value in a sample of 720 large, non-financial U.S firms from 1990 to 1995. Their findings indicate that the firms realize a statistically and economically significant premium in terms of hedging activities, and that hedging causes a firm's value to increase. On the other hand, Guay and Kothari (2003) employ a different approach by regressing market value sensitivities on the determinants of derivatives usage. The reports show that the risk exposure hedged by financial derivatives constitutes only a small portion of the overall risk profile for the sample of 234 large non-financial firms and that hedging has a limited impact on firm value.

The finance literature demonstrates that the improved firm value from hedging is related to the costs of financial distress, contracting costs, the costs of raising external capital, taxes, and underinvestment problems. Smith and Stulz (1985) suggest that firms use derivatives to reduce the volatility of earnings since they have incentives to

reduce the possibility of financial distress, which is costly (Mayers and Smith, 1987; and Bessembinder, 1991). Because hedging decisions increase the firm's debt capacity, they also raise the value of the firm through an increase in tax shields (Graham and Rogers, 2002). In addition, corporate risk hedging increases firm value by reducing underinvestment problems (Lessard, 1990). This occurs because hedging assures the firm's access to capital when there are positive net present value projects. Finally, hedging reduces a firm's expected tax liability when the tax schedule is convex (Mayers and Smith, 1982).

B. Competitive Motive

The goal of running a business is to win by defeating competitors. Porter (1979, 1980) develops a competitive forces model, in which companies take actions to keep their competitive advantages. However, only limited research has touched upon the influence that competition might have on management decisions. Present research holds that firms affect each other's strategic choices. White (2002) demonstrates that firms in the same industry are mutually influential. Land, Deane, and Blau (1991) show that a firm's conduct, at least in part, is result from the influence of nearby others within the same industry. The research of Fligstein (1985) has shown that firms are likely to copy the decisions of other firms in the same industry. Adam, Dasgupta and Titman (2004) discover that the incentives of a firm to hedge may actually decrease with the extent of hedging by competitors. Allayannis and Weston

(1999) find a positive link between the degree of competition in an industry and the extent of derivatives usage in that industry. Geczy, Minton and Schrand (1997) further demonstrate that "in industries with many firms there is more heterogeneity in hedging decisions than in industries with relatively few firms".

There is an obvious difference between the studies of Allayannis and Weston (2001) and Guay and Kothari (2003), which may be the main cause of the differences in results. Allayannis and Weston automatically classify as derivative users those firms that report the use of foreign currency derivatives in the footnotes of their financial statement, while Guay and Kothari focus on the fraction of risk exposure hedged.

Hull (2005) and Nain (2005) provide stronger support that the volatility of cash flows and in turn the firm value of an individual hedged firm increases with the extent of hedging in the industry. They suggest that the reason is that there is a positive correlation between firms' hedging activities and the sensitivity of output prices to the foreign exchange rate shocks. Nain (2005) also shows that if a firm decides not to hedge its foreign exchange risk exposure, while hedging is widely used by its industry, that firm's value will be adversely affected.

C. Hedging Versus Speculation

Because of data unavailability, there are limited empirical tests of risk management theories. Earlier studies such as those by Nance et al. (1993) rely primarily on surveys. Firms have been required to disclose their derivatives use in footnotes only since the early 1990s. Thus, it is only since then that researchers can distinguish derivative users from nonusers. After that, more and more studies on derivatives use have emerged. Most studies such as Allayannis and Weston (2001) classify all derivative users as hedgers. Obviously, this method may exaggerate the total number of hedgers, since speculators are also included in the sample.

Haushalter (2000) provides a more precise estimate of hedging by using the portion of the present year's production hedged with derivatives as a proxy for the dependent variable. Admittedly, this method may also be inaccurate, because the production exposed to exchange risk is not identical for different firms. For example, a domestic firm may not have any exports, and, consequently, this firm does not have any incentive to hedge exchange risk. On the other hand, a multinational firm may sell all its products in foreign markets, so hedging exchange rate movements is more meaningful for it.

On the other hand, Mian (1996) labels firms as hedgers if they report their hedging activities distinctly, which means hedging is a significant percentage of its sales. This

method should at least exclude some speculators from the sample. The underlying reason is that value maximization theory predicts an increase in firm value following hedging activities. Accordingly, firms are less likely to hide their hedging activities when they do hedge. The limitation of this method is that firms are closer to non-hedgers if they hedge only a very small portion of their risks.

Following Mian (1996), in this paper hedgers are classified as those firms that clearly disclose their hedging activities. To better understand the relation between hedging and firm value, this research proposes to use the fraction of the current year's foreign sales that has been hedged with derivatives to capture the extent to which firms hedge their risk exposure.

Following Nain (2005) and Allayannis and Weston (2001), this study will also estimate the influence of hedging foreign currency derivatives on firm market value, using a proxy for hedging which is explained in the following section. The purpose of this paper is to shed light on the question of whether a firm's value is affected by the hedging decisions of its competitors.

Chapter III. Assumptions and Hypotheses

Most conventional theories indirectly relate hedging activities to higher firm value. However, empirical studies provide conflicting evidence of this link. Therefore, the first hypothesis of this study is that hedging activities lead to higher firm value.

Suppose that firms are competitors in their market and hedging activities lead to higher firm value. Further assume that companies observe the hedging choices of their competitors before deciding on their own hedging decision. If that is the case, then equilibrium demands each firm's hedging decision to be a best reaction to the hedging choices of its rivals. Also, in industries where derivatives use is common, firms may be better off to use derivatives for hedging purpose.

This paper will test the following two hypotheses.

Null Hypothesis 1:

The degree of hedging in an industry has no effect on the benefits of hedging activity to a firm.

In other words, then firm value of un-hedged companies, with significant foreign sales, will not be influenced by the degree of hedging within the industry.

Null Hypothesis 2:

The decision of the firm to hedge does not depend on the hedging level within the industry.

Chapter IV Sample Selection

The sample consists of firms that are part of on the S&P 1500 Composite Index with complete data throughout the time period from 2003 to 2005. For each firm-year observation, all other financial statement information needed for research models are obtained from the COMPUSTAT annual database. Data on institutional shareholdings and options holdings, the notional amount of derivative usage, and CEO ownership, are collected from proxy statements and annual reports. The firms in the final sample are firms with complete performance data available on COMPUSTAT.

Firms without foreign sales are excluded because the goal of this research paper is to examine only those firms that are a firm which is exposed to foreign exchange risk and thus have a need for hedging. SFAS 133 requires firms to clearly indicate whether they use derivatives for hedging or trading purposes. The financial footnotes and SEC 10-K filings are checked for the following keywords using a text search: hedge, derivative, financial instrument, forward, futures, swap, option, notional value, and fair value. SEC 10-K statements are downloaded from the EDGAR database maintained by the SEC. If any of the keywords are found, the surrounding text is read thoroughly to confirm that it refers to foreign currency derivatives. A firm is identified as a foreign currency derivative user for that year if it discloses the use of derivatives for hedging purposes. For firms that are classified as foreign currency derivative users for hedging purposes, information on the year-end gross notional

outstanding amounts of foreign exchange derivatives is collected. Firms which do not disclose foreign currency derivative use for that year are classified as foreign currency derivative non-users for hedging purposes for that year.

Chapter V. Methodology

A. Test for Hypothesis I

The first investigation concerns the relationship between derivatives use and firm value. According to the findings of Allayannis and Weston (2001), firm value (as measured by estimates of Tobin's Q) will be higher if U.S. firms use foreign exchange derivatives. The following analysis uses a multivariate test to investigate the relationship between firm value and industry derivatives use. These results confirm the doubt on the notion that firms which hedge show higher firm value by estimating OLS regressions with Tobin's Q as the dependent variable. Consequently, the analysis also tries to verify, in addition to other factors that are known to influence firm value, whether the competitive use of derivatives in the same industry drives firms to change their hedging decisions. Therefore, the effect of foreign exchange hedging on firm value given the level of foreign sales of a firm and the industry hedging activity is examined by employing the following regression model.

VALUE = f (FOREIGN, INDHEDGACT, DEGREE, (INDHEDGACT - INDHEDGACT AVERAGE) *(DEGREE - DEGREE AVERAGE), (DEGREE - DEGREE AVERAGE) *(FOREIGN - FOREIGN AVERAGE), SIZE, PROFIT, GROWTH, LEVERAGE, TIME)

a. Dependent Variable -- Proxy for firm value (VALUE)

Tobin's Q --- a measure of firm value

Habib and Ljungqvist (2005) define the present value of the cash flows generated by the firm's assets as firm value, which can be estimated by Tobin's Q, as follows:

Tobin's Q = (market value of equity + assets - book value of equity) / Total Assets

Market value of equity= Price * shares outstanding (CRSP)

Thus, Q will be greater than 1 if corporate actions will benefit the firm producing value. The more value produced, the higher the Q. Tobin's Q will be less than 1 if corporate actions will harm the firm, thus reducing value. The more value is reduced, the lower the Q.

b. Proportion of foreign sales (FOREIGN):

Allayannis and Ofek (2001) state that geographic diversification increases firm value. In line with their methodology, we calculate the fraction of foreign sales to total sales for each firm as a proxy for geographic diversification. We expect that this variable is positively related to firm value when the firm hedges more while its risk exposure is relatively high and hedges less while its risk exposure is relatively low. On the other hand, it would have a negative value when the firm hedges more while its risk exposure is low and hedges less while its risk exposure is high.

c. Degree of hedging by a firm (DEGREE)

Following Allayannis and Ofek (2001), the fraction of notional value of foreign currency derivatives contracts to total assets is used to measure the degree of hedging by a firm.

d. Hedging activity of an industry (INDHEDGACT)

All firms with the same first-digit SIC code in the sample are classified as belonging to one industry. For each industry, the fraction of hedging activity in an industry is calculated as the total number of firms in that industry disclosing foreign currency derivatives usage for hedging divided by the total number of firms exposed to foreign exchange risk in that industry.

e. Interaction variable

(INDHEDGACT-INDHEDGACT AVERAGE)(DEGREE-DEGREE AVERAGE)*

This interaction variable is used to investigate the difference in firm value between un-hedged and hedged firms in industries, which is the focus of this project. It implies that, for a company which has a significant amount of foreign sales, the firm value increases more with hedging activities, if other firms in the corresponding industry are widely hedged using derivatives. On the other hand, the decision to remain un-hedged by a firm which has a significant amount of foreign sales, when many other companies in an industry are hedging is viewed as a negative signal about

management's ability to recognize and manage foreign exchange risk. Accordingly, un-hedged firms in an industry where hedging is common may face lower firm value.

We expect a positive effect on value if the firm hedges more than average when the industry hedges more than average and the firm hedges less than average when the industry hedges less than average. On the other hand, we expect a negative effect on if the firm hedges more than average when the industry hedges less than average or the firm hedges less than average when the industry hedges more than average. Bellowing Table 1 shows possible effects of the interaction between industry hedging and firm hedging on firm value.

