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Essays on Currency Risk Management

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ESSAYS ON CURRENCY RISK MANAGEMENT

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ABSTRACT

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In recent years a growing number of corporations have committed considerable resources to risk management, indicating the potential for risk management to protect and increase firm value. One can argue that most prior attempts to directly link the value of the firm to its hedging strategies are rather scant. Moreover, several questions with regards to firms' risk management activities remain unanswered. This study consists of two essays dealing with a series of questions regarding corporate risk management in modern U.S. multinational corporations.

In the first essay we first, test the valuation effects of currency hedging policies of firms around extraordinary exchange rate instability events. The exchange rate shocks of the Asian Currency crisis of 1997 and the Brazilian Real Devaluation of 1999 are used as the exchange rate instability events. These two currency crises provide us with a unique set of exogenous events to assess the effectiveness of currency risk management. The valuation effect is implemented by using two measures of firm value, namely Tobin's Q ratio and the firm's Excess Market Value. Second, we conduct tests specifically designed to shed light on the effectiveness of natural and financial hedges, in the attempt to determine whether financial hedging and non-financial (natural) hedging techniques are complementary or substitutive means for risk management during periods of exchange rate shocks.

By using a large cross section of non-financial firms from the S&P 500, results of the first essay indicate that firms, which hedged their foreign exchange exposures using foreign currency derivatives, were rewarded by the market at times of exchange rate turbulence. This result is robust for both the Asian and for the Brazilian financial crises and regardless of the measure of valuation used. Second, results show that firms that hedged their currency exposure using both

financial and non-financial hedging techniques were rewarded by a positive market valuation at the time of exchange rate shocks. The positive valuation impact is shown to be stronger when the total number of foreign country operations (GEO_2) is used to proxy for non-financial hedging, rather than using foreign sales/total sales ratio (GEO_1), which is a measure often used in the literature as a proxy for the same variable. Our results indicate that financial and natural hedging are complementary techniques in managing currency risk and shielding firm value against severe and abrupt exchange rate movements. This result is also robust for both currency crises and regardless of the valuation measure used.

In the second essay we investigate the relationship between currency risk management activities, firm value and the agency-related costs arising from the separation of ownership and control. Specifically, we test the damaging effects of corporate hedging motivated by the managerial risk preferences hypothesis as outlined by Tufano (1998). This study is the first to use the Corporate Governance Index (G); a state of the art measure, to proxy for the level of agency costs in the firm and relate it to the firm's currency hedging profile.

Using a sample of 1422 firm year observations from the S&P 500 during the 1990's, our results indicate that currency hedging is a value increasing strategy. Moreover, results of the valuation effects of hedging for firms that suffer from very weak governance structures and with severe agency costs (firms in the highest deciles of the G index) indicate that hedging is **not** a value destroying strategy. Using two alternative methods of valuation results show that hedging firms, in the above category, still outperformed their non-hedging counterparts and that the average hedging premium is positive and significant.

Overall, our findings do not support the negative valuation effect as predicted by Tufano (1998). Our results provide support to the hedging theories that link corporate hedging policies to managerial career and reputation concerns. In addition, our results are in line with the body of the finance literature suggesting that the realization of managerial risk preferences may not always lead to a lower shareholder and firm value.

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1. INTRODUCTION

Financial risks facing the corporation influence firm value in many direct and indirect ways. Typically, financial risks consist of unexpected changes in exchange rates, interest rates, and commodity prices. The fact that a significant number of corporations are committing resources to risk management (financial hedging) activities only indicates the potential for risk management to increase firm value (Bartram (2000)). The finance literature has provided two classes of explanations for the firm's risk management activities. One class focuses on risk management as a means to maximize firm and shareholder value. The second focuses on risk management as a means to maximize managers' private utility (see, for example, Smith and Stulz (1984) and Tufano (1996) and (1998)).

Risk management as a lever for shareholder and firm value creation is a highly debatable issue in the finance literature. It was triggered by the apparent contradiction between corporate practice, where financial risk management gained a lot of popularity[1], and various theories stating that risk management was generally redundant and could equally well, if not better, be performed by the shareholders themselves (Bartram (2000)).

The irrelevance of risk management has insights from the arguments first made by Miller and Modigliani (1958), whose work establishes the irrelevance of financing policies. Applying the logic of Miller and Modigliani (MM), corporate risk management

[1] The global derivative market has increased by a factor of 60 from the mid 1980's to late 1990's and reached a value of USD 63 trillion in the beginning of 2000 (BIS, 2000). Moreover, Survey results show that 50% of US non- financial firms use financial derivatives (Bodnar, Hayt and Marton (1998)). Other studies find percentages of 37% (Guay (1999)), 59.1% for large US firms (Geczy, Minton and Schrand (1997)) and 77.8% for German non-financial firms (Bodnar and Gebhardt (1999)).

as a financial activity would not increase shareholders value since the owners of the firm could perform the management of foreign exchange, interest rate and commodity price risk better than managers due to the effect of portfolio diversification (see also Markowitz (1959)). In addition, shareholders have varying preferences that they can only address when hedging individually, but not when hedging on the firm level.

Recently, a similar stream of literature argues that risk management may not necessarily increase firm value since it can be substituted by corporate diversification, whether industrial or geographic. Proponents of this view argue that it is either very expensive for firms to use financial hedging for specific risks or financial hedging contracts may not be available, after all, for these risks. In addition, firm specific risk is associated with moral hazard and adverse selection problems that render financial hedging contracts highly unsuccessful (see, for example, Bethel (1999), Hirshleifer and Subrahmanyam (1993), Stulz (2000)).

Despite the above arguments, another stream of literature has established several justifications for firm risk management activities. In addition, empirical studies have documented several rationales for risk management activities. For example, the neoclassical assumptions of the MM propositions of complete capital markets without information asymmetries, taxes, and transaction costs do not hold in reality. The existing capital market imperfections are, therefore, the basis for which corporate hedging strategies are needed and can add value (see, for example, Abuaf and Jorion (1990), Adler and Lehmann (1983), Alexius (1996), Bartram (2000), Froot and Rogoff (1994) and Rhim, Khayum and Kim (1996)).

Positive theories of risk management as a means for shareholder value creation argue that capital market imperfections such as transaction costs of financial distress, agency costs, corporate taxes and costs of external finances cause firm value to be a concave objective function. Consequently, a reduced cash flow volatility- from risk management- can result in lower costs associated with these capital market imperfections, larger cash flows to the owners of the firm and thus higher expected firm value (Bartram (2000), Culp and Miller (1995), Froot, Scharfstein and Stein (1993), Lessard (1990), Nance, Smith and Smithson(1993), Santomero (1995), Smith and Stulz (1985), Stultz (1990)).

In addition to capital market imperfections, Smith and Stultz (1984) introduced managerial risk aversion as a motivation for corporate risk management. Mangers typically have an undiversified wealth position due to their employment in the firm. Therefore, mangers whose human capital and wealth are poorly diversified prefer to reduce risk to which they are exposed. If managers judge that it will be less costly for them to manage this risk than to mange it on their own account, they will direct their firms to engage in risk management. Consequently, corporate risk management is driven by managerial personal preferences towards risk. The problem with risk management that is motivated by managerial preferences is that it has the potential of destroying firm and shareholder value. Specifically, Tufano (1998) argues that managerially motivated risk management has a damaging effect on firm value, as it allows managers to engineer the cash flows of their firms in a manner that allows them to evade the scrutiny of the external capital markets and thus allows mangers to engage in any type of project or investment under their discretion. The managerial risk preferences hypothesis advanced

by Tufano(1998) fueled more controversy regarding the role of risk management as a tool for shareholder and firm value creation.

Nevertheless, in recent years a growing number of corporations have committed considerable resources to risk management, indicating the potential for risk management to protect and increase firm value. The empirical examinations of the theories of hedging, on the other hand, have been plagued by a general unavailability of data on hedging activities (Allayannis and Weston (2000)). Until the beginning of the 1990's, a firm's exact derivative position was not disclosed. Early empirical studies had to rely on survey data to examine the determinants of derivative activity (Nance, Smith and Smithson (1993), Geczy, Minton and Schrand (1997)). Moreover, the majority of studies that attempted to relate firm value to its risk management strategies focused only on the determinants of hedging and whether the firm's hedging profile fits one theory or another. One can argue that most prior attempts to directly link the value of the firm to its hedging strategies are rather scant.

Moreover, several questions with regards to firms' risk management activities remain unanswered. For example, does currency risk management help to insulate firm value against exchange rate shocks? Second, does risk management alleviate or exacerbate the agency problem in multinational corporations? Third, what is the relationship between financial hedging and corporate diversification- are they substitutes or complements?

This study consists of two essays addressing a series of questions regarding corporate risk management in modern US. multinational corporations, in the hope of being able to answer some of the puzzling issues in this field.

In the first essay we first, test the hypothesis that foreign currency hedging increases firm value or at best insulates it against currency and exchange rate shocks. By using, the Asian Currency crisis of 1997 and the Brazilian Real devaluation of 1999 as examples of exchange rate shocks and by using two measures of firm value, namely Tobin's Q ratio and the firm's Excess Market Value for a large cross section of non-financial firms that have positive foreign exchange rate exposures and who had operations in the Asian and Latin American regions around the time of the crises. We argue that the currency crises of the 1990's provide a natural experiment to investigate the relation between the firm's use of derivatives and its market value. As a matter of fact, these crises are the type of events that currency risk management is designed to insulate the firm against.

Second, in the first essay we examine the role of natural hedges on firm value. The rational behind this investigation stems from the general belief that diversifying the firm's operations overseas can eliminate a portion of currency risk. We conduct tests specifically designed to shed light on the effectiveness of natural and financial hedges, in the attempt to determine whether financial hedging and non-financial (natural) hedging techniques are complementary or substitutive means for risk management.

Finally, in the second essay we investigate the relationship between currency risk management activities, firm value and agency-related costs arising from the separation of ownership and control in the firm. We use The Corporate Governance Index (G), which is an innovative methodology that directly tests the level of agency costs in the firm. The motivation of this essay stems from the argument that hedging is likely to be connected to managers' utility maximization as suggested by Tufano (1998). Specifically Tufano (1998) predicts a negative relationship between agency costs, managerially motivated

risk management activities and firm value. This essay provides a direct and unique test of this hypothesis.

The rest of this study is organized as follows. In section 2, we present the valuation effects of the Asian and the Brazilian Financial crises of the 1990's and the relationship between the firm's geographic diversity and its use of currency derivatives. Section 3 addresses the impact of corporate governance and agency costs on the firm's hedging activities and its value. Section 4 concludes this study.

2. ESSAY 1: THE VALUATION EFFECTS OF THE 1997 ASIAN CURRENCY CRISIS AND THE 1999 BRAZILIAN REAL DEVALUATION

The financial and economic crisis that ravaged Thailand, Indonesia, South Korea, Malaysia and other Asian countries during 1997 and 1998 triggered one of the most abrupt and severe economic slowdowns seen anywhere in the world during recent decades. Financial market volatility increased around the globe soon after the 50% Thai devaluation of July 1997. The reverberations of the Asian crisis on the world economies have been multifaceted. World economic growth slowed as the shortfall in demand from the Asian region caused both severe regional recession and a deterioration in the trade balance of important trading partners such as the United States (Pollard and Coughlin, 1999). Commodity prices weakened, export competition increased in many sectors and interest rates fell in the world's major economies. Moreover, industrial production slowed in many countries and corporate profits declined.[1]

Despite these disruptions, The US economy grew strongly through out the 1997-1998 period. Moreover, the cumulative total returns for the S&P 100 index of large US firms showed an astonishing 71 percent, nearly 60 percentage points better than the risk-free rate on 3-month T-Bills (see, for example, Emmons and Schmid (2000)). In fact, this experience has led some observers to conclude that the growth enhancing consequences of the crisis for the United States – primarily lower interest rates and commodity prices – were simply more powerful than the growth reducing factors which included reduced demand for US exports and financial loses suffered by lenders, investors and American

[1] For detailed discussion of the Asian crisis and its worldwide effects see the Economic Report of the President, 1999, pp. 227-51.

corporations in the region (see, for example, Coughlin and Pollard (2000), Emmons and Schmid (2000)). As a matter of fact, many observers and researchers believed that American firms, in particular those that used some kind of financial derivative activity were spared a lot of the downturn of the crisis (see, for example, Emmons and Schmid (2000)).

Meanwhile, in the international finance literature, research has argued and provided evidence that the use of currency derivatives can lower the firm's exposure to fluctuations in exchange rate (see, for example, Allayannis and Ofek (1997) and (1999)). Other theories of hedging have focused on the determinants of hedging and whether the firm's hedging profile fits one theory or another. With the exception of a pioneer study for a sample of US non-financial firms and another recent comparable international study,[2] no research has attempted to investigate the direct link between derivative usage and firm value. Even more surprising, no research has ever investigated the link between currency derivatives use and the value of the firm during a turbulent time as an exchange rate shock.

Studies that discussed the impact of the Asian currency crisis on the United States have focused primarily on the manufacturing sector, states exports, trade and commodity price effects (see, for example, Coughlin and Pollard (2000), Duca, Gazel and Lamb (1998), Gould and Taylor (1998), Pollard and Coughlin (1999), Valleta (1998)). Meanwhile, the impact of the crisis on the financial sector and, especially, on the value of US firms has been greatly overlooked[3].

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[2] See Allayannis and Weston (2001) for a sample of US non financial firms from 1991-1995. Pramborg (2003) for a sample of Swedish firms from 1997-2001.

[3] See Emmons and Schmid (2000) for a discussion of the impact of the crisis on the riskiness of the Fortune 500 firms.

This essay attempts to fill this void in the literature. More specifically, in this essay we test the hypothesis that foreign currency hedging increases firm value or at best insulates it against currency and exchange rate shocks. The exchange rate shocks of the Asian Currency crisis of 1997 and the Brazilian Real Devaluation of 1999 are used as the exchange rate instability events. We argue that these two currency crises provide us with a unique set of exogenous events to assess the effectiveness of currency risk management. The valuation effect is implemented by using two measures of firm value, namely Tobin's Q ratio and the firm's excess market value.

Second, in this essay we examine the role of natural hedges (geographic diversification) on firm value, in the attempt to determine whether financial hedging (currency derivatives) and natural hedging (geographic diversification) techniques are complementary or substitutive means for risk management during exchange rate crises events. We believe that during periods of exchange rate instability, the firm's geographic diversity and the extent of its foreign operations are important tools in shielding firm value against severe and abrupt exchange rate movements, so we hypothesize that a complementary relationship exists between the two risk management techniques. In this essay we conduct specific tests to shed light on the effectiveness of natural and financial hedges on firm value.

The main results of this essay document the presence of a hedging premium. Specifically, we find that for a sample of 627 firm year observations of US non-financial firms obtained from the S&P 500 and that had foreign exchange rate exposure[4] and operations in the Asian region around the time of the crisis from 1996-1998, users of

[4] A firm is said to have a foreign exchange rate exposure, if it reports a positive foreign sales to total sales ratio.

currency derivatives were shown to have a higher Q by 0.385 than non-currency derivatives users. Given that the mean Q for the sample is 2.31, this premium represents 16.62% of firm value. Similarly, using excess market value as an alternative valuation measure, the overall hedging premium is even greater. The hedging premium is 0.538 representing 26.5% of firm value for hedging firms through out the entire crisis period (1996-1998). In addition, multivariate regression analysis shows that the relationship between firm value and the use of derivatives is positive and significant in each year from 1996-1998 (i.e. during the pre-crisis, crisis and post crisis periods, respectively). The hedging premium remains significant even after controlling for other variables that affect firm value and regardless of the measure of valuation used.

Second using the Brazilian Real devaluation of 1999 (for robustness check) as our testing ground in assessing the effects of this exchange rate shock on firm value, and using the same valuation measures as before on a sample of 612 firm year observations of US non-financial firms with positive exchange rate exposure in Brazil and the Latin American region between 1998-2000, the results still document the presence of a hedging premium. The hedging premium is positive in each year and significant in 1998 (pre-crisis) and 1999 (crisis) and 2000 (post-crisis periods), respectively.

Moreover, when the sample was pooled for the entire period (1998-2000), a positive and significant hedging premium is still documented. Using Tobin's Q as a measure of value, the overall hedging premium 0.241 represents 8.89 % of firm value and is significant at the 5% level. In addition, using Excess Market value, the overall hedging premium 0.078 represents 2.95% of firm value and is also significant at the 5% level for the entire sample period (1998-2000). Thus, our results indicate that firms that hedged

their exposures, using foreign currency derivatives, were rewarded by the market at times of exchange rate turbulence.

Third, our results show that foreign currency hedging (financial hedging) and geographic diversification (natural hedging) are both complementary risk management techniques. The results show that both types of risk management strategies work together to increase and protect firm value from exchange rate instability and severe currency movements. Moreover, our results show that the hedging premium is positive and more significant when geographic diversification is proxied by the number of countries the firms operate in the afflicted region rather than relaying on the ratio of regional foreign sales to total sales ratio; which is a measure that is often used in the literature to proxy for the firm's degree of global diversification.

This essay contributes to the literature in the following ways: first, it attempts to test the currency hedging policies of firms during a time of exchange rate instability. As a matter of fact, the financial crises of the 1990's are the type of events that currency risk management is designed to insulate the firm against. Although severe in magnitude and relatively short in duration, these currency crises provide us with a natural experiment to determine the hedging effectiveness of currency derivatives by analyzing valuation changes during the pre-crisis, crisis and post- crisis performance evaluation of firm value.

Second, unlike other papers that focus on a sample of domestic and multinational firms, this study focuses exclusively on a sample of multinational firms that have foreign operations in Asia and Latin America. Focusing on multinational firms provides us with the advantage of appraising the valuation effect and the performance of firms whose use

of foreign currency derivatives is crucial and more important to maintain investments, particularly, in the face of a significant exchange rate instability event.

Third, for robustness purposes, in this essay we capture the valuation effects of currency derivatives using alternative valuation measures. Namely, we employ Tobin's Q ratio as well as Excess Market value as two separate measures of firm value.

Finally, in this essay we conduct tests to differentiate between value effects from financial hedging (currency derivatives) to those from non- financial hedging (geographic diversification) during the events of exchange rate and currency crises in an attempt to shed more light on the puzzling relationship between theses two hedging techniques that was uncovered in the international finance literature.

The essay is organized as follows. In section 2.1 we provide a brief chronology of the Asian crisis. Section 2.2 presents a review of the literature on the use of derivatives as a lever for firm value creation. In section 2.3 data sources, sample description and methodology are presented. In section 2.4 we document and discuss the empirical results of the univariate and multivariate tests of the performance of hedgers and non-hedgers during the Asian pre- crisis, crisis and post-crisis periods. In section 2.5 we directly test the relation between currency hedging and firm value during the Asian currency crisis in both univariate and multivariate frameworks. Section 2.6 presents the results of the effectiveness of natural and financial hedging techniques on firm value during the Asian currency crisis. Sections 2.7 and 2.8 provide robustness checks using the Brazilian real devaluation. Section 2.9 concludes the first essay with summary of the major results.

2.1. Chronology of the Asian crisis.

The events that initiated the crisis occurred in Thailand. Unable to defend the value of the Thai baht following a sustained attack by hedge funds, the Thai government decoupled the baht from the US dollar and devalued it by more than 50% of its value on July 2,1997 (Economic Report of the President (1999)). At the same time, Thailand requested an IMF assistance program to stabilize the economy and the financial sector. The Thai government received a rescue package of US$ 17.2 billion. Afterwards, attention of world financial markets was turned to Indonesia, which negotiated the first of four IMF rescue packages, totaling US$ 43 billion, in September 1997. This was the start of a contagion effect that spread to most other Asian countries. In November 1997, South Korea followed and negotiated a US$ 57 billion IMF assistance plan. Other Asian countries suffered severe economic downturns, but not to the extent of requiring IMF assistance. Malaysia imposed foreign currency controls and Hong Kong continued to align the value of the $HK with the $US. The Philippines ceased requiring a long standing IMF (Prideaux (1999)).

Although the first act in the drama of the Asian financial crisis is often blamed on the action of currency speculators withdrawing support for the Thai bath, the preconditions for the crisis were put in place in the years prior to 1997. A WTO (1998b) report on Asia pacific region provides a useful chronology of the events that occurred in the period 1995 to December 1998. From the WTO perspective, the crisis occurred as a the result of a series of events, commencing with the recognition as early as 1995 by the world's fund managers, that the high annual rates of economic growth in many Asian

countries is not sustainable. The economies of many East Asian nations were dependent on exports of a narrow range of products, the prices of which were beginning to fall by 1995. The 75% decline in the price of Korean semiconductor chips was cited as the principle cause of the large rise in the Korean current account deficit in 1996. To maintain strong growth, infrastructure investment was undertaken, and despite high levels of domestic personal savings, overseas borrowings were needed. Managers, on the other hand, accustomed to strong and sustained demand for their output, failed to recognize changing demand patterns and overproduction resulted. As a consequence, profits fell, some companies failed and employment declined. Meanwhile, Japan experienced a deflationary restructuring process which resulted in the value of the Yen falling, reducing Japan's ability to "bail out" other nations in the region.

Prideaux and Witt (1999) identified a number of possible causes of the crisis not mentioned in the WTO report. These included:

- High protection policies to safeguard national economies;
- Weak financial sectors and lack of domestic capital markets;
- Reliance on offshore markets for borrowing, particularly from Japan in order to finance public infrastructure construction and private sector expansion;
- Imprudent lending policies that encouraged the build up of short term debt from overseas markets and lending them domestically as long-term debt. In addition, corruption and favoritism in lending policies was widely practiced.
- The slowdown in Japanese economic activity, the build up of bad loans and corruption in the banking sector of Japan.

2.2. The Use of Derivatives as a Lever For Firm Value Creation: Literature Review.

Theories suggesting that corporate risk management increases firm and hence shareholder value rest on the basis of existing capital market imperfections. By reducing the likelihood of bankruptcy and costly financial distress, by harmonizing the need and availability of funds through coordinating investment and financing polices and finally by fixing the level of taxable income, risk management strategies can increase firm value.

Financial distress arguments for risk management were developed by Smith and Stulz (1985). They argue that by reducing the likelihood of financial distress, risk management can increase the value of the firm. Financial distress costs can be categorized into direct and indirect costs. Direct costs consist of all the costs pertaining to the administration of bankruptcy, for example, legal fees, management's labor spent on the bankruptcy procedure and so on. Indirect costs include any kind of implicit loss due to the possibility of financial distress, such as lost market share. For indirect costs there is a continuum of costs that increases at an accelerating rate as exposure to financial distress increases. Firms with greater variability of cash flows are more likely to find themselves in financial distress. By reducing cash flow variability hedging lowers the probability of the firm encountering financial distress and in turn lowers the expected costs of financial distress. This decrease in expected costs increases the firm's expected cash flows and so benefits shareholder. Moreover, the increase in firm value comes from the reduction of dead weight costs[5] and an increase in the debt capacity, which in turn can benefit the firm

[5] Uncertainty of future cash flows can result in firms being unable to meet their contractually fixed obligations like wages or interest payments. Therefore the transaction cost of financial distress originates from illiquidity. When a firm faces liquidity problems, indirect costs arises as a result of the negative influence on contracts with suppliers, customers, employees and creditors (Bartram (2000), Rawls and

through valuable tax shields and reduction of agency costs of excess free cash flows (Tufano, (1996)).

Empirical investigations of the impact of hedging on firm value generally support the financial distress cost arguments. Most of the studies have established an empirical relationship between corporate risk management and the probability of bankruptcy of a firm, which is measured, for instance, by the leverage ratio, the gearing ratio, the interest coverage ratio, credit rating and the firm's net interest payable or receivable. The higher the firm's gearing, the lower its interest cover ratio, the lower its credit rating and if it is paying net interest, the greater the probability of financial distress. Previous studies (i.e., Geczy, Minton and Schrand (1997), Graham and Rogers (2002), Haushalter (2000), Judge (2003), Myers and Smith (1990), Nance, Smith and Smithson (1993) and Tufano (1996)), confirm these relationships between financial distress and hedging.

The second way financial hedging can create value to the firm has been introduced by Stulz (1990), Lessard (1990) and Froot, Scharfstein and Stein (1993). According to these researchers, corporate risk management can increase value by coordinating investment and financing polices more efficiently. The underlying idea of their argument is that the value of the firm can be enlarged by realizing investment projects with positive NPV. Profitable projects, however, can only be undertaken if their financing is secured. Financial risks, on the other hand, cause corporate cash flows to be volatile. Hence, financing optimal investment projects from internal funds is not always guaranteed at every point in time. Consequently, the volatility of cash flows induces volatility to the investment programs and decisions (Bartram, (2000)). In addition, when

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Smithson (1990) Shapiro and Titman (1986), Smith, Smithson and Wilford (1990b)). See also Judge (2003) for a detailed review of financial distress costs.

the firm's cash flows are low, obtaining additional external financing is very costly. As a result the firm is forced to scale down on its value maximizing investments. Risk management programs that break the dependence of investment on cash flow can maximize firm value (Tufano, 1996). Since hedging can reduce cash flow variability, it enables the firm to avoid unnecessary fluctuations in either investment spending or external financing and so increases firm value. This hedging explanation relies on the basic premise that, without hedging, firms may be forced to underinvest in some states of the world because it is costly or impossible to raise external funds. Moreover, there is likely to be more asymmetric information about the quality of new projects for firms with high growth opportunities, for firms that are not in regulated industries and small firms. Therefore, Froot, Schafestein and Stein's (1993) theory suggests that companies with key planned investment programs and costly external finance can use risk management as away to guarantee the realization of important valuable projects and avoid executing them at a high cost of capital.

Empirically, the impact of financial hedging on the coordination of investment and financing policies has been investigated by Berkman and Bradbury (1996 and 1999), Geczy, Minton and Schrand (1997), Graham and Rogers (1999), Howton and Perfect (1998), Mian (1996), Nance, Smith and Smithosn (1993) and Tufano (1996). They all found a relationship between corporate risk management and liquidity measured by the quick ratio, the current ratio and the dividend payout ratio. Results basically suggest that companies with low liquidity (small quick or current ratios) are more likely to hedge than those with higher liquidity. Moreover, Geczy, Minton and Schrand (1997) found evidence that the firm's use of derivatives is positively related to the amount of R&D

expenditures, thus supporting Froot, Scharfestein and Stein's (1993) argument that hedging is used as a tool to mitigate the under-investment problems. As far as dividend payout ratio is concerned the mixed results found in the literature can be attributable to the fact that on the one hand, a lower dividend payout makes it more likely that funds will be available to service the firm's debt obligations (financing needs) as well as its investment requirements, therefore the lower the likelihood of the firm hedging. In other words, this explanation favors a positive relation between hedging and dividend payments (Nance et al. (1993)). Haushalter (2000), on the other hand argues that companies facing liquidity constraints might pay little or no dividends. Therefore, low dividends might imply liquidity constraints and more hedging, indicating a negative association between dividend payout and hedging. In addition, the relationship between growth and dividend payout is likely to be negative, according to Graham and Rogers (1999), Haushalter (1997) and Mian (1996). Gay and Nam (1998), on the other hand found that firms with a strong correlation between cash flow and investment expenses are naturally hedged and thus use less derivatives.

The third way corporate risk management increases firm value is by fixing the level of taxable income. Taxes form the third aspect of capital market imperfection which corporate risk management is designed to overcome. Smith and Stulz (1985) formalized the tax–induced explanation for corporate risk management. In the presence of a convex tax schedule, firms would reduce expected taxes by using risk management to fix the level of taxable income. A convex tax system exists in cases where the marginal tax rate increases progressively with taxable income. The tax function can also be convex due to various tax rules and regulations. Limits on carrying losses backward or forward, foreign

tax credits can also indirectly induce convex characteristics to the tax code (see, for example, Bartram, (2000); Smith, Smithson and Wilford, (1990b); and Smith and Stulz, (1985)). In the presence of convex tax regimes, changes in pre-tax income will lead to a higher corporate burden. Risk management reduces this burden the more convex the tax schedule and the more volatile the corporate income are.

Empirical results are mixed when it comes to the tax argument. On the one hand, there is evidence in support of the positive correlation between corporate risk management and tax regulations (investment tax credits and tax losses). For example see the work of Nance, Smith and Smithson (1993). Howton and perfect (1998) also found a significant progressive tax dummy. Moreover, Goldberg et al. (1994) found significant convexity variables. Finally, Berkman and Bradbury (1996) found empirical significance for the loss carry forwards, but not for the tax loss variable (see, for example, Bartram, (2000)).

On the other hand, some studies do not indicate the value relationship of corporate risk management and taxes since variables used to capture the convexity property of the tax regime do not often show significance. For example, Graham and Rogers (2002), Geczy, Minton and Schrand (1997), and Tufano (1996) find no significance of the tax variables. Where as Haushalter (1997), and Mian (1996), found very weak significance.

It's important to note that empirical examinations of the different theories of hedging have been plagued by a general unavailability of data on hedging activities. Until the beginning of the 1990's, a firm's exact derivative position was not disclosed. Early empirical studies had to rely on survey data to examine the determinants of derivative

activity. See for example, Nance, Smith and Smithson (1993), Bodnar et al. (1998) and (1999).

Recent Studies have focused on the type of hedging employed by the firm (commodity, interest rate or currency). For example, Visvanathan (1997) examined the use of interest rate swaps by the S&P 500 non-financial firms; he found evidence of transaction costs that are associated with financial distress. Haushlater (2000) examined the hedging activities of oil and gas producers and again found that total debt ratio is positively related to the use of derivatives, thus, consistent with theories of financial distress.

It's interesting that all the previous studies attempting to see the effect of risk management on shareholder value focused on the determinants of hedging and whether the firm's hedging profile fits one theory or another. No study attempted to directly link the value of the firm to its hedging profile. With the exception of Allaynnis and Weston (2001) who used a sample of large domestic and multinationl US firms from 1990-1995. Their study documented a presence of a hedging premium that was only clear after 1993. Moreover, Pramborg (2003) recently examined the valuation effect of hedging on a sample of Swedish firms over the period 1997-2001. A main finding of his study is that hedging transaction exposure increases firm value, where as hedging translation exposure does not add value.

This study builds on Allayannis and Weston's (2001) work and directs its focus on directly testing the impact of currency hedging on firm value. This study differs from its predecessors in several ways. First it tests the valuation effects of currency hedging policies of firms around extraordinary exchange rate instability events. The exchange rate

shocks of the Asian Currency crisis of 1997 and the Brazilian Real Devaluation of 1999 are used as the exchange rate instability events. We argue that these two currency crises provide us with a unique set of exogenous events to assess the effectiveness of currency risk management. Moreover these currency crises were severe in magnitude and relatively short in duration. Therefore, allow us to conduct a natural experiment to determine the hedging effectiveness of currency derivatives by analyzing valuation changes during the pre-crisis, crisis and post- crisis performance evaluation of firm value. Second, this essay unlike the paper of Allayannis and Weston (2001) focuses on a sample of multinational firms with foreign operations in the Asian and Latin American regions and excludes domestic firms. The focus on multinational firms provides us with the advantage of appraising the valuation effect and the performance of firms whose use of foreign currency derivatives is crucial and more important to maintain investments, particularly, in the face of significant exchange rate instability events. Third, this paper captures the valuation effect using two measures. Namely, we employ Tobin's Q ratio as well as Excess Market value as two separate measures of firm value.

2.3. Data Sources and Sample Description: Asian Sample

The sample used in this study consists of 627 firm year observations of US. Non-Financial firms, from the S&P 500 firms obtained from the COMPUSTAT data base. The sample covers the period from 1996-1998 (i.e., the period around the East Asian Financial crisis of 1997). The S&P 500 firms were used in this study because the S&P 500 index includes relatively large firms which are more likely to have exposure to various financial price risks and therefore this source potentially provides us with a rich

cross-section of hedging and non-hedging firms. Second, firms within this sample are required by SEC to actively report their hedging activities in their annual financial statements during the sample period. For a firm to be included in the sample, the firm must meet the following criteria: 1) the firm must be a US firm i.e., has an incorporation code of zero (obtained from Company Specifics section of COMPUSTAT). 2) The firm must report a positive Foreign sales to Total sales ratio, (obtained from the Geographical segment of COMPUSTAT database). Focusing on firms with foreign sales data, as mentioned earlier, allows us to concentrate on firms that are affected more by exchange rate movements because of the presence of foreign receivables or from operations abroad. For those firms the use of foreign currency derivatives is more important to maintain investments and may, thus, be rewarded by investors by higher market valuations. 3) The firm must have total assets of US$10 million[6]. 4) The firm should report operations in at least one country in the Asian region in 1996[7]. The information about operations is obtained from the Directory of American Firms Operating in Foreign Countries. [8] 5) The firm should not have an industrial classification code of 60-67, i.e., the sample excludes firms in Finance, Insurance and Real Estate industries. Most of these firms are market makers in foreign currency derivatives. They use derivatives for trading purposes hence their motivation for hedging might be different. 6) The firm must report data on any type of foreign currency derivatives used (i.e., Forwards& Futures, Swaps or Options). Gross Notional values of foreign currency derivatives are available in the firm's 10-K Annual

[6] SEC requires companies with more than 500 investors and total assets of $10million or more to file annual reports and other sec filings. The majority of the S&P 500 firms meet this criteria.

[7] The Asian region includes operations in the following countries: China-Hong Kong- Indonesia- India- Japan –Malaysia- Philippines – Singapore – South Korea – Taiwan – Thailand.

[8] The" Directory of American Firms Operating in Foreign countries" is only published every three years. Therefore data is only available for the years 1996 then again in 1999. For sake of conservatism, only firms that report operations in Asia in 1996 are included in the sample.

Reports and are hand-collected from the Electronic data Gathering, Analysis and Retrieval "EDGAR" database or from the Annual Report Gallery[9].

The Financial Accounting Standard Board (SFAS "133"), Accounting for Derivative Instruments and Hedging Activities requires every company to formally document, designate its hedging activities and other off-balance sheet risk and to assess the effectiveness of the transactions that receive hedge accounting. Firms are required to implement this disclosure after June 15, 1991. However, firms differ in the starting dates of their disclosure. Derivative reporting is usually found in the "Notes to annual Reports" section of the 10-K annual report. Information on the "Notional" as well as "Fair" values of derivatives is documented in the reports. In this essay the gross notional values of foreign currency derivatives are used. Notional value represents the future cash flows under the contract. Although the gross notional value may not represent the net amount of hedging, this value is used to proxy for the level of a firm's involvement in hedging. (See Allayannis and Weston (2001) for a similar procedure). It's important to note that firms that report different types of derivative instruments, other than currency derivatives, such as interest rate hedging or Commodity hedging are considered non-hedgers and are included in the "non-hedging" sample. Despite the potential bias that this might create in the sample, it seems realistic to focus on currency derivatives users since we are dealing with a currency crisis and an exchange rate shock. In addition this bias should work against our ability to find a hedging premium. The final sample resulted in 627 firm year observations from 1996 to 1998.

Table 1 presents some descriptive statistics of the sample. Panel A shows the

[9] If a firm or a firm year is missing from the EDGAR data base, the Annual Report Gallery is used to check for the missing information.

hedging profile of the S&P 500 firms through out the crisis period. By examining the number and distribution of Hedging and Non- Hedging firms in the sample, it's clear that more than half of the firms use foreign currency derivatives. This number has definitely increased through out the sample period. By 1998, more than sixty percent of the firms (63.6%) were using derivatives, compared to fifty three percent (53.6%) only in 1996. More interesting is the increase in the mean value of the notional amount of derivatives contracts (last column in panel A). In 1998, the mean gross notional value of foreign currency derivatives increased to $5938 million from $3998 million in 1996. Indicating, that not only the number but also the value of foreign currency contracts has been on the rise.

Panel B shows the type of foreign currency hedging instrument used by the hedging firms in the sample. From 1996-1998, more than seventy percent (71.62%) of the firms use foreign exchange forward contracts, which makes them the most widely used currency hedging instruments. Followed by currency options (25.20%) then by currency swaps (3.30%). Overall, the results from Table 1 are consistent with previous research[10] which document that foreign exchange forward contracts are the most commonly used foreign currency derivative instrument.