Insert Table 1

f. Control Variables

When estimating the effect of industry hedging on firm value, factors that have been known to impact firm value are controlled for in the regression. The control variables are similar to those used in previous research and the reasons for using them are given below.

Firm size (SIZE)

There is some evidence for US firms that large size leads to higher profitability

(Mueller, 1987, and Peitzman, 1977). It is argued that large firms are more likely to use derivatives than small firms because of the costs involved in setting up a hedging program. Therefore, total assets and total sales are used to control for size effects. It is expected that size is positively related to Tobin's Q.

Profitability (PROFIT):

Allayannis and Weston (2001) argue that a profitable firm is more likely to be valued higher than a less profitable one. If users of foreign currency derivatives are more profitable, they will have a higher value. To control for profitability, return on assets, defined as the ratio of net income to total assets will be used. It is expected that the profitability variable will be positively related to Tobin's Q.

Investment Growth (GROWTH)

Firm values are found to depend on future investment opportunities (Mayers, 1977, and Smith and Watts, 1992). Thus, the ratio of research and development expenditures to total sales is used as a proxy for investment growth (Yermack, 1996). It is expected that growth variables will be positively related to Tobin's Q.

Leverage (LEVERAGE)

According to Allayannis and Weston (2001), a firm's value can be affected by its capital structure. To control for differences in capital structure, we use a financial

leverage variable that is measured as the ratio of long term debt to shareholders' equity. It is expected that firms with more leverage will have a higher Tobin's Q.

Time effects (TIME)

Since firm observations are collected across multiple years, we use a yearly dummy to control for time varying effects. Time effects are controlled by using year dummies.

B. Test for Hypothesis II

It is noted by Nain (2005) that there might be a positive relationship between a firm's probability of hedging and the level of hedging in an industry. A logit model is used to examine whether a firm's decision to hedge is affected by the hedging level of other firms in this industry, if a need to hedge arises. The dependent variable is a hedging dummy that equals one if the firm discloses the use of foreign currency derivatives and zero otherwise.

DUMH = f (INDHEDGACT, FOREIGN, FOREIGN * INDHEDGACT, TAX, SUBS, SIZE, UNINVST, DISTRESS, MANGINC, INFOASY)

a. Decision to hedge (DUMH)

DUMH is equal to one if a firm uses foreign currency derivatives for hedging

purposes and zero otherwise.

b. Proportion of foreign sales (FOREIGN)

The fraction of foreign sales to total sales is expected to be positively related to hedging decisions since hedging exchange rate risk is more important for firms with a large proportion of foreign sales to total sales. This would have a positive effect on risk management decision to hedge while its risk exposure is relatively high. It would have a negative effect on risk management decision to hedge while its risk exposure is low.

c. Hedging activity in an industry (INDHEDGACT)

If hedging is common in an industry, firms are more like to hedge (Fligstein, 1985). All firms with the same first-digit SIC code in the sample are classified as belonging to one industry. For each industry, INDHEDGACT presents the fraction of hedging activity in an industry, which is calculated as the total number of firms in that industry disclosing foreign currency derivatives usage for hedging divided by the total number of firms exposed to foreign exchange risk in that industry.

*d. Interaction variable (FOREIGN * INDHEDGACT)*

This interaction variable is used to investigate the difference in firm hedge decision motive in industries, which is the second focus of this project. It implies that, for a

company which has a significant amount of foreign sales, the firm has a stronger motive to hedge, if other firms in the corresponding industry are widely hedged using derivatives as well. On the other hand, the motive to remain un-hedged by a firm will increase if a firm has an insignificant amount of foreign sales and operates in an industry in which hedging is uncommon.

Accordingly, our interaction of Foreign with INDHEDGACT is expected to be positively related to DUMH, because a firm's incentive to hedge increases with the number of other hedged firms in the industry, if a need to hedge arises.

e. Control Variables

Much of the literature argues that some firm specific characteristics might affect firm value. Kim and Lyn (1986), Morck and Yeung (1991), Bodnar, Tang and Weintrop, (1999) and Denis, Denis and Yost (2002) provide empirical support for research and development (R&D) and advertising expenditures as proxies for firm-specific (intangible) assets. Capital structure (debt) is also used to control for the valuation effects that may result from financial leverage. In the industrial diversification literature, Lang and Stulz (1994), Berger and Ofek (1995), and Servaes (1996) show the importance of controlling for firm size. Other factors such as growth opportunities (investment) and profitability are also included as additional corporate control variables. Table 2 provides an overview of our summary of control variables,

how they are estimated and their expected relationship with firm value.

Insert Table 2

Chapter VI. Empirical Results

A. Univariate Tests

The sample is constructed from firms that are part of the Standard & Poor's list of the S&P 1500 Composite Index (SPSUPX) which represents the top 1,500 stocks and mutual funds in the market. The S&P 1500 is comprised of stocks in the S&P 500 Large-Cap, S&P 400 Mid Cap Index, and S&P 600 Small Cap Index. Some of the companies in the initial sample are dropped owing to inability to locate the proxy statements or yearly reports for the fiscal years covered. Several observations also are deleted because of missing data in COMPUSTAT annual files. Therefore, the final complete data sample consists of 152 large cap firms, 96 mid caps and 135 small caps firms, giving us a total of 383 companies. Our empirical analysis covers a time period of 3 years, from 2003 to 2005.

This paper utilizes hand collected data relating to whether firms are hedging and the notional amount of derivatives used. The paper first describes the dispersion of hedging activities within these firms. These statistics of financial derivatives usage of firms of different sizes are presented in Table 3. The numbers of observations, mean, standard deviation and median values of the notional amount of derivatives are reported. All data are from 10-K disclosures and are measured in millions of dollar.

Panel A provides descriptive statistics for our sample of 152 large caps firms in the S&P 500 Large Cap Index. A firm is defined as a foreign exchange hedger if it provides a qualitative disclosure of any foreign currency hedging activity in its annual report. Panel B presents descriptive statistics on 96 median caps firms in the S&P 400 Mid Cap Index. Panel C presents descriptive statistics on 135 small capsfirms in the S&P 600 Small Cap Index.

Insert Table 3

Table 3 shows that there is a wide dispersion of derivative usage among hedging firms. On average, approximately 80% of the 152 firms listed in the S&P 500 Large Cap Index report the use of financial derivatives. Among the 96 firms listed in the S&P 400 Mid Cap Index, 40% of firms use foreign currency derivatives. Foreign currency derivatives are the least popular among firms in S&P 600 Small Cap Index (32% of 144). The standard deviation for the extent of hedging is $ 3000 million for large cap, $140 million for median cap and $45 million for small cap firms.

Given that in Table 3, as the percentage of hedgers in the sample of large cap firms (80%) is higher than that of mid (40%) and small cap firms (30%), it appears that large firms are more likely to hedge than medium and small size firms in response to foreign exchange risks. This phenomenon can be explained by the resource

constraints and financing problems of small firms. Recall that risk management requires hiring well-trained specialists and employing a large amount of extra funds, which make it an expensive activity that small firms may not be able to afford. The costs of these risk management activities can explain why larger firms hedge more. Also, larger firms usually have a greater proportion of foreign currency exposure and more funds to use, which provides another incentive for them to pay attention to risk management. Interestingly, despite their large size, for the large cap firms, compared to medium and small size firms, the speed of the increase of the percentage of firms which hedge in each year seems to be significantly lower in 3 year study periods. This fact suggests that an important risk management program is not exclusive to large firms nowadays.

The evidence suggests that small firms may belong to a strategic group that is distinct from that of their larger counterparts, and makes them face less competition. Small-firm profits are self-determining of other firm profits. Accordingly, large and small firms may repose different in same segments of the market instead of competing directly. Most importantly, this result suggests that larger firms are more likely to hedge and derivative users tend to be in more competitive economies.

Consider the differences in the underlying characteristics among these US companies. Much of the literature argues that some firm specific characteristics might affect firm

value. Table 4 provides some the descriptive statistics for our firm characteristic variables. The table reports the descriptive statistics of firm characteristics over the period 2003-2005. All variables are in dollar millions and defined in Table 2. All data are from 10-K disclosures. Means, medians, and standard deviations are reported.

Panel A provides firm characteristic data for the 152 large caps firms from the S&P 500 Large Cap Index. Panel B presents firm characteristics data for our 96 median caps firms in the S&P 400 Mid Cap Index. Panel C presents firm characteristics data for the 135 small cap firms in the S&P 600 Small Cap Index.

Insert Table 4

As noted above, our study breaks the sample into three groups according to firm sizes. Table 4 reports the descriptive statistics for the underlying characteristics used in the regression analysis for three sets of firms (large, median and small cap). The results demonstrate that firms with larger sizes have higher financial distress costs measured by leverage, have lower institutional shareholding and less managerial shareholding and options holdings. As a matter of fact, larger firms have higher tendency to suffer from the information asymmetry problem caused by the conflict of interests between managers and shareholders, because their activities are more complex to monitor.

The results reported in Table 3 and Table 4 further suggest that firms which are larger in terms of market value and sales revenues, derivatives for hedging more extensively. In addition, our results imply that the firms in the three groups present different characteristics. Firms use more derivatives in industries where fewer risk management substitutes exist. Moreover, higher financial distress leads to a stronger incentive to involve in hedge program. Our results consist with the previous literature that the risk management level adopted by a firm seems to be related to the costs of financial distress, contracting costs, the costs of raising external capital, taxes, and underinvestment problems.

B. Multivariate Tests

Test for Method I

As in Tufano (1996), our study investigates the determinants of the risk management decision for a dataset of 383 firms included in the S&P 1500 Composite Index. This research employs annual data from a more recent three year period from 2003 to 2005. These data allow for a greater number of observations and produce results that suffer less from problems related to small sample size. In addition, the large size of our sample makes it easier to capture the dynamic aspect a firm's the risk management decision. Finally, we employ a logit model in order to verify the theoretical arguments presented in the literature.

The first investigation concerns the relationship between derivatives use and firm value. An ordinary least squares (OLS) regression model is used to testify the relationship between firm value and industry derivatives use to account for the censoring of the dependent variable. The following analysis employs a multivariate test with Tobin's Q as a dependent variable. These results reject our hypothesis that firms with extensive hedging are valued higher.

VALUE = f (FOREIGN, INDHEDGACT, DEGREE, (INDHEDGACT - INDHEDGACT AVERAGE) *(DEGREE-DEGREE AVERAGE), (DEGREE-DEGREE AVERAGE) *(FOREIGN-FOREIGN AVERAGE), SIZE, PROFIT, GROWTH, LEVERAGE, TIME)

Table 5 reports an OLS regression with FX derivative use and firm value for large cap firms. The table displays the regression results for a sample of 152 large cap firms in the S&P 500 Large Cap Index. The dependent variable is Tobin's Q, which is calculated as the market value of total assets. INDHEDGACT presents the number of firms in an industry that use hedging divided by the total number of firms in that industry. P-values shown in boldface indicate that the corresponding coefficients of the regression are statistically significant at the 90% confidence level.