< Insert Table1 about here>

[10] For example, Fok et al. (1997) report that 66.2 percent of their sample of Fortune 500 firms use derivatives, Gay and Nam (1998) find that 66.9 percent of their sample taken from the Business Week 1000 use derivatives, Howton and Perfect (1998) find that 61.4 percent of their sample of Fortune 500/S&P 500 firms use derivatives. Surveys of Fortune 500/S&P 400 firms by Nance et al. (1993) and Dolde (1995) find that 61.5 percent and 85.2 percent of firms use derivatives, respectively. Bodnar, Hayt, Marston and Smithson (1995) survey a random sample of 2000 non-financial US firms and find that 65 percent of large firms use derivatives. Phillips 1995) surveyed members of the Treasury Management Association in the US and found that 63.2 percent of US firms use derivatives. Amongst firms using derivatives the most popular type of derivative is the forward contract

Table 2 shows the standard industry classification code for foreign currency hedging and non-hedging firms. It's clear that more than 20% of foreign currency derivative users (77 out of 370 hedging firms) are in the Chemicals and Allied products industry; SIC code (28). Followed by firms in Industrial and Commercial Machinery and Computer equipment; sic code (35), where currency hedgers represent 11% of the total number of hedging firms. Industries with sic codes from 10-13 (Mining, Metals and Oil & Gas extraction) do not engage in foreign currency hedging activities. On the other hand, the highest number of non-hedgers was found in the Business Services sector (SIC code 73). Almost twenty percent (19.84%) of non-hedging firms in the sample are in the SIC code (73). This is consistent with previous studies that showed that the highest levels of non-hedgers are present in the Services industries. The second highest number of non-hedgers was found in the Electronics and Electrical equipment industry (SIC code 36). Almost fourteen percent (13.62%) of firms in the non-hedging sample are in the SIC code (36). This is different than most previous studies that document a strong non hedging activity in service firms i.e. firms whose sic codes range from sic (73-87). It's important to note, however, that results in this essay should be interpreted carefully when compared to other studies. For example, the absence of hedging activities in firms with SIC codes 36, 10, 12 and 13 could be due to our definition of hedging in the sample. Some of the above-mentioned industries relay heavily on commodity hedging (sic codes 10-13) or interest rate hedging (sic code 36). And according to the sample construction criteria and hedging definition in our sample, any firm that reports any type of derivatives other than foreign currency will be included in the non-hedging sample. Therefore, being included

in the non-hedging sample doesn't necessarily mean that the firm is not involved in any hedging or market risk management activity. It simply means that these companies do not engage in currency risk management. Hence, if we take our definition of hedging into consideration, our results may well be consistent with what is documented in the literature.

< Insert Table2 about here>

Table 3 reports summary statistics of the main variables that are used in the subsequent analysis. Tobin's Q ratio and Excess Market value are used as alternative measures of the firm's value. Tobin's Q is defined as the ratio of the market value of the firm to the replacement cost of assets. It's computed as market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long- term debt divided by total assets of the firm (obtained from COMPUSTAT). Excess market value is defined as the market value of equity less book value of equity normalized by total sales. The benefit of using Tobin's Q is that it makes comparisons across firms relatively easier than comparison based on stock returns or other measures that require an adjustment for risk. The mean (median) value for Tobin' Q and Excess Market value in the sample are 2.31 (1.63), 2.03 (1.09) respectively. The median values are relatively smaller than the mean values indicating, that the distribution of Tobin's Q and Excess Market value are relatively skewed. Moreover, the mean and median values of Tobin's Q in the sample is much higher than that reported in Allayannis and Weston (2001), indicating that our firms are high market performers.[11]

< Insert Table3 about here>

The rest of Table 3 shows the summary statistics of the other variables that act as control variables in the subsequent regressions. To be able to infer that currency hedging increased firm value or at best insulated it against the Asian currency shock, it is important to control for the effect of other variables that could have an impact on value. These variables include[12]: Firm size, proxied by total assets[13], Geographic and industrial diversification, proxied by foreign sales to total sales ratio and by the industrial diversification dummy respectively. The firm's Leverage position is proxied by the ratio of long- term debt to total assets. Profitability is proxied by ROA, ROE and EBIT ratios. And finally, the firm's liquidity position and its ability to access financial markets is proxied by the dividend payout ratio. In the following sections we will discuss the impact of each variable on the firm value and its hedging profile and the expected signs that theory provides

The sample has a mean (median) value of total Assets of $2349.5 ($358) million. The mean value of foreign sales to total sales is 33.85% (32.82%). This means that hedging firms in the sample have foreign sales that are, on average, above 30% of their total sales, indicating that they have huge exchange rate exposures. Moreover, on average, the sample's gross notional value of foreign currency derivatives is $15548 million. The above values are somewhat greater than those reported by other studies. Allaynnis and Weston (2001), and Geczy et al. (1997), for example have reported mean

[11] Allayannis and Weston (2001) reported mean (median) Q for their sample of 1.18 (0.96) respectively.

[12] For a discussion of the theoretical justification for the use of some of these variables see Allayannis, Brown and Klapper (2001), Allayannis and Weston (2001), Muller (1987) and Peltzman (1977.

gross notional value of foreign currency derivatives of $186 and $200 million, respectively. One possible explanation is that previous studies focused on currency derivative activities during the early to mid 1990's, at a time when derivative usage was not effectively reported. In addition, it could be that as time passed, derivative hedging became more appreciated by firms.

Mean value of long term debt to total assets ratio is 21.87 (18.91). Profitability ratios for the entire sample have the following mean (median) values: ROA 7.41 (6.72), ROE 17.23 (16.61), EBIT 14.45 (13.13), respectively. The firms in the sample have a mean dividend payout ratio of 28.96%. Finally, the mean diversification dummy is 0.61. Which means that on average, approximately 61% of the firms in the sample are diversified across industries. The diversification dummy takes the value of one if the firm operates in more than one industry segment and zero otherwise. (Information on segment data is obtained from the COMPUTAT Line of Business description data file. All other variables, except the notional values of currency derivatives, are also obtained from the COMPUSTAT database). Overall, with the exception of a few variables, the summary statistics results in Table 3 are in line with results reported in earlier studies (see, for example Allayannis and Weston (2001)).

2.4. Pre-Crisis, Crisis and Post-Crisis Performance of Hedging and Non-Hedging firms: Asian Sample

2.4. A. Univariate Tests

In this section we examine some performance measures and firm-specific variables for the sample of foreign exchange currency hedgers and non-hedgers before,

[13] The natural log of total assets variable is also used in some parts of the analysis.

during, and after the Asian crisis of 1996. The univariate analysis shows the significance of mean and median tests for these variables between the hedging and non-hedging firms. The significance of means tests is conducted by one-way ANOVA, where as the median tests are conducted by the non-parametric Wilcoxon Sum Rank test. Table 4 presents the results of univariate analysis. From the firm-specific variables, it's clear that hedging firms are larger in size than their non-hedging counterparts for the entire sample period. The mean and median difference of total assets between hedging firms and non-hedging firms is positive and statistically significant during the pre-crisis, crisis and post- crisis periods. It's important to note that, hedging and firm size has been very controversial in the literature. For example, Warner (1977) suggests that smaller firms have proportionally higher bankruptcy costs than larger firms. Therefore, to the extent that hedging reduces the probability of bankruptcy, it is more beneficial for smaller firms to hedge than large firms. Nance, Smith and Smithson's (1993) hypothesis contends that large firms are more likely to hedge because the information and transaction costs of hedging exhibit economies of scale which makes it easier and cheaper for large firms. As far as the empirical evidence is concerned, Chow, Lee and Solt's (1997) work provide evidence on the positive relation between firm size and hedging. Where as Allayannis, Brown and Klapper (2001) found weak evidence on the negative relation between size and hedging in their work on Asian firms, which supports Warner's (1977) theory. Meanwhile, our results are consistent with those of Chow, Lee and Solt (1997).

<Insert Table 4 about here>

Table 4 also shows that hedging firms consistently have higher foreign sales to total sales ratios than their non-hedging counterparts. The mean and median tests for the value of foreign sales to total sales are positive and significant for the hedgers' sample through out the period. This result is consistent with the literature on foreign exchange exposure. According to Allayannis and Ofek (1999), Jorion (1990) and Emmons and Schmid (2000), multinationality increases the firm's exposure to currency changes and currency risk. Hence, the higher the foreign sales to total sales ratio, the higher the exposure to currency risk and the higher the need to mitigate that risk through the use of currency derivatives. Therefore, hedging firms consistently have higher foreign sales to total sales ratio.

The mean and median tests for the ratio of long-term debt to assets are negative, but not significant. Our univariate results, therefore, do not support the existing literature on the relationship between debt and hedging that document a positive relationship. Smith and Stulz (1985), for example, indicate that hedging can reduce the variance of firm value and thereby the expected cost of financial distress. Hence hedging firms tend to have higher debt ratios. Graham and Rogers (2000) found a positive and significant relation between hedging and total debt for US. firms. In addition, Schmid (1999), explains the positive relation between debt and hedging as follows; leverage amplifies the risk of the firms' underlying cash-flows, as perceived by the equity holders, hence its sensitivity to changes to the exchange rate movements increases. As a result, currency risk management becomes essential to mitigate this risk. Therefore, we see that hedging firms

are usually associated with a higher debt ratio. Our results, however, do not support this explanation.

Our results also show that hedging firms have consistently under-performed their non-hedging counterparts in terms of Return on Assets (ROA) and Earning before Interest, and Tax (EBIT) ratios[14]. Mean and median tests are negative and statistically significant, through out the period. Results support the predictions of hedging theories that less profitable firms are more likely to hedge since they are more susceptible to financial distress[15].

Finally, Table 4 shows that hedgers consistently paid higher dividends than non-hedgers. The mean and median differences in dividend payout ratio between hedgers and non-hedgers were positive and statistically significant before, during and after the crisis. Hence, the results support the view that hedging firms in our sample were not financially constrained before, during, and after the crisis. This result is in line with Nance, Smith and Smithson's (1993) predictions that a lower dividend payout makes it more likely that funds will be available to service the firm's debt obligations (financing needs) as well as its investment requirements, therefore the lower the likelihood a firm will seek hedging. In other words, this explanation favors a positive relation between hedging and dividend payments and our results support this prediction.

It is important to note that the relationship between hedging and dividend payout ratio has been controversial in the literature. While Nance, Smith and Smithson's (1993) argue for a positive relationship (discussed above), Haushalter (2000), on the other hand,

[14] ROE ratio is negative and significant during the crisis period only, but positive and insignificant otherwise.

argues for a negative relationship between hedging and dividend payments. According to his prediction, companies facing liquidity constraints might pay little or no dividends because they are financially constrained. For these firms hedging is a necessity in order to minimize the volatility of the underlying cash flows and escape the pains of having to borrow from the external capital markets[16]. Accordingly, a low dividend payout ratio implies that the firm is financially constrained and thus has a greater need to conduct hedging. This view predicts a negative relationship between hedging and dividend payments. Our results in Table 4 did not support the latter argument, instead they document a positive relationship between hedging and dividend payout ratio.

Overall, results of the univariate analysis for the determinants of hedging in Table 4 showed that hedging firms are larger in size, they have a high level of exposure as proxied by their ratio of foreign sales to total sales, they have lower profitability ratio and they consistently pay higher dividends than their non hedging counterparts.

2.4. B. The Determinants of Foreign Currency Hedging: Multivariate Test

In this section, we examine the determinants of foreign currency hedging in a multivariate setting. To draw inferences on the determinants of currency hedging, we regress the firm's hedging profile, proxied by its gross notional value of foreign currency contracts (Panel A), to several firm characteristics. Notional value is defined as the contract amount of any foreign currency forward, swap or option made by the firm, it represents the future cash flows under the contract. Panel A of Table 5 shows cross

[15] Allayannis and Weston (1999) in investigating the impact of industry structure on currency hedging found that most hedging companies in the US are from competitive industries that have a low profitability. Hence they hedge more.

[16] Tufano (1998) also discussed this possible motivation of hedging.

sectional regression results. It is clear that the growth opportunity of the firm, proxied by Tobin's Q variable, is found to be significantly positive in all regression specifications indicating that the higher the growth opportunities of the firm, the greater the incentive to hedge. This result is, however, different than what has been reported in other studies. Allayannis and Weston (2001), Geczy et al. (1997) and Hagelin (2003) have found that Tobin's Q is not significantly related to firms' hedging decisions. Moreover, this result is contrary to Tufano's (1998) hypothesis that low Q firms, where agency costs are expected to be great, can use hedging as a means to camouflage these agency problems by stabilizing their cash-flows, avoiding the use of external finance and, ultimately, evading the scrutiny of the external capital markets. Therefore, our results suggest that high (low) Q firms tend to hedge more (less).

Results in panel A also confirm the results seen previously in the univariate tests. For example, Currency hedging is positively and significantly related to firm size. This result is consistent with Chow, Lee and Solt's (1997) results and Nance's et al (1993) hypothesis, which contends that large firms are more likely to hedge because the information and transaction costs of hedging exhibit economies of scale that makes it cheaper for theses firms to hedge. The ratio of foreign sales to total sales is also positively and significantly related to hedging indicating, that the higher the exposure, the higher the need to use currency derivatives to mitigate the risk of currency fluctuations.

Again as we saw earlier in the univariate tests, dividend payout ratio is positively and significantly related to hedging. Thus we can conclude that hedging firms in our sample are not financially constrained firms, therefore, the higher the dividend payout ratio, the higher the use of derivatives. The firm's profitability, as proxied by the firm's

EBIT Ratio, ROA is negatively and significantly related to its use of currency derivatives. This result supports the prediction of theory as explained above.

As theory predicts (see, for example, Graham and Rogers (2000) and Schmid (1999)), we find that the coefficient of long-term debt to total assets is positive. However, the results show that this variable is barely significant (at the 10% level) in only one specification, but overall the coefficient is positive, but not significant indicating, that hedging is not related to debt as a percent of total assets. It is important to note that the sign of the coefficient of long-term debt/total assets ratio is opposite to what we saw in the univariate tests, where hedgers were shown to have a lower debt ratio than non-hedgers. But since the mean and median differences were not significant, then this result is not surprising.

Panel B of Table 5 presents the same relation, but using logit regressions, where, the dependent variable is FCD-dummy, which is a dummy variable that takes the value of 1 if the firm reports a notional value of foreign currency derivatives, and takes the value of zero otherwise. The independent variables are those that are explained above and are used in the univariate analysis.

<Insert Table 5 about here>

Results in Panel B confirm the results obtained in panel A as well as the results obtained earlier in the univariate analysis. Overall results in table 5 indicate that the firm's decision to hedge is positively and significantly related to the following; the firm's growth opportunities as proxied by Tobin's Q, firm size as proxied by total assets, the

degree of exposure to foreign exchange rate movements as proxied by the ratio of foreign sales to total sales and the firm's dividend payout ratio. The decision to hedge, on the other hand is shown to be negatively and significantly related to the firm's profitability level as proxied by the ROA and EBIT ratios. Finally, results show that there a positive, but weak relationship between the firm's hedging decision and it's leverage position as proxied by the firm's debt to assets ratio. This variable was positive and barely significant (10%) in panel A and positive, but insignificant in panel B. Overall, our results support the predictions of theory and are in line with what has been documented in the empirical literature (see, for example, Allayannis et al. (2003) and Hagelin et al. (2004)).

2.5. Pre-Crisis, Crisis and Post-Crisis Valuation of Hedging and Non-Hedging firms: Asian Sample

2.5. A. The Hedging Premium/ Discount: Univariate Tests.

In this section we examine the role of hedging in response to the Asian 1996 currency crisis. Specifically, we test whether currency hedging increased or at least preserved the value of the firm during the Asian currency crisis. Two measures of valuation are used to measure firm value; the firm's Tobin's Q ratio and its Excess market value.[17] To infer about the workings of foreign currency derivatives in response to the Asian crisis we focus on mean and median Tobin's Q and mean and median excess

[17] Tobin's Q is defined as the ratio of the market value of the firm to the replacement cost of assets. It's computed as market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long- term debt divided by total assets of the firm. Excess market value is defined as the market value of equity less book value of equity normalized by total sales.

market value.[18] Specifically, we look at and compare valuations before, during, and after the crisis for hedging and non-hedging firms. If currency hedging works, one would expect that hedging firms should have higher valuations than non-hedging firms. The univariate tests show the significance of mean and median tests for these variables between the two groups. The significance of means tests is conducted by one-way ANOVA, where as the median tests are conducted by the non-parametric Wilcoxon Sum Rank test. Table 6 reports these results.

<Insert Table 6 about here>

Panel A reports the results of the univariate analysis using Tobin's Q as a measure of value. Results show that during the pre-crisis period (1996) mean Q value is higher for hedgers than non-hedgers. The mean hedging premium 0.087, however, is not statistically significant. Median values show similar results. Hedgers outperform non-hedgers, but the median hedging premium 0.038 is not significant.

During the crisis period (1997), the mean Q ratio of hedgers is more than that of non-hedgers. The mean hedging premium 0.111 is statistically significant at the 5% level. Median Q values are also higher for hedgers. There is a median hedging premium of 0.127, which is statistically significant at the 1% level. Therefore, the results confirm the presence of a positive and statistically significant hedging premium during the crisis period.

[18] As discussed before, the distributions of Tobin's Q and excess market value are skewed (means are greater than medians); hence we examine the hypothesis using both means and medians.

In the post-crisis period (1998), the same trend continues. The mean Q values still show a hedging premium of 0.499 that is still significant at the 5% level. Moreover, the median difference of Q is positive and significant indicating, that hedging was indeed rewarded with higher market valuation during the post-crisis period. The median hedging premium is 0.024 and significant at 5% level. One possible explanation for the results of post crisis period is that investors may have not appreciated the benefits of hedging until the crisis hit, then investors were able to see the superior performance of hedgers during the crisis period. This explanation is favored in light of the univariate results. These previous results showed that hedgers had a consistently higher dividend payout ratio that was significant through out the entire period, which means that these firms were not financially constrained during and after the crisis and the use of currency derivatives could have been the reason for this performance.

By examining the overall sample (1996-1998), mean and median Tobin's Q for hedging firms are significantly positive than that of their non-hedging counterparts. So, when using the pooled sample our results still document a hedging premium that is positive and significant at the 5% level.

Focusing on excess market valuations, as shown in panel B, we continue to observe the same pattern. First, during the pre-crisis period (1996), mean and median excess market value is greater for hedgers than non-hedgers. However, only the median hedging premium 0.017 is statistically significant at the10% level.

Second, during the crisis period (1997), mean and median excess market value for hedgers are greater than non-hedgers and the mean and median hedging premium 0.111 and 0.018 are statistically significant at the 5% level respectively.

Third, during the post-crisis period (1998), mean and median excess market value for hedgers are again higher than non-hedgers and the mean and median hedging premium 0.697 and 0.064 are statistically significant at the 5% level respectively.

Finally, by examining the pooled sample (1996-1998), results still document the presence of a mean and median hedging premium 0.215 and 0.038 that are significant at the 5% and 1% respectively.

Overall, univariate results in Table 6 show that by using Tobin's Q ratio as a measure of value, limited support is given to the hypothesis that foreign currency hedging increased firm value before the Asian crisis. The significant hedging premium is found only during the crisis and post-crisis periods respectively. By using excess market value as a measure of firm value, on the other hand, the evidence becomes stronger. The mean and median hedging premium is positive and significant in each year. Moreover, results of the overall sample i.e. from 1996-1998 also support the same trend (last row of table 6 Panels A and B). Hedging firms had a positive and significant hedge premium through out the crisis using both methods of valuation indicating, that currency hedging increased the market value of the firm during the turbulent Asian currency crisis.

2.5. B. Currency Hedging and Firm value: Multivariate Tests

In this section we test the relation between currency hedging and firm value, proxied by Tobin's Q ratio and Excess market value, in a multivariate framework. To be able to document a relationship, we need as before, to control for the effects of other possible variables on Tobin's Q and Excess market value. Most of the control variables are those that are discussed earlier. We control for firm size, geographic and industrial diversification, firm's leverage, firm's profitability and its liquidity and ability to access

financial markets. Table 7 presents the results of the following cross sectional regression. Each panel reports regressions on a yearly basis and for the overall sample period i.e., from 1996-1998 (last column of table 7 panels A and B)).

$$Q_i = \beta_0 + \beta_1 Log(TA)_i + \beta_2 FSTS_i + \beta_3 DERVDUM_i + \beta_4 DERV_i + \beta_5 ROA_i + \beta_6 ROE_i + \beta_7 EBIT_i + \beta_8 DIVDUM_i + \beta_9 LDEBTA_i + \beta_{10} INDIV_i + \epsilon_i$$

For $i = 1,.....N$, where N is the number of firm year observation.

The most important independent variables that we use to test the hypothesis that foreign currency hedging resulted in higher market valuation for hedgers during the Asian crisis, is the foreign currency derivative dummy (DERVDUM) (panel A1) and the notional value of currency derivatives (DERV) (panel A2). As it is evident from Panel A1 of Table 7, the coefficient of the foreign currency derivative dummy (DERVDUM) is positive for each year and through out the entire sample period indicating, that hedging increased the Q value of the firm. The overall hedging premium is (0.317), (0.371) and (0.466) (last 3 columns) and is significant at the 5%, 10% and 5% levels respectively. In panel A2, results show that the coefficient of the notional value of foreign currency derivative variable (DERV) is also positive, indicating a hedging premium that is, however, not significant[19]. Therefore, we can conclude that our results give support to the hypothesis that currency hedging was rewarded by higher market valuation. On average, users of currency derivatives have a higher Q than non-users by 0.385. Given that the

[19] Coefficient of the notional value of derivatives is positive. The overall hedging premium (0.205), (0.216) and (0.221) in the last 3 columns of panel A2 are not significant .

mean Q for the sample is 2.31, this premium represents 16.62%[20] of firm value. It is important to note that the hedging premium in our results is higher in value than that reported in Allayannis and Weston's (2001).[21] However, the high hedging premium that we report in our results is understandable given that we focus on the hedging activities of large multinational firms only.

<Insert Table 7 about here>

Panel B of Table 7 shows regression results using, as dependent variable, the excess market value. The independent variables are the same as above.

$$EXMKT_i = \beta_0 + \beta_1 \text{ Log(TA)}_i + \beta_2 \text{ FSTS}_i + \beta_3 \text{DERVDUM}_i + \beta_4 \text{ DERV}_i + \beta_5 \text{ROA}_i + \beta_6 \text{ROE}_i + \beta_7 \text{ EBIT}_i + \beta_8 \text{ DIVDUM}_i + \beta_9 \text{ LDEBTA}_i + \beta_{10} \text{ INDIV}_i + \epsilon_i$$

For $i = 1,.....N$, where N is the number of firm year observation.

Results in table 7 again document the presence of a hedging premium. In panel B1 the coefficient of the foreign currency derivative dummy (DERVDUM) is positive and significant in each year and in the pooled sample. The overall average hedging premium is 0.538[22] and is significant at the 5% level. Therefore by using a different

[20] This value is obtained by taking the average of the overall hedging premium (In the last 3 columns of panel A1) and dividing it by the mean Q of the sample.
[21] Allayannis and Weston (2001) found an overall hedge premium of 0.068, which represents 5.7% of firm value from 1990-1995. This premium, however, is smaller than the hedging premium in our results since 50% of their sample was domestic firms; with zero foreign exchange exposure.
[22] The average hedging premium is the average of the coefficient of the derivative dummy (DERVDUM) in the last 3 columns of panel B1.

measure of value, the results document an even higher hedging premium, which represents 26.5% [23]of firm value through out the entire crisis period (1996-1998).

For the rest of the control variables in table 7, some turned out significant with the expected signs, while others non significant. For example, the coefficient of size, proxied by the log of total assets of the firm, is negative and significant in each year and for the overall sample and using both methods of valuations. See panels A1, A2, B1 and B2. It is important to note that the expected sign in the literature is mixed with regards to this variable[24]. Judge (2003) finds a negative, but insignificant result for size proxied by LN of total assets. Allayannis and Weston (2001) and Pramborg (2003) found differences in Tobin's Q for large firms as compared to small firms, where large firms were associated with a lower Tobin's Q. Our result seems to support the latter findings.

The coefficient of the ratio of foreign sales to total sales variable is mixed in our results. It is negative and significant in the pre-crisis period (1996), the crisis period (1997) and for overall pooled sample (1996-1998). It is also negative post crisis, but the coefficient is not significant in panels A1 and A2. Moreover, it is positive and significant in the overall pooled sample in panel B1. It is also positive, but not significant in the overall sample period in panel B2. These results totally contradict the multinationality theory. According to this theory, the greater the degree of multinatinality and the greater the extent of the firm's foreign operations and foreign involvement, the greater firm value becomes. See, for example, Morck and Yeung (1991), Bodnar et al, (1999). The result in our paper, however, shows a weak association between firm value and global

[23] See footnote 19 on how this value is obtained. Here we divide by the mean value of Excess Market variable in the sample, which is 2.03

[24] See Lang and Stulz (1994) for a discussion of this issue. Also see our discussion on the expected sign of this variable in section 2.4.A

diversification. It seems that our results provide some support to Denis' and Yost's (2002) results, which document a geographic diversification discount in their sample It is important to note, however, that further tests are conducted, in the following section, to shed more light on the association between firm value and geographic diversification, especially in the presence of currency derivatives.

The remaining control variables in Table 7 seem to support existing theories. For example, the coefficient of ROE and EBIT are both positive and significant at the 1% level, indicating that the higher the profitability of the firm, the higher its value. Similarly, the coefficient of the industrial diversification dummy (INDDIV) is negative and significant in each year and in the overall pooled sample in all panels. Thus, this result supports previous research on the value destroying effect of industrial diversification.[25]

The coefficient of the dividend payout ratio, a proxy for the firm's liquidity and its ability to access financial markets, is negative and significant in each year of the crisis and in the overall pooled sample in all panels. This result strongly supports the predictions of Lang and Stulz (1994) and Servaes (1996) who argue for a negative relationship between dividend pay out and firm value[26]. Our results, on the other hand,

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[25] Many theories and empirical investigations document that industrial diversification is an outgrowth of the agency problems between managers and shareholders and thus destroys value. (See for example, Jensen (1986), Lang and Stulz (1994), Berger and Ofek (1995) and Servaes (1996).

[26] According to the predictions of Lang and Stulz (1994) and Servaes (1996), if a firm paid dividends, then it's less likely to be capital constrained, which basically allows the firm to engage in any kind of investments under the discretion of management. Hence the more likely it can undertake negative NPV projects and destroy its value. Therefore, according to the prediction of this theory, dividend payout is negatively related to firm value. Moreover, our results also support Allaynnis and Weston (2001) who argue along the same line and add that if hedgers forego projects because they are not able to obtain the necessary financing, Their Tobin's Q might remain high because they undertake only positive NPV projects.

did not provide support to Fama's and French's (1998) "Dividend Signaling Hypothesis" and the positive impact of dividends on firm value.

With regards to the impact of leverage on firm value, our results show that the coefficient of the firm's long term debt to its assets ratio is positive and significant each year and in the overall sample period in panels A1 and B1. It is positive, but not significant in panel A2. Moreover the coefficient of leverage is positive, and not significant only during the crisis period and in the overall pooled sample in panel B2. Overall, this result is consistent with the predictions of theory. Firms with higher levels of debt have higher Q ratios and market values because debt acts as a monitoring mechanism for managers (Jensen, 1986). Allayannis and Weston (2001) found a positive and significant relationship between debt and firm value. Pramborg (2003), Hagelin et al. (2004), on the other hand, found a negative relationship between debt and firm value that was not significant. Our result supports the arguments of Jensen (1986) and the results of Allayannis and Weston (2001).

Overall, results from Table 7 for the Asian sample confirms that hedging foreign exchange risk using foreign currency derivatives was associated with higher market valuations through out the crisis period and regardless of the valuation measure used in the analysis. Moreover, the majority of the control variables came out significant and with the expected sign as theory predicts.

2.6. Firm Value, Foreign Currency Hedging and the Geographic Diversity of the Firm: Asian Sample

In this section we conduct specific tests in order to distinguish value effects from financial hedging (currency derivatives) to those from non- financial hedging (natural hedges or geographic diversification) during the Asian financial crisis. The rationale behind this investigation stems from the general belief that diversifying the firm's operations overseas can eliminate a portion of currency risk.

Researchers have established plausible arguments on how global (geographic) diversification and financial hedging (currency derivatives) can be considered substitutes for risk management. Such arguments can be traced as early as to Markowitz (1959).He argues that equity holders of the firm can generally manage risks more efficiently than if they let the firm manage risks for them. For systematic risks, equity holders can use asset allocation (global diversification) to achieve their desired level of risk, based on individual risk preferences. For idiosyncratic risks, equity holders can manage them at a low cost by holding a diversified portfolio.

Recently, the ineffectiveness of financial hedging has been discussed by Bethel (1999) and Stulz (2000). They argue that a firm can partly hedge its systematic risk components but it's hard to hedge its firm specific component with financial hedging instruments. The ineffectiveness of risk management in reducing firm-specific exposures is due to two reasons. First, transaction costs for small numbers of hedging contracts are very high, therefore, it is either very expensive for firms to use financial hedging for specific risks or financial hedging contracts may not be available after all for these risks. Second, firm specific risk is associated with moral hazard and adverse selection problems

that render financial hedging contracts highly unsuccessful. Based on these arguments, it seems that equity holders generally will not want to engage the firm in any type of financial risk management activities.

What is intriguing, however, is that financial derivative usage by firms has grown consistently over the years (see, for example, Bodnar, Hayt and Marston (1998)). Moreover, recent theories in the literature showed that under certain conditions, the firm's ability to allocate its assets cannot substitute for risk management activities (see, for example, Lim and Wang (2001)), implying a complementary relation between financial hedging and natural hedges.

In this section we shed some light on the relationship between currency hedging techniques and the geographic diversity of the firm during the Asian currency crisis. We believe that during exchange rate instability events, the firm's geographic diversity and the extent of its foreign operations could indeed be important tools in shielding firm value against severe and abrupt exchange rate movements.

In Table 8 we report the results of a multivariate OLS regression that relates the firm's valuation measures to its hedging profile. The analysis is similar to that conducted in the previous section, but here we include two sets of interactive variables to proxy for the interaction between currency hedging (financial hedging) and geographic diversification (non-financial hedging) on firm value. The valuation measures are the same used in the previous sections. Financial hedging is proxied, as before, by the foreign currency derivative dummy (DERVDUM). Geographic diversification, on the other hand, is proxied using two variables; the Asian foreign sales to total sales ratio (GEO_1)[27], and

[27] The foreign sales to total sales ratio is a very common proxy for geographic diversification that has been used in the literature (see Allayannis and Weston (2001) and Allayannis et al (2003) and (2001)).Here

the number of countries in which each firm operates in the Asian region (GEO_2)[28]. The rest of the control variables are the same as those used before in our previous analysis.

<Insert Table 8 about here>

In panel A of table 8 results show that currency hedging proxied by the derivative dummy (DERVDUM), increases firm value. The coefficient of the DERVDUM is positive and significant in each year and in the overall sample period. Thus, confirming our earlier results that financial hedging is a value increasing strategy for the firm.

The coefficient of geographic diversification proxied by the ratio of Asian foreign sales to total sales (GEO_1) is mixed. It is positive, but not significant in the pre-crisis period (1996). It is negative and significant in the crisis period (1997) and for the entire sample period. Finally, it is negative, but insignificant in the post-crisis period. This value discount is similar to that uncovered by Dennis and Yost (2002), but contradicts the prediction of multinationality theory, which suggests that geographic diversification is valuable, particularly in the presence of intangible assets and multinational networks (see, for example, Morck and Yeung, Doukas and Travlos (1998), and Doukas, Pentzalis and Kim (1999)).

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the Asian foreign sales to total sales ratio in our analysis is calculated as the percentage of foreign sales from the Asian subsidiaries divided by total sales of the firm. The data for this variable is obtained from the firm's 10K annual Reports. The mean value of this variable for the sample is 19.25, implying that, on average, firms in our sample have 19% of their foreign sales generated in the Asian region.

[28] Operation in the Asian region includes operation in the following countries; China-Hong Kong- Indonesia- India- Japan –Malaysia- Philippines – Singapore – South Korea – Taiwan – Thailand. The information on this variable is obtained from the Directory of American Firms Operating in Foreign Countries (1996). The mean value of this variable is 4.75 for the entire sample, indicating that on average each firm operates in at least 4 countries in the Asian region.

Interestingly, the coefficient of the interactive variable DERVDUM*GEO_1 is positive, but insignificant in 1996, 1998 and in the overall sample period (1996-1998). It is, however, negative, but insignificant in 1997. This result provides a weak support to the view that both types of hedging techniques are complementary and are value increasing to the firm.

The coefficient of the geographic diversification variable proxied by the number of countries in which the firms operate in the region (GEO_2) however, provides a stronger support to the positive valuation effect of both types of hedging techniques on firm value. First, the coefficient of GEO_2 is positive and significant in the pre-crisis, post-crisis and in the overall sample period. It is also positive, but insignificant in 1997. This result indicates that geographic diversification is a value increasing strategy for the firm. Second, the coefficient of the interactive variable DERVDUM * GEO_2 is positive and significant in the pre-crisis (1996), post-crisis (1998), and in the overall sample period (1996-1998). It is also positive, but not significant in the crisis period (1997). This result shows that financial hedging in the presence of geographic diversification increases or at best protects firm value during periods of exchanger rate instability.

In panel B, the results show that by using foreign sales to total sales ratio GEO_1 as a proxy for geographic diversification, the coefficient of the interactive term DERVDUM * GEO_1 is positive, but not significant in the post crisis period and in the overall pooled regression. However, the coefficient is negative, but insignificant in the pre-crisis period. Moreover, it is negative and significant in the crisis period. This result is inconsistent wit the positive valuation effect of financial hedging and geographic diversification.

However, when the GEO_2 variable is used to proxy for the firm's geographic diversity, the coefficient of the interactive term DERVDUM * GEO_2 is positive in each year and in the overall sample. Moreover, the hedging premium is positive and significant in the overall sample period and in the pre-crisis period as well. Thus, by using GEO_2 the positive valuation effects of both types of hedging strategies becomes stronger.

The inconsistent results obtained by using GEO_1 as a proxy for geographic diversification compared to the results obtained using GEO_2 as a proxy for the same variable, however, could be interpreted as follows; the ratio of regional foreign sales to total sales (GEO_1) is generally a good proxy for the extent of a firm's international involvement and its degree of multinationality. However, in the context of an exchange rate instability event, having high foreign sales to total sales ratio might not necessarily help the firm to protect its value against adverse exchange rate movements if the bulk of the sales have come from one country; let's say Thailand or Indonesia, during the turbulent period. However, if this firm is present and operates in more than one country of the troubled region at the same time, it could do a better job at reducing its exposure and preserving its value because not all countries in the region were hit by the crisis in the same magnitude and at the same time.

If we examine the rest of the control variables in the table, we'll pretty much see a pattern similar to the results we obtained earlier. Firm value is negative and significantly related to firm size; it is positive and significantly related to the firm's profitability profile as proxied by the firm's ROA, ROE and EBIT ratios. The ratio of long-term debt to total assets is positive and significant only in the overall pooled sample

(panel A), but positive and significant in each year and in the overall sample period (panel B), thus supporting the arguments that debt can help increase firm value because of its monitoring effect on managers (see, for example, Jensen (1986)). Dividend payment is negative and significnalty related to firm value as it indicates that firms are not capital constraints, which allows managers to engage in type of projects or investments under their discretion. Finally, firm value is negatively and significantly related to industrial diversification; a finding that has been documented by many studies (see, for example, Lang and Stulz (1994), Commnet and Jarrrell (1995) and Servaes (1996)).

Overall, results from Table 8 show that firms that hedged their currency exposure during the Asian currency crisis, using both financial and non-financial hedging strategies were rewarded by a positive market valuation. This result is stronger particularly when we proxy for non-financial hedging by the total number of countries the firm operates in the region (GEO_2) rather than relaying on foreign sales/total sales ratio (GEO_1) as a proxy for the same variable. Thus, our results support a complementary relationship between financial and natural hedging techniques of risk management.

2.7. The Brazilian Real Devaluation:

So far our results show that the use of currency derivatives have been beneficial to US firms with Asian currency exposures. However, to be able to generalize this result we have to apply some robustness checks and see if the results will still hold out. Luckily, at least from a research point of view, the 1990's have been plagued by several currency shocks and financial upheavals that affected many countries and the global financial

market.[29] This permits us to conduct the same experiment on a different sample and at a different time period. In this section the impact of foreign currency hedging and firm value is investigated on a sample of 612 US non-financial firms that operated in Brazil and the Latin American region during the Brazilian Real devaluation of 1999. The Brazilian crisis allows us to push the time period of investigation a few years forward from 1999-2000. In addition, Latin America is the US second largest trading partner. Hence, currency disruptions in the region can very well impact American firms there.