Insert Table 5

Table 6 provided the results for an OLS regression with FX derivative use and firm value for median cap firms. The table displays the regressions results for a sample of 96 median cap firms in the S&P 400 Mid Cap Index.

Insert Table 6

Table 7 provided the results for an OLS regression with FX derivative use and firm value for small cap firms. The table displays the results for a sample of 135 small cap firms in the S&P 600 Small Cap Index.

Insert Table 7

In table 5, 6 and 7, the coefficients on foreign sales and the industry derivatives usage level are not significant. Also, coefficients of the interaction of the industry derivative usage level relative to its average (DEGREE-AVERAGE) and the firm's hedging degree relative to its average (INDHEDGACT -AVERAGE) for all firm sizes have the anticipated sign they are not statistically significant. The null hypothesis of no correlation is accepted, which is that hedged and un-hedged firms are valued the same in spite of the level of hedging in the industry. It indicates that a firm's involvement in hedging activities does not depend on the competitive pressure within its industry. It is in line with some systematic theories that risk management is

irrelevant to firm value.

Test for Method II

A logit model is used to examine whether a firm's decision to hedge is affected by the hedging level of other firms in this industry, if a need to hedge arises. The dependent variable is a hedging dummy that equals one if the firm discloses the use of foreign currency derivatives and zero otherwise.

DUMH = f (INDHEDGACT, FOREIGN, FOREIGN * INDHEDGACT, TAX, SUBS, SIZE, UNINVST, DISTRESS, MANGINC, INFOASY)

Table 8, 9 and 10 show the logit regression estimates of how the extent of hedging in an industry affects a firm's decision to hedge. The extent of hedging in an industry is measured as the number of hedgers divided by the total number of firms in the industry. P-values shown in boldface indicate that the corresponding coefficients of the regression are statistically significant at the 90% confidence level.

Insert Table 8

Insert Table 9

Insert Table 10

According to the results of the logit model with all variables in Table 8, Table 9 and Table 10, most variables have the predicted coefficient as in Table 2 and are significant in explaining the probability that a firm will hedge. However, the coefficients of YEAR are not significant, possibly because "hedging with derivatives is a relatively new trend for risk management; whether the firm will hedge is not related to how seasoned the firm has been, but how willing the firm is in catching up new techniques". The coefficient on the interactive variable FOREIGN* INDHEDGACT is significant. The results reject the null hypothesis that a firm is likely to hedge when the extent of hedging in the industry is high. These results provide some evidence that a firm's hedging is influenced by hedging within its industry. A 1% increase in the extent of hedging in the industry results in a 253% increase in the probability of hedging for large cap firms. A 1% increase in the extent of hedging in the industry results in a 5.38% increase in the probability of hedging for mid caps. A 1% increase in the extent of hedging in the industry results in a 16.25% increase in the probability of hedging for small cap firms. Thus, large cap firms have a greater incentive to hedge and the effect of industry hedging is large compared to the effect of firm-specific control variables in the regressions.

Overall, as Table 8, Table 9 and Table 10 report, even when the endogenous relation

is controlled between the need for hedging and the competitive motive for risk management, firms will follow the industry "norm". The evidence also suggests that larger firms hedge more. Firms seem to hedge more when a sufficient number of their competitors actually take actions to hedge. This result also suggests that when there is an insufficient number of firms that use risk management, managers will be tempted not to hedge. The results also demonstrate that hedging is an increasing function of the level of hedging in the industry. The results reported confirm that firms manage risk because of the competitive motive, and are more willing to do so when they are large. This finding can be explained by the high costs of risk management. Recall that hedging activities such as hiring financial specialists and implement financial instruments are generally very costly and small firms might not be able to afford them.

Chapter VII. Conclusion

The study starts by constructing interactive variables that capture these effects. Using a proxy for the industry level of foreign exchange hedging activity, this research tests the effect of competition on foreign exchange risk management. This research extends Nain's (2004) work by taking into consideration both the hedging needs of a firm and the degree of hedging by a firm into consideration. However, the analysis suggests that even if a firm is un-hedged in a highly hedged industry, there will not be a significant negative effect on firm value. Therefore, the study contributes to the literature by demonstrating there is no impact of market competition on firm value, given the level of foreign sales of the firm and the level of industry hedging.

An important focus of firms' hedging strategies is to consider their competitors' actions. Adopting a foreign exchange hedging strategy that differs from "the norm" will expose firms to the increased competition risk from opponents. If a majority of firms in the same industry are "in the same boat," it will be easier for managers to handle the unexpected changes caused by the foreign exchange exposure. This thesis empirically tests the effect of competition and the level of hedging within its industry on the decision of a firm to hedge for a sample of US firms in S&P 1500. The study also adds empirical evidence that the hedging decisions of its rivals contribute to a firm's decision to hedge, if the necessity for hedging arises. Specifically, the incentive of an individual firm to hedge increases as its main competitors hedge, and the incentive decreases as its

competitors choose not to hedge. In other words, individual firms' derivatives usage depends on the level of hedging by other firms in their industries.

In particular, this research divides the sample into three sets according to firm size (large, median and small cap) and runs regressions separately. Firm size is shown to play an active role in the foreign exchange risk management decision and the results confirm that larger firms are more likely to hedge. The underlying reason might be that companies tend to manage exchange rate fluctuations to remain competitive. Larger firms are more able to manage margins successfully and smooth out the large swings of revenues and costs. In addition, foreign currency risk management is a costly activity that smaller firms might not be able to afford.

Another important implication of the empirical evidence of this paper is to capture the hedging activity of firms in various industries that are part of the listed in Standard & Poor's 1500 Composite Index. Industries differ in form and level of competition. Firms in highly competitive industries behave quite differently from firms in industries with low competition since competition is a key factor in determining how firms manage risk. However, different levels of competition may lead to different levels of hedging, thus having no effect on the outcomes for firm values. This paper seeks to measure the impact of industry hedging levels on firm value and provides insight into some aspect of risk management for managers. It is vital for managers to make decisions based

not only on the company's own conditions and needs, but also to pay close attention to the effect of the level of hedging by other competitors in the same industry.

Therefore, based on the above conclusions, some suggestions for foreign currency risk management are provided as follows:

A. Suggestions on hedging strategies for corporations

- Identify the FX risk level and evaluate the potential need for hedging

Foreign exchange risk exposure may cause tremendous earnings volatility and affect a firm's cash position, which increases the need for foreign currency risk management. It is vital to identify and quantify the foreign sales portion of the company so that there are realistic expectations of the need for hedge products.

- Research and assess the hedging activities of the company's competitors

An important focus of firms' hedging strategies is to observe their competitors' risk management activities. If a majority of firms in the same industry are "in the same boat," it will be easier for managers to reduce the possibility of adverse price movements caused by the foreign exchange exposure.

- Map the state of hedging activity in the whole industry

In some industries, more and more firms in the industry have realized the importance of

managing risk and are currently working to develop hedging programs. In some industries, no one hedges, thus there is no competitive advantage and everyone suffers together. Hence, managers need to obtain a clear idea of hedging within the industry.

- Develop risk management action plans

Managers should make sure that the risk management products and strategies are necessarily supported, properly executed, and regularly evaluated by senior management.

- Adjust hedge decisions accordingly

A risk management plan must be designed according to each organization' s particular goals, and market needs. The hedge decision should also be customized to each firm's risk tolerance.

B. Limitations and Future Research Avenues

The research is limited to consider that derivative holdings may measure, not only hedging activities, but also speculation. SFAS 133 requires firms to explicitly state whether they speculate with derivatives. However, speculative firms may present themselves as hedgers on purpose, since hedging activities are widely recognized as a value-increasing strategy.

In addition, this study simply uses firms' derivatives choices as a proxy for hedging choices. However, firms can hedge cash flows in many different ways, including other financial and operating strategies. This research could be extended by taking into consideration other methods that firms could use to hedge foreign exchange risk.

References

Adam, T., Dasgupta, S. and Titman, S., 2004, Financial Constraints, Competition, and Hedging in Industry Equilibrium, Hong Kong University of Science and Technology, Working Paper

Adam, T., and Chitru S. Fernando, 2003, Are There Speculative Components in Corporate Hedging and Do They Add Value? Hong Kong University of Science and Technology, Working Paper

Alkeback, P., and Hagelin N., 1999, Derivative Usage by Nonfinancial Firms in Sweden with an International Comparison., Journal of International Financial Management and Accounting 10:2, 105-121

Allayannis, G., and Ofek E., 2001, Exchange Rate Exposure, Hedging, and the Use of Foreign Currency Derivatives, Journal of International Money and Finance 20, 273-296

Allayannis, G., and Weston J.P., 2001, The Use of Foreign Currency Derivatives and Firm Market Value, Review of Financial Studies 14:1, 243-276.

Allaz, B. and Vila J.-L., 1993, Cournot Competition, Forward Markets and Efficiency, Journal of Economic Theory 59:1, 16

Aretz K., Bartram S. and Dufey G, 2007, Why hedge? Rationales for Corporate Hedging and Value Implications, Lancaster University Management School, Working Paper

Berger, P.G., E. Ofek, and Swary I., 1996, Investor Valuation of the Abandonment Option, Journal of Financial Economics, 42, 257-287.

Bessembinder, H., 1991. Forward Contracts and Firm Value: Investment Incentive and Contracting Effects, Journal of Financial and Quantitative Analysis, 26, 519-532.

Bodnar G., Charles T., and Joseph W., 1999, Both Sides of Corporate Diversification: The Value Impacts of Geographic and Industrial Diversification, National Bureau of Economic Research, Working Paper

Bodnar G., Abe de J. and, Victor M., 2003, The Impact of Institutional Differences on Derivatives Usage: A Comparative Study of US and Dutch Firms, European Financial Management, 9, 271-297

Braga S., Marcelo E., Vihang R. and Miller, Darius P., 2003, Does Corporate International Diversification Destroy Value? Evidence from Cross-Border Mergers and Acquisitions, (unpublished), Available at SSRN: http://ssrn.com/abstract=502322

Brown, G. 2001, Managing Foreign Exchange Risk with Derivatives, Journal of Financial Economics, 60:2/3: 401-491

Denis, D.J., Denis D.K. and Sarin A., 2002, Managerial Incentives and Corporate Diversification Strategies, Bank of America Journal of Applied Corporate Finance 10:2, 72-80.

Fligstein, N., 1985. The Spread of the Multidivisional Form, American Sociological Review, 50, 377-391

Geczy, C., Minton, B., and Schrand, C., 1999, Choices among Alternative Risk Management Strategies: Evidence from the Natural Gas Industry, University of Pennsylvania, Working Paper

Graham, J.R., and D.A. Rogers, 2002, Do Firms Hedge In Response to Tax Incentives? Journal of Finance 57:2, 815-840.

Graham John R, 1996, Debt and the Marginal Tax Rate, The Journal of Financial Economics, 41, 41-74

Guay, W. and S. P. Kothari, 2003, How Much Do Firms Hedge with Derivatives, Journal of Financial Economics, 70, 423-461

Gowri A, Mingjun T. and Zhen W., 2006, Firm Value and Hedging Level of Industry, Seminar in Financial Theory and Corporate Policy, Concordia University, Research Proposal

Haushalter, G.D. 2000, Financing Policy, Basis Risk, and Corporate Hedging: Evidence from Oil and Gas Producers, Journal of Finance 55:1, 107-152

Hull, J., 2005, Options, Futures and Other Derivatives (6th Edition), Prentice Hall College

John D. and Luc S., 1993, Three Agency-Cost Reasons for Hedging Foreign Exchange Risk, Barmarick Publications, 19: 6 , 35 – 44

Land, K., Deane, G., and Blau, J., 1991, Religious Pluralism and Church Membership: A Spatial Diffusion Model. American Sociological Review, 56, 237-249.

Lang, L.H.P. and Stulz, R., 1992, Effects of Bankruptcy Announcements on Competitors, Journal of Financial Economics, 32, 45-60.
Lessard, D.R., 1991, Global Competition and Corporate Finance in the 1990s, Journal of Applied Corporate Finance, 3: 4, 59-72

Mayers, D., and Smith C.W., 982, On the Corporate Demand for Insurance, Journal of Business, 55:2, 281-296.

Mayers, D., and Smith, Jr. C.W., 1987, Corporate Insurance and the Underinvestment Problem, Journal of Risk and Insurance, 54:1, 45-54.

Mian, S.L, 1996, Evidence on Corporate Hedging Policy, Journal of Financial and Quantitative Analysis, 31:3, 419-439.

Michel A. Habib and Alexander Ljungqvist, 2005, Firm Value and Managerial Incentives: A Stochastic Frontier Approach, Journal of Business, University of Chicago Press, 78: 6, 2053-2094

Modigliani and Mueller D., 1987, The Corporation: Growth, Diversification and Mergers, New York: Harwood Academic Publishers.

Morck, R. and Yeung B., 1991, Why Investors Value Multinationality, Journal of Business, 64: 165-187

Nain, A., 2005, Strategic Motives for Corporate Risk Management, University of Michigan, Working Paper

Nance D., Smith C. and Smithson C., 1993, On the Determinants of Corporate Hedging, The Journal of Finance, 48, 267-284

Porter, M. E., 1979, The Structure within Industries and Companies' Performance, Review of Economics and Statistics, 61:2, 214–27

Porter, M. E., 1980, Competitive Strategy: Techniques for Analyzing Industries and Competitors, New York, NY: Free Press, Copies are available at the Main and Seamus Heaney Libraries

Servaes, H., 1996, The Value of Diversification During the Conglomerate Merger Wave, Journal of Finance, 51: 1201-1225

Smith, C. and Watts R., 1992, The Investment Opportunity Set and Corporate Financing, Dividend, and Compensation Policies, Journal of Financial Economics, 32, 263-292.

Smith, C.W., and Stulz R.M., 1985, The Determinants of Firms' Hedging Policies, Journal of Financial and Quantitative Analysis, 20:4, 391-405.

Tufano Peter; 1996, Who manages risk? An Empirical Examination of Risk Management Practices in the Gold Mining Industry, The Journal of Finance, 51:4, 1097

Yermack, D., 1996, Higher Market Valuation of Companies with a Small Board of Directors, Journal of Financial Economics, 40, 185-211

Other Relevant Papers

Allayannis, G., Aretz K. and Bartram S.M., 2002, Corporate Hedging – Lessons Learned and Issues to be Explored, Darden School, Working Paper

Allayannis, Y., Brown G. and Klapper L., 2003, Capital Structure and Financial Risk: Evidence from East Asia, Journal of Finance, forthcoming

Allayannis G., Jane I., and James P. W., 2001, Exchange-rate Hedging: Financial vs. Operational Strategies, American Economic Review Papers & Proceedings, 91:2, 391-395

Allayannis G. and Ihrig J., 2001, Exposure and Markups, Review of Financial Studies, forthcoming

Amrita, N., 2005, The Strategic Motives for Corporate Risk Management, Department of Finance, University of Michigan, Working paper.

Amrita, N., 2005, Corporate Risk Management in an Industry Setting: An Empirical Investigation, Working Paper

Amrit Judge, 2004, The Determinants of Foreign Currency Hedging by UK Non-Financial Firms, Middlesex University, Working Paper

Antoine, G., 2006, Optimal Use of Futures Contracts for the Competitive Firm, Applied Financial Economics, 16: 5, 425.

Anand K., 1999, Firm Specific Factors and the Exchange Rate Exposure of Multinational Corporations, Florida Atlantic University, Doctor Dissertation

Armstrong, J., 1994, Competitor-oriented Objectives: The Myth of Market Share, Working Paper

Ardeshir J. Dalal and Moawia A., 2005, Competitive Firm Behavior with Simultaneous Price and Output Uncertainty, University of St. Andrews, Working Paper

Austin Murphy, 2006, Hedging Business Currency Risk, Working Paper

Aziz, L., 2004, Does Hedging Increase Firm Value? Evidence from Oil and Gas Producing firms, Working Paper

Bartram, S.M., 2000, Corporate Risk Management as a Lever for Shareholder Value Creation, Financial Markets, Institutions, and Instruments, 9:5: 279-324

Bartram, S.M., 2002, Enhancing Shareholder Value with Corporate Risk Management, Corporate Finance Review, 7:3: 7-12.

Berger, P.G., and E. Ofek, 1995, Diversification's Effect on Firm Value, Journal of Financial Economics, 37:1: 39-65

Berkman, H., Bradbury M.E., and Magan S., 1997, An International Comparison of Derivatives Use, Financial Management, 26:4: 69-73

Bartram, M. Sohnke, Gregory W. Brown and Frank R. Fehle, 2004, International Evidence on Financial Derivatives Usage, University of North Carolina, Working paper,

Berkman, H. and Bradbury M., 1996, Empirical Evidence on the Corporate Use of Derivatives, Financial Management, 25, 5-13

Bhagwan C. and Jonathan H., 1995, Corporate Risk Management for Multinational Corporations: Financial and Operational Hedging Policies, UCLA , Working Paper

Block, S. and, Timothy G., 1986, The Use of Interest Rate Futures and Options by Corporate Financial Managers, Financial Management, 15:.3, 73-78

Borokhovich K. A., Brunarski K. R; Crutchley C. E and Simkins, B. J, 2001, Borad Composition and Corporate Investment in Interest rate, Derivatives, Working Paper

Bodnar, G. and Gebhardt G., 1999, Derivatives Usage in Risk Management by US and German Non-financial Firms: A Comparative Survey, Journal of International Financial Management and Accounting, 10:3: 153-188.

Bodnar, G., Tang C. and Weintrop J., 1997, Both Sides of Corporate Diversification: The Value Impact of Geographical and Industrial Diversification, NBER, Working Paper.

Bodnar, G.M., Hayt G.S. and Marston R.C., 1998, 1998 Wharton Survey of Financial Risk Management by US Non-Financial Firms, Financial Management, 27:4: 70-91.

Bodnar, Gordon M., Gregory S. Hayt, and Richard C. Marston, 1996, 1995 Wharton Survey of Derivatives Usage by U.S. Non-financial Firms, Financial Management, 25, 113-133

Borokhovich K., Kelly B., Claire C. and, Betty S., 2004, Board Composition and Corporate Use of Interest Rate Derivatives, The Journal of Financial Research, 27: 2, 199-216

Brady S., 1994, A Hedge too Late, Corporate Finance, London: 110, 20-25

Breeden, D., and Viswanathan S., 1996, Why Do Firms Hedge? An Asymmetric Information Model, Duke University, Working Paper

Broll U., Schweimayer G., and Welzel P., 2003, Managing Credit Risk with Credit and Macro Derivatives, University of Augsburg, Discussion Paper, 252,

Brookes A., Hargreaves D., Lucas C .and White BD, 2000, Can Hedging Insulate Firms from Exchange Rate Risk? Reserve Bank of New Zealand Bulletin, 63:1, 21–34

Brown G., Peter C. and David H., 2003, Are Firms Successful at Selective Hedging? The University of North Carolina at Chapel Hill and Northwest Nazarene University, Working Paper

Campbell T.S., and Kracaw W.A., 1987, Optimal Managerial Contracts and the Value of Corporate Insurance, Journal of Financial Quantitative Analysis, 22:3, 315-328

Caillaud B., Georges D. and Bruno J., 2000, Corporate Insurance with Optimal Financial Contracting, Economic Theory, 16:1, 77-105

Carpenter J., 2000, Does Option Compensation Increase Managerial Risk Appetite? The Journal of Finance, 55: 5, 2311-2331

Carter, D. A., Rogers D. A., and Simkins B. J., 2003, Does Fuel Hedging Make Economic Sense? The Case of the US Airline Industry, Working Paper

Carter D. A., Christos P., and Betty J. S., 2001, Firmwide Risk Management of Foreign Exchange Exposure by U.S. Multinational Corporations, Oklahoma State University, Working Paper,

Carpenter J. N, 2000, Does Option Compensation Increase Managerial Risk Appetite? The Journal of Finance, 55:5; 2311

Chevalier, J. and Scharfstein D., 1995, Liquidity Constraints and the Cyclical Behavior of Markups, American Economic Review, 390-396

Christoph A., 2006, Spatial Agglomeration, Competition and Firm Size, Mimeo, University of Dortmund, Working Paper

Chowdhry B. and Jonathan T.B. Howe, 1999, Corporate Risk Management for Multinational Corporations: Financial and Operational Hedging Policies, European Finance Review, 2, 229-246

Chung, K. and Pruitt S., 1994, A Simple Approximation of Tobin's Q, Financial Management, 23, 70-74

Christine M C., Beverly J H., 2001, The Challenges of Risk Management in Diversified Financial Companies. Economic Policy Review - Federal Reserve Bank of New York, New York: 7: 1, 1-17

Cole E., Joan F. A., Kathleen E. and Sally L., Industry Analysis: The Five Forces, Purdue Extension, EC-722

Collins, R.A., 1985, Expected Utility, Debt-Equity Structure, and Risk Balancing, American Journal of Agricultural Economics, 67: 627-629

Collins, R.A., 1997, Toward a Positive Economic Theory of Hedging, American Journal of Agricultural Economics, 79: 488-499

Coase, R., 1937, The Nature of Firms, Economica, 4, 386-405

Core, J.E., Guay W.R., and Kothari S.P., 2002, The Economic Dilution of Employee Stock Options: Diluted EPS for Valuation and Financial Reporting, Accounting Review, 77:3, 627-653