2.7. A. Overview of the Brazilian Real Devaluation

Faced with growing capital flight caused by a loss of investor confidence in the government's fiscal reforms, the Brazilian government on January 15, 1999 abandoned its efforts to defend the Real allowing the currency to float freely against the dollar. By January 19, the devaluation of the currency had reached 28%, with most analysts predicting it will peak to 30% before stabilizing. By January 29, the Real had plunged by 44%, while analysts warned that Brazil could follow the path of Mexico and Russia. The uncontrolled devaluation was followed by a deep recession.

The loss of investor confidence in Brazilian fiscal reforms came mainly as a result of the high fiscal deficit that the government has been incurring for years. The fiscal deficit in Brazil came primarily from the cleaning up of the Brazilian banks that had bad debts. The government took the responsibility to finance those bad debts and started to borrow from the Brazilian banking system. After the Asian crisis hit and particularly after

[29] Early in 1994, before the Asian crisis, the world financial markets were shaken by the Mexican Pesos crisis. In 1998 the Russian crisis took place just as the world markets were recovering from the Asian upheaval. In 1999 The Brazilian crisis took place and its contagion effects were feared, particularly, through Latin America.

the Russian crisis, Brazilians believed that their currency would be next. They started demanding higher interest rates.

Hoping to lower interest rates, the Brazilian government started thinking of devaluating the Real (15-20% devaluation) did not seem harmful at that time. The final blow to the government's credibility, however, came at the start of January 1999 when the governor of Minas Gerais suddenly declared a moratorium on his state's debt with the federal government of Brazilia. Other opposition governors warned that they could not continue making their debt payments to the federal government as well. The government immediately started a round of renegotiations with the governors on the debt accords signed with their states. But the fears that these talks could fall apart and add to the public sector deficit, provoked a round of capital flight and loss of investor's confidence that resulted in the collapse of the government's floating peg exchange policy.[30]

2.7. B. Data selection and sample description:

The sample used in this study consists of a sample of US. non-financial firms from the S&P 500 firms. The sample covers the period from 1998-2000 (the period around the Brazilian Real crisis of 1999). The logic behind using the S&P 500 firms is the same as that discussed earlier. The index includes relatively large firms which are more likely to have exposure to various financial price risks and therefore potentially provide a rich cross-section of hedging and non-hedging firms. Second, firms within this sample are required by SEC to actively report their hedging activities in their annual financial statements during the sample period. We adopt the same firm selection criteria, as discussed above in the Asian sample, in section 2.3.

[30] For a detailed discussion of the events leading to the Brazilian devaluation see Edwin Taylor's (1999) account of The Effects of the Brazilian Devaluation. pp 6-11

Table 9 presents some descriptive statistics of the sample. Panel A shows the hedging profile of the firms through out the Brazilian crisis period. By examining the number and distribution of hedging and non-hedging firms in the sample, it's clear that more than sixty percent (60.29%) of the firms use foreign currency derivatives from 1998-2000. The number of currency derivative users increased from 1998 to 1999 (60.78%, 62.56% respectively). We notice, however, a slight drop in this number in 2000 (57.60%). Some firms did not report currency derivative information in the year 2000 instead they reported interest rate and/or commodity hedging information. Because hedging firms in our sample are defined as those who report foreign currency hedging information only, these firms were included in the non-hedgers sample. Therefore, we notice that in the year 2000 the number of hedging firms slightly declined, where as the number of non hedging firms slightly increased (from 39.2% in 1998 to 42.2% in 2000). We see the same trend in the mean gross notional value of foreign currency derivatives (last column in Panel A). The mean gross notional value of foreign currency derivatives increased to $5350.2 million in 1999 from $4165.6 million in 1998 indicating, that not only the number but also the value of foreign currency contracts has been on the rise. In 2000, however, the mean gross notional value of foreign currency derivatives slightly declined to $4738.1 million. For the same reason explained above.

Panel B of Table 9 shows the type of foreign currency hedging instrument used by hedging firms in the sample. From 1998-2000, more than seventy percent (71.81%) of the firms have used foreign exchange forward contracts, making them the most widely used currency hedging instrument. Followed by currency options (25.20%) then by currency swaps (2.98%). Overall, results from table 9 are robust with our results from the

Asian sample and are consistent with previous research.[31]

<Insert Table 9 about here>

Table 10 shows summary statistics for the main variables that are used in the analysis. The mean (median) value for Tobin' Q and Excess Market value in the sample are 2.71 (1.61), 2.64 (1.24) respectively. The median values are relatively smaller than the mean values indicating, that the distribution of Tobin's Q and Excess Market value are relatively skewed. Hence in our univariate analysis we'll be using both mean and median tests. We note that the mean and median values for our two valuation measures are slightly higher than those reported earlier for our Asian sample, indicating that most firms in the Brazilian sample are high market performers.

Again, to be able to infer that currency hedging increased firm value or at best insulated it against the Brazilian currency shock, it is important to control for the effect of other variables that could have an impact on value. These variables include[32]: Firm size, Geographic and industrial diversification,. The firm's Leverage, its profitability and liquidity measures. The sample has a mean (median) value of total Assets of $14741 ($5622) million. The mean value of foreign sales to total sales is 33.34% (32.65%). This means that hedging firms in the sample have foreign sales that are, on average, above 30% of their total sales. Moreover, on average, the sample's gross notional value of foreign currency derivatives is $4751.8 million.

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[31] See for example Bodnar, Hayt, Marston and Smithson (1995), Dolde (1995), Fok et al. (1997), Gay and Nam (1998), Howton and Perfect (1998) Nance et al. (1993), and Phillips (1995).

[32] For a discussion of the theoretical justification for the use of some of these variables see Allayannis, Brown and Klapper (2001), Allayannis and Weston (2001), Muller (1987) and Peltzman (1977).

Mean value of long-term debt to total assets ratio is 24.80 (22.28). Profitability ratios for the entire sample have the following mean (median) values: ROA 7.44 (6.74), ROE 19.90 (17.15), EBIT 14.49 (13.08) respectively. The firms in the sample have a mean dividend payout ratio of 32.89%. Finally, the results show that on average, approximately 59% of the firms in the sample are diversified across industries. Overall, most of the mean and median values for most variables are greater than those in the Asian sample, possibly because of the time span of the investigation.

<Insert Table 10 about here>

2.7. C. Univariate Tests of Pre-Crisis, Crisis and Post-Crisis Performance of Hedging and Non-Hedging firms:

In this section we examine some performance measures and firm-specific variables for the sample of foreign exchange currency hedgers and non-hedgers before, during and after the Brazilian crisis, 1998-2000 using univariate analysis. Table 11 shows the results of this analysis. The results show, as before, that hedgers have a larger size than non-hedgers thought out the entire sample period. The mean and median difference of total assets between hedging firms and non-hedging firms is positive and statistically significant pre-crisis, crisis and post- crisis periods. Our results are consistent with those of Chow, Lee and Solt (1997) and are robust to those from the Asian sample

<Insert Table 11 about here>

Table 11 also shows that hedging firms consistently have higher foreign sales to total sales ratios than their non-hedging counterparts. The mean and median tests for the value of foreign sales to total sales are positive and significant for the hedgers' sample through out the period. This result is consistent with the literature on foreign exchange exposure and Multinationality theory. See Allayannis and Ofek (1999), Jorion (1990) and Emmons and Schmid (2000).

The mean and median values for the ratio of long-term debt to assets is negative and significant during the crisis period only and positive and insignificant otherwise. Our univariate results, therefore, do not support existing literature on the relationship between debt and hedging. It is also different than that obtained in the Asian sample.

Regarding the performance ratios, hedging firms have consistently under-performed their non-hedging counterparts in their Return on Assets ratio (ROA) and Earning before Interest and Tax (EBIT) ratios[33]. Mean and median tests are negative and statistically significant, through out the period. Results support what hedging theory predicts. According to theory, less profitable firms are more likely to hedge since they are more susceptible to financial distress. This result is also robust to what we found earlier in the Asian sample.

Finally, the mean and median differences in dividend payout ratio between hedgers and non-hedgers were positive and statistically significant before, during and after the crisis. Hence, the results support the view that hedging firms in our sample were not capitally constrained firms before, during and after the crisis. This result is in line

[33] ROE ratio is negative and significant during the crisis period only, but positive and insignificant otherwise.

with Nance, Smith and Smithson's (1993) predictions and is also robust to the results obtained from the Asian sample.

2.7. D. The Hedging Premium/ Discount: Univariate Tests

In this section we use univariate analysis to directly test whether currency hedging increased or at least preserved the value of the firm during the Brazilian currency crisis

<Insert Table 12 about here>

Table 12 reports the results of the univariate analysis. It is clear that during the pre-crisis period (1998) mean Q value is more for hedgers than non-hedgers. The hedging premium (0.060) is statistically significant at the 10% level. Median values show similar results. Hedgers outperform non-hedgers but, the median hedging premium (0.061) is more significant (at 5% level).

During the crisis period (1999), the mean Q ratio of hedgers is more than that of non-hedgers. The hedging premium (0.140) is statistically significant at the 1% level. Median Q values are also higher for hedgers than non-hedgers. There is a median hedging premium of (0.039), which, as before, is statistically significant at the 1% level. Therefore, the results again show that there is a positive and statistical hedging premium for users of currency derivatives during the Brazilian Real devaluation. This result is also robust to what was obtained earlier in the Asian sample

In the post-crisis period (2000), the same trend continues. The mean Q values still show a hedging premium of (0.430) that is still significant at the 5% level. Moreover, the median difference of Q is positive and significant indicating, that hedging was indeed

rewarded with higher market valuation post-crisis. The median hedging premium in 2000 is (0.380) and significant at 1% level. Results using Tobin's Q, therefore, indicate that investors were indeed anticipating a Real Devaluation and a crisis that could have been as bad as the Asian or the Russian crisis. Investors appreciated the benefits of hedging even before the crisis hit. They continued to reward currency hedging firms during and after the crisis as well. Moreover, through out the entire period (1998-2000) mean and median Tobin's Q is positive and significant, indicating that hedging firms outperformed their non-hedging counterparts.

By examining excess market value in panel B of Table 12, we continue to see robust results. First, during the pre-crisis period (1998), mean and median excess market value is greater for hedgers than non-hedgers. The median hedging premium (0.135) is statistically significant at the1% level, where as the mean hedging premium (0.260) is significant at the 10% level. Second, during the crisis period (1999), mean and median excess market value for hedgers is greater than non-hedgers and the hedging premium is statistically significant at the 5% level. Third, during the post-crisis period (2000), mean and median excess market value for hedgers is again higher than non-hedgers and the hedging premium is statistically significant at the 5% level.

Overall, univariate results of firms with Brazilian exposures provide strong support to the positive valuation effects of currency hedging during times of exchange rate instability events. The hedging premium is positive and significant in each year of the crisis and regardless of the valuation measure used.

2.7. E. The Hedging Premium/ Discount: Multivariate Tests

In this section we test the relationship between currency hedging and firm in a multivariate framework. To be able to document a relationship between currency hedging strategies and firm value during the Brazilian Real Devaluation of 1999, we need to control for the effects of other possible variables on Tobin's Q and Excess market value as we did earlier. Most of the control variables are those that are discussed in previous sections. Table 13 shows the valuation effects of hedging in the Brazilian sample. Again as we did in the Asian sample, in each panel we report the below regression on a yearly basis and for the overall sample i.e. from 1998-2000 (last column of table 12 panels A and B).

$$V_i = \beta_0 + \beta_1 \text{Log}(TA)_i + \beta_2 FSTS_i + \beta_3 DERVDUM_i + \beta_4 ROA_i + \beta_5 ROE_i + \beta_6 EBIT_i + \beta_7 DIVDUM_i + \beta_8 LDEBTA_i + \beta_9 INDIV_i + \epsilon_i$$

For $i = 1,.....N$, where N is the number of firm year observation.

V_i = Tobin's Q ratio (panel A) and Excess Market Value (Panel B)

As it's clear from panel A of table 13, the coefficient of the foreign currency derivative dummy (DERVDUM) is positive for each year and through out the entire sample period indicating, that hedging increased the Q value of the firm. The overall hedging premium is (0.088), (0.360) and (0.275) respectively (last 3 columns of Table 13) and is significant at the 5% level. Therefore, our results document a positive and significant hedging premium during the Brazilian currency crisis that is robust to our

earlier results of the Asian crisis. Users of currency derivatives are shown to have a higher Q than non-users by 0.241 Given that the mean Q for the sample is 2.71 this premium represents 8.89 % of firm value.

<Insert Table 13 about here>

Consistent to the results in panel A, our results in panel B of Table 13 still document a positive and significant hedging premium when using Excess Market value as an alternative valuation measure. The overall average hedging premium is 0.078, which represents 2.95% of firm value and is also significant at the 5% level for the entire sample period (1998-2000).

For the rest of the control variables, we see a pattern in the signs and significance of the coefficients of these variables that are consistent and robust to the results in the Asian sample. Our results show that firms that are smaller in size, that have high profitability ratios, that pay lower dividends, that have a higher leverage, that are industrially focused tend to have a higher market value regardless of the measure of valuation used.

Overall, results from the Brazilian sample confirms that hedging foreign currency risk using foreign currency derivatives was rewarded by higher market valuation each year and through out the entire crisis period and regardless of the measure of valuation used in the analysis. In addition, the majority of the control variables used in the regressions came out significant and displayed the same expected sign as theory predicts. It is important to note that these results are robust and consistent to results uncovered

earlier in the Asian sample. Together both samples provide a strong support of the positive valuation hypothesis and to the benefits of foreign currency hedging, as a risk management technique, during exchange rate shocks.

2.8. Firm Value, Foreign Currency Hedging and the Geographic Diversity of the Firm: Brazilian Sample

In this section, we investigate valuation effects from financial hedging to those from geographic diversification. We use the same set of interactive variables as we used in the Asian sample. Namely we employ GEO_1 and GEO_2 as alternative proxies of geographic diversification. GEO_1 represent the Latin American foreign sales to total sales ratio[34]. Similarly GEO_2 represents the number of countries that the firm operates in the Latin American region. Table 14 reports the results of this analysis.

<Insert Table 14 about here>

In panel A of Table 14 the results again show that by using the ratio of regional foreign sales to total sales ratio GEO_1 as a proxy for the firm's geographic diversity, we do not support the positive valuation effect of the two types of hedging techniques on firm value. Specifically, we find that the coefficient of the interactive term DERVDUM * GEO_1 is negative in the pre-crisis period and in the overall sample, whereas it is positive in the crisis and post-crisis periods respectively. In addition, the variable is not significant in any year. On the other hand, when GEO_2 variable is used in

[34] This variable is obtained for the Directory of American Firms Operating in Foreign Countries in the year 1999.

the regression a positive and statistically significant hedging premium is documented in the crisis, post-crisis and the overall pooled sample respectively.

The same trend and pattern is similarly observed in panel B of Table 14. As a matter of fact, by using Excess Market Value as an alternative measure of value, an even more significant hedging premium is documented.

Overall, results from Table 14 are robust to our results in the Asian sample. Both results support the arguments that financial and non-financial hedging techniques are complementary and can both work together to increase firm value or at least protect it against exchange rate and currency shocks. It is important to note that this result is generally true and stronger when the number of countries that the firm operates in the crisis region is used as a proxy for the firm's geographic diversity.

2.9. Summary of Results.

This essay examines whether foreign currency hedging increases firm value or at best insulates it against currency and exchange rate shocks. Financial theory suggests that hedging exchange rate risk through currency derivatives can increase or at best can protect firm value by reducing the chances of financial distress. The Financial and currency crises of the 1990's provide us with an exogenous set of events that allows us to carry out an investigation in order to determine the effectiveness of foreign currency hedging in periods of currency upheavals.

By using first a large cross section of firms from US non-financial firms from the S&P500 that have a positive foreign sales total sales ratio and who had operations in the Asian and Latin American regions around the time of the Asian financial crisis of 1997 and the Brazilian Real devaluation of 1999, the results indicate that firms, which hedged their foreign exchange exposures using foreign currency derivatives, were rewarded by the market at times of exchange rate turbulence. This result is robust for both the Asian and for the Brazilian financial crises and regardless of the measure of valuation used. Second, results show that firms that hedged their currency exposure using both financial and non-financial hedging techniques were rewarded by a positive market valuation at the time of exchange rate shocks. The positive valuation impact is shown to be stronger when the total number of foreign country operations (GEO_2) is used to proxy for non-financial hedging, rather than using foreign sales/total sales ratio (GEO_1), which is a measure often used in the literature as a proxy for the same variable. Our results indicate that financial and natural hedging are complementary techniques in managing currency risk and

shielding firm value against severe and abrupt exchange rate movements. This result is also robust for both currency crises and regardless of the valuation measure used.

Moreover, results for the Asian sample are generally consistent with previous research[35] that showed that the effect of the Asian crisis on US firms had been benign and that the growth enhancing consequences of the crisis for the United States – primarily lower interest rates and commodity and input prices–were simply more powerful than the growth reducing factors which included reduced demand for US exports, financial and revenue disturbances suffered by lenders, investors, and firms that have operated in the region during the crisis.

[35] See, for example, Coughlin and Pollard (2000) and Gould and Taylor (1998)

3. ESSAY 2: CURRENCY RISK MANAGEMENT STRATEGIES AND AGENCY COSTS

Agency theory has had a strong impact on research in financial economics (Bartram, 2000). Central elements in the agency problem are the interdependence of different interests, information sets, and alternatives of action for two major parties; the principle (a shareholder) and an agent (a manager). The role of risk management in alleviating or exacerbating the agency problem, resulting from the separation of ownership and control, has fueled a lot of controversy in the finance literature.

While, some researchers argue that risk management eliminates agency costs by reducing the under-investment and asset substitution problems, particularly in firms that have volatile returns and that are highly leveraged (for example see Dobson and Soenen (1993), MacMinn (1978), Meyers (1977), Smith, Smithson and Wilford (1990), and Smithson (1998) among others), others argue that divergent risk preferences exist between managers, whose wealth position is undiversified, and shareholders. Hence managers may use the investing and financing policy of the firm, or more specifically corporate risk management policy as a tool to suit their own personal risk preferences. Corporate hedging motivated by managerial risk preferences is potentially damaging if mangers use it to evade the scrutiny of the external capital markets, engage in value destroying projects and hence exacerbate the agency problems in the firm (see, for example, Bartram (2000), Haeglin et. al. (2004), Mayers and Smith (1982), Smith and Stulz (1984), Stulz (1984), Stulz (1990), Tufano(1996) and (1998)).

Empirical investigations of the agency costs of risk management focused on firm specific performance indicators and ratios to measure the asset substitution problem, such as debt ratio, R&D to sales, capital expenditures to total assets, book value to market

value of equity and Tobin's Q ratio (see, for example, Allayannis and Weston (1997), Berkman and Bradbury (!996), Dolde (1995), Fehle (1998), Gay and Nam (1998), Graham and Rogers (1999), Haushalter (1997), Howtan and Perfect (1998), Mian (1996), and Nance, Smith and Smithson, (1993)).

On the other hand, empirical studies testing the divergence of managerial interest component of the agency problem focus on the incentive structure in general and managerial compensation in particular. This is due to the fact that shareholders can resolve management's conflict of interest through suitable incentive structures. By linking the compensation and evaluation of managers appropriately to stock prices, shareholders can ensure that corporate policies take shareholder value into account and that risk reducing value destroying strategies on part of management are mostly avoided. Results of empirical studies support the hypothesis that corporations are less likely to conduct risk management and that they hedge less, the more important stock options are for management compensation whose value increases the more volatile firm value becomes (Gay and Nam (1998), Geczy, Minton and Schrand (1997), Haeglien et.al. (2004), Haushlater (1997), Schrand and Unal (1998), and Tufano (1996)).

While the empirical literature recognizes the relationship between corporate hedging policies and managerial agency conflicts arising from managerial risk preferences, it does not take into account other important determinants of managerial agency conflicts that have been documented in the literature such as the extent to which managers can act on their own self interests and the costs of evaluating and replacing managers (see Jensen and Meckling (1976), and Lel (2004)). These different aspects of managerial agency conflicts highlight the importance of governance structures on corporate hedging policies. Corporate governance should be an important determinant of risk management activities,

as corporate governance is the market solution to agency problems (see Fama (1980) and Lel (2004))

This essay provides new evidence on the potential effects of corporate governance structure on the firm's currency hedging activities. Specifically this essay investigates the relationship between currency risk management activities, firm value and the agency-related costs arising from the separation of ownership and control using an innovative methodology, which proxies for the level of agency conflict in the firm. The degree of agency conflicts in the firm is proxied by the Corporate Governance Index or the "G" index. The Corporate Governance Index is a state of the art measure, which proxies for the balance of power between shareholders and managers. The index is constructed by Gompers, Ishii and Metrick (2001) using laws, regulations and 24 distinct corporate governance provisions, which define the power sharing relationship between shareholders and managers during the 1990's. The higher the index, the lower shareholders' rights and the more powerful managerial provisions become, hence, resulting in a higher level of agency conflicts (i.e. weaker governance) in the firm and vice versa.

The use of the Corporate Governance index "G" provides some advantages for our study. Specifically, using the "G" index which is composed of the regulations set by the securities commission (at the federal level), corporate laws (at the state level), and corporate by laws, charter provisions, and other rules (at the firm level) allows us to focus on a larger and much broader set of corporate-governance provisions and its relationship to the firm's hedging activities and its value. These provisions are viewed as a slow moving "constitution" for the firm that sets the rules for faster adjusting forms of governance such as board membership, CEO compensation, and shareholder activism. (Gompers et al. 2001). As far as the currency hedging literature is concerned, to the best

of our knowledge, no study using US data has attempted to directly use the firm's corporate governance structure as a measure of agency costs and relate it to the firm's currency hedging profile.

This essay builds on recent international evidence that documents the role of managerial agency conflicts, corporate governance and hedging policy in foreign firms. While these recent studies[1] have only focused on certain aspects of the governance structure at the firm level and at the country level, this essay extends the literature by analyzing the role of managerial agency conflicts and currency hedging strategies using a corporate governance index for US firms that takes into account federal, state and firm level governance provisions.

In this essay we test the damaging effects of corporate hedging motivated by the managerial risk preferences hypothesis as outlined by Tufano (1998). If currency risk management strategies (currency hedging) are undertaken to suit managerial risk preferences in order to evade the scrutiny of the external capital markets and to protect managers "pet" projects, then currency risk management should exacerbate the agency costs in the firms. It is predicted, therefore, that currency hedging strategies should be more (less) prominent in firms in the higher deciles of the "G" index, which are associated with higher (lower) levels of agency conflicts and weaker (stronger) corporate governance structures. Moreover, this type of currency hedging will be associated with a decline (increase) in firm value.

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[1] For example Allayannis, Lel and Miller (2003) used the inside and outside ownership of the largest block holder as a measure of the degree of internal governance structure in the firm and used the English legal origin as a proxy for strong external governance at the country level to examine the impact of corporate governance on hedging decisions and firm value for a sample of American Depositary Receipts (ADR's) from thirty five countries in the 1990's. Lel (2004) examined the relationship between hedging policies and the degree of agency conflicts associated with corporate governance at the firm and country levels for a sample of 34 countries around the world. He also used the inside and outside ownership of the largest block

By using a sample of 1422 firm year observations from the S&P 500 during the years 1993, 1995, and 1998 respectively, results show that firms that hedge currency risk tend to be in the higher deciles of the G index (high agency costs, weak governance structure). Where as non-hedging firms tend to be in the lower deciles of G (low agency costs, strong governance structure). This relationship is significant and consistent in each year and through out the pooled sample. In addition, the results show that the G index is positively and significantly (5% level) related to the likelihood of hedging in the sample, indicating that the higher the G index of the firm (weak governance and less protection for shareholder rights), the higher its currency hedging activity.

With regards to currency hedging, corporate governance and firm value, the overall results document that hedging firms in our sample have significantly higher valuations than their non-hedging counterparts using both Tobin's Q and Excess Market value as two alternative valuation measures. The average hedging premium[2] using Tobin's Q is 0.192, which represents 9.2% of firm value. Using the Excess Market valuation measure, the average hedging premium[3] is 0.260 and 0.102 representing 14.2% and 5.5% of firm value, respectively. Overall, the results indicate that currency hedging is a value increasing strategy

The valuation effects of hedging for firms in the Management Portfolio ($G \geq 14$) i.e. for firms that suffer from very weak governance structures and with severe agency conflicts show that their hedging activities are **not** value destroying. Using Tobin's Q as a

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holder as a measure of the degree of internal governance structure in the firm and used the "strict enforcement of law" to proxy for external governance structure at the country level.

[2] The average hedging premium is the average of the coefficient of the derivative dummy in all three regressions (see table 11, panel A1).

[3] The average hedging premium is the average of the coefficient of the derivative dummy (and the average coefficient of the continuous value of the derivative variable) in all three regressions. (see table 11, panel B1)

measure of value, results show that hedging firms, in the above category, still outperformed their non-hedging counterparts and that the average hedging premium 0.909[4] is positive and significant at the (5% level). By using Excess Market value as another measure of valuation (for robustness checks), the average hedging premium 0.705 is also positive and significant at the (5 %level). Moreover, firms in the Shareholder portfolio ($G \leq 5$), which have the strongest governance structures and the lowest degrees of agency conflicts, have showed a positive hedging premium as well. The average hedging premium 0.399[5] is smaller than that of firms in the Management Portfolio ($G \geq 14$) i.e. firms with the weakest governance structures and the highest degrees of agency conflicts. Moreover, the results show that this hedging premium is only significant at the (5% level) when using Tobin's Q as a valuation measure, but not significant using Excess Market value.

Overall, our findings do not support Tufano's (1998) prediction that currency risk management in firms suffering from high levels of agency conflicts is associated with value decreasing effects. Overall, our results are more in line with the body of the finance literature suggesting that the realization of managerial risk preferences may not always lead to a lower shareholder and firm value. The realization of the mangers' risk preferences aims eventually at the reduction of corporate risk in order to avoid bankruptcy. Therefore, this leads to a hedging strategy that increases shareholder value.[6]

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[4] The average hedging premium is the average coefficient of the derivative dummy in all three regressions (see table 11, panel A3).

[5] The average hedging premium is the average coefficient of the continuous value of the derivative variable used in all three regressions (see table 11, panel A2)

[6] Bartram (2000) makes a similar argument; "while corporate mangers may be risk averse due to their undiversified personal wealth position, they cannot sell the stock of their firm short in order to reduce the riskiness of their private portfolio. As a result they not only have a special interest in the ongoing existence of the firm, but also have an incentive to reduce their personal exposure by means of corporate hedging."

Our results also provide some support to the hedging theories that link corporate hedging policies to managerial career and reputation concerns. Hedging can reduce the noise associated with performance measures to the extent that it reduces firm's cash flow volatility (Stulz, 1996). Therefore, hedging can reduce the degree of informational asymmetry among managers, shareholders, and the labor market. This implies that managers with superior skills may engage in hedging to better communicate their skills to the labor market (see Breeden and Viswanathan, (1998)). Consequently, the higher the degree of information asymmetry[7], the higher the desire of "good-performing" managers to convey their superior skills to the market by aggressively hedging currency risk exposure in a way that adds value to the firm and to the shareholders. This explains why hedging firms in the Management Portfolio (i.e. firms with the weakest corporate governance structure, highest level of agency and with the highest level of asymmetric information between managers and shareholders) were rewarded with higher valuations than non hedging firms and their hedging premium was even higher than the hedging premium for firms in the Shareholder Portfolio (i.e. firms with the strongest corporate governance provisions, lowest agency costs and lowest degree of asymmetric information between mangers and shareholders).

Finally, our results support the recent international literature regarding the role of corporate governance and agency costs on the firm's hedging decisions that was documented in foreign firms. Specifically, our results support the study of Allayannis, Lel and Miller (2003), which documents that hedging is valuable even when internal (firm specific) corporate governance is weak, if the firm happens to reside in a country

[7] Studies have used the level of institutional ownership in the firm and whether the largest block holder is an outsider or an insider to proxy for the information asymmetry between managers and shareholders in the

with good external governance (English legal origin). And that is true for the firms in our sample. The US enjoys a large and stable financial market with overall strong governance provisions compared to many other countries and that could explain the positive valuation effect for firms in the Management Portfolio.

This essay is organized as follows, in section 3.1, a review of the literature on the agency cost of risk management is provided. Section 3.2, shows the corporate governance index construction, research methodology, data selection and sample description. Section 3.3 shows descriptive statistics of the sample, and the major empirical results of the essay. Section 3.4 concludes this essay with a summary of the major results.

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firm. (see for example Tufano (1996), Geczy et al (1997), Graham and Rogers (2002), Lel (2004) and Allayannis et al. (2003)).

3.1. Agency Cost of Risk Management: Literature Review

3.1. A. Corporate Risk Management as a means to alleviate agency costs:

Positive theories of corporate risk management argue[8] that hedging can be an effective tool to eliminate or alleviate conflicts of interest between shareholders and debt holders by reducing the volatility of firm value (see for example, Dobson and Soenen (1993), Smith, Smithson and Wilford (1990) and Smithson (1998)).

Conflicts of interest can arise when the firm is highly leveraged and its value is volatile. While it is in principle optimal to realize investments projects with positive net present value (NPV) and to reject those with negative NPV, managers who act in the interest of shareholders may not realize all profitable investment projects in the presence of high leverage (under-investment problem)[9]. This is because firm value is volatile (due to financial risks), and increases in value generally have to be used to satisfy debt holders first. Therefore, low firm value and high leverage can lead to the rejection of profitable projects, if the success of the investment primarily increases the probability that debt can be repaid, but does not largely benefit equity holders. This under-investment problem is more important as more investment projects and growth options are available (Dobson and Soenen (1993), Smith, Smithson and Wilford (1990a)).

Corporate risk management represents a means to alleviate the conflicts of interest and the welfare loss resulting from the non-realized valuable investment opportunities by reducing the volatility of firm value.

Empirical investigations of the under-investment problem indeed document a relationship between the firm's risk management activities, firm's debt level and its growth opportunities. For example, Berkman and Bradbury (1996), Fehle (1998),

Graham and Rogers (1999), Haushalter (1997), Howton and Perfect (1998), and Schrand and Unnal (1998) all found empirical evidence in support of the fact that risk management activities are concentrated to a larger extent in companies with higher debt ratios, many investment projects and higher growth options[10]. Moreover, Guy (1999), Goldberg et al. (1994), Mayers and Smith (1982), and Mian (1996) found that companies in more regulated industries are less likely to hedge since regulation reduces the under-investment problem.

Ceczy, Minton and Schrand (1997), Dolde (1995b), Guay (1999), Nance,Smith and Smithson (1993) find a significant relationship between risk management and investment variables such as R&D to sales and Tobin's q ratio. However, these studies could not identify a significant difference in the debt ratio of users and non-users of derivatives. Tufano (1996), on the other hand, finds significant results for the debt ratio, however, results for variables representing the investment opportunities are not significant

In addition, to the under-investment problem, agency costs can arise because of risk shifting or asset substitution problems between shareholders and debt holders. The asset substitution problem arises because shareholders of a leveraged firm have a strong interest in taking on very risky projects. This is because the residual claims of shareholders can be interpreted as a call option on the assets of the firm (for example see, Jensen and Meckling (1976), MacMinn (1987), and Mason and Merton (1985)). In general, there is a positive relationship between the value of an option and the volatility

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[8] For a thorough review of the literature on risk management and shareholder value see Bartram (2000)
[9] See MAcMinn(1987a) and Myers (1977)
[10] Where the investment set is proxied by various ratios such as; R&D to sales, Tobin's q, capital expenditures to total assets, book value of equity to market value of equity, book value of equity to total assets or the price earnings ratio.

of the underlying asset (Bartram (2000), and Tufano (1996)). Hence the realization of risky investment projects increases the value of the shareholders' options (even if the project has a negative NPV) since the volatility of firm value increases. The incentive to pursue this wealth transfer increases when corporations carry excessive amounts of debt, as the call option of the shareholders has only its time value left[11] (Bartram (2000)).

Agency costs occur in the presence of the asset substitution problem due to the justified attempts of the debt holders to block this wealth transfer. This is done either by demanding higher compensations for supplying capital[12], or by imposing restrictive debt covenants on the financing or investment policies of the firm. Debt covenants are welfare reducing as they limit the degrees of freedom of management and possibly obstruct the realization of profitable, yet risky investment opportunities (see for example, Fite and Pfleiderer (1995), Mayers and Smith (1982), Mayers and Smith (1987), Smith and Warner (1979).

Corporate hedging contributes to the reduction or avoidance of the agency costs resulting from the asset substitution problem by lowering the riskiness of the investment projects. As a result, both groups (shareholders and debt holders) have the same incentive of realizing less risky projects if they have positive NPV (Bartram (2000), Bessembinder (1991), Campbell and Kracaw (1990)).

Empirically, the asset substitution component of the agency problem and risk management has been investigated by looking at the violation of debt covenants in the presence of financial risks. Empirical investigations show that corporate hedging is indeed used to reduce the risk of breaking a covenant (Francis and Stephen (1993), and Geczy, Minton and Schrand (1997)). Other studies investigated the impact of using

[11] See Dobson and Soenen (1993) for numerical examples.

convertible debt and preferred stock, as substitutes for risk management. Theoretically, companies that are using these instruments are less likely to face the asset substitution problem, hence using these instruments should mean less use of risk management hedging strategies for these firms. Empirical investigations, on the other hand, did not find support for these arguments.[13]

3.1. B. Corporate Risk Management as a means to exacerbate agency costs:

While risk management offers benefits, it has costs as well. One of the potentially serious costs of risk management is exacerbating the agency conflicts between managers and shareholders, leading firms to poorer investment decisions. By facilitating the protection of managers "pet" projects that enhance management's welfare, risk management can reduce shareholder and firm value. This potential cost arises from cash flow hedging (Tufano (1996) and (1998)).

The principles of cash flow hedging has been first discussed by Donaldson (1961) and Lessard (1991) and refined by Froot, Scharfestein and Stein (1993, 1994) and Tufano (1998). The cash flow hedging concept suggests that managers engineer their operating cash flows in such a way as to be able to carry out investment projects without having to resort to expensive capital markets (Tufano (1998)). This principle, however, might cause a potential source of concern from an agency perspective. If the projects that managers seek to protect are negative NPV investments to shareholders, and managers are only supporting them because of some private utility and benefits that they derive from, then the absence of external capital market scrutiny can lead to serious resource misallocation and destruction of shareholder and firm value. It is clear, therefore, that risk management

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[12] See Smitih, Smithson and Wilford (1990c)

[13] for example, Geczy, Minton and Schrand (1997), Goldberg et al. (1994), and Nance, Smith and Smithson (1993) all found weak empirical evidence for preferred stock as a substitute for hedging.

strategies that help managers bypass these external monitors exacerbate the agency problem between managers and shareholders.

Risk management as a potential source of agency conflict also has its roots in the work of Stulz (1984, 1990), Mayers and Smith (1982), and Smith and Stultz (1985). Stulz (1984) introduced managerial risk aversion as a motivation for corporate risk management. Managers typically have an undiversified wealth position due to their employment in the firm. Therefore, managers whose human capital and wealth are poorly diversified prefer to reduce risk to which they are exposed. If managers judge that it will be less costly for them to manage this risk than to manage it on their own account, they will direct their firms to engage in risk management. Consequently, corporate risk management is driven by managerial personal preferences towards risk.

It can be argued, however, that the risk preferences of managers and shareholders may not always fully deviate. This is because managerial risk preferences ultimately aim at reducing corporate risk, in order to prevent the firm from going bankrupt. Hence managerial strategies can lead to a hedging strategy that increases firm and shareholders' value[14]. Moreover, by linking the compensation and evaluation of managers appropriately to stock price, shareholders can insure that corporate policies take shareholder value into account and avoid or minimize value-destroying strategies on part of management.