Core J. and Guay W., 2002, Estimating the Value of Employee Stock Option Portfolios and Their Sensitivities to Price and Volatility; Journal of Accounting Research, 40: 3, 613

Craig H., 2006, Getting an Edge on the Competition, Logging & Sawmilling Journal, 31-33

Cross J., 2000, Gold Derivatives: The Market View; The World Gold Council Publications

Dalvi M. and Vincent G. M., 1999, Liquidity Risk for Firms and Financial Markets, Derivative Quarterly, 49-55

Dechow P., K., Watts S. R., 1998, The Relation between Earnings and Cash Flows, Journal of Accounting & Economics, 25, 133-168

DeMarzo P. and Duffie D., 1991, Corporate Financial Hedging with Proprietary Information, Journal of Economic Theory, 53, 261-286

DeMarzo P. M., and Darrell D., 1995, Corporate Incentives for Hedging and Hedge Accounting, Review of Financial Studies, 8, 743-771

DeMeza D., 1986, Safety in Conformity but Profits in Deviance, Canadian Journal of Economics, 19, 261-269

DeAngelo, H., and Masulis R.W., 1980, Optimal Capital Structure Under Corporate and Personal Taxation." Journal of Financial Economics, 8:1: 3-29

DeCeuster M.J.K., Durinck E., Laveren E. and Lodewyckx J., 2000, A Survey into the Use of Derivatives by Large Non-financial Firms Operating in Belgium, European Financial Management, 6:3: 301-318

Dionne G., and Thouraya T., 2005, On Risk Management Determinants: What Does Really Work? Mimeo, Risk Management Chair, HEC Montreal

Dionne G. and Garand M., 2003, Risk Management Determinants Affecting Firms' Values in the Gold Mining Industry: New Empirical Evidence; Economics Letters, 79:1, 43

Dionne, G, and Thouraya T, 2005, Risk Management and Corporate Governance: The Importance of Independence and Financial Knowledge for the Board and the Audit Committee, HEC Montreal, Canada.

Dionne, G., Robert G., François G. and Charles V., 1997, Debt, Moral Hazard and Airline Safety: an Empirical Evidence, Journal of Econometrics, 79, 379-402

Douglas J., Nile W. H., 2000, Using Strategic Commitment to Influence Competitor Response, Working Paper

Doherty N., 2000, Creating Value through Managing Corporate Risk: Insurance, Financial Products and Financial Strategies, Assurances, 68, 3, 309-332

Dolde W., 1995, Hedging, Leverage, and Primitive Risk, Journal of Financial Engineering, 4, 187-216

Don A., 2000, Why Corporations Should Hedge, ASX Perspective, 4th quarter, 29-32

Downie D., McMillan J. and Nosal E., 1996, The University of Waterloo Survey of Canadian Derivatives Use and Hedging Activities, In Managing Financial Risk, Yearbook 1996,C.W. Smithson, ed. CIBC-Wood Grundy: New York, 214-233

Dunning, J., 1973, The Determinants of International Product, Oxford Economic Papers, 25, 289-336

Elliott, W.B, Huffman S.P., and Makar S.D., 2003, Foreign Denominated Debt and Foreign Currency Derivatives: Complements or Substitutes in Hedging Foreign Currency Risk, Journal of Multinational Financial Management, 13: 2,123-139

Fehle, F.R., 1999, Panel Evidence on Corporate Risk Management, Canadian Journal of Administrative Sciences, 16, 229-242

Fehle, F.R., and Tsyplakov S., 2002, Dynamic Risk Management: Theory and Evidence, Working Paper

Fok R. C.W., Carolyn C. and Ming C. C., 1997, Determinants of Corporate Hedging and Derivatives: A Revisit, Journal of Economics and Business, 49, 569-585

Francis, J. and Stephan J., 1993, Characteristics of Hedging Firms: An Empirical Investigation, in Robert J. Schwartz and Clifford W. Smith, Jr., eds., Advanced Strategies in Financial Risk Management, New York Institute of Finance, 615- 635.

Froot K.A., Scharfstein D.S., and Stein J.C., 1993, Risk Management: Coordinating Corporate Investment and Financing Policies, Journal of Finance, 48:5, 1629-1658

Froot K.A., D.S. Scharfstein, and J.C. Stein 1994, A Framework for Risk Management, Harvard Business Review 72:6: 91-102.

Gay G. D. and Nam J, 1999, The Underinvestment Problem and Corporate Derivatives Use, Financial Management; 27:4, 53

Géczy, C., Minton B.A., and Schrand C., 1997, Why Firms Use Currency Derivatives, Journal of Finance 52:4, 1323-1354

Graham, J., Rogers, D., 2000, Is Corporate Hedging Consistent with Value Maximization? An Empirical Analysis, Duke University, Working Paper

Graham J. R; 1996, Proxies for the Corporate Marginal Tax Rate, The Journal of Financial Economics, 42, 187

Graham J. R and Smith C. W, 1999, Tax Incentives to Hedge, The Journal of Finance, 54:.6; 2241

Grant K., and Marshall A.P., 1997, Large UK Companies and Derivatives, European Financial Management, 3:2, 191-208

Greene W., 2002, The Bias of the Fixed Effects Estimator in Nonlinear Models, New York University, Working paper

Goldberg, S.R., Godwin J.H., Kim M., and Tritschler C.A., 1998, On the Determinants of Corporate Usage of Financial Derivatives, Journal of International Financial Management and Accounting, 9: 2, 132-166

Gregory W. B., Peter R. C. and David H., 2006, Are Firms Successful at Selective Hedging? Journal of Business, 79, 6

Gordon, B. and Gebhardt G., 1998, Derivatives Usage in Risk Management by U.S. and German non-Financial Firms: A Comparative Survey, Journal of International Financial Management & Accounting, 10:3, 153

Guay W., 1999, The Sensitivity of CEO Wealth to Equity Risk: an Analysis of the Magnitude and Determinants; Journal of Financial Economics, 53, 43

Guay, W. and Kothari S. P., 2003, How Much do Firms Hedge with Derivatives, Journal of Financial Economics, 70, 423-461

Guay, W., 1999, The Impact of Derivatives on Firm Risk: An Empirical Examination of New Derivatives Users, Journal of Accounting & Economics 26, 319-351

Hagelin, N., 2003, Why Firms Hedge With Currency Derivatives: An Examination of Transaction and Translation Exposure, Applied Financial Economics, 13, 55-69

Harry L. W., 1984, Exchange Rate Risk and the Multinational Firm, Doctor Dissertation, Texas A&M University

Han, L.-M, 1996, Managerial Compensation and Corporate Demand for Insurance, Journal of Risk and Insurance 63:3, 381-404

Haushalter, G.D. 2000, Financing Policy, Basis Risk, and Corporate Hedging: Evidence from Oil and Gas Producers, Journal of Finance 55:1, 107-152

Hentschel, L., and Kothari S.P., 2001, Are Corporations Reducing or Taking Risk with Derivatives? Journal of Financial and Quantitative Analysis, 36, 93-118

Howton, S.D., and Perfect S.B., 1998, Currency and Interest-Rate Derivatives Use in US firms, Financial Management, 27:4, 111-121

Hull J., 1997, Options, Futures and Other Derivatives (4th Edition), Prentice Hall, Englewood Cliffs, NJ

Hull J., 2002, Options, Futures and Other Derivatives (5th Edition), Prentice Hall, Englewood Cliffs, NJ

Hunter D., 2005, Time-Varying Exchange Rate Exposure of Small and Large Firms, University of South Florida, Unpublished Manuscript

Ian H. G., 2006, The Corporate Hedging Process, Adapted from an Article Published by Bank of Montreal, New York University

Jalilvand A., 1999, Why Firms Use Derivatives: Evidence from Canada, Canadian Journal of Administrative Sciences, 16:3; 213

Jay B.S. and Satchidananda S. S., 2006, Comparing Decision Trees with Logistic Regression for Credit Risk Analysis, Working Paper

Jensen, M.C., and Meckling W.H., 1976, Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, Journal of Financial Economics, 3, 305-360

Jin, Y. and Jorion P., 2006, Firm Value and Hedging: Evidence from U.S. Oil and Gas Producers, The Journal of Finance, 61:2

Jorion P., 1990, The Exchange Rate Exposure of U.S. Multinationals, Journal of Business, 63, 331-345.

Judge, A. P., 2005, Hedging and the Use of Derivatives: Evidence from UK Non-financial Firms, Middlesex University, Discussion Paper

Kedia S. and Abon M., 2003, Foreign Currency Denominated Debt: An Empirical Investigation, Journal of Business, 76: 4, 521-546

Keloharju M. and Mervi N., 2001, Why Do Firms Raise Foreign Currency Denominated Debt? Evidence from Finland, European Financial Management, 7:4, 481-496

Kesten C. G. and Scott A J., 2005, Competitor-oriented Objectives: The Myth of Market Share, International Journal of Business, forthcoming

Klaus, S., 2003. Hedging Foreign Exchange Risks: Theories and Evidence, Working Paper

Knopf J. D; Nam J. and Thornton J. H, 2002, The Volatility and Price Sensitivities of Managerial Stock Option Portfolios and Corporate Hedging; The Journal of Finance, 57:2, 801

Kim, D. K., 2002, Two Essays on Managerial Incentives and Corporate Decisions, Ph.D., University of South Carolina, 70

Lang, L. and Stulz R., 1994, Tobin's Q, Corporate Diversification and Firm Performance, Journal of Political Economy, 102, 1248-1280

La Porta, R, Lopez-de-Silanes F., Shleifer A., and Vishny R.W., 1998. Law and Finance, Journal of Political Economy, 106:6, 1113-1155

La Porta, R, Lopez-de-Silanes F., and Shleifer A., 1999, Corporate Ownership around the World, Journal of Finance, 54:2, 471-517

Lel U., 2002, Corporate Hedging Policy around the World, Working Paper

Lee M., 1995, Semi-Parametric Estimation of Simultaneous Equations with Limited Dependant Variables: a Case Study of Female Labor Supply, Journal of Applied econometrics, 10, 187

Leland H., 1998, Agency Costs, Risk Management, and Capital Structure, The Journal of Finance, 53: 4, 1213

Lim S., and Heli C. W., 2001, Stakeholder Firm-Specific Investments, Financial Hedging, and Corporate Diversification, Ohio State University, Working Paper

Lorrain, F. and Harrison W., 1971, Structural Equivalence of Individuals in Social Networks, Journal of Mathematical Sociology, 1, 49–80

Loderer, C. and Pichler K., 2000, Firms, Do You Know your Currency Risk Exposure? Survey results, Journal of Empirical Finance, 7: 317-344

MacMinn, R. and James G., 2000, On Corporate Insurance, in Handbook of Insurance, Georges Dionne (Ed.), Kluwer Academic Publishers, 541-564.

MacMinn, R.D., 1987, Insurance and Corporate Risk Management, Journal of Risk and Insurance, 54:4, 658-677.

Maddala G.S., 1991, Limited Dependant and Qualitative Variables in Econometrics, Cambridge University Press

Madura J., 1993, Coping with Exchange Rate Risk, Business Credit, ABI/INFORM Global, 95:9, 22

MacKay P. and Phillips G., 2003, How Does Industry Affect Firm Financial Structure, Working Paper

Marston R. C., 2001, The Effects of Industry Structure on Economic Exposure, Journal of International Money and Finance, forthcoming

Matthew, S. B., 2003, The Diffusion of the Sixth-Generation Processor in the Global Computer Industry, Competition and Social Influence, 108: 6, 1175–1210

Mayers, D., and Smith C.W., 1982, On the Corporate Demand for Insurance, Journal of Business 55:2, 281-296

Mayers, D., and Smith C.W., Jr. 1987, Corporate Insurance and the Underinvestment Problem, Journal of Risk and Insurance, 54:1, 45-54

Mian, S.L. 1996, Evidence on Corporate Hedging Policy, Journal of Financial and Quantitative Analysis 31:3: 419-439.

Michael D. G., 2006, Industry Competition and Total Factor Productivity Growth, U.S. Bureau of Labor Statistics, BLS Working Paper

Michelle A., 1999, Foreign Currency Exposure: Hedging Options, Journal of Practical Global Business

Miller M. H., and Franco M., 1961, Dividend Policy, Growth, and the Valuation of Shares, Journal of Business, 34, 411-433

Modigliani F., and Merton H. M., 1958, The Cost of Capital, Corporation Finance and the Theory of Investment, American Economic Review, 48, 261-297

Morellec E. and Smith C. W. Jr, 2002, Investment Policy, Financial Policies, and the Control of the Agency Conflicts, The Bradley Policy Research Center, Working Paper, 02, 16

Morck R. and Yeung B., 1991, Why Investors Value Multinationality, Journal of Business, 64, 165-187

Myers S.C., 1977, Determinants of Corporate Borrowing, Journal of Financial Economics, 5, 147-175.

Myers S.C, 1984, The Capital Structure Puzzle, Journal of Finance, 39:3, 575-592

Myers S.C., 1993, Still Searching for Optimal Capital Structure, The Revolution in Corporate Finance. Basil Blackwell, New York, NY, 91-99

Myers S., and Majluf N., 1984, Corporate Financing and Investment Decisions when Firms Have Information that Investors do not Have, Journal of Financial Economics, 13,187-221

Nance D., Smith C., and Smithson C., 1993, On the Determinants of Corporate Hedging, The Journal of Finance, 48, 267-284

Nicholas C., Mila G., Shane M H., Andrew W L., 2006, Do Hedge Funds Increase Systemic Risk? Economic Review - Federal Reserve Bank of Atlanta, 91: 4, 49-77

Norbert A., Why Hedge?- A Critical Review of Theory and Empirical Evidence, ZEW - Zentrum für Europäische Wirtschaftsforschung International Finance and Financial Management, L 7,1,D-68161 Mannheim

Olga I. and Darren H. M., 2001, Factors Affecting Hedging Decisions Using Evidence from the Cotton Industry, Paper presented at the NCR-134 Conference on Applied Commodity Price Analysis, Forecasting, and Market Risk Management
Peltzman S., 1977, The Gains and Losses from Industrial Concentration, Journal of Law and Economics, 20, 229-263

Pantzalis C., Betty J. S., and Paul L., 2001, Operational Hedges and the Foreign Exchange Exposure of U.S. Multinational Corporations, Journal of International Business Studies, 32, 793-812

Paul S., Ian S. and Andrew S., 2005, To Hedge or Not, Finance & Investment Conference, 19-21

Pennings, J.M.E., and Leuthold R.M., 2000, The Role of Farmers' Behavioral Attitudes and Heterogeneity in Futures Contracts Usage, American Journal of Agricultural Economics, 82: 908-919

Petersen M. A. and Thiagarajan R., 2000, Risk Measurement and Hedging: with and without Derivatives, Financial Management; 5

Peter M., Gordon M. P., 2003, How Does Industry Affect Firm Financial Structure, Southern Methodist University, University of Maryland and NBER, Working Paper

Phillips A. L., 1995, 1995 Derivatives Practices and Instruments Survey, Financial Management, 24: 2, 115-125

Rawls S.W., and Smithson C.W., 1990, Strategic Risk Management, Journal of Applied Corporate Finance, 2:4, 6-18.

Rajgopal S., Shevlin T., 1999, Stock Option Compensation and Risk Taking: The Case of Oil and Gas Producers, University of Washington, Working Paper

Rajan R. and Luigi Z., 1995, What Do We Know about Capital Structure? Some Evidence from International Data, Journal of Finance, 50: 5, 1421-1460

Rajgopal S. and Shevlin T., 2002, Empirical Evidence on the Relation between Stock Option Compensation and Risk Taking, Journal of Accounting & Economics, 33:2, 145

Richard D. P., David C. J. and Stephen D. S., 1996, Corporate Hedging in the Insurance Industry: The Use of Financial Derivatives by US Insurers, Financial Institutions Center

Richard C. M.，2001，The Effects of Industry Structure on Economic Exposure，Journal of International Money and Finance，20 ，149–164

Ross M. P., 1996, Corporate Hedging: What, Why and How? University of. California at Berkeley, Working Paper

Ross S., 1997, The Determination of Financial Structure: the Incentive Signaling Approach, Bell Journal of Economics, 8, 23-40

Rogers D. A., 2002, Does Executive Portfolio Structure Affect Risk Management? CEO Risk-Taking Incentives and Corporate Derivatives Usage, Journal of Banking & Finance, 26:2,271

Schrand C., and Unal H., 1998, Hedging and Coordinated Risk Management: Evidence from Thrift Conversions, Journal of Finance, 53:3, 979-1015

Servaes H. 1996, The Value of Diversification During the Conglomerate Merger Wave, Journal of Finance, 51, 1201-1225

Shapiro A.C., and Titman, S. S., 1986, An Integrated Approach to Corporate Risk Management, The Revolution in Corporate Finance, Basil Blackwell, New York, NY, 215-229.

Shapiro A. C., 2002, Multinational Financial Management, 7th edition, Prentice Hall Inc.,

Shapiro B.I., and Brorsen B.W., 1988, Factors Influencing Farmers= Decisions of Whether or Not to Hedge, North Central Journal of Agricultural Economics 10, 145-53.

Shmuel O. and Yumi O., 2007, Optimal Static Hedging of Volumetric Risk in a Competitive Wholesale Electricity Market, University of California, Working Paper

Smith C. and Watts R., 1992, The Investment Opportunity Set and Corporate Financing, Dividend, and Compensation Policies, Journal of Financial Economics, 32, 263-292

Smith C.W., and Stulz R.M., 1985, The Determinants of Firms' Hedging Policies, Journal of Financial and Quantitative Analysis, 20:4, 391-405

Smith C.W., Jr. 1995, Corporate Risk Management: Theory and Practice, Journal of Derivatives, 2:4, 21-30

Stulz R.M., 1984, Optimal Hedging Policies, Journal of Financial and Quantitative Analysis, 19:2, 127-140

Stulz R.M., 1990, Managerial Discretion and Optimal Hedging Policies, Journal of

Financial Economics, 26:1, 3

Stulz R.M., 1996, Rethinking Risk Management, Bank of America Journal of Applied Corporate Finance, 9, 8

Stulz R.M., 2002, Derivatives, Risk Management and Financial Engineering, Southwestern College, Working Paper

Tai M., 1998, Additional Evidence on the Determinants of Hedging: The Case of Taiwan Journal of Financial Studies, National Sun Yat-sen University, 6:2, 49-63

Ted R., Jessica C. and Martin F., The Gold Hedge Indicator, Alchemist Issue 31

Febrero, 1996, A Survey of Corporate Risk Management: Too hot to handle? - The art of risk-spreading, The Economist

Thilo P, 2004, Hedging with Credit Derivatives and its Strategic Role in Banking Competition, University Augsburg, Working Paper

Thouraya T., 2005, Research on Corporate Hedging Theories: A Critical Review of the Evidence to Date, Department of Finance and Canada Research Chair in Risk Management, HEC Montreal, Working paper

Titman S. and Wessels R., 1988, The Determinants of Capital Structure Choice, The Journal of Finance, 43:1, 1

Tim A., Sudipto D., Sheridan T., 2005, Financial Constraints, Competition and Hedging in Industry Equilibrium, Journal of Finance, forthcoming

Tom C. and Yash J. M., 1995, How to Evaluate Corporate FX Risk Management Programs, Working Paper

Tronstad R., 1991, The Effects of Firm Size and Production Cost Levels on Dynamically Optimal after-tax Cotton Storage and Hedging Decisions, Southern Journal of Agricultural Economics, 165-179.

Tufano P., 1996, Who Manages Risk? An Empirical Examination of Risk Management Practices in the Gold Mining Industry; The Journal of Finance, 51:.4, 1097
Tufano P., 1998, The Determinants of Stock Price Exposure: Financial Engineering and The Gold Mining Industry, The Journal of Finance, LIII, 3

Turvey C.G., and Baker T.G., 1989, Optimal Hedging under Alternative Capital Structures and Risk Aversion, Canadian Journal of Agricultural Economics, 37, 135-143

Turvey C. G., and Baker T.G., 1990, A Farm-Level Financial Analysis of Farmers' Use of Futures and Options Under Alternative Farm Programs, American Journal of Agricultural Economics, 72, 946-957

Turvey C. G., 1989, The Relationship between Hedging with Futures and the Financing Function of Farm Management, Canadian Journal of Agricultural Economics, 37, 629-638.

Warner J., 1977, Bankruptcy Costs: Some Evidence, Journal of Finance, 32, 337-348

Wong F., 2000, The Association between SFAS No. 119 Derivatives Disclosures and the Foreign Exchange Risk Exposure of Manufacturing Firms, Journal of Accounting Research, 38, 387-417.