In addition, divergent risk preferences between managers and shareholders may not always have negative impact on firm value. Hedging theories link corporate hedging policies to managerial career and reputation concerns. Hedging can reduce the noise associated with performance measures to the extent that it reduces firm's cash flow

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[14] For further discussion of this argument, see Bartram (2000), Miller and Reuer (1994), Santomero (1995), and Sercu and Uppal (1995).

volatility (Stulz, 1996). Therefore hedging can reduce the degree of informational asymmetry among managers, shareholders, and the labor market. This implies that managers with superior skills may engage in hedging to better communicate their skills to the labor market (see, for example, Breeden and Viswanathan, (1998), and Lel (2004)). Moreover, several studies test whether the degree of informational asymmetry influences hedging decisions and they find that firms with greater fraction of institutional ownership should have less hedging activities if hedging is undertaken to reduce the problems related to informational asymmetry between managers and shareholders (see, for example, Tufano (1996), Geczy et al. (1997), Haushalter (2000), Graham and Rogers (2002)).

Nevertheless, the potential conflict of interest from divergent risk preferences between managers and shareholders cannot be ignored. For example, conglomerate diversification, which in many cases is considered as a substitute to risk management, is associated with a loss of value to the owners and is pursued only because they are in the interest of management (see for example, Allayannis and Weston (1997), Berger and Ofek (1995), Comment and Jarrell (1995), Densis, Denis and Sarin (1997), and Levi and Sercu (1991)).

Studies that relate firm risk management activities to managerial private utility focus on managerial compensation and incentive structures. For example, in Smith and Stultz's (1985) model, the degree and intensity of corporate risk management depends on the amount of managerial wealth tied in options or stock. Mangers with greater option holdings are less likely to engage in risk management activities than mangers with greater stock ownership. Stocks provide linear payoffs whereas options provide convex payoffs. The convexity of the option contract may induce managers- whose wealth is tied in

options- to accept higher degrees of risk because lower risk reduces the volatility and hence the value of their options.

The results of empirical studies support the hypothesis that corporations are less likely to conduct risk management and that they hedge less, the more important stock options are for management compensation (see, for example, Gay and Nam (1998), Geczy, Minton and Schrand (1997), Haushalter (1997), Schrans and Unal (1998), and Tufano (1996)).

Apart from the use of managerial compensation structures, no study in the US has focused on the overall governance structure and the extent of the agency conflicts between mangers and shareholders on the hedging strategies of the firm.

3.1. C. Corporate Risk Management and governance structure: The two faces of corporate governance

As corporate governance is the market solution to agency problems, therefore corporate governance should be an important determinant of risk management (see, for example, Fama, (1980)). It is important to note, however, that the literature is divided with regards to the impact of governance structure on hedging policies. While Aggrawal and Samwick (1999), Demarzo and Duffie (1995), Demsetz (1983), Fama and Jensen (1983) suggest that strong corporate governance increases hedging and weak governance decreases it, Tufano (1998) argues the opposite; weak corporate governance may indeed encourage hedging activities and vice versa.

According to proponents of the first view[15], strong corporate governance may encourage hedging in several ways. First, to prevent any disciplining actions by shareholders, poorly performing mangers may hedge more aggressively so as to make

sure the firm meets its performance targets, which in turn, helps managers secure their jobs, reputation and possible bonuses. Second, hedging makes it easier (lower monitoring costs for shareholders to evaluate managerial performance because it reduces the noise in firm measures (see, for example, DeMarzo and Duffie (1995)) Hedging also lowers the variance of firm's performance, which is expected to have a positive effect on the executive pay-for-performance sensitivity (see, for example, Aggarwal and Samwick (1999)). Further shareholders may prefer corporate hedging because it enables better portfolio optimization decisions.

By the same logic, weak corporate governance may reduce hedging. For example, managers with considerable voting power do not have much incentive to meet the performance targets as their low voting counterparts would (see, for example, Demsetz (1983), Fama and Jensen (1983)). In addition, because of their uncontested control of the firm's activities and the low level of shareholder's monitoring, mangers with inferior skills may opt out of hedging so that their true type will not be revealed to the labor market (Lel, 2004). Overall, proponents of this view predict that a positive relationship between hedging and strong governance mechanisms will be consistent with the primary goal of corporate governance.

The proponents of the second view, however, argue that weak corporate governance, may be associated with more hedging, since corporate insiders benefit fully from hedging, though they bear only a part of the costs associated with it. In addition, hedging may insulate managers from the monitoring power provided by the external capital markets, which may motivate mangers to engage in hedging (see, for example, Tufano

[15] For a thorough explanation of this view see Lel (2004)

(1998)). Therefore, according to this hypothesis, well- governed firms may be less likely to engage in hedging and vice versa.

On the empirical front, two very recent studies investigated the impact of governance structure on firm value and hedging in foreign firms. Allayannis, Lel and Miller (2003) used the inside and outside ownership of the largest block holder as a measure of the degree of internal governance structure of the firm and used the "English legal origin" as a proxy for strong external governance at the country level to examine the impact of corporate governance on hedging decisions and firm value for a sample of American Depositary Receipts (ADR's) from thirty five countries in the 1990's. Moreover, Lel (2004) examined the relationship between hedging policies and the degree of agency conflicts associated with corporate governance at the firm and country levels for a sample of 34 countries around the world. He also used the inside and outside ownership of the largest block as a measure of internal firm specific governance and used the "strict enforcement of law" to proxy for external governance structure at the country level.

Both studies document that currency hedging is a value increasing strategy for firms around the world. They also found that stronger "internal" corporate governance structures as well as stronger "external" governance structures lead to increases in firm value. They also found that weak "internal" governance associated with weak "external" governance leads to a positive hedging premium that is not significant. Finally they document that currency hedging is valuable even when "internal" governance is weak, if the firm resides in country with strong "external" governance mechanisms.

This essay builds on the recent body of literature that acknowledges the role of governance structure on hedging policies. In this essay the relationship between currency risk management activities, firm value and the agency-related costs arising from the

separation of ownership and control is investigated using the Corporate Governance Index as a proxy for the level of agency conflict in the firm. The Corporate Governance Index is a state of the art measure, which proxies for the governance structure in the firm by emphasizing the balance of power between shareholders and managers. This index was constructed by Gompers, Ishii and Metrick (2001) using laws, regulations and 24 distinct corporate governance provisions, which define the power sharing relationship between shareholders and managers during the 1990's. The higher the index, the weaker the firm's governance structure, the lower shareholders' rights and the more powerful managerial provisions become, hence, resulting in a higher level of agency costs in the firm and vice versa.

Using the Corporate Governance index "G", which is composed of the regulations set by the securities commission (at the federal level), corporate laws (at the state level), and corporate by laws, charter provisions, and other rules (at the firm level) provides us with the opportunity of focusing on a larger and much broader set of corporate-governance provisions and investigate their relationship to the firm's hedging activities and its value. As far as the currency hedging literature is concerned, to the best of our knowledge, no study using US data has attempted to directly use corporate governance structure as a measure of the level of agency in the firm and relate it to the firm's currency hedging profile.

3.2. Methodology, Data Sources and Sample Selection.

3. 2. A. The Governance Index

In this essay we test the valuation effects of hedging in firms associated with weaker governance structures and higher levels of agency costs using a state of the art measure of the level of agency in the firm. We use Gomper's, Ishii's and Metrick's (2001) "Corporate Governance index (G)" as a proxy for the level of agency in the firm. The G index is constructed using regulations and 24 distinct corporate governance provisions[16], which define the power sharing relationship between shareholders and managers in the 1990's. The index construction is straightforward: For every firm one point is added for every provision that restricts share holder rights[17]. Such restrictions can also be interpreted as increases in managerial power. It is important to note that in the construction of this index, no judgment as to the efficacy or wealth effects of any of these provisions is made, rather the interest is on what a given provision does to the balance of power between shareholders and mangers. (Gompers, Ishii and Metrick, 2001)

The Governance index "G" is just the sum of one point for the existence of each provision with an index range from 0-24. The firms are broken up into groups beginning with $G \leq 5$, then each value for G from $G = 6$ through $G = 13$, and finishing with $G \geq 14$. These ten "deciles" are similar but not identical in size, with relative sizes that are fairly stable from 1990 to 1995. Most of the changes in the distribution of G come from changes due to mergers, bankruptcies, and additions of new firms by the IRRC. In 1998, the sample size increased by about 25 percent, with the distribution of these new firms

[16] See Appendix A for a detailed list and explanation of each provision.

[17] The Investor Responsibility Research Center (IRRC) publishes detailed listings of these provisions for each firm in years 1990, 1993, 1995 and 1998. The IRRC universe covers most of the value weighted market. The IRRC firm-level data does not include provisions that apply under state law, hence the IRRC

tilted towards lower values of G. At the firm level, G is relatively stable.

In most cases, the existence of a provision indicates an active move by management and an attempt to restrict shareholder rights. There are two exceptions to this rule – "secret ballots" and "cumulative voting" – in which the provisions tend to come from shareholder pressure[18]. A secret ballot, also called "confidential voting" by some firms, designates a third-party to count proxy votes and does not allow management to know how specific shareholders vote. Cumulative voting allows shareholders to concentrate their directors' votes so that a large minority holder can ensure some board representation (see, for example, Appendix A for detailed descriptions). Both of these provisions tend to be proposed by shareholders and opposed by management after they have been proposed. In contrast, none of the other 21 provisions enjoy consistent shareholder support or management opposition; in fact, many of these provisions receive significant numbers of shareholder proposals for their repeal (Ishii, (2000)). Thus, the presence of secret ballots and cumulative voting are considered to be ***increases*** in shareholder rights. For the Governance Index, one point is added for all firms that **do *not*** have these provisions.

It is important to note that out of the 23 provisions listed in Appendix A, there are only two provisions – anti greenmail and golden parachutes – whose classification seems ambiguous. Greenmail – the payment of above-market prices to corporate raiders in order reduce their threat of takeover is certainly a discretionary tool that adds to managerial power once a raider has accumulated a large stake. In this respect, an anti-greenmail provision reduces managerial power, and, by extension, increases shareholder rights. It is

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data is supplemented by state-level variation in take over laws as given by Pinnell (2000); another IRRC publication.

[18] For a detailed discussion of this issue see Gompers Ishii and Metrick (2001) pp 11-15

also true, however, that greenmail is a profitable exit route for raiders, and the prohibition of greenmail payments will make the accumulation of large "raider" stakes less profitable, *ex ante*. In this respect, prohibitions on greenmail payments are like prohibitions on paying ransom to kidnappers (Gompers, Ishii and Metrick (2001)). By restricting their later options, managers reduce the probability of ever receiving hostile attention in the first place. The net impact on both managerial entrenchment and shareholder wealth of these two different effects – discretion and deterrence – is unclear (Shleifer and Vishny, 1986). However, Gompers, Ishii and Metrick (2001) found evidence that the presence of anti-greenmail restrictions is positively correlated with 20 out of the 23 other provisions. It is significantly positively correlated in eight of the cases and is not significantly negative for any of them. Furthermore, according to Pinnell (2000), states with anti-greenmail laws tend to pass them in conjunction with laws designed, less ambiguously, to prevent takeovers. Since it seems likely that most firms and states perceive anti-greenmail as a takeover defense[19], anti-greenmail provisions are treated like other provisions and are coded as a decrease in shareholder rights.

Golden parachutes – large payments to senior executives in the event of job separation following a change in control – are another case with some ambiguity. While such payments would appear to deter takeovers by increasing their costs, one could argue that these parachutes also ease the passage of mergers through contractual compensation to the managers of the target company. While the net impact on managerial entrenchment

[19] It is well known that in the United States, the primary methods of reducing agency conflicts arising from the separation of ownership and control are the legal protection of minority investors, the use of board of directors as monitors of senior management and an active corporate control (takeover) market. Therefore anti-take over defenses implemented by firms is seen as a way to exacerbate the agency conflicts in the firm and distorts the power sharing relationship between managers and shareholders in favor of mangers. This explains the focus on anti-takeover provisions placed in corporate by-laws of firms in the construction of the G index..

and shareholder wealth is ambiguous, the more important effect is the clear decrease in shareholder rights. In this case, the "right" is the ability of a controlling shareholder to fire management without incurring an additional cost. Furthermore, golden parachutes, Like anti-greenmail provisions, are found to be highly positively correlated with all the other 20 provisions (see Gompers Ishii and Metrick (2001)). Thus, golden parachutes are treated as a restriction of shareholder rights. Firms that have such provisions were added one point in the G index.

In the subsequent sections of this essay, special attention and analysis is given to the two extreme deciles of G. The first decile is known as the **"Shareholder Portfolio"** which includes firms that score from 0-5 ($G \leq 5$). Firms in the Shareholder Portfolio have a low level of agency because managerial provisions are small and shareholders rights are more protected. On the other hand firms in the last decile of G are firms with a G index score of 14 and above ($G \geq 14$). They are considered to be firms in the **Management portfolio**. The Management Portfolio is comprised of firms with the weakest shareholder rights (highest management power). Hence this portfolio contains firms that have a very high level of agency. Between these two extreme situations, however, a general rule applies: the higher the index, the higher the level of agency costs in the firm.

3.2. B. Data sources and sample selection.

Our sample consists of the Standard & Poor's (S&P) 500 firms for the years 1993, 1995 and 1998. The S&P 500 firms is a logical choice for this investigation since the main data source used in the construction of the corporate governance index is the Investor Responsibility Research Center data base (IRRC), which publishes detailed listing of corporate governance provisions and corporate bylaws for each firm during the years 1990, 1993, 1995 and 1998. The IRRC universe itself is drawn from the Standard &

Poor's (S&P) 500 as well as the annual lists of the largest corporations in the publications of Forbes, Fortune and Business Week. Therefore using the S&P 500 sample facilitates the process of data compilation and increases the accuracy of matching firms across the CRSP, COMPUSTAT data bases with the G index data set. The rationale behind matching the sample across these three databases is discussed below.

The S&P 500 firms are obtained from the COMPUSTAT database in the years 1993, 1995 and 1998.[20] This resulted in a sample of 535 firms on average in each year. In other words a total sample of approximately 1605 firm year observations is obtained for all three years. For each firm in each year, the company name, SIC code, company ticker symbol and CUSIP number is obtained from the company specifics section of the COMPUSTAT database. Information on long-term debt, institutional ownership, total assets, dividend payout ratio, Tobin's Q, Excess Market value and the profitability profile for each firm is also obtained from various sections of COMPUSTAT[21]. In order to obtain the G index score for each firm in the sample, each firm is hand-matched to the Center for Research in Security Prices (CRSP) database. The matching is done by using company name and supplemented by company CUSIP number or ticker symbol, where necessary.

From the CRSP database, information on each company's primary number (PREMNO)[22] is obtained. The primary number for each firm is again hand-matched to

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[20] The year 1990 was excluded from the analysis despite the availability of the G index data for that year because hedging information and derivative reporting was not required by the SEC before June 15 1991.
[21] This information will be used as regression variables in the subsequent analysis. The rationale behind the use of these variables will be discussed in the following section.
[22] The Primary number (PREMNO) is one of the ways that firms are identified and classified in the CRSP database. In fact, company information can be obtained from CRSP by using either; company name, company ticker symbol, CUSIP number or by PREMNO number. Once a company is identified in CRSP using any of the above ways, information on the other identifiers becomes displayed as well. Information in the G index database, on the other hand can be obtained only through knowing the company's PREMNO number. Hence matching the sample to CRSP is crucial for the analysis.

the PREMNO in the G index data set in order to obtain the corresponding G index score for each firm. Using the S&P 500 firms as our sample proved to be very reliable. We were able to match more than 95 percent of the firms in the sample to the CRSP database and we were able to find complete annual data for more than 90 percent of these matches in the COMPUSTAT. The matching process resulted in a sample of approximately 525 firms in each year (1575 firm year observations) with complete information on the G index score, long-term debt, institutional ownership, total assets, dividend payout ratio, Tobin's Q, Excess Market Value and the firms' profitability ratios.

Afterwards, we proceed to obtain currency derivative information for the sample. Information on derivatives and currency hedging is available in the firm's 10-K Annual Reports. Gross notional values of foreign currency derivatives are found in the "Notes to Annual Reports" section of the firms' 10 K annual Reports. The 10 K reports are retrieved from the Electronic Data Gathering and Retrieval "EDGAR" database and from the Annual Report Gallery, where necessary. For every firm in the sample, the derivative information is hand collected from each report in each year of the sample.

Notional value of derivatives represents the contract amount and the future cash flows under the contract. Like other research, we use this variable to proxy for the level of a firm's involvement in hedging.[23] Firms that report any form of currency hedging such as currency forwards, currency options and currency swaps contracts are included as "hedging" firms in the sample. Firms that do not report any form of currency hedging activity or report interest rate and or commodity hedging only are included as "non-

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[23] See Allayannis and Weston (2001) for a similar procedure.

hedging" firms in the sample[24]. Firms in the Finance, Insurance and Real Estate industries i.e., firms with an industrial classification code (SIC 60-67) are excluded from the sample entirely. Most of the firms in these industries are market makers in foreign currency derivatives. They hedge for trading purposes; hence managerial motivation for hedging might be different than the rest of the firms in other industries.

After screening the sample for derivative information and after excluding firms in SIC codes 60-67 from the sample, the final sample consists of 459, 472, and 491 firms with complete information on currency hedging strategies, firm specific and performance variables, valuation measures and the G index score for the years 1993, 1995 and 1998 respectively. The final sample consists of 1422 firm year observations covering the entire sample period.

3.3. Empirical Results.

3.3. A. Descriptive statistics of the sample.

Table 15 reports the distribution of the "G" index in the sample. Panel A reports the summary statistics of G in the overall S&P 500 sample in each year. It is clear that G is relatively stable for firms in each year. The MIN G is 2, 3, 3 in 1993, 1995 and 1998 respectively. The MAX G is 16 in every year. The median G is 10 and is stable between years as well. Mean G for the sample is 9.597 which, shows that on average the overall level of agency for the S&P 500 firms is moderate. Panel B reports the summary statistics of G for "Hedging firms" in the sample. It is clear that MIN, MAX, mean and median values of G are greater for hedging firms in each year than those reported for the overall sample in panel A. In 1998 we also notice that the mean value of G has declined, in

[24] While we are aware that the restriction of interest rate and commodity hedging firms to the non-hedging sample might create some kind of bias, we are interested in studying the impact of currency risk management only.

absolute terms, by one point (almost 3%) compared to its mean value in the previous two years. Similarly, we find that the median value of G in 1998 had declined by one point, in absolute terms, (almost 10%) than the previous two years. This is basically due to the increase in the number of firms in the G index data base by the IRRC. As mentioned in the previous section, most of the firms added to the data base had G index distributions that were tilted towards lower G values.

Panel C reports the distribution of the G index for "Non-Hedging firms". It is clear that the mean, median, MIN, and MAX values of "G" are lower than those reported for hedgers in each year and in the overall pooled sample. Mean and (median) "G" values for non-hedging firms are 9.165 and (9) in the overall sample respectively. Overall, these results indicate that non-hedging firms had a lower "G" index score than their hedging counterparts and that result is consistent in every year of the sample.

<Insert Table 15 about here>

Finally, panel D reports the total number of firms in the sample in each year and across each decile. The total number of firms in the sample increased from 459 in 1993 to 491 in 1998 (an addition of only 32 firms over the five year period). If we examine the number of firms across each decile, we'll notice that the total number of firms in the Shareholder portfolio ($G \leq 5$) is 110 firms in all years and that the number of firms increases from 1993 to 1998. Whereas the total number of firms in the Management portfolio ($G \geq 14$) is only 59 firms in all years, the number of firms slightly increases (from 18 to 21 firms in 1993 to 1998 respectively). This shows that the shareholder portfolio has the greatest activity level in terms of number of firms being added. This

reflects the overall improvement in governance structure (protection of shareholder rights) of firms in the mid to late 1990's. If we examine the number of firms in the remaining deciles in each year, we'll notice that this number does not necessarily increase from year to year. The reason is that some firms drop out due to bankruptcy or mergers. Finally, in panel D we see that the majority of the S&P 500 firms are concentrated in decile G=11 in years 1993 and 1995 respectively. And are concentrated in decile G =10 in the year 1998. This reflects the fact that, overall, most of these firms have moderate to high agency costs.

Table 16 reports the use of foreign currency derivatives in the S&P 500 firms in each year and in the entire sample period. Overall there are 744 hedging firms and 678 non-hedging firms in the entire sample period. The number of hedgers increases each year in the sample; from 199 firms in 1993 (representing 43.4% in 1993) to 303 firms in 1998 (representing 61.7% in 1998). By examining the mean gross notional value of the foreign currency derivative contracts in the sample, we'll again see an increase in value throughout the sample period; from $1747 million in 1993 (14.9%) to $ 7820 million in 1998 (66.7%). Overall, the results in Table 16 show that not only the number of hedging firms increased throughout the sample period, but also the value of foreign currency contracts increased considerably, indicating the overall importance that foreign currency derivatives gained throughout the 1990's.

<Insert Table 16 about here>

Table 17 reports the number and distribution of hedging and non-hedging firms in the sample based on the G index deciles. In 1993, the highest number of hedging firms

was found in decile G=11, where as the highest number of non-hedging firms in the same year was found in decile G=6. The same trend continues in the following year. In 1995, the highest number of hedging firms was found in decile G=11, where as the highest number of non-hedging firms in the same year was found in decile G ≤ 5 (management portfolio). Similarly, in 1998 the highest number of hedging firms was found in decile G=10 and the highest number of non-hedging firms in the same year was also found in decile G ≤ 5. Overall, the results in this table show that hedging firms tend to be in the higher deciles of G (higher agency costs, weaker governance structure), while non-hedging firms tend to be in the lower deciles of G (lower agency costs and stronger governance structures).

<Insert Table 17 about here>

Table 18 presents the summary statistics of the valuation measures and some of the performance and firm specific measures for the entire sample (panel A) as well as for hedging firms (panel B) and non-hedging firms (panel C) in the sample. Tobin's Q ratio and Excess Market value are used as alternative measures of the firm's value. Tobin's Q is defined as the ratio of the market value of the firm to the replacement cost of assets. It's computed as market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long- term debt divided by total assets of the firm (obtained from COMPUSTAT). Excess market value is defined as the market value of equity less book value of equity normalized by total sales. The benefit of using Tobin's Q is that it makes comparisons across firms relatively easier than comparison based on stock returns or other measures that require an adjustment for risk. The firm's currency hedging profile is proxied by two variables; namely the gross notional value of foreign

currency derivatives, which is the future cash flow under the contract (obtained for the 10-K annual reports) and the foreign exchange derivative dummy, which is a dummy variable that equals to one if the firm reports any form of currency derivative hedging, zero otherwise. The rest of the variables in the table are the control variables used in the subsequent regressions[25]. They include: Total assets of the firms as a proxy for firm size. Long-term debt and the ratio of long-term debt to total assets as a proxy for the firm's leverage position. Return on assets, Return on Equity and Earning before income and tax (EBIT) as a proxy for the firm's profitability profile. Dividend payout ratio is used as a proxy for the firm's liquidity position and its ability to access financial markets[26]. Finally the institutional ownership structure of the firm is used a proxy for the degree of information asymmetry in the firm between managers and shareholders[27].

In panel A, the mean (median) value for Tobin' Q and Excess Market value in the sample are 2.07 (1.49) and 1.83 (0.91), respectively. It is important to note that the mean and median values of Tobin's Q in the overall sample are much higher than that reported in Allayannis and Weston (2001), indicating that our firms are high market performers[28] The mean gross notional value of foreign currency derivatives is $ 4266 million. This value is greater than those reported by other studies. Allayannis and Weston (2001), and Geczy et al. (1997), for example, have reported mean gross notional value of foreign currency derivatives of $186 and $200 million, respectively. One possible explanation for the difference is that these studies have focused on currency derivative activities during the early 1990's. It could be that as time passed, derivative hedging became more

[25] For a detailed definition of each variable see Appendix B
[26] See Allaynnis and Weston (2001) for a similar procedure.
[27] Allayannis, Lel and MIller (2003), Lel (2004), Tufano (1996), Geczy et al. (1997), Graham and Rogers (2002) all used institutional ownership structure to proxy for the degree of information asymmetry in the firm.

appreciated by firms. Results for the foreign currency derivative dummy variable indicate that on average 52% of firms in the sample use foreign currency derivatives. This result is generally in line with most usage ratios reported for US based studies (see, for example, Allayannis and Weston (2001), but is generally lower than usage ratios reported in non-US based firms. For example Bodnar (1999) finds that 78% of German firms use currency derivatives.

Mean and (median) value of total assets in the sample is $10609 million ($3630 million), mean and (median) long-term debt to total assets ratio is 20.36 (18.06). Profitability ratios for the entire sample have the following mean (median) values: ROA 6.82 (6.42), ROE 16.41 (14.01), EBIT 13.80 (12.58) respectively. The firms in the sample have a mean and (median) dividend payout ratio of 44.85 (24.70). Finally, the mean and (median) institutional ownership of the firm is 25.67 (24.92).

Panel B presents the summary statistics for hedging firms in the sample. Results show the following ; with regards to Tobin's Q and excess market value measures, hedging firms have a mean (median) values of 2.27 (1.56) and 2.05 (0.99) respectively. This value is higher than the mean and median reported for the entire sample in the previous panel, indicating that hedging firms have a higher value than the mean of the sample. The mean and (median) notional value of foreign currency derivatives for hedging firms is $111719 million ($7772 million).Hedging firms are also larger in size as indicated from the mean and (median) values of total assets; $10738 million ($3750 million) respectively. Mean and (median) long term debt / assets ratio is also greater for hedging firms than for the overall sample; 21.84 (18.42), indicating that hedging firms have a greater leverage ratio. This result is consistent with what currency hedging

[28] Allayannis and Weston (2001) reported mean (median) Q for their sample of 1.18 (0.96) respectively.

literature has documented regarding the relationship between hedging and debt. Debt amplifies the volatility of the underlying cash flows hence risk management becomes essential to mitigate that risk (see, for example, Graham and Rogers (2002) and Schmid (1999)). With regards to profitability ratios, hedging firms generally have lower profitability ratios than the overall sample as evident from their ROA, ROE and EBIT ratios. Finally, results show that hedging firms in the sample have a high dividend payout ratio and low institutional ownership structure than the overall sample. The theoretical justification behind these relationships will be discussed in the following section.

Panel C reports the summary statistics for non-hedging firms in the sample. It is clear from these results that non-hedgers have a lower Tobin's Q and Excess market value measures than hedging firms. The mean and (median) values for these variables are 1.87 (1.45) and 1.57 (0.85), respectively. Mean and (median) total assets for non-hedgers are $10480 million ($3295 million), indicating the non-hedgers have smaller size than non-hedgers. Similarly for their leverage ratio, non-hedgers have lower debt to assets ratio than non-hedgers. With regards to profitability ratios, non-hedging firms have higher profitability ratios than their hedging counterparts as evident from their ROA, ROE and EBIT ratios. Finally, results show that hedging firms in the sample have a lower dividend payout ratio and higher institutional ownership structure than hedging firms in the sample. Overall, the results from this table show that hedging firms have a higher value than non-hedging firms as shown by Tobin's Q and Excess Market value, they have larger sizes, higher debt ratios, lower profitability ratios, higher dividend pay out ratios and a lower level of institutional ownership.

<Insert Table 18 about here>

Table 19 presents summary statistics of the valuation measures, performance and firm specific variables in the sample across the deciles of the corporate governance index "G". Regarding the valuation measures, results show that firms in the (shareholder portfolio), the lowest decile of "G" ($G \leq 5$) have higher mean and median values than firms in the (Management portfolio) highest decile ($G \geq 14$). Mean (median) Tobin's Q in the shareholder portfolio is 2.66 (2.27), while mean (median) Tobin's Q in the Management portfolio is 1.70 (1.30). With respect to Excess market value, the results show that mean (median) Excess market value in the shareholder portfolio is 2.14 (1.70), while mean (median) Tobin's Q in the Management portfolio is 1.36 (0.88). This result is consistent with that of Gompers', Ishii and Metrick (2001), who documented that the higher the index, indicating higher levels of agency conflicts in the firm, the lower the value of Tobin's Q .

With regards to the notional value of derivatives, the results show that its value is highest in decile G= 10 where the mean notional value of derivatives is $13077 million. Generally, the notional value of derivatives is higher at the higher values of the G index, indicating that the volume of hedging activities is greater at the higher levels of G (firms with weaker governance and higher agency costs).The lowest mean notional value of derivatives is in the Shareholder portfolio ($96 million). This result is consistent with the results of the previous tables that show that hedging firms are in the highest deciles of G.

<Insert Table 19 about here>

Results for the remaining variables in Table 19 show that firms in the higher deciles of G have the following characteristics ; a larger size, a higher leverage position,

as indicated by the ratio of long-term debt to total assets. Firms in the higher deciles of G also have a lower institutional ownership structure, higher dividend payout ratios and lower profitability ratios, as indicated by their ROA, ROE, and EBIT ratios. It is clear that most of these characteristics are similar to the characteristics of hedging firms in the sample, as we documented earlier in Table 18. Therefore the overall results in Table 19 indicate that the majority of hedging activities take place in firms in the higher deciles of the Corporate Governance Index (G).

Table 20 presents the Industry classification code for hedging and non-hedging firms in the sample based on the 2-digit SIC code for each year. Panel A presents the results for firms in the year 1993, panels B and C present the results in years 1995 and 1998 respectively. It's clear from Panel A that more than 21% of foreign currency derivative users are in the Chemicals and Allied products industry; SIC code (28). Followed by firms in Industrial and Commercial Machinery and Computer equipment; sic code (35), where currency hedgers represent 16% of the total number of hedging firms. Industries with SIC codes 13, 14, 25, 42, 45, 48, 49, 50, 51, 55, 58, 75, 87 do not engage in foreign currency hedging activities. It is important to note, however, that the absence of hedging activities in these industries is due to our definition of hedging in the sample. Some of the above-mentioned industries relay heavily on commodity hedging (SIC codes 13-14) or interest rate hedging (the rest of the industries above), according to the sample construction criteria and hedging definition in our sample, any firm that reports any type of derivatives other than foreign currency will be included in the non-hedging sample. Therefore, firms not being included in the hedging sample don't necessarily mean that they are not involved in any hedging or market risk management

activity. It simply means that these companies do not engage in currency risk management activities.

Panel A also shows that the highest number of non-hedging firms is found in the Business Services sector (SIC code 73). Almost thirteen percent of non-hedging firms in the sample are in SIC code (73). Panel B and Panel C of table 20 also show a similar pattern for hedging and non-hedging firms. In panel B results show that in 1995 (22.7%) of hedging firms are in SIC code 28 and (13.4%) of non hedging firms are in SIC code 73. In 1998 (panel C), we again see that the highest number of hedging firms(18%) is in the Allied products and Chemicals industry (SIC code 28) and the highest number of non hedging firms(13.8%) are in the Business Services industry (SIC code 73).

Moreover, by examining the SIC code classification of firms across the G index deciles[29] in each year, results show that the majority of firms in SIC code 28 are in the higher deciles of G (G= 11, 15 and 10 in the years 1993, 1995 and 1998 respectively). Similarly, the majority of firms in SIC code73 are in the lower deciles of the G index (G= 6, 7 and $G \leq 5$ in the years 1993, 1995 and 1998 respectively). This is consistent with the above results that document that hedging firms are in the highest deciles of the G index, while non-hedging firms are generally in the lower deciles of G.

Overall, results in Table 20 are consistent with previous studies that showed that the highest levels of hedging firms are in the Chemicals and Allied products, Industrial and Commercial Machinery and Computer Equipment and Electronics industries i.e. SIC codes 28, 35 and 36, while non-hedging firms are mainly present the Services induatries i.e., in SIC codes 70-87 (see for example Allayannis and Weston (2001) and Bodnar et al. (1999)).

<Insert Table 20 about here>

3.3.B. Foreign Currency Hedging, Corporate Governance and Agency Costs: Univariate Analysis

Table 21 presents the univariate analysis of the mean (median) values of the Corporate Governance index across the S&P500 hedging and non hedging firms in each year and pooled across the entire sample period. The results show that the mean and median G index of hedging firms (GI_H) is consistently and significantly[30] higher than the G index of non-hedging firms (GI_{NH}) in each year and throughout the entire sample period. The results strongly indicate that hedging firms are characterized by having higher agency conflicts, and weaker corporate governance structures than their non-hedging counterparts.

Moreover, results in Table 21 appear to be consistent with Tufano's (1998) hypothesis which predicts that firms with weak corporate governance, as evident by the severity of managerial agency conflicts, may be associated with more hedging, since corporate insiders benefit fully from hedging, though they bear only a part of the costs associated with it. In addition, hedging may insulate managers from the monitoring power provided by the external capital markets, which may motivate mangers to engage in hedging. Our results provide support to that argument.

<Insert Table 21 about here>

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[29] See Appendix C.

[30] The mean and median difference between GI_H - GI_{NH} is positive and significant at the 5% level in 1993, 1995 and 1998 respectively. For the entire sample period it was positive and significant at the 1% level.

In Table 22 we present the univariate analysis for the performance and firm specific variables of hedgers and non-hedgers in the sample in each year based on the G index deciles. The univariate analysis shows the significance of mean and median tests for these variables between hedging and non-hedging firms in the sample. The significance of mean tests, conducted by one-way ANOVA, where as the median tests are conducted by the non-parametric Wilcoxon Sum Rank test. In panel A we report the univariate analysis for all firms pooled across the deciles of G. Results in panel A show that hedging firms are larger in size than non-hedgers. The mean and median difference of total assets between hedging firms and non-hedging firms is positive and statistically significant in each year in the sample period. It's important to note that, hedging and firm size has been very controversial in the literature. For example, Warner (1977) suggests that smaller firms have proportionally higher bankruptcy costs than larger firms. Therefore, to the extent that hedging reduces the probability of bankruptcy, it is more beneficial for smaller firms to hedge than large firms. Nance, Smith and Smithson's (1993) hypothesis contends that large firms are more likely to hedge because the information and transaction costs of hedging exhibit economies of scale which makes it easier and cheaper for large firms. As far as the empirical evidence is concerned, Chow, Lee and Solt's (1997) work provide evidence on the positive relation between firm size and hedging. Allayannis, Brown and Klapper (2001), on the other hand, found weak evidence for the negative relationship between firm size and its hedging profile. Our results are consistent with those of Chow, Lee and Solt (1997).

<Insert Table 22 about here>

The mean and median tests for the ratio of long-term debt to assets are negative, but not significant in 1993 and are positive and significant in 1995 and 1998 respectively. Our univariate results, therefore, support the existing literature on the positive relationship between debt and hedging. For example Graham and Rogers (2000) and Schmid (1999) found a positive and significant relation between hedging and total debt for US firms. Our results support theories (see, for example, Smith and Stulz (1985)) that indicate that hedging can reduce the variance of firm value and thereby the expected cost of financial distress. Hence hedging firms tend to have a higher debt ratio.

Results in panel A also show that hedging firms have a consistently lower institutional ownership structure. The mean and median difference is negative and significant in 1998. The median is negative and significant in 1995. The mean and median differences in institutional ownership are negative, but not significant otherwise. Institutional ownership is used as a proxy for the degree of informational asymmetry in the firm. Lower institutional ownership is also a sign of higher agency conflicts and bad governance structure in the firm as it reflects a high level of information asymmetry between mangers and shareholders (see, for example, Allayannis et al (2003), Lel (2004) and Tufano (1996)).

Our results also show that hedging firms have consistently under-performed their non-hedging counterparts in terms of Return on Assets (ROA), Return on Equity (ROE) and Earning before Interest, and Tax (EBIT) ratios. Mean and median tests are negative and statistically significant, through out the period. Results support the prediction of the

theories of hedging that argue that less profitable firms are more likely to hedge since they are more susceptible to financial distress[31].

Finally, Table 22 shows that hedgers consistently paid higher dividends than non-hedgers. The mean and median differences in dividend payout ratio between hedging and non-hedging firms were positive and statistically significant in 1993, 1995 and 1998 respectively. This result is in line with Nance, Smith and Smithson's (1993) predictions, which favor a positive relation between hedging and dividend payments. According to their theory, a lower dividend payout makes it more likely that funds will be available to service the firm's debt obligations (financing needs) as well as its investment requirements, therefore the lower the likelihood a firm will seek hedging and vice versa.