Wysocki P., 1995, Determinants of Foreign Exchange Derivatives Use by U.S. Corporations: An Empirical Investigation, University of Rochester, Working paper

Wysocki P., 1996, Managerial Motives and Corporate Use of Derivatives: Some Evidence, University of Rochester, Working paper

Yermack, D., 1996. Higher market valuation of companies with a small board of directors, Journal of Financial Economics, 40, 185-211

Yanbo J. and Philippe J., Firm Value and Hedging: Evidence from U.S. Oil and Gas Producers, The Journal of Finance, LXI, 2

Young S. K., Ike M., and Jouahn N., 2003, Is Operational Hedging a Substitute for or Complement to Financial Hedging? Journal of Corporate Finance, forthcoming,

Zhen W., 2006, Research Proposal on How does the Hedging Behavior of Competitors Affect a Firm's Own Decision to Hedge? Concordia University, Research Proposal

Table 1 Possible Effects of the Interaction between Industry Hedging and Firm Hedging upon Firm Value

Industry hedging	Firm hedging	Outcome upon value	Firm Value
High	High	Positive	High
High	Low	Negative	Low
Low	High	Negative	Low
Low	Low	Positive	High

Table 2 Summary of control variables, how they are estimated, and their expected relationship with firm value

Control Variables	Symbol	Expected Relation	Estimator	Reasons
Firm size	SIZ	+	Value of log (total assets)	Larger firms are more likely to use derivatives because derivative usage is associated with economies of scale
Tax schedule	TAX	+	Net operating loss carry forward / total assets	If a firm's effective tax schedule is convex, then the expected taxes can be reduced by hedging
Substitutes for derivatives	SUBS	-	Value of convertible bonds and preferred stock / total assets	Derivative use should decline if firms have substitutes for derivative use
Financial Distress	DISTRESS	-	Earnings before interest and taxes / interest expenses	The benefits of hedging will increase if a firm faces higher costs of financial distress
Information asymmetry	INFOASY	-	Institutional ownership	Firms that face more information asymmetry are more likely to hedge

Under investment problem	UNINVES	+	(R&D development expense) / sales	Firms with under investment problem are more likely to use derivatives
Managerial incentives	MANGINC	-	(options + shares held by the CEO) / shares outstanding	If a manager's end of period wealth is a concave function of firm value, it is optimal for a manager to completely hedge the value of the firm

Table 3 Descriptive Statistics of Foreign Exchange Hedging Activity Disclosures

This table reports summary descriptive statistics (mean, median and standard deviation) of the variables used in the regression analysis. It presents data on the final complete data sample of 383 companies in the S&P 1500. The research time period is 3 years, from 2003 to 2005. All data are from 10-K disclosures. All values are in millions of dollar.

Panel A provides descriptive statistics on 152 large cap firms in the S&P 500 Large-Cap Index. A firm is defined as a foreign exchange hedger if it provides a qualitative disclosure of any foreign currency hedging activity in its annual report. Panel B presents descriptive statistics on 96 median cap firms in the S&P 400 Mid Cap Index. Panel C presents descriptive statistics on 135 small cap firms in the S&P 600 Small Cap Index.

Panel A Descriptive Statistics for Large Caps

Year	2003	2004	2005
Number of Hedgers	122	124	124
Sample Size	152	152	152
Percentage of Hedgers	80.26%	81.58%	81.58%
Mean of Notional Amount of Derivatives used for Hedging ($ millions)	886.05	929.93	929.38
Median of Notional Amount of Derivatives used for Hedging ($ millions)	89.00	102.20	115.50
Standard Deviation of Notional Amount of Derivatives used for Hedging ($ millions)	3168.91	3027.45	2800.43

Panel B Descriptive Statistics for Median Caps

Year	2003	2004	2005
Number of Hedgers	36	38	43
Sample Size	96	96	96
Percentage of Hedgers	37.50%	39.58%	44.79%
Mean of Notional Amount of Derivatives used for Hedging ($ millions)	52.28	66.90	67.91
Median of Notional Amount of Derivatives used for Hedging ($ millions)	0.00	0.00	0.00
Standard Deviation of Notional Amount of Derivatives used for Hedging ($ millions)	131.09	145.76	139.96

Panel C Descriptive Statistics for Small Caps

Year	2003	2004	2005
Number of Hedgers	44	43	50
Sample Size	135	135	135
Percentage of Hedgers	32.59%	31.85%	37.04%
Mean of Notional Amount of Derivatives used for Hedging ($ millions)	13.44	13.36	13.66
Median of Notional Amount of Derivatives used for Hedging ($ millions)	0.00	0.00	0.00
Standard Deviation of Notional Amount of Derivatives used for Hedging ($ millions)	49.01	44.69	35.76

Table 4 Descriptive Statistics of Firm Characteristics 2003-2005

The table reports the descriptive statistics of firm characteristics over the period 2003-2005. All variables are in dollar millions and defined in Table 2. All data are from 10-K disclosures. Means, medians, and standard deviations are reported.

Panel A provides firm characteristics data on 152 large caps firms in the S&P 500 Large-Cap Index. Panel B presents firm characteristics data on 96 median caps firms in the S&P 400 Mid Cap Index. Panel C presents firm characteristics data on 135 small caps firms in the S&P 600 Small Cap Index.

Panel A Firm Characteristics of Large Cap Firms

		2003			2004			2005		
Control Variables	Symbol	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation
Firm Size ($US mil)	SIZ	3.90	3.84	0.52	3.94	3.89	0.51	3.97	3.91	0.50
Tax Schedule (%)	TAX	0.05	0.01	0.30	0.06	0.01	0.39	0.07	0.01	0.44
Substitutes for Derivatives (%)	SUBS	0.03	0.00	0.06	0.02	0.00	0.04	0.01	0.00	0.04
Financial Distress (%)	DISTRESS	260.69	60.86	66.61	720.91	92.78	341.09	1881.43	106.07	1655.55
Information asymmetry (%)	INFOASY	17.74	16.23	13.85	18.73	17.90	13.34	19.96	17.16	14.44
Under investment problem (%)	UNINVES	0.08	0.03	0.10	0.07	0.03	0.07	0.07	0.03	0.07
Managerial incentives ($US mil)	MANGINC	5.09	4.67	1.51	5.10	4.60	1.54	5.10	4.60	1.66

Panel B Firm Characteristics of Median Cap Firms

		2003			2004			2005		
Control Variables	Symbol	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation
Firm Size ($US mil)	SIZ	3.14	3.16	0.31	3.19	3.20	0.33	3.23	3.25	0.32
Tax Schedule (%)	TAX	41.18	6.12	83.03	49.67	7.13	102.80	46.46	8.33	92.55
Substitutes for Derivatives (%)	SUBS	0.07	0.00	0.18	0.06	0.00	0.15	0.05	0.00	0.13
Financial Distress (%)	DISTRESS	222.24	56.59	544.92	520.44	68.38	2079.14	400.23	68.86	1647.74
Information asymmetry (%)	INFOASY	24.49	21.43	15.58	25.17	24.43	15.25	24.51	21.60	15.58
Under investment problem (%)	UNINVES	0.07	0.03	0.10	0.07	0.03	0.09	0.07	0.03	0.09
Managerial incentives ($US mil)	MANGINC	3.38	1.50	7.48	2.83	1.35	5.68	2.25	1.03	4.92

Panel C Firm Characteristics of Small Cap Firms

		2003			2004			2005		
Control Variables	Symbol	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation
Firm Size ($US mil)	SIZ	2.58	2.65	0.37	2.60	2.67	0.42	2.65	2.67	0.41
Tax Schedule (%)	TAX	24.12	7.94	44.58	26.24	8.29	48.15	28.07	7.33	48.13
Substitutes for Derivatives (%)	SUBS	0.06	0.00	0.13	0.05	0.00	0.12	0.05	0.00	0.11
Financial Distress (%)	DISTRESS	309.20	5.20	2589.26	139.76	6.42	718.99	211.11	6.63	1031.48
Information asymmetry (%)	INFOASY	29.49	30.70	14.45	29.23	28.85	13.99	29.52	29.36	14.53
Under investment problem (%)	UNINVES	0.09	0.04	0.13	0.09	0.04	0.13	0.08	0.04	0.11
Managerial incentives ($US mil)	MANGINC	2.02	2.45	8.37	2.87	2.20	8.26	2.29	1.97	7.70

Table 5 OLS Regression with FX Derivative Use and Firm Value for Large Cap

The Table displays the results by estimating OLS regressions for a sample of 152 large caps firms in the S&P 500 Large-Cap Index. The dependent variable is Tobin's Q, which is calculated as the market value of total assets to book value. INDHEDGACT presents the number of firms in an industry that use hedging divided by the total number of firms in that industry. P-values shown in boldface indicate that the corresponding coefficients of the regression are statistically significant at the 95% confidence level.

VALUE = f (FOREIGN, INDHEDGACT, DEGREE, (INDHEDGACT - INDHEDGACT AVERAGE) *(DEGREE-DEGREE AVERAGE), (DEGREE-DEGREE AVERAGE) *(FOREIGN-FOREIGN AVERAGE), SIZE, PROFIT, GROWTH, LEVERAGE, TIME)

Dependent Variable: TOBIN_Q			
Method: Least			
Included observations: 456			
Variable	Coefficient	Standard Error	Probability
C	0.0787	0.1867	0.6735
FOREIGN	0.1694	0.2151	0.4316
INDHEDGACT	-0.834	0.7047	0.2374
DEGREE	10.848	3.192	**0.0007**
(DEGREE-AVERAGE)* (INDHEDGACT -AVERAGE)	20.269	33.051	0.5411
SIZE	-0.232	0.0815	0.0046
PROFIT	0.1083	0.0061	**0**
GROWTH	6.696	0.481	**0**
LEVERAGE	-0.025	0.0382	0.5107
YEAR03	0.3971	0.0951	0
YEAR04	0.2232	0.0929	0.0167
R-squared	0.5809	Mean of dependent Variable	2.4238
Adjusted R-squared	0.5724	Standard Deviation of dependent Variable	1.2191
Standard Error	0.7971	F-statistic	68.6982
Log likelihood	-538.6010	Probability (F-statistic)	0
Durbin-Watson statistics	1.6949		

Table 6 OSL Regression with FX Derivative Use and Firm Value for Median Cap Firms

The table displays the results by estimating OLS regressions for a sample of 96 median caps firms in the S&P 400 Mid Cap Index. The dependent variable is Tobin's Q, which is calculated as the market value of total assets to book value. INDHEDGACT presents the number of firms in an industry that use hedging divided by the total number of firms in that industry. P-values shown in boldface indicate that the corresponding coefficients of the regression are statistically significant at the 95% confidence level

VALUE = f (FOREIGN, INDHEDGACT, DEGREE, (INDHEDGACT - INDHEDGACT AVERAGE) *(DEGREE-DEGREE AVERAGE), (DEGREE-DEGREE AVERAGE) *(FOREIGN-FOREIGN AVERAGE), SIZE, PROFIT, GROWTH, LEVERAGE, TIME)