Overall, the results of the univariate analysis show that hedging is associated with economies of scale as indicated by the fact that hedging firms are larger in size,. Moreover, hedging is undertaken by firms having higher debt capacities, indicating that hedging can lower the volatility of the firm's underlying cash flows, thus enabling the firm's to pay their debt and contractual obligations and avoid costly external finance. In addition, results show that hedging is undertaken in firms with lower institutional ownership structures, where shareholders monitoring of managers activities is low, thus indicating that currency risk management may be driven by managerial risk preferences. Finally, results in this table indicate that hedging is undertaken in firms that have lower profitability ratios, who are more susceptible to financial distress. As well as in firm who pay high dividends as more dividends imply less funds being available to service the firm's debt obligations.

[31] Allayannis and Weston (1999) in investigating the impact of industry structure on currency hedging found that most hedging companies in the US are from competitive industries that have a low profitability. Hence they hedge more.

3.3. C. The determinants of Foreign Currency Hedging: Multivariate Analysis

To draw inferences on the determinants of currency hedging and whether the governance structure and the level of agency impact the hedging decision in the firm, we use a logit regression to regress the firm's hedging profile, proxied by the foreign currency derivative dummy (DERVDUM)[32] to the G index and some firm specific characteristics. The independent variables include the following; the Corporate Governance Index (G) as a proxy for the level of agency conflicts and the governance structure in the firm and the firm specific and performance variables discussed above.

<Insert Table 23 about here>

Results in table 23 show that the Corporate Governance Index "G" is positively and significantly (1% level) related to the likelihood of hedging. This result indicates that the higher the G index in the firm, indicating a weak governance structure as well as high agency costs in the firm, the more likely that firms will undertake currency hedging. This result provides strong support to Tufano's (1998) hypothesis regarding the rationale for hedging in firms with weak governance/high agency conflicts between shareholders and managers. Specifically, Tufano (1998) predicts that the severity of managerial agency conflicts may be associated with more hedging, since corporate insiders benefit fully from hedging, though they bear only a part of the costs associated with it. In addition, hedging may also insulate managers from the monitoring power provided by the external capital markets, which may motivate mangers to engage in hedging. Therefore, according

[32] which is a dummy variable that take the value of one if the firm is involved in any type of currency hedging , such as forwards, futures or options contracts

to this hypothesis, firms with high agency conflicts and firms with weaker governance structures may be more likely to engage in hedging and vice versa.

As for the remaining firm specific variables in the regression, some variables turned out significant and with the same sign as theory predicts, while others were not. For example, results confirmed that currency hedging is positively and significantly related to firm size, indicating the importance of economies of scale for hedging firms. This result is consistent with Chow, Lee and Solt's (1997) and and Nance's et al (1993) hypothesis discussed previously. This result is also consistent to the results of the univariate analysis discussed in the previous section.

We find that the coefficient of long-term debt to total assets is positive. However, the results show that this variable is not significant, indicating, that hedging is not related to debt as a percent of total assets. This variable was positive and significant in the univariate analysis in the previous section.

Institutional ownership is found to be negative and significantly related to the likelihood of hedging. This result confirms our findings in the univariate analysis. This negative relationship could be explained in two ways. First, lower institutional ownership structure is an indication of low shareholder's monitoring. So if managerial hedging decisions are based on managerial risk preferences that might go against that of the shareholders, then we should expect that the lower the institutional ownership in the firm, the higher the hedging activity. Second, low institutional ownership could be interpreted as creating a high level of informational asymmetry in the firm between shareholders and managers[33]. Hedging, on the other hand, can reduce the noise associated with

[33] Studies have used the level of institutional ownership in the firm to proxy for the information asymmetry between managers and shareholders in the firm. (see for example Tufano (1996), Geczy et al (1997), Graham and Rogers (2002), Lel (2004) and Allayannis et al. (2003)).

performance measures to the extent that it reduces firm's cash flow volatility (Stulz, 1996). Therefore hedging can reduce the degree of informational asymmetry among managers, shareholders, and the labor market. This implies that managers with superior skills may engage in hedging to better communicate their skills to the labor market (see Breeden and Viswanathan, (1998)). Therefore, as the degree of information asymmetry in the firm becomes high, the desire of "good-performing" managers to convey their superior skills to the market by aggressively hedging currency risk exposure becomes. It is important to note that since the valuation effect of hedging is not knows at this point, then the negative relationship between hedging and institutional ownership could be interpreted as either the first or the second view

With regards to the firm's profitability level and the likelihood of hedging, results in Table 23 confirm what we saw earlier in the univariate analysis. The firm's profitability, as proxied by the firm's EBIT ratio and ROA ratio is negatively and significantly related to its use of currency derivatives. The firm's ROE ratio, however, is not significant. Overall results support the hypothesis that less profitable firms are more likely to hedge since they are more susceptible to financial distress.

Finally, the results show that dividend variable does not have a significant explanatory power in the decision to hedge. The coefficient of the dividend pay out ratio (DIVP) is negative and insignificant. This result is opposite to our result in the univariate analysis. A negative relationship between dividends and hedging is, however, consistent with Haushalter's (2000) predictions. Low dividend payments may imply that the firm is capitally constrained. If hedging is used as a tool to minimize the volatility and the unpredictability of the underlying cash flows, then it is expected that hedging will be

more prominent in firms that are capitally constrained. The negative relationship in our result is consistent with this prediction. However, the variable is not significant.

Overall results in this table show the following; currency hedging is undertaken by firms with weak governance structures and high agency conflicts between managers and shareholders. They are also prominent in firms with high informational asymmetry and low managerial monitoring as indicated by the low institutional holding ratio. These firms are also shown to be more financially constrained, as indicated by their low dividend payout ratio. Finally, these firms are also shown to have a lower profitability ratios, larger sizes and greater debt ratios.

3.3. D. Firm Value, Corporate Governance and Foreign Currency Hedging Strategies: Univariate Analysis

So far the results, particularly those that revealed the relationship between currency hedging and the G index, on one hand and the results between currency hedging and the level of institutional ownership holding, on the other hand, seem to strongly suggest that hedging is pursued to satisfy the risk preferences of managers as agued by Tufano (1998). It is important to note, however, that risk management driven by managerial risk preferences might not necessarily go against the wealth and value of the shareholders. In other words, in order to be able to either fully support or refute Tufano's (1998) predictions regarding managerially motivated risk management strategies, the valuation effects of hedging in presence of agency conflicts between managers and shareholders have to be ultimately examined.

Table 24 presents the results of the valuation effect of hedging in the presence of agency conflicts, between shareholders and managers of the firm, in a univariate setting.

The mean and median difference in firm value between hedgers and non-hedgers is examined in each year and through out the sample period. Firm valuation is captured using two variables namely; Tobin's Q and Excess Market value measures. Panel A reports the results for all firms pooled across the G index deciles. Overall results in panel A show that hedging firms were rewarded with higher market valuation in each year and throughout the entire sample period. The mean and median difference is positive using both Tobin's Q and Excess market value measures. The mean and median differences (the hedging premia) are positive and significant in 1998, and for the overall sample period using the two valuation measures. The median difference is significant and positive only in 1995 using both measures of valuation. In 1993, however, the hedging premium is positive, but not significant using both measures of value. This last result could be attributed to the fact that currency hedging became more important in the mid to late 1990's, when the world financial markets were rattled with currency crises and the benefits of currency hedging was shown and more emphasized in the finance literature.[34] Overall, results in panel A show that hedging is a value increasing strategy for the firm, thus supporting results reported in earlier studies that document the positive effects of hedging on firm and shareholder value (see, for example, Allayannis and Weston (2001), Allayannis et al. (2003), Lel (2004), Hagelin et al. (2004)).

<Insert Table 24 about here>

Panel B reports the univariate results of the valuation effects of hedging in the Shareholder Portfolio. Results show that, overall, hedging adds value to well-governed

[34] Allayannis and Weston (2001) also documented a hedging premium for their sample that was only

firms that are suffering from the least levels of agency conflicts. The mean and median difference in Tobin's Q between hedgers and non-hedgers is positive and significant only in the overall sample period. The hedging premium is positive, but not significant in 1995 and 1998. Moreover, in 1993 results document a hedging discount that is not significant. By using Excess market value as a measure of value, the results document a hedging premium in 1995, 1998 and in the overall sample period, that is not significant. In the year 1993, a hedging discount that is not significant is again documented. Overall, results for the Shareholder Portfolio are surprising, as they don't quite fit the predictions of existing literature[35]. At best we can say that our univariate analysis shows a weak support to the positive valuation effects of currency hedging on well-governed firms.

Finally in panel C we report the results of the univariate analysis for the Management Portfolio. By using both measures of valuation, results document the presence of a positive hedging premium that is highly significant in each year and for the overall sample period. This result contradicts Tufano's (1998) hypothesis. Despite the fact that hedging strategies appear to be more prominent in the higher deciles of the G index these activities are **not** value destroying to the firms and to the shareholders. Overall this result documents that not all forms of managerially motivated hedging is value destroying to the firm.

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significant after 1993.

[35] See our discussion on "The two faces of corporate governance" in the literature review section of the essay.

3.3. E. Firm Value, Corporate Governance and Foreign Currency Hedging Strategies: Multivariate Analysis

In this section we test the relation between currency hedging and firm value, proxied by Tobin's Q ratio and Excess market value, in a multivariate framework. To be able to document a relationship between hedging, firm value in presence of agency conflicts, we need as before, to control for the effects of other possible variables on Tobin's Q and Excess market value. Most of the control variables are those that are discussed earlier. In panels A1-A3 of Table 25, the following OLS regression is performed.

$$Q_i = \beta_0 + \beta_1 \text{ DERVi} + \beta_2 \text{DERVDUM}_i + \beta_3 \text{ Log(TA)} + \beta_4 \text{ LDEBTA}_i + \beta_5 \text{ INSTIT}_i + \beta_6 \text{EBIT}_i + \beta_7 \text{ ROA}_i + \beta_8 \text{ ROE}_i + \beta_9 \text{ DIVP} + E_i$$

For i = 1,.....N, where N is the number of firm year observation.

Panel A1 reports the results for the overall sample of firms pooled across the G index deciles. Results show that the coefficient of the foreign exchange derivative dummy (DERVDUM) is positive and significant in all regressions. The average hedging premium[36] using Tobin's Q is 0.192, which represents 9.2% of firm value. The coefficient of the continuous variable of hedging (DERV) is also positive in all

[36] The average hedging premium is the average of the coefficient of the derivative dummy in all three regressions. (see table 11, panel A1).

regressions, but not significant. Overall, results using Tobin's Q support the hypothesis that currency hedging increases firm value.

For the rest of the control variables, some turned out significant with the expected signs, while others non significant. For example, the coefficient of the log of total assets of the firms, which proxies for firm size is negative and significant at the 5% level in all regressions. This result is in line with Allayannis and Weston (2001) and Pramborg (2003) who found differences in Tobin's Q for large firms as compared to small firms, where large firms were associated with a lower Tobin's Q.

With regards to the ratio of long term debt to assets, results show this variable to be insignificant. The sign on the variable is also mixed. It is negative in 4 regressions and positive in the other 2. Theory predicts that firms with higher levels of debt have higher Q and market values. The reason is because debt acts as a monitoring mechanism for managers (Jensen, 1986). Allaynnis and Weston (2001) found a positive and significant relationship between debt and firm value. Pramborg (2003), Hagelin et. al. (2004), on the other hand, found a negative relationship between debt and firm value that was not significant. Our results seem to support that of Pramborg's (2003).

Regarding the institutional ownership structure of the firm, results show that a negative and statistically significant relationship exists between institutional ownership and firm value. This result is puzzling and contradicts what theory predicts. Specifically, Shleifer and Vishny (1997) argue that large shareholders, such as institutions, have a stronger financial incentive to monitor management, while Coffee (1991) and Gillan and Starks (2000) add that institutional investors have greater incentives to monitor since they cannot always sell the shares of underperforming firms due to potential adverse price effects, as well as due to indexing. McConnel and Servaes (1990) find empirical evidence

of a significant positive relationship between Q and the fraction of shares owned by institutional investors and Smith (1996) finds an increase in shareholder wealth when financial institutions include a firm in their watch list. Finally, recently, Hartzell and Starks (2003) find that institutional ownership is positively related to the pay-for-performance sensitivity of executive compensation and negatively related to the level of compensation suggesting that institutions mitigate agency costs through effective monitoring.

With the regards to the remaining control variables, results show the following; the coefficient of ROA and EBIT are both positive and significant, indicating that the higher the profitability of the firm, the higher its value. This result is consistent with the predictions of theory and other studies (see for example Allayannis and Weston (2001)). Finally, our results show that Dividend pay out ratio is negative, but insignificant. This result is in line with the predictions of Lang and Stulz (1994) and Servaes (1996) who argue that if a firm paid dividends, then it's less likely to be capital constrained. Thus the firm does not need the external capital markets, which basically allows it to engage in any kind of investments under the discretion of the management. Hence the less capital constrained a firm is, the more likely it can undertake negative NPV projects and hence destroy its value. Therefore, our results support the theory that dividend payout is negatively related to firm value.

In panel A2, we present the valuation effect (using Tobin's Q) of currency hedging in the shareholder portfolio. Results show that the coefficient of the notional value of derivative is positive. The average hedging premium 0.399[37] is positive and significant at the 5% level in all regressions. The derivative dummy, however, is

negative, but not significant. Overall, results show that hedging is a value increasing strategy for firms in the lower deciles of the G index (i.e. lowest agency conflicts and better governance structure).

Results for the rest of the control variables are the same as above with the exception of institutional ownership and dividend pay out ratio. Institutional ownership (INSTIT) is found to be positive and significantly related to firm value in 2 regressions, consistent with the predictions of Shleifer and Vishny (1997) (see our discussion above). Moreover Dividend pay out (DIVP) is positive and significant in 2 regressions, thus consistent with the predictions of Fama and French (1998), who inferred from their empirical results that dividends signal information about future profitability (expected net cash flows), where high dividend payouts may act as a signal that a firm's cash flows and profitability are high. Hence, this signaling per se could increase firm value. It seems that results for the Shareholder Portfolio support the "Dividend Signaling Hypothesis".

<Insert Table 25 about here>

Panel A3 reports the valuation effect (using Tobin's Q) for firms in the Management portfolio. Results document that hedging firms outperformed their non-hedging counterparts and that the average hedging premium 0.909[38] of the derivative dummy is positive and significant at the (5% level). By using the continuous variable of derivatives (DERV), a hedging premium is still documented, but not significant in any regression specification. The rest of the control variables were found to have the same

[37] The average hedging premium is the average coefficient of the continuous value of the derivative variable used in all three regressions (see table 11, panel A2)

pattern as explained in Panel A1. Overall, results in Panel A3 are consistent with the earlier results of the univariate analysis, we find that hedging is **not** a value destroying strategy for firms in the highest deciles of the G index, which are characterized by having the weakest governance structure and have the highest level of agency conflicts. Again this result contradicts the potential value destroying effect of hedging in the presence of agency conflicts, as outlined by Tufano (1998).

In panels B1-B3 of Table 25 we present the valuation effect of currency hedging in the presence of agency conflicts using Excess Market value as an alternative valuation method. The following regression is conducted;

$$EXMKT_i = \beta_0 + \beta_1 DERVi + \beta_2 DERVDUM_i + \beta_3 Log(TA) + \beta_4 LDEBTA_i + \beta_5 INSTIT_i + \beta_6 EBIT_i + \beta_7 ROA_i + \beta_8 ROE_i + \beta_9 DIVP + E_i$$

For $i = 1,.....N$, where N is the number of firm year observation.

Panel B1 reports the results for the overall sample of firms pooled across the G index deciles. Using Excess Market valuation measure, the average hedging premium[39] for derivative dummy (DERVDUM) is 0.260 and for the continuous value of derivatives (DERV) is 0.102 which represent 14.2% and 5.5% of firm value respectively. Results indicate that, overall, currency hedging is a value increasing strategy for the firm. It is important to note that using Excess market valuation as a measure of value, stronger

[38] The average hedging premium is the average coefficient of the derivative dummy in all three regressions (see table 11, panel A3).

[39] The average hedging premium is the average of the coefficient of the derivative dummy (and the average coefficient of the continuous value of the derivative variable) in all three regressions. (see table 11, panel B1)

support is given to the positive valuation theory of hedging since both the derivative dummy as well as the continuous value of the derivative variable are positive and significant. The rest of the control variables display the same pattern as panel A1.

Panel B2 reports the results of the valuation effect in the Shareholder Portfolio. Results document the presence of a hedging premium using both the derivative dummy and the continuous value of derivative, however both are not significant. So weak support is provided for the positive value effect of hedging in the Shareholder Portfolio when we use Excess Market Value, as an alternative valuation measure.

Finally, results in Panel B3 confirm the positive valuation effect of hedging in the Management Portfolio. The average hedging premium 0.705 for the derivative dummy is also positive and significant at the (5 %level). The coefficient of the notional value of derivatives (the continuous derivative variable) is also positive, but not significant.

Overall results from table 25 did not support Tufano's (1998) predictions regarding the potential value decreasing effect of currency risk management in firms suffering from high levels of agency conflicts. Overall our results are more in line with the body of finance literature that suggest that the realization of managerial risk preferences may not always lead to a lower shareholder and firm value. The realization of the mangers' risk preferences aims eventually at the reduction of corporate risk in order to avoid bankruptcy. Therefore, this leads to a hedging strategy that increases shareholder value.[40]

Our results also provide some support to the hedging theories that link corporate hedging policies to managerial career and reputation concerns. Hedging can reduce the

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[40] Bartram (2000) makes a similar argument; "while corporate mangers may be risk averse due to their undiversified personal wealth position, they cannot sell the stock of their firm short in order to reduce the riskiness of their private portfolio. As a result they not only have a special interest in the ongoing existence of the firm, but also have an incentive to reduce their personal exposure by means of corporate hedging."

noise associated with performance measures to the extent that it reduces firm's cash flow volatility (Stulz, 1996). Therefore hedging can reduce the degree of informational asymmetry among managers, shareholders, and the labor market. This implies that managers with superior skills may engage in hedging to better communicate their skills to the labor market (see Breeden and Viswanathan, (1998)). Therefore, the higher the degree of information asymmetry[41] in the firms; the higher the desire of "good-performing" managers to convey their superior skills to the market by aggressively hedging currency risk exposure in a way that adds value to the firm and to the shareholders. This explains why hedging firms in the Management Portfolio (the weakest corporate governance structure, highest level of agency and with the highest level of asymmetric information between managers and shareholders) were rewarded with higher valuation than non hedging firms and their hedging premium was even higher than the hedging premium for firms in the Shareholder Portfolio (strongest corporate governance provisions, lowest agency costs and lowest degree of asymmetric information between mangers and shareholders).

Finally, our results support the recent international literature regarding the role of corporate governance and agency costs on the firm's hedging decisions that was documented in foreign firms. Specifically, our results support Allayannis', Lel's and Miller's (2003) study, which documents that hedging is valuable even when internal (firm specific) corporate governance is weak, if the firm happens to reside in a country with good external governance (English legal origin). And that is true for the firms in our

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[41] Studies have used the level of institutional ownership in the firm and whether the largest block holder is an outsider or an insider to proxy for the information asymmetry between managers and shareholders in the firm. (see for example Tufano (1996), Geczy et al (1997), Graham and Rogers (2002), Lel (2004) and Allayannis et al. (2003)).

sample. The US enjoys a large and stable financial market with overall strong governance provisions compared to many other countries and that could explain the positive valuation effect for firms in the Management Portfolio.

3.3.4. Summary of Results

This essay provides new evidence on the potential effects of corporate governance structure on the firm's currency hedging activities. Specifically, in this essay we investigate the relationship between currency risk management activities, firm value and the agency-related costs arising from the separation of ownership and control using an innovative methodology, which proxies for the level of agency conflict in the firm. The degree of agency conflicts in the firm is proxied by the Corporate Governance Index or the "G" index.

By using a sample of 1422 firm year observations from the S&P 500 during the years 1993, 1995, and 1998 respectively, results show that currency hedging firms tend to be in the higher deciles of the G index (high agency costs, weak governance structure). Where as non-hedging firms tend to be in the lower deciles of G (low agency costs, strong governance structure). With regards to currency hedging, corporate governance and firm value, the overall results document that hedging firms in our sample consistently showed a significantly higher value than their non-hedging counterparts using both Tobin's Q and Excess Market value as two alternative firm valuation measures. The average hedging premium using Tobin's Q is 0.192, which represents 9.2% of firm value. Using Excess Market valuation measure, the average hedging premium for the notional value of derivatives is 0.260 and for the derivative dummy 0.102 which represents 14.2) and 5.5% of firm value respectively. Results indicate that, overall, currency hedging is a value increasing strategy for the firm.

By examining the valuation effect of hedging on the two extreme deciles of G, results show the following; for firms that suffer from very weak governance structures and are

accordingly plagued by the severest levels of agency conflicts (Management Portfolio), hedging is **not** a value destroying strategy. Using Tobin's Q as a measure of value, results show that hedging firms still outperformed their non-hedging counterparts and that the average hedging premium 0.909 is positive and significant at the (5% level). By using Excess Market value as another measure of valuation (for robustness checks), the average hedging premium 0.705 is also positive and significant at the (5 %level).

Firms which have the strongest governance structures and the lowest degrees of agency conflicts (Shareholder portfolio) have also showed a positive hedging premium. The average hedging premium 0.399 is, however, smaller than that in the Management Portfolio and is only significant at the (5% level) when using Tobin's Q as a valuation measure, but not significant using Excess Market value

Overall, the results in this essay did not support Tufano's (1998) predictions regarding the potential value decreasing effect of currency risk management in firms suffering from high levels of agency conflicts. Overall, our results are more in line with the body of finance literature that suggest that the realization of managerial risk preferences may not always lead to a lower shareholder and firm value because mangers still have an interest in the existence of the firm and want to prevent it form going bankrupt. Our results also provide some support to hedging theories that link corporate hedging policies to managerial career and reputation concerns.

Finally, our results support the recent international literature regarding the role of corporate governance and agency costs on firm's hedging decisions, which documents that hedging is valuable even when firm-specific corporate governance is weak, if the firm happens to reside in a country with good external governance. Our results are consistent with these findings. Because the US enjoys a large and stable financial market

with overall strong governance provisions compared to many other countries, positive valuation effects from currency hedging is still documented even for firms suffering from weaker governance provisions and higher levels of agency conflicts between mangers and shareholders.

4. CONCLUSION

In recent years, despite controversial arguments in the finance literature regarding the irrelevance of risk management activities, a growing number of corporations have committed considerable resources to risk management, indicating the potential for risk management to protect and increase firm value. One can argue that most prior attempts to directly link the value of the firm to its hedging profile is limited. Moreover, several questions with regards to firms' risk management activities remain unanswered. In this study, we presented two essays on currency risk management activities in US non-financial, multinational corporations in an attempt to investigate some of the puzzling issues in the hedging literature.

In the first essay we first, examined the valuation effects of currency hedging policies of firms around extraordinary exchange rate instability events. The exchange rate shocks of the Asian Currency crisis of 1997 and the Brazilian Real Devaluation of 1999 were used as the exchange rate instability events. Financial theory suggests that hedging exchange rate risk through currency derivatives can increase or at least protect firm value by reducing the chance of financial distress. Moreover, the financial and currency crises of the 1990's, although severe in magnitude, were relatively short in duration hence they provided us with a pre-crisis, crisis and post-crisis evaluation of firm value. Second, in the first essay we also investigated the effectiveness of natural and financial hedges on firm value and the relationship between the two hedging techniques during periods of exchange rate instability.

By using a large cross section of non- financial firms from the S&P500 that had positive foreign sales total sales ratio and that had operations in the Asian and Latin American regions around the time of the crises, the results document the presence of a hedging premium. By using Tobin's Q and excess market value as alternative measures of value and by controlling for the effect of other variables that may impact firm value, such as size, geographic and industrial diversification, firm's leverage position, firm's profitability and it's liquidity and ability to access financial markets, the results document a hedging premium. In firms with Asian exposure, results document that users of currency derivatives were shown to have a higher Q by 0.385 than non users. This premium is significant and represents 16.62% of firm value. Similarly, using Excess Market Value as an alternative valuation measure, the overall hedging premium is 0.538 and it represents 26.5% of firm value for hedging firms through out the entire crisis period (1996-1998).

Moreover, in firms with Brazilian exposure, using Tobin's Q as a measure of value, the overall hedging premium 0.241 was found to be significant and represented 8.89 % of firm value. In addition, by using Excess Market value, the overall hedging premium 0.078 was also significant and represented 2.95% of firm value for the entire sample period (1998-2000).

Our results thus indicate that firms, which hedged their foreign exchange exposures using foreign currency derivatives, were rewarded by the market at times of exchange rate turbulence. This result is robust for both crises and regardless of the measure of valuation used. Moreover, results for the Asian sample are generally consistent with previous research that showed that the effect of the Asian crisis on US firms had been

benign and that the growth enhancing consequences of the crisis for the United States – primarily lower interest rates and commodity and input prices–were simply more powerful than the growth reducing factors which included reduced demand for US exports, financial and revenue disturbances suffered by lenders, investors, and firms that have operated in the region during the crisis.

Regarding the effectiveness of natural and financial hedging on firm value and the relationship between the two hedging techniques, our results showed that firms that hedged their currency exposure using both financial and non-financial hedging techniques were rewarded by a positive market valuation at the time of currency devaluations and exchange rate shocks. This result is robust for both crises and regardless of the valuation measure used. It is important to note, however, that when we proxied for non-financial hedging techniques by the total number of countries the firm operates in rather than relaying on foreign sales/total sales ratio as a proxy for the same variable, the coefficient of the interactive variable between financial hedging and natural hedging (DERVDUM * GEO_2) became more significant and more pronounced, indicating that both types of hedging strategies increase firm value. Overall, results of this investigation support theories that suggest that currency derivative hedging and geographic diversification are complementary tools of currency risk management.

In the second essay, we investigated the relationship between currency risk management activities, firm value and the agency-related costs arising from the separation of ownership and control. Specifically, we conducted tests to assess the damaging effects of corporate hedging motivated by managerial risk preferences as outlined by Tufano (1998). The degree of agency costs in the firm was proxied by the

Corporate Governance Index (G). The G index is an innovative methodology that proxies for the balance of power between managers and shareholders in the firm, thus it proxies for the level of agency costs in the firm.

By using a sample of 1422 firm year observations from the S&P 500 during the years 1993, 1995, and 1998 respectively, results showed that currency hedging firms tend to be in the higher deciles of the G index (i.e. in firms with high agency costs and weak governance structures). This result generally supports the managerial risk preference hypothesis. However when the valuation effect of hedging was investigated in the "Management Portfolio" of the Corporate Governance Index (i.e. the portfolio containing the firms suffering from the weakest shareholder rights, the highest levels of agency costs and the weakest governance structures), interestingly, hedging was **not** value decreasing.

This result does not provide support to Tufano's (1998) predictions regarding the damaging effects of managerially motivated hedging on firm value. Our results, on the other hand are in line with the body of the finance literature suggesting that the realization of managerial risk preferences may not always lead to a lower shareholder and firm value because mangers still have an interest in the existence of the firm and want to prevent it from going bankrupt.

Finally, our results support the recent international literature regarding the role of corporate governance and agency costs on firm's hedging decisions, which documents that hedging is valuable even when firm-specific corporate governance is weak, if the firm happens to reside in a country with good external governance.

The overall results of this study can be summarized as follows; Currency risk management is a value increasing strategy for the firm. It is particularly an important tool

in protecting and shielding firm value at times of exchange rate upheavals and severe currency devaluation events. Furthermore, currency risk hedging in the presence of natural hedging techniques (geographic diversification) results in a positive value premium for the firm, indicating that both types of hedging strategies work together as complements to enhance firm value at times of exchange rate shocks. Finally, our results show that currency risk management strategies are more common in firms that enjoy high managerial provisions and greater power to managers over shareholders i.e. in firms with weak corporate governance structures and high agency costs, indicating that currency risk management is driven by managerial risk preferences. However, our results show that this managerially motivated hedging is not necessarily damaging (value decreasing) to the firm. Our results show that hedging firms in the above category still outperformed their non-hedging counterparts and that the average hedging premium is positive and significant.

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Table 1

Number and Percentages of US firms using Foreign Exchange Currency Derivatives and the Type of Instrument Used: Asian Currency Crisis sample

The table presents the number and percentages of foreign Exchange Derivative use for a sample of 627 US. Non-Financial firms around the East Asian Financial crisis (1996-1998) Panel(A). The sample excludes firms with: Foreign Sales/Total Sales Ratio equal to zero. Firms with size less than $10 million. Firms that do not have operations (subsidiaries and /or Foreign Sales) in any of the East Asian countries. Financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67) are also excluded from the sample. "Hedging" firms are defined as firms that have data on any type of Foreign Exchange Currency Derivatives (Forwards, Options, swaps) available in the firm's 10-K Annual Reports from 1996-1998. "Non-Hedging" firms are defined as firms that do not report any type of currency hedging activity in their annual reports. Firms that report other types of hedging activity (Commodity and/or Interest Rate hedging) are also included in the "Non-Hedging" sample. Foreign Currency Hedging data is obtained from the Firms' 10-K annual Reports via the Electronic Data Gathering, Analysis and Retrieval database "EDGAR" and/or Annual Report Gallery. Mean Notional value of foreign currency derivatives is the average contract amount of any foreign currency forward, futures, swap or option made by the firm during the year, it represents the future cash flows under the contract. It is expressed in millions of dollars Foreign operations data is obtained from the Directory of American Firms Operating Abroad. All other variables are obtained from the COMPUSTAT database. Panel (B) shows the total number and percentages of the type of foreign currency derivative instrument used by the hedging firms in the sample

Panel A

Foreign currency hedging profile for the S&P500 Firms

Year	#Hedging Firms	%	# Non-Hedging firms	%	Total	%	Mean Notional Value(millions)	%
1996	112	53.6	97	46.4	209	100	$3998	26.0
1997	125	60.0	84	40	209	100	$5512	35.6
1998	133	63.6	76	36.4	209	100	$5938	38.4
All Years	370	59.0	257	41	627	100	15448	100

Table 1 (continued)

Panel B

Type of Foreign Currency Derivative Instruments used by Hedging firms

Year	Forward Contracts	%	Options contracts	%	Swap contracts	%	Total Users	%
1996	77	68.75	30	26.79	5	4.46	112	100
1997	90	72	31	24.8	4	3.2	125	100
1998	98	73.68	32	24.06	3	2.25	133	100
All Years	265	71.62	91	25.20	12	3.30	370	100

Table 2
Industry Classification of US. Foreign Currency Hedging and Non-Hedging Firms Based on the 2 Digits SIC Classification. – Asian currency crisis sample

The table presents the industry classification of 627 Non Financial US. Firms based on the 2-digit industry classification codes for the period from 1996-1998. The sample excludes firms with: Foreign Sales/Total Sales Ratio equal to zero. Firms with size less than $10 million. Firms that do not have operations (subsidiaries and /or Foreign Sales) in any of the East Asian countries. Financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67) are also excluded from the sample. "Hedging" firms are defined as firms that have data on any type of Foreign Exchange Currency Derivatives (Forwards, Options, swaps) available in the firm's 10-K Annual Reports from 1996-1998. "Non-Hedging" firms are defined as firms that do not report any type of currency hedging activity in their annual reports. Firms that report other types of hedging activity (Commodity and/or Interest Rate hedging) are included in the "Non-Hedgers" sample. Foreign Currency Hedging data is obtained from the Firms' 10-K annual Reports via the Electronic Data Gathering, Analysis and Retrieval database "EDGAR" and/or Annual Report Gallery. All other variables are obtained from the COMPUSTAT database.

2 Digit SIC Code	Title & Description of Industry	# of Hedging firms	# of Non-Hedging firms
10	Metal Mining	-	2
12	Coal Mining	-	3
13	Oil and Gas Extraction	-	10
14	Mining and Quarrying Nonmtl Minerals (Except Fuels)	8	-
17	Construction-Special Trade Contractors	-	2
20	Food and Kindered Products	16	2
22	Textile Mill Products	8	-
23	Apparel and Other Finished Products	6	2
24	Lumber and Wood Products, Except Furniture	7	3
25	Furniture and Fixtures	-	2
26	Paper and Allied Products	11	4
27	Printing, Publishing and Allied Industries	-	5
28	Chemicals and Allied Products	77	10
29	Petroleum Refining and Related Industries	8	-
30	Rubber and Miscellaneous Plastic Products	15	2
32	Stone, Clay, Glass and Concrete Products	8	
33	Primary Metal Products	8	5
34	Fabricated Metal Products. Except Machinery and Transportation Equipment	9	10
35	Industrial and Commercial Machinery and Computer Equipment	40	17
36	Electronics and Other Electronic Equipment	34	35
37	Transportation Equipment	10	11
38	Measuring, Analyzing and Controlling Instruments	29	20
39	Miscellaneous Manufacturing Industries	18	3
42	Motor Freight Transportation, Warehousing	-	3
45	Air Transportation	-	3
47	Transportation Services	8	3

2 Digit SIC Code	Title & Description of Industry	# of Hedging firms	# of Non-Hedging firms
48	Communications	8	2
49	Electric, Gas and Sanitary Services	-	3
50	Whole Sale Trade- Durable Goods	13	11
51	Whole Sale Trade – Non Durable Goods	-	6
55	Automotive Dealers, Gas Service Stations	-	3
58	Eating and Drinking Places	-	3
59	Miscellaneous Retail	6	3
73	Business Services	15	51
75	Automotive Repair Services and Parking	-	3
78	Motion Pictures	-	3
79	Amusement and Recreation Services	-	3
80	Health Services	-	3
87	Engineering, Accounting and Research Services	8	6
	Total	370	257

Table 3
Summary Statistics for US. Foreign Currency Hedging and Non-Hedging firms (Asian sample)

The table presents the summary statistics of firms in the S&P 500 that "used" or "have not used" foreign currency derivatives to hedge their exposure to currency risk around the East Asian Financial crisis in the period from 1996-1998. The sample consists of 627 firm year observations on Non Financial firms that have data available on their foreign currency hedging activity in their 10-K annual reports. The sample does not cover firms that have foreign sales to total sales ratio equal zero. Firms with size less than $10 million. Firms that do not have operations (subsidiaries and /or Foreign Sales) in any of the East Asian countries. Financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67) are also excluded from the sample. Excess market value is defined as the market value of equity less book value of equity normalized by total sales. Tobin's Q is computed as market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long term debt divided by total assets of the firm. Notional value of foreign currency derivatives is the contract amount of any foreign currency forward, futures, swap or option made by the firm, it represents the future cash flows under the contract. Foreign exchange derivative dummy is a dummy variable that takes the value of 1 if the firm hedges its foreign currency exposure and equal zero otherwise. Return on assets (ROA %) is defined as the income before depreciation and other extraordinary items divided by total assets. Return on Equity (ROE%) is defined as Income before depreciation and other extraordinary items divided by common Equity. EBIT margin is defined as operating income after depreciation less cost of goods sold, Selling, General & administrative expenses divided by net sales. LDebt/Assets ratio is defined as the percentage of long- term debt divided by total assets. Ldebt is the firm's long term debt. Dividend pay out is defined as the percentage of the total amount of dividends declared on the common stock divided by income before extraordinary items and discounted operations less preferred dividend requirements. Dividend dummy is a dummy variable that takes the value of 1 if the firm has paid dividend at end of the year .and zero otherwise. Foreign Sales /Total sales is the percentage of the sum of all geographic segments (all foreign segments) of the firm divided by net sales. Total Assets is defined as current assets plus net property, plant and equipment plus other non current assets of the firm in millions of dollars. Diversification dummy is a dummy variable that takes the value of 1 if the firm is active in more than one business segment and zero otherwise

Variables	No. Obs.	Mean	Median	Std. Dev.
Excess Market Values	627	2.03	1.09	2.543
Tobin's Q	624	2.31	1.62	2.049
Notional Values of Foreign Currency Derivatives (millions $)	627	15548	46.3	27029
Foreign Exchange Derivative Dummy	627	0.59	1	0.49
Return on Assets	672	7.41	6.72	8.13
Return on Equity	623	17.23	16.61	25.48
EBIT	625	14.45	13.13	15.28
Ldebt/Toal Assets ratio	626	21.87	18.91	17.29
Ldebt	625	333162	82949.5	1317956
Dividend Dummy	619	0.756	1	0.600
Divided Pay out	612	28.96	23.89	70.87
Foreign Sales / Total Sales%	627	33.85	32.82	21.63
Total Assets (millions $)	627	2349.5	357.69	5334.52
Industrial Diversification Dummy	614	0.62	1	0.46

Table 4

Pre-Crisis, Crisis and Post -Crisis Univariate Analysis of Hedging and Non-Hedging Firms (Asian sample)

The table presents mean [median] values of some performance and firm-specific variables for our sample of foreign exchange currency hedging and non-hedging firms before, during and after the Asian crisis, 1996-1998. The sample consists of 627 Non Financial firms that have data available on their foreign currency hedging activity in their 10-K annual reports. The sample does not cover firms that have foreign sales to total sales ratio equal zero. Firms with size less than $10 million. Firms that do not have operations (subsidiaries and /or Foreign Sales) in any of the East Asian countries. Financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67) are also excluded from the sample. "Hedging" firms are defined as firms that have data on any type of Foreign Exchange Currency Derivatives (Forwards, Options, swaps) available in the firm's 10-K Annual Reports from 1996-1998. "Non-Hedging" firms are defined as firms that do not report any type of currency hedging activity in their annual reports. Firms that report other types of hedging activity (Commodity and/or Interest Rate hedging) are included in the "Non-Hedging" sample. Performance and firm-specific variables are defined, as before, in the previous table. The significance of means difference between foreign currency hedgers and non-hedgers is computed by one-way ANOVA. Non-parametric Wilcoxon Rank-Sum test is used to test for the difference of medians of hedgers and non-hedgers. ***, **, And * denote statistical significance for difference of groups at the 1%, 5% and 10% levels respectively.