Dependent Variable: TOBIN_Q			
Method: Least Squares			
Included observations: 288			
Variable	Coefficient	Standard Error	Probability
C	4.6770	0.6817	0
FOREIGN	-0.3117	0.2187	0.1553
DEGREE	0.1673	0.1449	0.2492
INDHEDGACT	-0.6284	0.5803	0.2798
(DEGREE-AVERAGE)* (INDHEDGACT -AVERAGE)	0.5168	2.2338	0.0817
SIZE	-0.8541	0.1798	**0**
PROFIT	0.0934	0.0077	**0**
GROWTH	3.8981	0.5782	**0**
LEVERAGE	-0.3410	0.0702	**0**
YEAR03	-0.0519	0.1243	0.6761
YEAR04	0.0112	0.1177	0.9237
R-squared	0.5983	Mean of dependent Variable	2.1515
Adjusted R-squared	0.5838	Standard Deviation of dependent Variable	1.2061
Standard Error	0.7780	F-statistic	41.2665
Log likelihood	-330.7780	Probability (F-statistic)	0
Durbin-Watson statistics	1.8275		

Table 7 OLS Regression with FX Derivative Use and Firm Value for Small Caps

The Table displays the results by estimating OLS regressions for a sample of 135 small caps firms in the S&P 600 Small Cap Index. The dependent variable is Tobin's Q, which is calculated as the market value of total assets to book value. INDHEDGACT presents the number of firms in an industry that use hedging divided by the total number of firms in that industry. P-values shown in boldface indicate that the corresponding coefficients of the regression are statistically significant at the 95% confidence level

VALUE = f (FOREIGN, INDHEDGACT, DEGREE, (INDHEDGACT - INDHEDGACT AVERAGE) *(DEGREE-DEGREE AVERAGE), (DEGREE-DEGREE AVERAGE) *(FOREIGN-FOREIGN AVERAGE), SIZE, PROFIT, GROWTH, LEVERAGE, TIME)

Dependent Variable: Q			
Method: Least Squares			
Included observations: 396			
Variable	Coefficient	Standard Error	Probability
C	6.8189	0.4896	0
FOREIGN	-0.7182	0.2700	**0.0081**
INDHEDGACT	-0.1416	0.5897	0.8103
DEGREE	0.0608	0.3542	0.8638
(DEGREE-AVERAGE) *(INDHEDGACT -AVERAGE)	1.0087	0.5895	0.0879
SIZE	-1.9263	0.1735	**0**
PROFIT	4.5363	0.5719	**0**
GROWTH	3.5518	0.6437	**0**
LEVERAGE	0.0003	0.0004	0.5059
YEAR03	0.1062	0.1435	0.4598
YEAR04	0.1313	0.1422	0.3564
R-squared	0.3882	Mean of dependent Variable	2.2256
Adjusted R-squared	0.3755	Standard Deviation of dependent Variable	1.4607
Standard Error	1.1542	F-statistic	30.6990
Log likelihood	-614.1560	Probability (F-statistic)	0
Durbin-Watson statistics	1.8872		

Table 8 Logit Estimates of the Likelihood of FX Hedging for Large Caps

This table shows logit regression estimates of how the extent of hedging in an industry affects a firm's decision to hedge. The dependent variable is a hedging dummy that equals one if the firm does not disclose the use of foreign currency derivatives and zero otherwise. The extent of hedging in an industry is measured as the number of hedgers divided by the total number of firms in the industry. P-values shown in boldface indicate that the corresponding coefficients of the regression are statistically significant at the 95% confidence level.

DUMH = f (INDHEDGACT, FOREIGN, FOREIGN * INDHEDGACT, TAX, SUBS, SIZE, UNINVST, DISTRESS, MANGINC, INFOASY)

Dependent Variable: DUMH				
Method: ML - Binary Probit (Quadratic hill climbing)				
Included observations: 449				
Covariance matrix computed using second derivatives				
Variable	Coefficient	Standard Error	z-Statistic	Probability
C	-2.4181	1.2076	-2.0023	**0.0452**
INDHEDGACT *FOREIGN	253.0861	42.4207	5.9660	**0**
FOREIGN	2.0075	0.6545	3.0671	**0.0022**
TAX	-4.9618	4.4981	-1.1031	0.2700
SUBSTITUTES	-6.5270	3.0059	-2.1713	**0.0299**
SIZE	0.6175	0.2752	2.2439	**0.0248**
UNDERINVEST	-3.2967	1.6173	-2.0383	**0.0415**
FINDISTRESS	8.74E-05	0.0001	0.6032	0.5463
MAGINCENT	-0.1457	0.0635	-2.2930	**0.0218**
INSTITUTIONAL	-0.0116	0.0093	-1.2429	0.2139
Mean of dependent variable	0.8240	Standard Deviation of Dependent Variable		0.3811
Standard Error of regression	0.2486	Average. log likelihood		-0.1981
Log likelihood	-88.9890			
Observations with Dependent=0	79	Total observations		449
Observations with Dependent=1	370			

Table 9 Logit Estimates of the Likelihood of FX Hedging for Median Caps

This table shows logit regression estimates of how the extent of hedging in an industry affects a firm's decision to hedge. The dependent variable is a hedging dummy that equals one if the firm does not disclose the use of foreign currency derivatives and zero otherwise. The extent of hedging in an industry is measured as the number of hedgers divided by the total number of firms in the industry. P-values shown in boldface indicate that the corresponding coefficients of the regression are statistically significant at the 95% confidence level.

DUMH = f (INDHEDGACT, FOREIGN, FOREIGN * INDHEDGACT, TAX, SUBS, SIZE, UNINVST, DISTRESS, MANGINC, INFOASY)

Dependent Variable: DUMH				
Method: ML - Binary Probit (Quadratic hill climbing)				
Included observations: 285				
Covariance matrix computed using second derivatives				
Variable	Coefficient	Standard Error	z-Statistic	Probability
C	-1.2226	1.0237	-1.1943	0.2323
FOREIGN	-1.0672	1.4459	-0.7380	0.4605
FOREIGN* INDHEDGACT	5.3751	3.1212	1.7220	**0.0851**
TAX	0.0022	0.0010	2.2112	**0.0270**
SUBS	-0.7258	0.8095	-0.8966	0.3699
SIZE	0.1628	0.3106	0.5241	0.6002
UNINVES	0.2328	1.3788	0.1688	0.8659
DISTRESS	-0.0005	0.0002	-2.2388	**0.0252**
MANGINC	-0.0167	0.0143	-1.1656	0.2438
INFOASY	0.0018	0.0058	0.3172	0.7510
Mean of dependent variable	0.4000	Standard Deviation of Dependent Variable		0.4907
Standard Error of regression	0.4649	Average. log likelihood		-0.6009
Log likelihood	-171.2700			
Observations with Dependent=0	171	Total observations		285
Observations with Dependent=1	114			

Table 10 Logit Estimates of the Likelihood of FX Hedging for Small Caps

This table shows logit regression estimates of how the extent of hedging in an industry affects a firm's decision to hedge. The dependent variable is a hedging dummy that equals one if the firm does not disclose the use of foreign currency derivatives and zero otherwise. The extent of hedging in an industry is measured as the number of hedgers divided by the total number of firms in the industry. P-values shown in boldface indicate that the corresponding coefficients of the regression are statistically significant at the 95% confidence level

DUMH = f (INDHEDGACT, FOREIGN, FOREIGN * INDHEDGACT, TAX, SUBS, SIZE, UNINVST, DISTRESS, MANGINC, INFOASY)

Dependent Variable: DUMH				
Method: ML - Binary Logit (Quadratic hill climbing)				
Included observations: 396				
Covariance matrix computed using second derivatives				
Variable	Coefficient	Standard Error	z-Statistic	Probability
C	-2.4868	0.9917	-2.5074	0.0122
FOREIGN	-5.2568	1.6961	-3.0992	**0.0019**
FOREIGN* INDHEDGACT	16.2508	4.2314	3.8405	**0.0001**
TAX	0.0220	0.0281	0.7842	0.4329
SUBS	0.7508	0.9078	0.8270	0.4082
SIZE	0.6483	0.3478	1.8637	0.0624
UNINVES	-0.7133	1.2260	-0.5817	0.5607
DISTRESS	5.98E-05	3.93E-05	1.5211	0.1282
MANGINC	4.4537	1.5302	2.9104	**0.0036**
INFOASY	-1.4119	0.8452	-1.6703	0.0948
Mean of dependent variable	0.3459	Standard Deviation of Dependent Variable		0.4762
Standard Error of regression	0.4594	Average. log likelihood		-0.5928
Log likelihood	-234.7490			
Observations with Dependent=0	259	Total observations		396
Observations with Dependent=1	137			

Table 11: Possible Effects of the Interaction between Industry Hedging and Firm Hedging upon Firm Value using Alternative Method:

According to the requirements of the committee members, another methodology is used to test possible effects of the interaction on firm value

Interaction Variables=1 if (Degree-Degree Average)*(Industry-Industry Average) >0

Interaction Variables=0 if (Degree-Degree Average)*(Industry-Industry Average) <0

As the results of the regression of firm value upon the relevant variables show, the coefficient of the interaction variable is not statistically significant for large, median and small cap firms.

Industry hedging	Firm hedging	Interaction Variables	Firm Value
High	High	1	High
High	Low	0	Low
Low	High	0	Low
Low	Low	1	High

Panel A: Results for large cap firms:

Dependent Variable: TOBIN_Q			
Method: Least Squares			
Sample: 1 456			
Variable	Coefficient	Std. Error	Prob.
C	1.915574	0.340426	0
FOREIGN	0.076485	0.187248	0.6831
DEGREE	0.166023	0.217402	0.4455
INTERACTION	0.022855	0.087032	0.793
SIZE	-0.23228	0.081478	0.0046
PROFIT	0.108308	0.006113	0
GROWTH	6.692074	0.481207	0
LEVERAGE	-0.02526	0.038257	0.5094
YEAR03	0.385595	0.103967	0.0002
YEAR04	0.224022	0.092985	0.0164

Panel B: Results for median cap firms:

Dependent Variable: TOBIN_Q			
Method: Least Squares			
Sample: 1 288			
Variable	Coefficient	Std. Error	Prob.
C	4.32549	0.614107	0
FOREIGN	-0.39443	0.219565	0.0735
DEGREE	0.17833	0.148876	0.232
INTERACTION	-0.05299	0.103759	0.61
SIZE	-0.82381	0.179926	0
PROFIT	0.095705	0.007675	0
GROWTH	4.059032	0.573802	0
LEVERAGE	-0.34545	0.069987	0
YEAR03	0.00595	0.117909	0.9598
YEAR04	0.053355	0.114366	0.6412

Panel C: Results for small cap firms:

Dependent Variable: Q			
Method: Least Squares			
Sample: 1 396			
Variable	Coefficient	Std. Error	Prob.
C	7.069038	0.483526	0
FOREIGN	-0.99896	0.25537	0.0001
DEGREE	0.045831	0.030272	0.1309
INTERACTION	-0.0103	0.134266	0.9389
SIZE	-1.89429	0.171395	0
PROFIT	4.624558	0.564211	0
GROWTH	3.808569	0.63902	0
LEVERAGE	0.000393	0.000371	0.2908
YEAR03	0.086094	0.141072	0.542
YEAR04	0.116393	0.139692	0.4052