	1996 (Pre-Crisis)				1997 (Crisis)				1998 (Post-Crisis)			
	Hedging (1)	Non-Hedging (2)	Difference (1-2)	p-Values	Hedging (1)	Non-Hedging (2)	Difference (1-2)	p-Values	Hedging (1)	Non-Hedging (2)	Difference (1-2)	p-Values
Size (Total Assets)	12559 [5088.44] (n=112)	8415.8 [3632.12] (n=97)	4143.2*** [1456.32]***	0.000 [0.000]	13141.2 [5360.9] (n=125)	9595.7 [4382.7] (n=84)	3545.5*** [978.2]***	0.000 [0.000]	13984.07 [5715.50] (n=133)	10792.1 [5048.80] (n=76)	3191.97*** [666.7]***	0.000 [0.000]
(Foreign Sales)/(Total Sales)	39.45 [38.42] (n=112)	24.7 [22.5] (n=97)	14.75*** [15.87]***	0.000 [0.000]	38.49 [36.95] (n=125)	25.98 [20.19] (n=84)	12.51*** [16.76]***	0.000 [0.000]	38.81 [37.67] (n=133)	28.81 [25.81] (n=76)	10.00*** [11.86]***	0.000 [0.000]
LDebt/Assets	19.4 [17.69] (n=112)	20.00 [19.68] (n=97)	-0.60 [-1..99]	0.668 [0.196]	20.67 [17.94] (n=125)	22.50 [18.91] (n=84)	-1.83 [-0.97]	0.233 [0.443]	24.101 [18.63] (n=133)	24.778 [24.06] (n=76)	-0.677 [-5.43]	0.827 [0.689]
EBIT	12.31 [12.60] (n=112)	16 [14.23] (n=97)	-3.69** [-1.63]**	0.036 [0.021]	13.84 [12.80] (n=125)	16.09 [14.80] (n=84)	-2.25** [-2.00]**	0.012 [0.015]	14.85 [12.81] (n=133)	14.13 [12.72] (n=76)	0.720 [0.09]*	0.510 [0.087]
ROA	7.38 [6.71] (n=112)	7.52 [7.00] (n=97)	-0.14*** [-0.29]***	0.010 [0.002]	6.482 [6.66] (n=125)	8.185 [7.41] (n=84)	-1.70*** [-0.75]***	0.000 [0.000]	6.21 [6.527] (n=133)	7.94 [6.588] (n=76)	-1.73** [-0.06]***	0.010 [0.004]
ROE	18.28 [17.19] (n=112)	16.29 [16.04] (n=97)	1.99 [1.15]	0.163 [0.135]	14.61 [16.72] (n=125)	17.56 [15.90] (n=84)	-2.95* [0.82]	0.096 [0.203]	19.54 [17.35] (n=133)	16.67 [16.10] (n=76)	13.93 [1.25]	0.524 [0.652]
Dividend Payout	31.30 [28.27] (n=112)	23.25 [21.81] (n=97)	14.97*** [6.46]***	0.000 [0.000]	38.20 [26.34] (n=125)	29.10 [20.28] (n=84)	9.1*** [6.06]***	0.008 [0.000]	42.80 [24.90] (n=133)	37.45 [21.85] (n=76)	5.35*** [3.05]***	0.004 [0.002]

Table 5
The Determinants of Foreign Currency Hedging (Asian Sample)

The table presents the results of a cross sectional regression that relates firm characteristics and some of its operating measures of performance to its hedging profile from 1996-1998 (panel A). The dependent variable is FCD which is the gross notional value of foreign currency contracts as reported in the firm's 10-K annual reports. Notional value is defined as the contract amount of any foreign currency forward, swap or option made by the firm, it represents the future cash flows under the contract in millions of dollars. The independent variables include the following; Total Assets (TA), defined as current assets plus net property, plant and equipment plus other non current assets of the firm in millions of dollars. Foreign Sales /Total sales (FSTS), defined as the percentage of the sum of all geographic segments (all foreign segments) of the firm divided by net sales. Return on assets (ROA) is defined as the income before depreciation and other extraordinary items divided by total assets. LDebt/Assets (DEBTA) ratio is defined as the percentage of long term debt divided by total assets. (EBIT) margin is defined as operating income after depreciation less cost of goods sold, Selling, General & administrative expenses divided by net sales. Tobin's Q is computed as market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long- term debt divided by total assets of the firm. Dividend pay out (DIVP) is defined as the percentage of the total amount of dividends declared on the common stock divided by income before extraordinary items and discounted operations less preferred dividend requirements. (DIVDUM) Dividend dummy is a dummy variable that takes the value of 1 if the firm has paid dividend at end of the year .and zero otherwise. EXMKT is defined as Excess market value it is the market value of equity less book value of equity normalized by total sales. T values of coefficients are in parenthesis. ***, **, And * denote statistical significance at the 1%, 5% and 10% levels respectively. (Panel B) represents the results of a logit regression where the dependent variable is (FCD-DUM), which is the foreign exchange derivative dummy that takes a value of 1 if the firm reports the notional value of foreign currency contracts in its 10-K annual reports and zero otherwise.

Panel A: OLS regression

Dependent variable; FCD		
Independent Variables	Regression1 1	Regression 2
Constant	0.405 (1.007)	0.4995 (0.1571)
Log(TA)		0.08221 (9.304)***
TA	0.093 (2.013)**	
FSTS	0.300 (6.391)***	0.286 (7.052)***
ROA	-0.065 (-1.703)*	-1.110 (-2.065)**
DEBTA	0.060 (1.178)	0.078 (1.665)*
EBIT	-0.021 (1.748)*	-0.018 (-1.990)**
DIVDUM	0.039 (2.210)**	
DIVP		0.076 (2.425)**
Tobin's Q	0.177 (2.990)**	0.187 (4.626)***
F value	9.087	9.089
P value	0.000***	0.000***
R^2	0.032	0.044
Adj R^2	0.027	0.039

Table 5 (continued)

Panel B: logit regression

Dependent variable; FCD-DUM		
Independent Variables	Regression 1	Regression 2
Log(TA)	0.0544 (2.507)***	0.1755 (2.839)***
FSTS	0.0288 (5.317)***	0.0314 (6.202)***
ROA	-0.0576 (-2.359)***	-0.0576 (-2.359)***
DEBTA	0.0028 (1.391)	0.004 (0.941)
EBIT	-0.0137 (-1.797)**	-0.014 (-1.762)*
ROE	-0.001 (-0.452)	0.002 (0.235)
DIVDUM	0.041 (2.272)**	
DIVP		0.008 (0.606)
Tobin's Q	0.229 (2.552)**	0.133 (1.709)*
Logliklihood	-398.078	-287.54
# Obs D=1	361	359
# Obs D=0	238	236
Convergence	0.001	0.001

Table 6
Pre-Crisis, Crisis and Post–Crisis Valuation Measures of Hedging and Non-Hedging Firms (Asian Sample)

The table presents the pre-crisis, crisis and post-crisis univariate analysis of mean and and [median] hedging premium/discount of the S&P 500 Non- financial firms that have hedged their currency exposure during the Asian Financial crisis from 1996-1998. The sample consists of 627 Non Financial firms that have data available on their foreign currency hedging activity in their 10-K annual reports. The sample does not cover firms that have foreign sales to total sales ratio equal zero. Firms with size less than $10 million, firms that do not have operations (subsidiaries and /or Foreign Sales) in any of the East Asian countries, financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67) are also excluded from the sample. Valuation measures used are Tobin's Q (Panel A) and Excess Market value (Panel B). Tobin's Q is computed as market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long term debt divided by total assets of the firm. Excess market value is defined as the market value of equity less book value of equity normalized by total sales. The significance of means difference between foreign currency hedgers and non-hedgers is computed by one-way ANOVA. Non-parametric Wilcoxon Rank-Sum test is used to test for the difference of medians of hedgers and non-hedgers. ***, **, And * denote statistical significance for difference of groups at the 1%, 5% and 10% levels respectively.

Panel A: Tobin's Q valuation measure **Panel B: Excess Market Value valuation**

	Tobin's Q				Excess Market Value			
Years	**Hedging firms**	**Non-Hedging firms**	**Mean H – Mean N-H**	**P-value**	**Hedging firms**	**Non-Hedging firms**	**Mean H – Mean N-H**	**P-value**
1996 (Pre-Crisis)	2.064 [1.490] (n=112)	1.981 [1.452] (n=97)	0.083 [0.038]	0.738 [0.935]	1.846 [1.046] (n=112)	1.591 [1.028] (n=97)	0.255 [0.017]*	0.375 [0.090]
1997 (Crisis)	2.351 [1.751] (n=125)	2.240 [1.624] (n=84)	0.111** [0.127]***	0.041 [0.008]	2.070 [1.194] (n=125)	1.960 [1.176] (n=84)	0.111** [0.018]***	0.016 [0.000]
1998 (Post-Crisis)	2.779 [1.657] (n=133)	2.280 [1.620] (n=76)	0.499** [0.024]**	0.050 [0.049]	2.614 [1.178] (n=133)	1.917 [1.114] (n=76)	0.697** [0.064]**	0.026 [0.016]
All years(1996-1998)	2.394 [1.647] (n=370)	2.186 [1.617] (n=257)	0.028** [0.030]**	0.023 [0.031]	2.122 [1.119] (n=370)	1.907 [1.081] (n=257)	0.215** [0.038]***	0.030 [0.002]

Table 7
Foreign Currency Derivative Use and Firm Value (Asian Sample)

The table presents the results of a cross sectional regression that relates the firm's valuation measures to its hedging profile. The dependent variables are; Tobin's Q (panels A1 and A2) and Excess market value (panels B1 and B2). Tobin's Q is computed as market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long term debt divided by total assets of the firm. Excess market value is defined as the market value of equity less book value of equity normalized by total sales. The independent variables are: log total assets log (TA), defined as natural log of current assets plus net property, plant and equipment plus other non current assets of the firm in millions of dollars. Foreign Sales /Total sales (FSTS), defined as the percentage of foreign sales (the sum of all sales from all geographic segments of the firm) divided by total sales. (DERVDUM) is Foreign exchange derivative dummy , which is a dummy variable that takes the value of 1 if the firm hedges its foreign currency exposure and equal zero otherwise. (DERV) is the gross notional value of derivatives, which is the future cash flow under the contract. Return on assets (ROA) is defined as the income before depreciation and other extraordinary items divided by total assets. Return on Equity (ROE) is defined as Income before depreciation and other extraordinary items divided by common Equity. EBIT margin is defined as operating income after depreciation less cost of goods sold, Selling, General & administrative expenses divided by net sales. (DIVDUM) is a dummy variable that takes the value of 1 if the firm pays a dividend and zero otherwise. LDebt/Assets (LDEBTA) ratio is defined as the percentage of long debt divided by total assets. INDDIV is a dummy variable that takes the value of 1 if the firm is active in more than one business segment and zero otherwise. T values of coefficients are in parenthesis. ***, **, And * denote statistical significance at the 1%, 5% and 10% levels respectively.

Panel A1: Tobin's Q and Foreign Currency Derivatives

Dependent variable
Tobin's Q

Independent Variables	Regression 96			Regression 97			Regression 98			Regression All years 1996-1998		
Constant	0.6521	0.4631	0.048	0.328	0.4602	0.429	1.302	0.632	0.419	3.300	0.702	0.044
	(1.008)	(0.079)	(0.561)	(0.310)	(0.527)	(0.584)	(0.165)	(0.577)	(0.494)	(0.519)	(0.664)	(0.058)
Log (TA)	-0.1321	-0.204	-0.0969	-0.254	-0.164	-0.151	-0.057	-0.291	-0.239		-0.237	-0.192
	(-1.896)**	(-2.91)***	(-1.198)	(-3.27)***	(-1.73)*	(-1.608)*	(-1.658)*	(-2.533)**	(-2.261)**	-0.206 (-2.883)***	(-2.975)***	(-2.54)**
FSTS	0.004	-0.005	-0.007	-0.004	-0.011	-0.0124	-0.005	-0.005	-0.009	-0.003	-0.013	-0.140
	(0.727)	(-1.379)	(-1.695)*	(-1.997)**	(-1.935)**	(-2.16)**	(-0.034)	(-0.721)	(-1.428)	(-2.628)**	(-3.07)***	(-3.2)***
DERVDUM	0.504	0.204	0.294	0.331	0.423	0.466	0.504	0.364	0.470	0.317	0.371	0.466
	(1.834)*	(1.963)**	(2.329)**	(2.106)**	(1.978)**	(1.783)*	(2.045)**	(2.189)**	(1.671)*	(2.761)**	(1.978)*	(2.301)**
ROA	0.0698			0.032			0.1455			0.093		
	(3.38)***			(3.570)***			(3.129)***			(3.389)***		
ROE		0.029			0.016			0.032			0.008	
		(3.675)***			(3.073)***			(3.281)***			(2.601)**	
EBIT			0.014			0.029			0.082			0.072
			(2.578)***			(3.41)***			(3.249)***			(3.004)***
DIVDUM	-0.520	-1.330	-1.198	-0.436	-1.129	-1.728	-1.335	-1.567	-1.474	-0.620	-0.657	0.624
	(-2.308)**	(-3.621)***	(-4.30)***	(-2.019)**	(-3.28)***	(3.45)***	(-3.044)**	(-3.23)***	(-3.431)***	(-3.638)***	(-3.42)***	(-3.39)***
LDEBTA	0.0001	0.022	0.023	0.0002	0.015	0.0166	0.004	0.032	0.020	0.0005	0.001	0.006
	(2.165)**	(3.780)***	(2.914)***	(0.406)	(1.928)**	(1.377)	(0.264)	(0.352)***	(2.608)***	(2.289)**	(2.168)**	(2.49)**
INDDIV	-0.008	-0.018	-0.102	-0.131	-0.013	-0.122	-0.180	-0.145	-0.120	-0.161	-0.154	-0.132
	(-2.110)**	(-2.100)**	(-1.989)**	(1.998)**	(-1.997)**	(-1.989)**	(-2.040)**	(-1.981)**	(-1.997)**	(-2.098)**	(-2.100)**	(1.910)*
F value	6.459	19.20	8.23	9.755	5.35	5.77	13.144	12.91	18.23	24.02	10.97	16.93
P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.289	0.470	0.283	0.296	0.203	0.214	0.386	0.358	0.438	0.293	0.145	0.207
Adj R^2	0.244	0.451	0.243	0.266	0.165	0.177	0.357	0.326	0.414	0.280	0.132	0.125

Table 7 (continued)

Panel A2: Tobin's Q and Foreign Currency Derivatives

Dependent variable Tobin's Q												
Independent Variables		**Regression 96**			**Regression 97**			**Regression 98**			**Regression All years 1996-1998**	
Constant	0.259 (0.544)	0.239 (0.679)	0.213 (0.461)	0.062 (0.902)	0.045 (0.572)	0.021 (0.485)	0.587 (0.165)	0.452 (0.377)	0.459 (0..394)	0.328 (0.258)	0.302 (0.264)	0.242 (0.258)
Log (TA)	-0.122 (-1.996)*	-0.135 (2.111)***	-0.241 (-2.108)**	-0051 (-2.031)**	-0.015 (-1.989)*	-0.023 (-1.798)*	-0.035 (-1.858)*	-0.029 (-2.500)**	-0.037 (-2.061)**	-0.106 (-2.183)**	-0.032 (-2.015)**	-0.102 (-2.22)**
FSTS	-0.007 (-1..976)*	-0.005 (-1.887)	-0.003 (-1..295)	-0.005 (-1..979)*	-0.004 (-2..243)**	-0.010 (-2..26)**	-0.004 (-0.024)	-0.013 (-0.271)	-0.010 (-1.228)	-0.001 (-1.980)*	-0.010 (-1.207)	-0.040 (-1.12)
DERV	0.511 (1.463)	0.211 (1.363)	0.322 (1.329)	0.073 (0.311)	0.004 (1.527)	0.006 (1.283)	0.025 (1.045)	0.035 (1.109)	0.047 (1.251)	0.205 (0.761)	0.216 (0.978)	0.221 (0.781)
ROA	0.147 (3.996)***			0.033 (3.476)***			0.012 (3.229)***			0.023 (2.001)**		
ROE		0.005 (0.970)			0.006 (2.073)**			0.031 (2.343)**			0.012 (2.002)**	
EBIT			0.004 (0.745			0.005 (1.451)			0.022 (2.249)**			0.045 (2.123)**
DIVDUM	-0.281 (2.405)***	-0.333 (-2.100)**	-0.198 (-2.330)**	-0.527 (-2.970)***	-0.482 (-2.451)**	-0.154 (2.330)**	-1.033 (-2.044)**	-1.067 (-3.13)***	-1.034 (-2.001)**	-1.025 (-2.038)**	-0.327 (-2.12)**	-0.012 (-2.05)**
LDEBTA	0.0004 (1.345)	0.0002 (0.780)	0.0002 (0.914)	0.027 (0.406)	0.003 (0.800)	0.006 (1.377)	0.001 (0.326)	0.001 (0.152)	0.002 (0.214)	0.000 (0.289)	0.001 (0.168)	0.001 (0.251)
INDDIV	-0.012 (-2.010)**	-0.010 (-2.900)***	-0.100 (-2.589)***	-0.002 (-1.456)	-0.003 (-1.558)	-0.100 (-1.289)	-0.100 (-1.040)	-0.105 (-1.998)*	-0.030 (-1.725)*	-0.006 (-1.098)	-0.004 (-1.900)*	-0.001 (1.980)*
F value	15.20	13.94	7.23	5.677	9.755	5.89	4.244	10.712	10.812	17.021	18.571	18.542
P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.402	0.485	0.283	0.187	0.296	0.200	0.178	0.230	0.221	0.253	0.280	0.208
Adj R^2	0.376	0.450	0.243	0.154	0.266	0.192	0.165	0.200	0.215	0.225	0.262	0.198

Table 7 (continued)

Panel B1: Excess Market value and Foreign Currency Derivatives

Dependent variable Excess MKT value												
Independent Variables	**Regression 96**			**Regression 97**			**Regression 98**			**Regression All years 1996-1998**		
Constant	1.271	1.487	1.328	0.691	0.479	0.558	0.139	0.142	0.144	0.708	0.454	0.887
	(0.527)	(0.812)	(0.522)	(1.177)	(0.382)	(0.422)	(1.080)	(0.480)	(0.231)	(0.094)	(0.883)	(0.451)
Log (TA)	-2.049	-0.235	-0.035	-0.081	-0.187	-0.201	-0.122	-0.250	-0.144	-0.104	-0.266	-0.199
	(-2.355)**	(-2.581)**	(-2.451)**	(-1.228)	(-2.603)**	(-2.180)**	(-2.533)**	(-1.695)*	(-2.012)**	(-2.563)**	(-2.7)*	(-2.65)**
FSTS	-0.001	-0.005	0.002	-0.002	-0.094	0.003	0.0024	-0.002	-0.002	-0.0006	0.01	-0.005
	(-0.501)	(-1.086)	(0.897)	(-0.611)	(-2.291)**	(1.025)	(0.2517)	(-0.237)	(-0.221)	(-0.283)	(2.1)**	(-0.982)
DERVDUM	0.091	0.373	0.132	0.295	0.624	0.545	0.748	0.677	0.524	0.711	0.577	0.325
	(1.977)*	(2.423)**	(2.011)**	(1.869)*	(1.898)*	(2.123)**	(1.923)**	(1.725)*	(2.011)**	(1.988)**	(2.26)**	(2.111)**
ROA	0.078			0.0305			0.103			0.041		
	(3.342)***			(2.977)***			(2.873)***			(5.724)***		
ROE		0.061			0.029			0.101			0.023	
		(1.554)			(1.921)*			(2.110)**			(1.456)	
EBIT			0.012			0.018			0.111			0.032
			(1.979)**			(1.65)*			(6.871)***			(4.6)***
DIVDUM	-0.326	-1.710	-0.211	-0.5080	-1.880	-1.90	-0.654	-0.012	-0.212	-0.3172	-0.911	-0.93
	(-2.096)**	(-5.35)***	(-2.88)**	(-2.636)**	(-2.23)***	(-4.42)***	(-2.384)**	(-2.33)***	(-4.81)***	(-4.09)***	(-1.99)*	(-1.76)*
LDEBTA	0.017	0.012	0.015	0.0095	0.001	0.018	0.003	-0.004	-0.008	0.005	0.002	0.002
	(1.977)*	(1.204)	(1.897)*	(1.879)*	(0.978)	(1.724)*	(2.280)**	(-0.556)	(-0.756)	(2.461)**	(2.33)**	(2.51)**
INDDIV	-0.023	-0.012	-0.003	-0.115	-0.101	-0.112	-0.016	-0.015	-0.017	-0.090	-0.098	-0.007
	(-1.813)*	(1.823)**	(1.900)**	(-1.452)**	(-1.611)*	(-1.523)*	(-0.288)	(-2.020)**	(-2.011)**	(-2.221)**	(-1.99)*	(-1.91)*
F value	4.445	3.455	7.54	4.115	3.730	3.930	12.27	11.05	14.05	17.57	10.190	11.390
P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.175	0.222	0.256	0.167	0.145	0.151	0.376	0.301	0.364	0.196	0.111	0.144
Adj R^2	0.136	0.198	0.126	0.127	0.123	0.113	0.346	0.298	0.338	0.185	0.109	0.131

Table 7 (continued)
Panel B2: Excess Market value and Foreign Currency Derivatives

Dependent variable Excess MKT value												
Independent Variables	**Regression 96**			**Regression 97**			**Regression 98**			**Regression All years 1996-1998**		
Constant	0.271 (0.507)	0.462 (0.712)	0.311 (0.4350	0.144 (0.613)	0.234 (0.182)	0.165 (0.345)	0.135 (1.082)	0.103 (0.280)	0.202 (0.160)	0.028 (0.024)	0.054 (0.082)	0.042 (0.123)
Log (TA)	-0.295 (-3.231)***	-0.205 (-2.631)**	-0.234 (-2.113)**	-0.065 (-1.992)*	-0.081 (-2.001)**	-0.054 (1.998)*	-0.433 (-2.123)**	-0.450 (-1.992)*	-0.267 (1.870)*	-0.214 (-2.300)**	-0.266 (-1.93)*	-0.120 (1.999)*
FSTS	-0.005 (-1.612)*	-0.005 (-1.086)	-0.004 (-1.076)	-0.001 (-0.511)	-0.001 (-1.291)	-0.001 (-1.340)	0.002 (0.124)	-0.010 (-0.047)	0.002 (0.213)	0.004 (0.883)	0.003 (0.987)	0.023 (0.945)
DERV	0.004 (1.927)*	0.002 (1.423)	0.002 (1.354)	0.123 (1.069)	0.121 (1.095)	0.231 (1.450)	0.226 (1.321)	0.230 (1.612)	0.345 (1.432)	0.217 (1.234)	0.207 (1.360)	0.201 (1.326)
ROA	0.125 (3.221)***			0.076 (3.657)***			0.100 (2.003)**			0.021 (2.274)**		
EBIT		0.012 (1.979)**			0.023 (2.011)**			0.132 (2.344)**			0.031 (2.11)**	
ROE			-0.010 (-1.279)			0.026 (2.100)**			0.210 (2.001)**			0.123 (2.101)**
DIVDUM	-0.315 (-2.025)**	-0.760 (-3.25)***	-0.511 (3.231)***	-0429 (-2.232)**	-1.002 (-2.110)**	-0.320 (-1.985)*	-0.234 (-2.025)**	-0.321 (-2.241)**	-0.221 (-2.102)**	-0.132 (-2.110)**	-0.13 (-2.16)*	-0.112 (-2.100)**
LDEBTA	0.070 (0.577)	0.052 (0.204)	0.100 (0.123)	0.010 (2.022)**	0.010 (2.024)**	0.001 (1.450)	0.002 (1.280)	-0.002 (-0.956)	0.003 (0.765)	0.012 (1.891)*	0.102 (2.01)**	0.112 (1.780)
INDDIV	-0.012 (-1.830)*	-0.010 (1.823)*	-0.002 (2.010)**	-0.001 (-2.052)**	-0.100 (-2.123)**	0.019 (1.456)	-0.010 (-1.188)	-0.010 (-1.011)	0.002 (0.987)	-0.010 (-1.921)*	-0.009 (-1.91)*	-0.005 (-1.98)*
F value	10.12	12.45	11.25	14.38	15.61	14.22	12.14	13.28	14.52	15.42	16.52	13.14
P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.156	0.145	0.115	0.376	0.381	0.325	0.386	0.376	0.366	0.532	0.521	0.385
Adj R^2	0.123	0.122	0.105	0.350	0.365	0.314	0.357	0.346	0.361	0.519		

Table 8

Firm Value Foreign Currency Derivatives and Geographic Diversification (Asian currency crisis sample)

This table reports the results of OLS regression that relates the firm's financial and non-financial hedging strategies to its value during the Asian financial crisis. Financial hedging is proxied by the foreign exchange derivative dummy (DERVDUM), which is a dummy variable that takes the value of 1 if the firm reports any type of currency hedging instruments in its 10K annual Reports. Non-financial hedging is proxied by two variables; GEO_1 represents the ratio of percentage of Asian sales relative to the total sales ratio of the firm. GEO_2 represents the total number of countries that the firm operates in the Asian region around the time of the crisis. The sample consists of 627 firm year observations obtained from the S&P 500 non-financial firms. The dependent variable in the regression is the firm's Tobin's Q ratio (panel A) and Excess Market Value (panel B). The rest of the control variables are those discussed before. T values of coefficients are in parenthesis. ***, **, and * denote statistical significance at the 1%, 5% and 10% respectively.

Panel A: Tobin's Q, foreign currency derivatives and geographic diversity

Dependent variable: Tobin's Q

Independent variables	1996			1997			1998			All Years 1996-1998	
Constant	0.652	0.314	0.123	0.062	0.490	0.321	0.771	0.672	0.676	0.330	0.284	0.342
	(0.315)	(0.410)	(0.546)	(0.495)	(0.623)	(0.422)	(0.391)	(0.241)	(0.400)	(0.519)	(0.566)	(0.611)
DERVDUM	0.504	0.034	0.031	0.145	0.162	0.160	0.241	0.451	0.504	0.317	0.405	0.313
	(1.935)*	(1.883)*	(1.891)*	(1.897)*	(1.897)*	(1.988)*	(2.117)**	(1.989)*	(2.045)**	(1.978)*	(2.092)**	(2.012)**
GEO_1	0.004			-0.004			-0.002			-0.004		
	(0.727)			(-1.979)**			(-0.562)			(-1.772)*		
DERVDUM*GEO_1	0.254			-0.075			0.126			0.157		
	(1.141)			(-1.043)			(0.352)			(1.542)		
GEO_2		0.066	0.067		0.017	0.017		0.009	0.010		0.012	0.010
		(1.964)*	(1.694)*		(1.023)	(1.022)		(0.210)	(1.854)*		(1.983)*	(1.885)*
DERVDUM*GEO_2			0.050			0.090			0.258			0.261
			(1.755)*			(0.745)			(1.855)*			(1.875)*
Log (TA)	-0.295	-0.122	-0.251	-0.065	-0.054	-0.057	-0.152	-0.135	-0.133	-0.142	-0.207	-0.165
	(-3.231)***	(1.765)*	(2.113)**	(-1.999)**	(-1.987)*	(1.982)*	(-2.110)**	(-1.999)**	(-2.0122)**	(-2.115)**	(-2.885)**	(-2.532)**
ROA	0.069		0.145	0.033		0.033	0.144		0.104	0.040		0.038
	(3.383)***		(2.900)***	(2.030)**		(2.452)**	(2.004)**		(2.850)**	(2.260)**		(2.890)***
EBIT		0.003			0.007			0.028			0.072	
		(2.745)**			(2.130)**			(2.071)**			(2.004)**	
DIVDUM	-0.520	-0.281	-0.215	-0.572	-0.436	-0.456	-1.340	-1.320	-2.090	-0.321	-0.622	-0.193
	(-2.308)**	(-2.405)**	(2.312)**	(2.971)***	(-2.410)**	(-2.130)**	(-2.415)**	(3.050)***	(-2.343)**	(-3.100)***	(-3.628)***	(-2.319)**
LDEBTA	0.004	0.0001	0.005	0.0008	0.0003	0.0002	-0.030	-0.002	0.005	0.0005	0.0005	0.0004
	(0.749)	(1.345)	(1.257)	(0.406)	(0.800)	(0.480)	(-0.256)	(-0.332)	(0.383)	(1.559)	(2.089)**	(1.938)*
INDIV	-0.001	-0.002	-0.011	-0.001	-0.002	-0.002	-0.011	-0.001	-0.011	-0.012	-0.002	-0.002
	(-2.111)**	(-1.987)*	(-1.971)*	(-1.958)*	(-1.982)*	(-1.997)*	(-1.925)*	(-1.900)*	(-1.852)*	(-1.895)*	(-1.910)*	(-1.855)*
F value	6.429	9.451	12.25	9.677	7.902	9.755	12.09	12.97	14.52	16.37	22.02	22.9
P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.279	0.485	0.554	0.296	0.350	0.300	0.537	0.534	0.536	0.187	0.293	0.314
Adj R^2	0.254	0.450	0.533	0.266	0.330	0.295	0.517	0.513	0.519	0.176	0.280	0.306

Table 8(continued)

Panel B: Excess Market Value, foreign currency derivatives and geographic diversity

Dependent variable:Excess MKT value												
Independent variables		**1996**			**1997**			**1998**			**All Years 1996-1998**	
Constant	0.271 (0.255)	0.215 (0.310)	0.213 (0.346)	0.465 (1.458)	0.618 (1.178)	0.523 (0.212)	0.326 (0.924)	0.312 (0.852)	0.258 (0.512)	0.194 (0.708)	0.187 (0.725)	0.192 (0.712)
DERVDUM	0.309 (1.775)*	0.304 (1.993)**	0.314 (1.910)*	0.718 (2.476)****	0.295 (1.861)*	0.650 (2.436)**	0.747 (1.923)*	0.520 (1.782)*	0.461 (1.852)*	0.171 (1.789)*	0.168 (1.825)*	0.170 (1.952)*
GEO_1	-0.0054 (-1.210)			-0.008 (-1.697)*			0.002 (0.258)			0.006 (0.278)		
DERVDUM*GEO_1	-0.153 (-1.308)			-0.356 (-1.769)*			0.375 (0.825)			0.083 (0.764)		
GEO_2		0.070 (0.906	0.071 (0.694)		0.017 (0.257)	0.042 (1.412)		0.014 (0.133)	0.009 (0.211)		0.003 (1.602)*	0.002 (1.526)*
DERVDUM*GEO_2			0.210 (1.727)*			0.351 (1.840)			0.236 (1.833)*			0.100 (1.984)**
Log (TA)	-0.122 (-2.631)***	-0.132 (1.625)*	-0.152 (2.103)**	-0.081 (-1.229)	-0.066 (-1.991)*	-0.067 (1.882)*	-0.051 (0.985)	-0.045 (-1.928)*	-0.0542 (-2.100)**	-0.110 (-2.635)**	-0.115 (2.526)**	-0.113 (-2.320)**
ROA	0.078 (3.283)***		0.045 (2.100)**	0.0736 (3.230)***		0.076 (2.622)**	0.104 (2.861)***		0.120 (2.410)**	0.041 (2.526)**		0.051 (2.214)**
EBIT		0.002 (1.745)*			0.008 (1.478)			0.0723 (3.451)***			0.0321 (2.152)**	
DIVDUM	-0.326 (-2.080)**	-0.381 (-2.050)**	-0.325 (2.112)**	-0.538 (2.284)**	-0.572 (-2.974)***	-0.429 (-2.230)**	-0.281 (-3.061)***	-0.205 (-3.382)***	0.311 (3.215)***	-0.313 (-2.095)**	-0.314 (-2.013)**	-0.321 (-2.100)**
LDEBTA	0.018 (1.577)*	0.015 (1.556)*	0.015 (1.557)*	0.009 (1.719)*	0.000 (0.406)	0.010 (2.022)**	0.004 (0.734)	0.003 (0.287)	0.002 (0.338)	0.006 (1.636)*	0.003 (1.687)*	0.005 (1.521)
INDIV	-0.003 (-1.981)**	-0.003 (-1.987)*	-0.001 (-1.821)*	-0.013 (-1.768)*	-0.001 (-1.873)*	-0.012 (-1.546)	-0.013 (-0.952)	-0.010 (-1.235)	-0.001 (-1.325)	-0.001 (-1.875)*	-0.001 (-1.785)*	-0.002 (-1.892)*
F value	4.465	4.981	5.02	5.651	5.550	5.040	4.050	5.027	5.170	15.430	16.320	16.361
P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.175	0.178	0.137	0.259	0.187	0.195	0.163	0.172	0.175	0.182	0.180	0.187
Adj R^2	0.136	0.135	0.123	0.213	0.154	0.156	0.136	0.152	0.136	0.171	0.169	0.176

Table 9

Number and Percentages of US firms using Foreign Exchange Currency Derivatives and the Type of Instrument Used: Brazilian Currency Crisis sample

The table presents the number and percentages of foreign Exchange Derivative use for a sample of 612 US. Non-Financial firms around the Brazilian Real Devaluation crisis (1999-2000) Panel (A). The sample excludes firms with: Foreign Sales/Total Sales Ratio equal to zero. Firms with size less than $10 million. Firms that do not have operations (subsidiaries and /or Foreign Sales) in any of the Latin American region. Financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67) are also excluded from the sample. "Hedging" firms are defined as firms that have data on any type of Foreign Exchange Currency Derivatives (Forwards, Options, swaps) available in the firm's 10-K Annual Reports from 1999-2000. "Non-Hedging" firms are defined as firms that do not report any type of currency hedging activity in their annual reports. Firms that report other types of hedging activity (Commodity and/or Interest Rate hedging) are also included in the "Non-Hedging" sample. Foreign Currency Hedging data is obtained from the Firms' 10-K annual Reports via the Electronic Data Gathering, Analysis and Retrieval database "EDGAR" and/or Annual Report Gallery. Mean Notional value of foreign currency derivatives is the average contract amount of any foreign currency forward, futures, swap or option made by the firm during the year, it represents the future cash flows under the contract. It is expressed in millions of dollars Foreign operations data is obtained from the Directory of American Firms Operating Abroad. All other variables are obtained from the COMPUSTAT database. Panel (B) shows the total number and percentages of the type of foreign currency derivative instrument used by the hedging firms in the sample

Panel A

Foreign currency hedging profile for the S&P500 Firms

Year	#Hedging Firms	%	# Non-Hedging firms	%	Total	%	Mean Notional Value(millions)	%
1998	124	60.78	80	39.2	204	100	4165.6	29.22
1999	127	62.56	76	37.4	203	100	5350.2	37.53
2000	118	57.6	87	42.4	205	100	4738.1	33.24
All Years	369	60.29	243	39.7	612	100	14253.9	100

Table 9 (continued)

Panel B

Type of Foreign Currency Derivative Instruments used by Hedging firms

Year	Forward Contracts	%	Options contracts	%	Swap contracts	%	Total Users	%
1998	86	69.35	34	27.4	4	3.23	124	100
1999	93	73.2	31	24.41	3	2.36	127	100
2000	86	72.8	28	23.75	4	3.39	118	100
All Years	265	71.81	93	25.20	11	2.98	369	100

Table 10
Summary Statistics for US. Foreign Currency Hedging and Non-Hedging firms (Brazilian Sample)

The table presents the summary statistics of firms in the s&p 500 that "used" or "have not used" foreign currency derivatives to hedge their exposure to currency risk around the Brazilian Real devaluation 1998-2000. The sample consists of 612 Non Financial firms that have data available on their foreign currency hedging activity in their 10-K annual reports. The sample does not cover firms that have foreign sales to total sales ratio equal zero. Firms with size less than $10 million. Firms that do not have operations (subsidiaries and /or Foreign Sales) in any of the Latin American countries. Financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67) are also excluded from the sample. Excess market value is defined as the market value of equity less book value of equity normalized by total sales. Tobin's Q is computed as market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long term debt divided by total assets of the firm. Notional value of foreign currency derivatives is the contract amount of any foreign currency forward, futures, swap or option made by the firm, it represents the future cash flows under the contract. Foreign exchange derivative dummy is a dummy variable that takes the value of 1 if the firm hedges its foreign currency exposure and equal zero otherwise. Return on assets (ROA %) is defined as the income before depreciation and other extraordinary items divided by total assets. Return on Equity (ROE%) is defined as Income before depreciation and other extraordinary items divided by common Equity. EBIT margin is defined as operating income after depreciation less cost of goods sold, Selling, General & administrative expenses divided by net sales. LDebt/Assets ratio is defined as the percentage of long- term debt divided by total assets. Ldebt is the firm's long term debt. Dividend pay out is defined as the percentage of the total amount of dividends declared on the common stock divided by income before extraordinary items and discounted operations less preferred dividend requirements. Dividend dummy is a dummy variable that takes the value of 1 if the firm has paid dividend at end of the year .and zero otherwise. Foreign Sales /Total sales is the percentage of the sum of all geographic segments (all foreign segments) of the firm divided by net sales. Total Assets is defined as current assets plus net property, plant and equipment plus other non current assets of the firm in millions of dollars. Diversification dummy is a dummy variable that takes the value of 1 if the firm is active in more than one business segment and zero otherwise

Variables	No. Obs.	Mean	Median	Std. Dev.
Excess Market Values	609	2.64	1.24	3.6368
Tobin's Q	610	2.71	1.61	3.1246
Notional Values of Foreign Currency Derivatives (millions $)	612	4751.8	47.1	31435
Returns on Assets	612	7.446	6.74	7.4245
Return on Equity	612	19.90	17.15	52.537
EBIT	612	14.49	13.08	11.001
Ldebt/Toal Assets ratio	609	24.80	22.28	18.493
Dividend Dummy	602	0.753	1	0.1322
Divided Pay out	602	32.89	25.04	65.60
Foreign Sales / Total Sales%	612	33.34	32.65	20.53
Total Assets (millions $)	612	14741	5622	36198
Industrial Diversification Dummy	598	0.59	1	0.37

Table 11
Pre-Crisis, Crisis and Post -Crisis Univariate Analysis of Hedging and Non-Hedging Firms (Brazilian Sample)

The table presents mean [median] values of some performance and firm-specific variables for our sample of foreign exchange currency hedging and non-hedging firms before, during and after the Brazilian crisis, 1998-2000. The sample consists of 612 Non Financial firms that have data available on their foreign currency hedging activity in their 10-K annual reports. The sample does not cover firms that have foreign sales to total sales ratio equal zero. Firms with size less than $10 million. Firms that do not have operations (subsidiaries and /or Foreign Sales) in any of the Latin American countries. Financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67) are also excluded from the sample. "Hedging" firms are defined as firms that have data on any type of Foreign Exchange Currency Derivatives (Forwards, Options, swaps) available in the firm's 10-K Annual Reports from 1996-1998. "Non-Hedging" firms are defined as firms that do not report any type of currency hedging activity in their annual reports. Firms that report other types of hedging activity (Commodity and/or Interest Rate hedging) are included in the "Non-Hedging" sample. Performance and firm-specific variables are defined, as before, in the previous table. The significance of means difference between foreign currency hedgers and non-hedgers is computed by one-way ANOVA. Non-parametric Wilcoxon Rank-Sum test is used to test for the difference of medians of hedgers and non-hedgers. ***, **, And * denote statistical significance for difference of groups at the 1%, 5% and 10% levels respectively.

	1998 (Pre-Crisis)				1999 (Crisis)				2000 (Post-Crisis)			
	Hedging (1)	Non-Hedging (2)	(1-2)	p-Values	Hedging (1)	Non-Hedging (2)	(1-2)	p-Values	Hedging (1)	Non-Hedging (2)	(1-2)	p-Values
Size (Total Assets)	12559 [5088.44] (n=1124)	8415.8 [3632.12] (n=80)	4143.2*** [1456.32]***	0.000 [0.000]	13141.2 [5360.9] (n=127)	9595.7 [4382.7] (n=76)	3545.5*** [978.2]***	0.000 [0.000]	13984.07 [5715.50] (n=118)	10792.1 [5048.80] (n=87)	3191.97*** [666.7]***	0.000 [0.000]
(Foreign Sales)/(Total Sales)	39.45 [38.42] (n=124)	24.7 [22.5] (n=80)	14.75*** [15.87]***	0.000 [0.000]	38.49 [36.95] (n=127)	25.98 [20.19] (n=76)	12.51*** [16.76]***	0.000 [0.000]	38.81 [37.67] (n=118)	28.81 [25.81] (n=87)	10.00*** [11.86]***	0.000 [0.000]
LDebt/Assets	19.4 [17.69] (n=124)	20.00 [19.68] (n=80)	-0.60 [-1..99]	0.668 [0.196]	20.67 [17.94] (n=127)	22.50 [18.91] (n=76)	-1.83 [-0.97]	0.233 [0.443]	24.101 [18.63] (n=118)	24.778 [24.06] (n=87)	-0.677 [-5.43]	0.827 [0.689]
EBIT	12.31 [12.60] (n=124)	16 [14.23] (n=80)	-3.69** [-1.63]**	0.036 [0.021]	13.84 [12.80] (n=127)	16.09 [14.80] (n=76)	-2.25** [-2.00]**	0.012 [0.015]	14.85 [12.81] (n=118)	14.13 [12.72] (n=87)	0.720 [0.09]*	0.510 [0.087]
ROA	7.38 [6.71] (n=124)	7.52 [7.00] (n=80)	-0.14*** [-0.29]***	0.010 [0.002]	6.482 [6.66] (n=127)	8.185 [7.41] (n=76)	-1.70*** [-0.75]***	0.000 [0.000]	6.21 [6.527] (n=118)	7.94 [6.588] (n=87)	-1.73** [-0.06]***	0.010 [0.004]
ROE	18.28 [17.19] (n=124)	16.29 [16.04] (n=80)	1.99 [1.15]	0.163 [0.135]	14.61 [16.72] (n=127)	17.56 [15.90] (n=76)	-2.95* [0.82]	0.096 [0.203]	19.54 [17.35] (n=118)	16.67 [16.10] (n=87)	13.93 [1.25]	0.524 [0.652]
Dividend Payout	31.30 [28.27] (n=124)	23.25 [21.81] (n=80)	14.97*** [6.46]***	0.000 [0.000]	38.20 [26.34] (n=127)	29.10 [20.28] (n=76)	9.1*** [6.06]***	0.008 [0.000]	42.80 [24.90] (n=118)	37.45 [21.85] (n=87)	5.35*** [3.05]***	0.004 [0.002]

Table 12
Pre-Crisis, Crisis and Post–Crisis Valuation Measures of Hedging and Non-Hedging Firms (Brazilian currency crisis Sample)

The table presents the pre-crisis, crisis and post-crisis univariate analysis of mean and and [median] hedging premium/discount of US. s&p 500 Non- financial firms that have hedged their currency exposure during the Brazilian crisis in 1998-2000. The sample consists of 612 Non Financial firms that have data available on their foreign currency hedging activity in their 10-K annual reports. The sample does not cover firms that have foreign sales to total sales ratio equal zero. Firms with size less than $10 million. Firms that do not have operations (subsidiaries and /or Foreign Sales) in any of the East Asian countries. Financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67) are also excluded from the sample. Valuation measures used are Tobin's Q (Panel A) and Excess Market value (Panel B). Tobin's Q is computed as market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long term debt divided by total assets of the firm. Excess market value is defined as the market value of equity less book value of equity normalized by total sales. The significance of means difference between foreign currency hedgers and non-hedgers is computed by one-way ANOVA. Non-parametric Wilcoxon Rank-Sum test is used to test for the difference of medians of hedgers and non-hedgers. ***, **, And * denote statistical significance for difference of groups at the 1%, 5% and 10% levels respectively.

Panel A: Tobin's Q valuation measure **Panel B: Excess Market Value valuation**

	Tobin's Q				Excess Market Value			
Years	**Hedging firms**	**Non-Hedging firms**	**Mean H – Mean N-H**	**P-value**	**Hedging firms**	**Non-Hedging firms**	**Mean H – Mean N-H**	**P-value**
1998 (Pre-Crisis)	2.42 [1.71] (n=124)	2.36 [1.65] (n=80)	0.06* [0.06]**	0.071 [0.035]	2.34 [1.195] (n=124)	2.08 [1.060] (n=80)	0.26** [0.135]***	0.035 [0.01]
1999 (Crisis)	2.930 [1.710] (n=127)	2.790 [1.675] (n=76)	0.140*** [0.039]***	0.002 [0.003]	3.32 [1.10] (n=127)	2.91 [1.07] (n=76)	0.410** [0.030]***	0.016 [0.000]
2000 (Post-Crisis)	2.69 [1.740] (n=118)	2.260 [1.385] (n=87)	0.430** [0.380]**	0.050 [0.040]	2.56 [1.00] (n=118)	2.22 [0.90] (n=87)	0.34** [0.010]**	0.026 [0.035]
All years(1998-2000)	2.68 [1.720] (n=369)	2.47 [1.568] (n=243)	0.21** [0.152]**	0.023 [0.021]	2.122 [1.119] (n=369)	1.907 [1.081] (n=243)	0.215** [0.038]***	0.030 [0.002]

Table 13

Foreign Currency Derivative Use and Firm Value (Brazilian currency crisis Sample)

The table presents the results of a cross sectional regression that relates the firm's valuation measures to its hedging profile for a sample of 612 US non financial firms that hedged their currency exposure during the Brazilian crisis 1998-2000. The dependent variables are; Tobin's Q (panel A) and Excess market value (panel B). Tobin's Q is computed as market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long term debt divided by total assets of the firm. Excess market value is defined as the market value of equity less book value of equity normalized by total sales. The independent variables are: log total assets log (TA), defined as natural log of current assets plus net property, plant and equipment plus other non current assets of the firm in millions of dollars. Foreign Sales /Total sales (FSTS), defined as the percentage of foreign sales(the sum of all foreign sales form all of the firms' geographic segments divided by Total sales. (DERVDUM) is Foreign exchange derivative dummy , which is a dummy variable that takes the value of 1 if the firm hedges its foreign currency exposure and equal zero otherwise. Return on assets (ROA) is defined as the income before depreciation and other extraordinary items divided by total assets. Return on Equity (ROE) is defined as Income before depreciation and other extraordinary items divided by common Equity. EBIT margin is defined as operating income after depreciation less cost of goods sold, Selling, General & administrative expenses divided by net sales. (DIVDUM) is a dummy variable that takes the value of 1 if the firm pays a dividend and zero otherwise. LDebt/Assets (LDEBTA) ratio is defined as the percentage of long-term debt divided by total assets. INDDIV is a dummy variable that takes the value of 1 if the firm is active in more than one business segment and zero otherwise. T values of coefficients are in parenthesis. ***, **, And * denote statistical significance at the 1%, 5% and 10% levels respectively.

Panel A: Tobin's Q and Foreign Currency Derivatives.

Dependent variable Tobin's Q												
Independent Variables	**Regression 98**			**Regression 99**			**Regression 00**			**Regression All years**		
Constant	0.347 (1.660)	0.311 (1.451)	0.155 (0.123)	0.296 (0.334)	0.201 (0.441)	0.199 (0.398)	0.191 (1.292)	0.210 (1.321)	0.133 (0.988)	0.041 (0.302)	0.5719 (1.006)	0.205 (0117)
Log (TA)	-0.354 (-1.873)**	-0.2031 (-1.888)**	-0.315 (-1.980)*	0.143 (0.599)	0.123 (0.610)	-0.325 (-1.200)*	0.067 (0.963)	0.055 (0.789)	0.065 (1.201)	-0.032 (-1.791)*	-0.116 (-1..53)	0.078 (0.787)
FSTS	-0.054 (-0.370)	-0.002 (-0.298)	0.005 (0.312)	0.074 (0.804)	0.050 (0.685)	-0.002 (-1.23)*	0.001 (0.005)	0.002 (0.024)	0.011 (0.112)	0.082 (1.889)*	-0.0147 (-1.966)**	-0.007 (-1.09)
DERVDUM	0.154 (2.503)**	0.178 (2.468)**	0.168 (2.82)**	0.147 (2.367)**	0.137 (2.425)**	0.211 (2.651)**	0.087 (1.992)*	0.099 (2.10)**	0.098 (2.22)**	0.088 (2.323)**	0.360 (1.77)**	0.275 (1.924)**
ROA	0.543 (7.062)***			0.583 (7.306)***			0.573 (6.827)***			0.607 (7.458)***		
ROE		0.046 (2.226)**			0.120 (2.597)**			0.092 (1.462)			0.020 (4.15)***	
EBIT			0.196 (2.572)***			0.162 (2.138)**			0.185 (2.205)**			0.106 (7.741)***
DIVDUM	-0.282 (-2.682)**	-0.321 (-2.222)**	-0.412 (2.133)**	-0.436 (-2.047)**	-0.555 (-2.123)**	-0.612 (-2.233)**	-0.192 (-2.150)**	-0.211 (-2.22)**	-0.312 (-2.311)**	-0.254 (-6.818)***	-2.053 (-5.10)***	-1.672 (-4.25)***
LDEBTA	0.297 (1.651)*	0.130 (1.466)*	0.302 (1.330)	0.445 (3.166)***	0.325 (3.77)***	0.362 (2.11)**	0.021 (0.295)	0.031 (0.299)	0.005 (1.002)	0.028 (0.765)	0.037 (3.72)***	0.032 (3.361)***
INDDIV	-0.018 (-2.010)**	-0.010 (-1.988)*	-0.122 (-1.522)	-0.011 (-2.102)**	-0.001 (-2.01)**	0.012 (-2.10)*	-0.120 (-2.010)**	-0.101 (-2.11)**	-0.001 (-2.01)*	-0.101 (-2.108)**	-0.120 (-1.988)*	-0.111 (-1.871)*
F value	22.02	18.99	16.85	10.93	10.00	12.80	19.42	18.57	16.85	20.80	10.85	15.75
P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.528	0.411	0.328	0.416	0.399	0.421	0.543	0.466	0.321	0.471	0.289	0.368
Adj R^2	0.504	0.398	0.318	0.378	0.387	0.402	0.515	0.432	0.299	0.461	0.269	0.345

Table 13 (continued)

Panel B: Excess Market value and Foreign Currency Derivatives

Dependent variable: Excess Market value

Dependent variables	Regression 98			Regression 99			Regression 00			Regression All years 1998-2000	
Constant	0.627	0.612	0.512	0.231	0.211	0.322	0.306	0.254	0.231	0.187	0.180	0.179
	(0.507)	(0.515)	(0.612)	(0.874)	(0.535)	(0.745)	(1.170)	(1.009)	(1.020)	(1.096)	(0.258)	(0.504)
Log (TA)	-2.775	-2.100	-2.181	-0.129	-0.122	-0.132	-0.125	-0.135	-0.133	-0.010	-0.102	0.197
	(-2.323)**	(-2.213)**	(-2.233)*	(-1.689)**	(-1.697)*	(-2.011)**	(-1.533)*	(-2.005)**	(-1.60)**	(-2.216)**	(-2.100)**	(1.46)
FSTS	0.001	0.002	-0.021	-0.164	-0.153	-0.115	0.011	0.001	0.130	0.082	-0.002	-0.005
	(0.121)	(0.120)	(-0.118)	(-1.825)*	(-1.684)*	(-1.807)*	(0.167)	(0.258)	(1.624)*	(1.983)**	(-0.358)	(-0.599)
DERVDUM	0.140	0.137	0.124	0.116	0.112	0.124	0.092	0.072	0.102	0.087	0.065	0.0800
	(1.813)*	(1.997)*	(1.987)*	(1.809)*	(1.952)*	(1.987)*	(1.981)*	(1.752)*	(2.103)**	(2.093)**	(1.985)*	(2.01)***
ROA	0.249			0.436			0.120			0.345		
	(2.671)***			(3.563)***			(2.223)**			(3.624)***		
ROE		0.145			0.251			0.105			0.053	
		(1.988)*			(1.521)			(1.952)*			(2.520)**	
EBIT			0.321			0.451			0.222			0.028
			(3.328)***			(3.22)***			(2.054)**			(2.729)***
DIVDUM	-0.317	-0.312	-0.328	-0.250	-0.226	-0.340	-0.654	-0.632	-0.714	-0.205	-0.205	-0.457
	(-3.484)***	(-2.987)***	(-3.981)***	(-2.659)**	(-2.130)**	(-3.451)***	(-4.484)**	(-3.514)***	(-3.468)***	(-3.20)***	(2.897)***	(-3.71)***
LDEBTA	0.041	0.001	0.002	0.031	0.021	0.012	0.140	0.132	0.241	0.002	0.002	0.0518
	(0.602)	(0.524)	(0.781)	(0.305)	(0.301)	(0.482)	(1.880)*	(1564)	(2.057)**	(0.966)	(0.812)	(0.981)
INDIV	-0.001	-0.001	-0.010)	-0.005	-0.002	-0.010	-0.006	-0.002	-0.001	-0.010	-0.0002	-0.001
	(-1.083)	(-1.235)	(-1.23)*	(-1.053)	(-1.023)	(-1.030)	(-0.689)	(-1.412)	(-1.750)*	(-1.908)*	(-1..568)	(-1.912)*
F value	11.092	11.000	10.002	9.087	8.052	8.087	8.986	8.656	10.860	18.340	18.025	20.850
P valuie	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.355	0.342	0.255	0.456	0.210	0.256	0.305	0.289	0.355	0.380	0.258	0.428
Adj R^2	0.323	0.320	0.152	0.404	0.198	0.203	0.271	0.217	0.301	0.366	0.210	0.407

Table 14

Firm Value Foreign Currency Derivatives and Geographic Diversification (Brazilian currency crisis sample)

This table reports the results of OLS regression that relates the firm's financial and non-financial hedging strategies to its value during the Brazilian Real devaluation. Financial hedging is proxied by the foreign exchange derivative dummy (DERVDUM), which is a dummy variable that takes the value of 1 if the firm reports any type of currency hedging instruments in its 10K annual Reports. Non-financial hedging is proxied by two variables; GEO_1 represents the ratio of percentage of Latin American sales relative to the total sales ratio of the firm. GEO_2 represents the total number of countries that the firm operates in the Latin American region around the time of the crisis. The sample consists of 612 firm year observations obtained from the S&P 500 non-financial firms. The dependent variable in the regression is the firm's Tobin's Q ratio (panel A) and Excess Market Value (panel B). The rest of the control variables are those discussed before. T values of coefficients are in parenthesis. ***, **, and * denote statistical significance at the 1%, 5% and 10% respectively.

Panel A: Tobin's Q, foreign currency derivatives and geographic diversity

Dependent variable: Tobin's Q												
Independent variables	**1998**			**1999**			**2000**			**All Years 1998-2000**		
Constant	0.150	0.156	0.149	0.137	0.129	0.123	0.310	0.316	0.256	0.101	0.108	0.115
	(0.246)	(0210)	(0.246)	(0.495)	(0.494)	(0.242)	(0.221)	(0.421)	(0.411)	(1.513)	(1.066)	(0.953)
DERVDUM	0.145	0.154	0.157	0.084	0.123	0.106	0.163	0.154	0.150	0.182	0.151	0.158
	(1.813)*	(1.823)*	(1.891)*	(1.997)**	(2.011)**	(2.008)**	(1.741)*	(1.719)*	(1.645)**	(2.100)**	(2.012)**	(2.130)**
GEO_1	-0.110			0.074			0.012			-0.082		
	(-0.180)			(0.804)			(0.313)			(-1.772)*		
DERVDUM*GEO_1	-0.128			0.363			0.142			-0.132		
	(-0.725)			(1.443)			(0.552)			(-1.062)		
GEO_2		0.053	0.051		0.073	0.071		0.067	0.056		0.092	0.072
		(0.964)	(1.694)*		(1.823)*	(1.822)*		(1.745)*	(1.654)*		(2.234)**	(2.100)**
DERVDUM*GEO_2			0.210			0.089			0.206			0.230
			(0.655)			(1.845)*			(1.905)*			(2.120)**
Log (TA)	-0.415	-0.324	-0.334	-0.182	-0.187	-0.157	-0.032	-0.040	-0.033	-0.009	-0.024	-0.105
	(-2.237)**	(-2.165)**	(-2.123)**	(-1.867)*	(-1.980)*	(1.882)*	(-1.791)*	(-1.729)*	(-1.712)**	(-2.202)**	(-1.885)*	(-2.022)**
ROA	0.354		0.248	0.381		0.352	0.290		0.204	0.349		0.315
	(2.062)**		(2.475)***	(3.215)**		(2.552)**	(2.284)**		(2.250)**	(2.620)***		(2.512)**
EBIT		0.303			0.036			0.052			0.256	
		(2.045)**			(1.480)			(1.058)			(2.094)**	
DIVDUM	-0.268	-0.294	-0.278	-0.383	-0.291	-0.262	-0.231	-0.247	-2.490	-0.217	-0.273	-0.219
	(-2.284)***	(-2.194)**	(-2.177)**	(-2.929)***	(-2.481)**	(-2.100)**	(-2.465)**	(-2.178)**	(-2.143)**	(-2.600)***	(-2.428)**	(-2.310)**
LDEBTA	0.207	0.217	0.211	0.345	0.312	0.267	0.050	0.075	0.068	0.004	0.033	0.002
	(1.652)*	(1.754)*	(1.507)	(2.166)**	(1.890)*	(1.600)	(1.220)	(1.622)*	(1.830)*	(0.096)	(0.563)	(0.042)
INDIV	-0.003	-0.004	-0.011	-0.013	-0.011	-0.023	-0.020	-0.022	-0.021	-0.010	-0.001	-0.012
	(-1.988)**	(-1.897)*	(-1.971)*	(-1.658)*	(-1.652)*	(-2.010)**	(-1.625)*	(-1.800)*	(-1.702)*	(-1.685)*	(-1.810)*	(-1.652)*
F value	12.026	10.093	12.015	15.701	15.912	17.407	12.009	15.970	17.510	22.847	24.274	24.580
P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.428	0.417	0.338	0.488	0.389	0.300	0.375	0.537	0.471	0.372	0.405	0.425
Adj R^2	0.405	0.379	0.311	0.411	0.366	0.295	0.327	0.517	0.461	0.359	0.388	0.410

Table 14(continued)

Panel B: Excess Market Value, foreign currency derivatives and geographic diversity

Dependent variable:Excess MKT value												
Independent variables	**1998**			**1999**			**2000**			**All Years 1998-2000**		
Constant	0.247 (0.660)	0.118 (0.212)	0.119 (0.236)	0.132 (0.833)	0.156 (0.708)	0.523 (0.212)	0.309 (0.965)	0.322 (0.853)	0.288 (0.582)	0.189 (0.769)	0.154 (0.234)	0.142 (0.522)
DERVDUM	0.154 (2.402)**	0.157 (1.799)*	0.151 (1.910)*	0.085 (1.981)*	0.116 (1.842)*	0.650 (2.436)**	0.011 (1.961)*	0.025 (1.872)*	0.061 (1.862)*	0.087 (2.093)**	0.056 (2.103)**	0.071 (2.052)**
GEO_1	0.001 (0.100)			-0.011 (0.167)			0.051 (0.258)			0.050 (1.357)		
DERVDUM*GEO_1	-0.005 (-0.899)			0.075 (1.208)			0.032 (0.805)			0.069 (1.768)*		
GEO_2		0.073 (1.009)	0.051 (0.686)		0.216 (2.257)**	0.042 (1.912)*		0.003 (0.047)	0.005 (0.261)		0.065 (1.678)*)	0.062 (1.688)*
DERVDUM*GEO_2			0.202 (1.514)			0.231 (1.980)**			0.033 (2.833**)			0.122 (2.099)**
Log (TA)	-0.425 (-2.227)**	-0.577 (-1.925)*	-0.030 (0.519)	-0.125 (-1.229)	-0.066 (-1.991)*	-0.067 (1.882)*	-0.032 (-0.498)	-0.125 (-1.529)	-0.0542 (-2.100)**	-0.033 (-2.079)**	-0.021 (2.825)***	-0.023 (-2.320)**
ROA	0.249 (2.670)***		0.143 (1.921)**	0.345 (3.108)***		0.076 (2.622)**	0.290 (3.281)***		0.305 (2.450)**	0.056 (2.371)**		0.053 (2.211)**
EBIT		0.290 (2.855)***			0.215 (1.972*			0.341 (3.451)***			0.0321 (2.152)**	
DIVDUM	-0.317 (-3.384)***	-0.169 (-2.044)**	-0.215 (2.282)**	-0.242 (-2.226)**	-0.243 (-2.587)**	-0.429 (-2.230)**	-0.167 (-2.290)**	-0.153 (-2.282)**	-0.176 (2.225)**	-0.222 (-2.095)**	-0.314 (-2.280)**	-0.216 (-2.110)**
LDEBTA	-0.041 (-0.602)	0.028 (1.054)	0.001 (0.700)	0.011 (0.119)	0.013 (0.116)	0.010 (2.022)**	0.003 (0.044)	0.002 (0.028)	0.010 (0.213)	0.046 (1.098)	0.046 (1.098	0.043 (1.014)
INDIV	-0.012 (-1.951)*	-0.022 (-1.990)*	-0.012 (-1.921)*	-0.001 (-1.868)*	-0.001 (-1.873)*	-0.012 (-1.546)	-0.001 (-0.322)	-0.001 (-1.035)	-0.002 (-1.025)	-0.015 (-1.699)*	-0.015 (-1.699)*	-0.014 (-1.692)*
F value	11.091	10.837	11.109	8.327	9.087	9.040	8.023	7.020	7.170	14.920	16.410	18.955
P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.356	0.416	0.338	0.274	0.456	0.295	0.308	0.277	0.305	0.468	0.472	0.487
Adj R^2	0.323	0.378	0.311	0.164	0.405	0.256	0.279	0.254	0.271	0.457	0.461	0.476

TABLE 15

Distribution of the Governance Index

The table provides sample statistics on the distribution of the corporate governance index (G) in a sample of firms from the S&P 500 during the period 1993, 1995 and 1998 respectively. The sample consists of 1422 firm year observations. The Corporate Governance index (G) is used as a proxy for the level of agency in the firm. The G index is constructed using regulations and 24 distinct corporate governance provisions, which define the power sharing relationship between shareholders and managers. Firms that score from 0-5 ($G \leq 5$) are considered to be in the Shareholder portfolio. Firms in the shareholder portfolio are considered to have a very low level of agency conflicts. Firms with a G index score of 14 and above ($G \geq 14$) are considered to be firms in the Management portfolio. Firms in the Management portfolio are considered to have a very high level of agency conflicts. Panel A shows the distribution of the index in the entire sample. In Panel B, the distribution of the G index is shown across 744 firms that have reported the use of currency hedging strategies (Forwards, options and/or currency swap contracts) during 1993, 1995 an 1998. Panel C, shows the distribution of the G index in a sample of 678 firms that did not report any type of foreign currency hedging contracts during the sample period. Panel D, shows the total number of firm across the G index deciles for the entire sample during the years 1993, 1995 and 1998. Foreign Currency Hedging data is obtained from the Firms' 10-K annual Reports via the Electronic Data Gathering, Analysis and Retrieval database "EDGAR" and/or Annual Report Gallery.

Panel A

The distribution of the G index in the S&P 500 firms

Year	MIN G	Max G	Mean G	Med G	St Dev G	Total# Firms
1993	2	16	9.592	10	2.759	459
1995	3	16	9.642	10	2.638	472
1998	3	16	9.557	10	2.648	491
All Years	2.67	16	9.597	10	2.682	1422

Panel B **The distribution of the G index in the S&P 500 Hedging firms**

Year	MIN G	Max G	Mean G	Med G	St Dev G	Total# Firms
1993	4	16	10.057	11	2.488	199
1995	4	16	10.076	11	2.480	242
1998	4	16	9.752	10	2.592	303
All Years	4	16	9.962	10.7	2.520	744

Table 15 continued

Panel C

The distribution of the G index in the S&P 500 Non- Hedging firms

Year	MIN G	Max G	Mean G	Med G	St Dev G	Total# Firms
1993	2	15	9.143	9	2.942	260
1995	3	15	9.105	9	2.747	230
1998	3	14	9.247	9	2.722	188
All years	2.67	14.67	9.165	9	2.800	678

Panel D

The total number of firms in the S&P 500 across the G index Deciles

	1993	%	1995	%	1998	%
G≤ 5	31	6.7	37	7.9	42	8.5
G=6	51	11.1	44	9.3	47	9.6
G=7	35	7.7	33	7.0	37	7.5
G=8	52	11.3	42	8.9	41	8.3
G=9	51	11.1	58	12.3	57	11.6
G=10	35	7.6	45	9.5	82	16.7
G=11	85	18.5	92	19.5	70	14.3
G=12	69	15.0	67	14.2	56	11.4
G=13	32	6.9	34	7.2	38	7.7
G ≥ 14	18	3.9	20	4.2	21	4.2
Total	459	100	472	100	491	100

TABLE 16

Use of Foreign Currency Derivatives

The table presents the number and percentages of US non-financial firms from the S&P 500 using foreign exchange currency derivatives during the years 1993, 1995 and 1998. The sample excludes Financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67). "Hedging" firms are defined as firms that have data on any type of Foreign Exchange Currency Derivatives (Forwards, Options, swaps) available in the firm's 10-K Annual Reports in 1993, 1995 and 1998. "Non-Hedging" firms are defined as firms that do not report any type of currency hedging activity in their annual reports. Firms that report other types of hedging activity (Commodity and/or Interest Rate hedging) are also included in the "Non-Hedgers" sample. Foreign Currency Hedging data is obtained from the Firms' 10-K annual Reports via the Electronic Data Gathering, Analysis and Retrieval database "EDGAR" and/or Annual Report Gallery. Notional value of foreign currency derivatives is the contract amount of any foreign currency forward, futures, swap or option (in millions) made by the firm, it represents the future cash flows under the contract. Mean Notional value (in millions) represents the average value of foreign currency contracts in each year in the hedging sample

Foreign exchange currency hedging profile for the S&P 500 Firms

Year	#Hedging Firms	%	# Non-Hedging firms	%	Total	%	Mean Notional Value of hedging	%
1993	199	43.4	260	56.6	459	100	1747	14.9
1995	242	51.3	230	48.7	472	100	2152	18.4
1998	303	61.7	188	38.3	491	100	7820	66.7
All Years	744	100	678	100	1422	100	11719	100

TABLE 17
Distribution of S&P 500 Hedging and Non-Hedging firms based on the G index Deciles

The table presents the total number and distribution of hedging and non-hedging firms across the deciles of the corporate governance index (G) respectively. The sample consists of 1422 firm year observations drawn from the S&P 500 non-financial firms during the years 1993, 1995 and 1998. The Corporate Governance index (G) is used as a proxy for the level of agency in the firm. The G index is constructed using regulations and 24 distinct corporate governance provisions, which define the power sharing relationship between shareholders and managers. Firms that score from 0-5 ($G \leq 5$) are considered to be in the Shareholder portfolio. Firms with a G index score of 14 and above ($G \geq 14$) are considered to be firms in the Management portfolio. Hedging firms (H) are firms that have data on any type of Foreign Exchange Currency Derivatives (Forwards, Options, swaps) available in the firm's 10-K Annual Reports in 1993, 1995 and 1998. Non-Hedging (Non H) firms are defined as firms that do not report any type of currency hedging activity in their annual reports. Firms that report other types of hedging activity (Commodity and/or Interest Rate hedging) are also included in the Non-Hedgers sample. Foreign Currency Hedging data is obtained from the Firms' 10-K annual Reports via the Electronic Data Gathering, Analysis and Retrieval database "EDGAR" and/or Annual Report Gallery.

G-index	1993		1995		1998	
	H	Non -H	H	Non- H	H	Non- H
G≤5	4	27	4	33	19	23
G=6	9	42	23	21	26	21
G=7	14	21	10	23	16	21
G=8	22	30	21	21	21	20
G=9	20	31	27	31	36	21
G=10	20	15	23	22	62	20
G=11	44	41	63	29	48	22
G=12	39	30	40	27	35	21
G=13	17	15	21	13	24	14
G>14	10	8	10	10	16	5
Total	199	260	242	230	303	188

Table 18

Summary Statistics for US. Foreign Currency Hedging and Non-Hedging Firms.

The table presents the summary statistics of some valuation and performance measurers of the S&P 500 Non-financial firms that "used" or "have not used" foreign currency derivatives to hedge their exposure to currency risk during the years 1993, 1995 and 1998. The sample consists of 1422 firm year observations. The sample includes firms that have data available on their foreign currency hedging activity in their 10-K annual reports during the sample period. Firms with size less than $10 million, Financial Firms in Finance, Insurance and Real Estate (2-Digit SIC codes from 60-67) are excluded from the sample. Excess market value is defined as the market value of equity less book value of equity normalized by total sales. Tobin's Q is computed as market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long term debt divided by total assets of the firm. Notional value of foreign currency derivatives is the contract amount of any foreign currency forward, futures, swap or option made by the firm, it represents the future cash flows under the contract. Foreign exchange derivative dummy is a dummy variable that takes the value of 1 if the firm hedges its foreign currency exposure and equal zero otherwise. Total Assets is defined as current assets plus net property, plant and equipment plus other non current assets of the firm in millions of dollars. Long-term debt is defined as Debt obligation due in more than one year from firm's balance sheet (in millions). Long-term debt/total assets is the ratio of the firm's long term debt to its total assets. Return on assets is defined as the income before depreciation and other extraordinary items divided by total assets. Return on Equity is defined as Income before depreciation and other extraordinary items divided by common Equity. EBIT margin is defined as operating income after depreciation less cost of goods sold, Selling, General & administrative expenses divided by net sales. Dividend pay out ratio is defined as the percentage of the total amount of dividends declared on the common stock divided by income before extraordinary items and discounted operations less preferred dividend requirements. Institutional ownership structure of the firm is defined as the percentage of the firm's aggregate number of shares held by institutions to the common shares outstanding. Except for the notional value of derivatives and the hedge dummy, all other variables are obtained from the annual data files of the COMPUSTAT database. Panel A shows the summary statistics for the entire sample. Panels B and C show the statistics for hedging and non-hedging firms in the sample respectively.

Panel A: Summary statistics for the S&P 500 firms

Variables	No. Obs.	Mean	Median	Std. Dev.
Excess Market value	1422	1.83	0.91	2.56
Tobin's Q	1422	2.07	1.49	1.91
Notional Values of Foreign Currency Derivatives (in millions $)	1422	4266	0	16126
Foreign Exchange Derivative Dummy	1422	0.52	1	0.50
Total Assets	1417	10609	3630	27278
Long term debt	1414	21953	69287	48834
Long term debt/total asset	1414	20.36	18.06	15.51
Return on Assets	1417	6.82	6.42	7.18
Return on Equity	1417	16.41	14.01	25.30
EBIT	1417	13.81	12.58	13.99
Divided Pay out ratio	1417	44.85	24.7	276.7
Institutional ownership	1417	25.67	24.92	14.17

Table 18 (continued)

Panel B: Summary statistics for the S&P 500 Hedging firms

Variables	No. Obs.	Mean	Median	Std. Dev.
Excess Market value	744	2.05	0.99	2.89
Tobin's Q	744	2.27	1.56	2.24
Notional Values of Foreign Currency Derivatives (in millions $)	744	11719	7772.3	22159
Foreign Exchange Derivative Dummy	744	1	1	0
Total Assets	744	10738	3750	28263
Long term debt	735	23077	7043	58347
Long term debt/total asset	735	21.84	18.42	15.81
Return on Assets	744	6.76	6.59	7.64
Return on Equity	744	16.61	16.41	22.89
EBIT	744	14.02	12.85	15.30
Divided Pay out ratio	698	50.80	24.30	77.14
Institutional ownership	712	25.40	20.22	14.49

Panel C: Summary statistics for the S&P 500 Non- Hedging firms

Variables	No. Obs.	Mean	Median	Std. Dev.
Excess Market value	678	1.57	0.85	2.13
Tobin's Q	678	1.87	1.45	1.42
Notional Values of Foreign Currency Derivatives (in millions $)	678	0	0	0
Foreign Exchange Derivative Dummy	678	0	0	0
Total Assets	678	10480	3295	26212
Long term debt	668	19601	5015	54323
Long term debt/total asset	668	19.75	17.16	15.21
Return on Assets	678	6.88	6.34	6.66
Return on Equity	678	16.19	15.90	27.69
EBIT	678	13.58	12.11	12.44
Divided Pay out ratio	606	29.35	25.08	120.46
Institutional ownership	619	29.01	30.68	13.86

Table 19

Summary Statistics for the S&P 500 Firms Across the G- index Deciles.

The table presents the summary statistics of some valuation and firm specific measurers of performance for the S&P 500 Non financial firms classified according to the G index deciles during the years 1993, 1995 and 1998 respectively. The sample consists of 1422 firm year observations. The sample includes firms that have data available on their foreign currency hedging activity reported in their 10-K annual reports during the sample period. The sample also includes firms that have a reported G index score in each year respectively. Firms with size less than $10 million, Financial Firms in Finance, Insurance and Real Estate (2-Digit SIC codes from 60-67) are excluded from the sample. The valuation measures include Excess market value measure and the firm's Tobin's Q ratio. The firm's notional value of foreign currency derivatives is the contract amount of any foreign currency forward, futures, swap or option made by the firm, it represents the future cash flows under the contract. The rest of the firm specific and performance measures include: Total Assets (TA), Long term debt/total assets (LDEBTA), Institutional ownership structure of the firm (INSTIT), Dividend pay out ratio (DIVP), Return on assets (ROA), Return on Equity (ROE) and the EBIT margin. Except for the notional value of derivatives and the G index score, all other variables are obtained from the annual files of the COMPUSTAT data base. All these variables are defined in details in the previous tables. The table shows the mean, [median] and (STDEV.) for each variable respectively.

G index deciles	Tobin's Q (Q)	Excess Market value (EXMKT)	Notional value of derivatives (DERV)	Total assets (TA)	Long-term debt/total assets (LDEBTA)	Institutional investors (INSTIT)	Dividend Payout ratio (DIVP)	Return on Assets (ROA)	Return on Equity (ROE)	Earning before interest and taxes (EBIT)
G≤5	2.66	2.14	96	5663	20.37	29.84	23.84	8.89	23.08	14.81
	[2.27]	[1.70]	[0]	[3479]	[16.87]	[28.40]	[20.89]	[8.54]	[17.13]	[14.21]
	(1.68)	(2.10)	(173)	(7042)	(17.29)	(13.13)	(47.81)	(6.07)	(33.99)	(9.07)
G=6	1.88	1.52	418	8373	20.26	28.52	26.43	8.76	18.81	14.69
	[1.33]	[0.79]	[0]	[5102]	[19.69]	[27.81]	[20.06]	[7.52]	[16.37]	[14.05]
	(1.44)	(1.81)	(895)	(9164)	(15.92)	(14.61)	(32.15)	(6.45)	(11.10)	(8.94)
G=7	2.03	1.90	718	8770	15.39	29.48	25.90	7.66	16.81	16.45
	[1.62]	[0.91]	[0]	[3879]	[12.82]	[25.13]	[22.83]	[6.51]	[15.94]	[11.92]
	(1.74)	(2.84)	(2027)	(13442)	(12.42)	(10.49)	(29.60)	(6.46)	(10.28)	(11.74)
G=8	2.15	1.84	1008	8035	15.84	29.16	26.16	7.05	17.93	10.36
	[1.37]	[0.67]	[0]	[4073]	[12.74]	[29.91]	[15.91]	[6.15]	[15.61]	[11.78]
	(2.07)	(2.35)	(350)	(10862)	(13.79)	(14.96)	(34.04)	(8.89)	(44.37)	(26.29)
G=9	2.27	2.06	6813	14283	21.55	26.81	38.58	6.95	17.54	14.97
	[1.49]	[0.86]	[0]	[2954]	[22.19]	[25.94]	[24.75]	[6.70]	[16.96]	[13.29]
	(2.04)	(2.55)	(4221)	(3476)	(11.83)	(12.85)	(112.9)	(5.65)	(13.84)	(9.89)
G=10	2.07	1.89	13077	13383	27.31	26.43	28.73	6.41	15.03	14.25
	[1.48]	[0.88]	[0]	[5171]	[27.21]	[28.38]	[26.03]	[6.77]	[15.63]	[12.84]
	(1.88)	(2.55)	(4131)	(32195)	(18.51)	(16.20)	(17.30)	(7.41)	(26.29)	(9.14)
G=11	1.94	1.49	2298	9419	21.56	22.75	29.36	6.98	16.37	14.48
	[1.48]	[0.88]	[0]	[2830]	[18.94]	[24.91]	[24.04]	[6.32]	[15.84]	[12.56]
	(1.80)	(1.88_	(622)	(26815)	(14.71)	(11.39)	(131.7)	(7.28)	(16.22)	(9.39)
G=12	2.12	2.28	1692	15274	22.59	22.19	39.38	5.59	16.03	12.11
	[1.37]	[0.76]	[0]	[3272]	[21.92]	[20.60]	[25.05]	[6.26]	[15.23]	[12.82]
	(2.24)	(4.01)	(691)	(48945)	(19.96)	(15.30)	(56.80)	(8.92)	(23.54)	(15.88)
G=13	2.11	1.77	1625	11431	17.12	20.85	24.23	5.62	15.61	14.90
	[1.38]	[0.89]	[0]	[2937]	[17.23]	[20.44]	[27.6]	[5.52]	[15.55]	[13.31]
	(2.60)	(2.84)	(1073)	(30423)	(10.89)	(15.83)	(51.79)	(4.61)	(7.76)	(9.05)
G>14	1.70	1.36	481	10697	21.25	20.28	29.96	4.38	12.39	10.21
	[1.30]	[0.88]	[0]	[4437]	[20.87]	[17.73]	[27.32]	[3.65]	[9.68]	[9.09]
	(1.44)	(1.76)	(873)	(1634)	(13.97)	(13.49)	(47.81)	(5.57)	(27.73)	(8.23)

Table 20

Industry Classification of US. Foreign Currency Hedging and Non-Hedging Firms Based on the 2 Digit SIC code

The table presents the industry classification (based on the 2-digit SIC code) and number of firms using foreign Exchange currency Derivatives for a sample of US. firms from the S&P 500 during the years 1993, 1995 and 1998. The sample excludes Financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67). "Hedging" firms are defined as firms that have data on any type of Foreign Exchange Currency Derivatives (Forwards, Options, swaps) available in the firm's 10-K Annual Reports in 1993, 1995 and 1998. "Non-Hedging" firms are defined as firms that do not report any type of currency hedging activity in their annual reports. Firms that report other types of hedging activity (Commodity and/or Interest Rate hedging) are also included in the "Non-Hedgers" sample. Foreign Currency Hedging data is obtained from the Firms' 10-K annual Reports via the Electronic Data Gathering, Analysis and Retrieval database "EDGAR" and/or Annual Report Gallery. Panel A shows the industry classification code of hedging and non-hedging firms in 1993. Panels B and C show their distribution in the years 1995 and 1998 respectively.

Panel A: 1993

2 Digit Sic Code	Title & Description of Industry	# of Hedging Firms	# of Non-Hedging Firms
13	Oil and Gas Extraction	0	23
14	Mining and Quarrying Nonmetal Minerals (Except Fuels)	0	2
17	Construction-Special Trade Contractors	2	2
20	Food and Kindered Products	10	9
24	Lumber and Wood Products, Except Furniture	3	2
25	Furniture and Fixtures	0	4
26	Paper and Allied Products	9	6
27	Printing, Publishing and Allied Industries	2	6
28	Chemicals and Allied Products	43	19
29	Petroleum Refining and Related Industries	7	2
30	Rubber and Miscellaneous Plastic Products	9	6
33	Primary Metal Products	2	4
34	Fabricated Metal Products. Except Machinery and Transportation Equipment	7	9
35	Industrial and Commercial Machinery and Computer Equipment	32	11
36	Electronics and Other Electronic Equipment	19	26
37	Transportation Equipment	15	9
38	Measuring, Analyzing and Controlling Instruments	15	19
39	Miscellaneous Manufacturing Industries	7	2
42	Motor Freight Transportation, Warehousing	0	2
45	Air Transportation	0	4
47	Transportation Services	2	9
48	Communications	0	19
49	Electric, Gas and Sanitary Services	0	4
50	Whole Sale Trade- Durable Goods	3	2
51	Whole Sale Trade – Non Durable Goods	0	2
55	Automotive Dealers, Gas Service Stations	0	10
58	Eating and Drinking Places	0	2
59	Miscellaneous Retail	2	5
73	Business Services	10	32
75	Automotive Repair Services and Parking	0	4
87	Engineering, Accounting and Research Services	0	4
	Total	**199**	**260**

Table 20 (continued)

Panel B: 1995

2 Digit Sic Code	Title & Description of Industry	# of Hedging Firms	# of Non-Hedging Firms
13	Oil and Gas Extraction	9	15
14	Mining and Quarrying Nonmetal Minerals (Except Fuels)	0	2
17	Construction-Special Trade Contractors	0	5
20	Food and Kindered Products	14	7
24	Lumber and Wood Products, Except Furniture	0	5
25	Furniture and Fixtures	3	2
26	Paper and Allied Products	11	5
27	Printing, Publishing and Allied Industries	3	7
28	Chemicals and Allied Products	55	18
29	Petroleum Refining and Related Industries	7	2
30	Rubber and Miscellaneous Plastic Products	7	9
33	Primary Metal Products	4	2
34	Fabricated Metal Products. Except Machinery and Transportation Equipment	7	9
35	Industrial and Commercial Machinery and Computer Equipment	35	9
36	Electronics and Other Electronic Equipment	32	15
37	Transportation Equipment	16	9
38	Measuring, Analyzing and Controlling Instruments	18	15
39	Miscellaneous Manufacturing Industries	7	2
42	Motor Freight Transportation, Warehousing	0	2
45	Air Transportation	3	2
47	Transportation Services	4	7
48	Communications	0	20
49	Electric, Gas and Sanitary Services	0	5
50	Whole Sale Trade- Durable Goods	0	5
51	Whole Sale Trade – Non Durable Goods	0	7
55	Automotive Dealers, Gas Service Stations	0	2
58	Eating and Drinking Places	3	2
59	Miscellaneous Retail	4	5
73	Business Services	0	31
75	Automotive Repair Services and Parking	0	2
87	Engineering, Accounting and Research Services	0	2
	Total	**242**	**230**

Table 20 (continued)

Panel C: 1998

2 Digit Sic Code	Title & Description of Industry	# of Hedging Firms	# of Non-Hedging Firms
13	Oil and Gas Extraction	3	21
14	Mining and Quarrying Nonmetal Minerals (Except Fuels)	0	2
17	Construction-Special Trade Contractors	5	0
20	Food and Kindered Products	16	5
24	Lumber and Wood Products, Except Furniture	0	5
25	Furniture and Fixtures	5	0
26	Paper and Allied Products	11	5
27	Printing, Publishing and Allied Industries	0	10
28	Chemicals and Allied Products	53	12
29	Petroleum Refining and Related Industries	2	7
30	Rubber and Miscellaneous Plastic Products	14	2
33	Primary Metal Products	5	2
34	Fabricated Metal Products. Except Machinery and Transportation Equipment	11	5
35	Industrial and Commercial Machinery and Computer Equipment	41	5
36	Electronics and Other Electronic Equipment	29	18
37	Transportation Equipment	23	2
38	Measuring, Analyzing and Controlling Instruments	27	10
39	Miscellaneous Manufacturing Industries	9	0
42	Motor Freight Transportation, Warehousing	0	2
45	Air Transportation	3	2
47	Transportation Services	3	7
48	Communications	5	15
49	Electric, Gas and Sanitary Services	0	5
50	Whole Sale Trade- Durable Goods	2	5
51	Whole Sale Trade – Non Durable Goods	0	2
55	Automotive Dealers, Gas Service Stations	2	5
58	Eating and Drinking Places	2	2
59	Miscellaneous Retail	7	2
73	Business Services	25	26
75	Automotive Repair Services and Parking	0	2
87	Engineering, Accounting and Research Services	0	2
	Total	**303**	**188**

Table 21
Univariate Analysis of the Agency Costs Between Hedging and Non- Hedging firms Based on the G Index.

The table presents univariate analysis of mean [median] values of the Corporate Governance Index (G) across a sample of Hedging (GI_H) and Non Hedging (GI_{NH}) firms obtained from the S&P 500 firms during the years 1993,1995 and 1998. The sample consists of 1422 firm year observations. The sample includes Non Financial firms that have data available on their foreign currency hedging activity as well as information on their level of agency conflict as proxied by the Corporate Governance index (G). The G index is constructed using regulations and 24 distinct corporate governance provisions, which define the power sharing relationship between shareholders and managers. Currency hedging information is available in the firms' 10-K annual reports. Financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67) are excluded from the sample. "Hedging" firms are defined as firms that have data on any type of Foreign Exchange Currency Derivatives (Forwards, Options, swaps) available in the firm's 10-K Annual Reports from 1993-1998. "Non-Hedging" firms are defined as firms that do not report any type of currency hedging activity in their annual reports. Firms that report other types of hedging activity (Commodity and/or Interest Rate hedging) are included in the "Non-Hedging" sample. The significance of means is computed by one-way ANOVA. Non-parametric Wilcoxon Rank-Sum test is used to test for the differences of the median of G across hedging and non-hedging firms. ***, **, And * denote statistical significance for difference of groups at the 1%, 5% and 10% levels respectively.

Years	GI_H (1)	GI_{NH} (2)	(1-2)	P-value
1993	10.057 [11.1] (n=199)	9.143 [9] (n=260)	0.911** [2.1]**	0.026 [0.03]
1995	10.076 [11.4] (n=242)	9.105 [9] (n=230)	0.971** [2.4]**	0.011 [0.016]
1998	9.752 [10.1] (n=303)	9.247 [9] (n=188)	0.505** [0.35]**	0.017 [0.011]
All Years	9.962 [10.67] (n=744)	9.165 [9.00] (n=678)	0.797*** [1.67]***	0.000 [0.001]

Table 22

Univariate Analysis of the performance and firm specific characteristics of Hedging and Non-Hedging firms Based on the G Index.

The table presents univariate analysis mean [median] values of some performance and firm-specific variables for our sample of foreign exchange currency hedgers and non-hedgers during the period 1993, 1995 and 1998. The sample consists of 1422 Non Financial firms that have data available on their foreign currency hedging activity in their 10-K annual reports. Firms with size less than $10 million. Financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67) are also excluded from the sample. The classification of "Hedging" firms and "Non-Hedging" firms is the same as that described above. Performance and firm-specific variables are defined, as before, in the previous tables. The significance of means difference between foreign currency hedgers and non-hedgers is computed by one-way ANOVA. Non-parametric Wilcoxon Rank-Sum test is used to test for the difference of medians of hedgers and non-hedgers. ***, **, And * denote statistical significance for difference of groups at the 1%, 5% and 10% levels respectively. Panel A shows the univariate analysis of all firms in all deciles of G. Panels B and C show the univariate analysis of firms in the Shareholder portfolio and in the Management portfolio respectively.

Panel A: firms across the G- index deciles

	1993				1995				1998			
	Hedging (1)	Non-Hedging (2)	(1-2)	p-Value	Hedging (1)	Non-Hedging (2)	(1-2)	p-Value	Hedging (1)	Non-Hedging (2)	(1-2)	p-Value
TA	11025 [2319] (n=199)	6915 [3255] (n=267)	4110 [936]**	0.241 [0.023]	11838 [3503] (n=242)	7883 [2763] (n=230)	3955 [740]**	0.255 [0.020]	14028 [5502] (n=303)	10550 [4971] (n=188)	3478** [531]**	0.043 [0.030]
LDEBTA	16.55 [14.07] (n=199)	18.57 [16.6] (n=267)	-2.02 [-2.45]	0.321 [0.364]	19.10 [16.97] (n=242)	18.25 [16.55] (n=230)	0.85* [0.4]*	0.070 [0.056]	25.12 [21.8] (n=303)	24.18 [19.7] (n=188)	0.94* [2.1]**	0.065 [0.050]
INSTIT	28.39 [28.66] (n=199)	28.84 [30.72] (n=267)	-0.46 [-2.06]	0.319 [0.229]	28.31 [28.6] (n=242)	28.99 [30.94] (n=230)	-0.68 [-2.34]*	0.336 [0.097]	28.01 [29.14] (n=303)	30.08 [31.13] (n=188)	-2.07* [-1.99]*	0.091 [0.072]
EBIT	12.80 [10.78] (n=199)	13.38 [11.54] (n=267)	-0.58** [-0.82]**	0.053 [0.036]	11.71 [12.38] (n=242)	15.54 [14.18] (n=230)	-3.83*** [-1.80]**	0.012 [0.025]	14.50 [12.88] (n=303)	14.58 [13.09] (n=188)	-0.08*** [-0.21]**	0.010 [0.037]
ROA	6.10 [5.06] (n=199)	6.56 [5.88] (n=267)	-0.46** [-0.82]**	0.039 [0.025]	7.30 [6.78] (n=242)	7.31 [7.36] (n=230)	-0.01 [-0.53]*	0.999 [0.091]	6.39 [6.66] (n=303)	7.94 [6.71] (n=188)	-1.55** [-0.05]*	0.021 [0.054]
ROE	12.59 [13.75] (n=199)	14.68 [14.71] (n=267)	-2.09* [-0.96]**	0.063 [0.035]	16.17 [16.55] (n=242)	16.72 [16.91] (n=230)	-0.55* [-0.36]	0.096 [0.203]	18.50 [16.01] (n=303)	19.73 [17.38] (n=188)	-123** [-1.37]*	0.024 [0.052]
DIVP	94.55 [28.31] (n=199)	57.7 [26.94] (n=267)	36.85** [1.37]***	0.020 [0.000]	28.30 [22.83] (n=242)	23.30 [22.17] (n=230)	5.00*** [0.66]**	0.008 [0.030]	37.7 [26.20] (n=303)	31.72 [24.90] (n=188)	5.98*** [1.30]***	0.004 [0.002]

Table 22 continued

Panel B: firms in the Shareholder Portfolio (G ≤ 5)

	1993				1995				1998			
	Hedging (1)	Non-Hedging (2)	(1-2)	p-Value	Hedging (1)	Non-Hedging (2)	(1-2)	p-Value	Hedging (1)	Non-Hedging (2)	(1-2)	p-Value
TA	6812 [5012] (n=4)	15198 [3940] (n=27)	-8368 [1072]*	0.589 [0.10]	11646 [11544] (n=4)	3570 [2424] (n=33)	8076*** [9120]***	0.009 [0.000]	15678 [9358] (n=19)	11645 [8916] (n=22)	4033*** [442]***	0.000 [0.000]
LDEBTA	23.31 [22.30] (n=4)	21.70 [14.81] (n=27)	[1.61* [7.49]*	0.090 [0.100]	45.1 [40.20] (n=4)	27.27 [19.07] (n=33)	17.83** [21.13]***	0.030 [0.000]	25.62 [18.04] (n=19)	27.30 [20.58] [n=22)	-1.68 [-2.54]	0.887 [0.200]
INSTIT	22.40 [22.7] (n=4)	27.70 [23.40] (n=27)	-5.30 [3.30]	0.585 [0.196]	59.4 [59.2] (n=4)	61.20 [63.41] (n=33)	-1.80 [-4.27]	0.233 [0.443]	59.01 [57.43] (n=19)	67.62 [66.67] (n=22)	-8.62 [-9.24]	0.172 [0.236]
EBIT	20.45 [17.63] (n=4)	9.27 [7.08] (n=27)	11.18** [10.55]**	0.015 [0.021]	34.50 [33.45] (n=4)	11.98 [8.47] (n=33)	22.52** [24.98]**	0.020 [0.015]	18.22 [16.71] (n=19)	13.32 [11.48] (n=22)	4.90*** [5.23]**	0.010 [0.027]
ROA	14.4 [13.15] (n=4)	10.5 [5.66] (n=27)	3.90** [7.49]	0.050 [0.112]	11.64 [11.75] (n=4)	6.72 [6.75] (n=33)	4.68** [5.00]***	0.022 [0.000]	9.07 [10.92] (n=19)	6.97 [6.25] (n=22)	2.10** [4.67]***	0.033 [0.024]
ROE	23.80 [26.29] (n=4)	12.55 [12.34] (n=27)	11.25** [13.95]**	0.043 [0.035]	14.05 [13.05] (n=4)	33.50 [14.79] (n=33)	-19.45 [-1.74]	0.650 [0.203]	41.18 [18.97] (n=19)	18.77 [17.44] (n=22)	22.41* [1.53]*	0.064 [0.052]
DIVP	34.87 [33.75] (n=4)	27.00 [16.03] (n=27)	7.87*** [17.72]***	0.008 [0.000]	39.41 [34.18] (n=4)	29.45 [25.28] (n=33)	9.96** [8.90]***	0.017 [0.000]	35.06 [32.29] (n=19)	24.60 [26.34] (n=22)	10.46** [5.95]***	0.041 [0.001]

Table 22 (continued)

Panel C: firms in the Management portfolio (G ≥ 14)

	1993				1995				1998			
	Hedging (1)	Non-Hedging (2)	(1-2)	p-Value	Hedging (1)	Non-Hedging (2)	(1-2)	p-Value	Hedging (1)	Non-Hedging (2)	(1-2)	p-Value
TA	5272 [2523] (n=10)	4399 [2187] (n=8)	873 [336]	0.821 [0.715]	7068 [3899] (n=10)	6818 [3104] (n=10)	250 [795]	0.966 [0.703]	8767 [5037] (n=16)	7757 [4518] (n=5)	1010** [519]*	0.020 [0.055]
LDEBTA	11.11 [4.40] (n=10)	28.30 [26.08] (n=8)	-17.19 [-21.68]	0.232 [0.157]	21.73 [22.10] (n=10)	19.49 [21.28] (n=10)	2.24 [0.82]	0.850 [0.886]	19.27 [17.38] (n=16)	33.12 [33.06] (n=5)	-13.85* [-14.32]*	0.070 [0.059]
INSTIT	20.21 [20..23] (n=10)	27.37 [27.23] (n=8)	-7.16** [-7.00]**	0.041 [0.031]	28.37 [21.76] (n=10)	28.86 [27.95] (n=10)	-0.49* [-6.19]*	0.059 [0.060]	21.38 [23.13] (n=16)	22.04 [27.9] (n=5)	0.66* [4.77]*	0.094 [0.059]
EBIT	10.45 [9.24] (n=10)	12.93 [10.38] (n=8)	-2.48 [-1.14]	0.606 [0.584]	11.68 [13.75] (n=10)	15.71 [11.32] (n=10)	-4.03 [2.43]	0.218 [0.286]	10.56 [10.66] (n=16)	7.011 [7.11] (n=5)	3.54 [3.55]	0.580 [0.705]
ROA	8.50 [7.03] (n=10)	2.50 [2.82] (n=8)	6.00** [4.21]**	0.050 [0.045]	5.77 [7.24] (n=10)	8.26 [8.31] (n=10)	-2.49 [-1.07]	0.346 [0.556]	6.39 [8.73] (n=16)	1.53 [1.33] (n=5)	4.86 [7.40]*	0.140 [0.089]
ROE	12.10 [13.82] (n=10)	5.45 [4.92] (n=8)	6.65* [8.90]*	0.063 [0561]	13.87 [17.61] (n=10)	18.76 [19.32] (n=10)	-4.89 [-1.71]	0.358 [0.501]	13.68 [17.40] (n=16)	4.36 [4.63] (n=5)	9.32 [12.77]	0.243 [0.257]
DIVP	18.85 [15.75] (n=10)	55.78 [56.74] (n=8)	-36.93* [-40.99]*	0.100 [0.100]	53.37 [52.68] (n=10)	32.15 [20.04] (n=10)	21.22 [32.64]	0.327 [0.413]	27.83 [33.26] (n=16)	2.58 [3.79] (n=5)	25.25 [29.47]	0.395 [0.571]

Table 23
The Determinants of Foreign Currency Hedging

The table presents the results of a logit regression that relates firm characteristics and some of its operating measures of performance to its hedging profile. The sample includes 1422 firm year observations drawn from the S&P 500 non-financial firms. The dependent variable is the foreign exchange derivative dummy (FCD dummy) that takes the value of 1 if the firm reports a notional value of derivative in its 10-K annual report and zero otherwise. The independent variables include the following; Corporate Governance Index (G), Log of Total Assets (log TA), defined as current assets plus net property, plant and equipment plus other non current assets of the firm in millions of dollars. Return on assets (ROA) is defined as the income before depreciation and other extraordinary items divided by total assets. Return on Equity (ROE) is defined as Income before depreciation and other extraordinary items divided by common Equity. Long-term Debt/ total assets (LDEBTA) ratio is defined as the percentage of total debt divided by total assets. EBIT margin is defined as operating income after depreciation less cost of goods sold, Selling, General & administrative expenses divided by net sales. Firm Dividend pay out ratio (DIVP) is defined as the percentage of the total amount of dividends declared on the common stock divided by income before extraordinary items and discounted operations less preferred dividend requirements. T values of coefficients are in parenthesis. ***, **, And * denote statistical significance at the 1%, 5% and 10% levels respectively. Panel A presents the result of the regression for the sample pooled across the G index deciles. Panels B and C present the results of the regression for firms in the Shareholder portfolio and Management portfolio respectively.

Dependent variable: FCD dummy			
Independent variables	Regression 1	Regression 2	Regression 3
G	0.0975	0.0968	0.0976
	(2.784)***	(2.7581)***	(2.785)***
Log(TA)	0.0343	0.0271	0.0347
	(1.7090)**	(1.5606)**	(1.702)**
LDEBTA	0.0018	0.0011	0.0021
	(0.268)	(0.169)	(0.3051)
INSTIT	-0.01413	-0.0142	-0.0144
	(-2.406)***	(-2.457)***	(-2.483)***
ROA	-0.0051		
	(-2.329)**		
ROE		0.0031	
		(0.611)	
EBIT			-0.0019
			(-2.263)**
DIVP	-0.0019	-0.002	-0.0020
	(-1.4037)	(-1.389)	(-1.388)
Logliklihood	-284.77	-284.23	-284.79
# obs D=1	742	743	744
# obs D=0	678	678	678
convergence	0.001	0.001	0.001

Table 24
Univariate Valuation Measures of Hedging and Non-Hedging Firms Based on the "G"index.

The table presents the mean and [median] hedging premium/discount of US. non- financial firms that have hedged their currency exposure during the years 1993, 1995 and 1998. The sample covers 1422 firms from the S&P500 firms that have data available on their foreign currency hedging activity in their 10-K annual reports. The sample does not cover firms in Financial Firms in Finance, Insurance and Real Estate (2-Digit sic codes from 60-67). Firms with total assets less than $ 10 million are also excluded from the sample. Valuation measures used are Tobin's Q (Panel A) and Excess Market value (Panel B). Tobin's Q is computed as market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long term debt divided by total assets of the firm. Excess market value is defined as the market value of equity less book value of equity normalized by total sales. The significance of means difference between foreign currency hedgers and non-hedgers is computed by one-way ANOVA. Non-parametric Wilcoxon Rank-Sum test is used to test for the difference of medians of hedgers and non-hedgers. ***, **, And * denote statistical significance for difference of groups at the 1%, 5% and 10% levels respectively.

Panel A: Firms across the G index deciles

	Tobin'Q				Excess Market Value			
	Hedging Firms (1)	Non-Hedging Firms (2)	(1-2)	P-value	Hedging Firms	Non-Hedging Firms	(1-2)	P-value
1993	1.824 [1.368] (n=199)	1.725 [1.356] (n=260)	0.099 [0.012]	0.671 [0.852]	1.660 [0.812] (n=199)	1.380 [0.741] (n=260)	0.280 [0.071]	0.359 [0.944]
1995	1.885 [1.495] (n=242)	1.874 [1.345] (n=230)	0.011 [0.150]**	0.976 [0.028]	1.740 [0.797] (n=242)	1.490 [0.769] (n=230)	0.250 [0.028]**	0.216 [0.049]
1998	2.848 [1.809] (n=303)	2.260 [1.575] (n=188)	0.248** [0.234]**	0.020 [0.036]	2.555 [1.418] (n=303)	1.986 [0.973] (n=188)	0.569** [0.445]**	0.026 [0.016]
All Years	2.273 [1.647] (n=744)	1.870 [1.617] (n=678)	0.011*** [0.030]**	0.023 [0.031]	2.122 [1.119] (n=744)	1.907 [1.081] (n=678)	0.215** [0.038]***	0.030 [0.002]

Table 24 (continued)

Panel B: Firms in the shareholder Portfolio (G ≤ 5)

	Tobin's Q				Excess market value			
	Hedging Firms	Non-Hedging Firms	(1-2)	P-value	Hedging Firms	Non-Hedging Firms	(1-2)	P-value
1993	1.680 [1.457] (n=4)	2.280 [2.457] (n=27)	-0.600 [-1.000]	0.317 [0.234]	1.159 [1.011] (n=4)	1.507 [1.529] (n=27)	-0.348 [-0.518]	0.564 [0.684]
1995	2.490 [2.570] (n=4)	1.760 [1.766] (n=33)	0.730 [0.804]	0.529 [0.770]	1.910 [1.795] (n=4)	1.290 [1.269] (n=33)	0.620 [0.526]	0.532 [0.637]
1998	4.220 [4.146] (n=19)	3.370 [3.364] (n=22)	0.850 [0.782]	0.467 [0.497]	3.830 [3.431] (n=19)	3.330 [2.889] (n=22)	0.500 [0.542]	0.734 [0.724]
All Years	2.897 [2.705] (n=27)	2.558 [2.205] (n=82)	0.339** [0.500]**	0.049 [0.039]	2.482 [2.460] (n=27)	2.240 [1.870] (n=82)	0.242 [0.590]	0.275 [0.571]

Panel C: Firms in the Management Portfolio (G ≥ 14)

	Tobin's Q				Excess market value			
	Hedging Firms	Non-Hedging Firms	(1-2)	P-value	Hedging Firms	Non-Hedging Firms	(1-2)	P-value
1993	2.584 [2.351] (n=10)	0.981 [0.862] (n=8)	1.603*** [1.489]***	0.010 [0.009]	1.842 [1.183] (n=10)	0.628 [0.414] (n=8)	1.214** [0.769]**	0.043 [0.045]
1995	1.700 [1.523] (n=10)	1.640 [1.173] (n=10)	0.060* [0.350]*	0.074 [0.062]	1.198 [1.134] (n=10)	0.881 [0.562] (n=10)	0.317* [0.572]**	0.056 [0.024]
1998	1.874 [1.049] (n=16)	1.357 [0.945] (n=5)	0.517** [0.104]**	0.040 [0.030]	1.090 [0.832] (n=16)	1.540 [0.774] (n=5)	0.450* [0.058]*	0.092 [0.059]
All Years	2.033 [1.810] (n=36)	1.630 [0.950] (n=23)	0.403** [0.860]**	0.0486 [0.042]	1.344 [1.130] (n=36)	1.316 [0.570] (n=23)	0.028** [0.560]**	0.030 [0.022]

Table 25

Foreign Currency Derivative Use Agency Costs and Firm Value

The table presents the results of a cross sectional OLS regression that relates the firm's valuation measures to its hedging profile. The dependent variables are the firms' valuation measures; Tobin's Q (Panel A) and Excess market value (Panel B). Panel A1 presents the results of OLS regression of firms that are pooled across the G index deciles and where Tobin's Q is the dependent variable. Panels A2 and A3 present the results of the same OLS regression of firms in the shareholder portfolio (G<5) and firms in the Management portfolio (G>14) respectively. Panel B1 presents the results of OLS regression where the Firm's Excess market value is the dependent variable and the sample includes firms pooled across the G index deciles. Panels B2 and B3 show the same OLS regression for firms in the Shareholder Portfolio and Management Portfolio respectively. The independent variables are: the gross notional value of foreign exchange contracts (DERV), the foreign exchange derivative dummy (DERV Dummy), which is a dummy variable that takes the value of 1 if the firm hedges its foreign currency exposure and equal zero otherwise. log Total Assets log (TA), Long-term debt/Assets (LDEBTA) ratio is defined as the percentage of total debt divided by total assets. (INSTIT) is Institutional ownership it is defined as the percentage of the firm's aggregate number of shares held by institutions to the common shares outstanding. Return on assets (ROA), Return on Equity (ROE) is defined as Income before depreciation and other extraordinary items divided by common Equity. EBIT margin is defined as operating income after depreciation less cost of goods sold, Selling, General & administrative expenses divided by net sales. Dividend pay out (DIVP) is defined as the percentage of the total amount of dividends declared on the common stock divided by income before extraordinary items and discounted operations less preferred dividend requirements. T values of coefficients are in parenthesis. ***, **, And * denote statistical significance at the 1%, 5% and 10% levels respective

Panel A1: Firms across the G index deciles

Dependent Variable: Tobin's Q						
Independent Variables	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5	Regression 6
Constant	0.0483	0.8983	0.7756	0.3360	0.3331	0.3214
	(0.523)	(0.351)	(0.365)	(0.595)	(0.408)	(0.429)
DERV				0.0041	0.0551	0.0512
				(0.335)	(0.402)	(0.390)
DERVDUM	0.1971	0.1871	0.1919			
	(2.137)**	(2.0667)**	(2.1007)**			
Log (TA)	-0.1549	-0.1667	-0.1805	-0.1473	-0.1594	-0.1725
	(-2.557)***	(-2.7247)***	(-2.933)***	(-2.435)***	(-2.601)***	(-2.807)***
LDEBTA	0.0005	-0.0034	-0.0022	0.00067	-0.003	-0.0021
	(0.0915)	(-0.5583)	(-0.374)	(0.109)	(-0.536)	(-0.351)
INSTIT	-0.0203	-0.0221	-0.0214	-0.0205	-0.0222	-0.0216
	(-3.053)***	(-3.299)***	(-3.208)***	(-3.069)***	(-3.308)***	(-3.222)***
EBIT			0.0082			0.0081
			(1.403)**			(1.380)*
ROA	0.0362			0.0362		
	(2.574)***			(2.564)***		
ROE		0.0033			0.0035	
		(0.7671)			(0.814)	
DIVP	-0.0001	-0.0003	-0.0003	-0.0002	-0.0003	-0.0003
	(-0.181)	(-0.330)	(-0.328)	(-0.2472)	(-0.390)	(-0.390)
F value	4.1459	3.0440	3.3039	3.9381	2.8747	3.1196
P value	0.000***	0.006***	0.003***	0.000***	0.009***	0.005***
R^2	0.0556	0.04167	0.0448	0.0532	0.0394	0.0424
Adj R^2	0.0422	0.0279	0.0312	0.0395	0.0257	0.0288

Table 25 (Continued)

Panel A2: Firms in the Shareholder Portfolio

Dependent Variable: Tobin's Q						
Independent Variables	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5	Regression 6
Constant	0.3570	0.6130	0.6692	0.441	0.4730	0.878
	(0.172)	(0.553)	(0.622)	(0.244)	(0.633)	(0.538)
DERV				0.3104	0.4202	0.4676
				(2.227)**	(2.821)**	(2.317)**
DERVDUM	0.4288	-0.2102	-0.2452			
	(1.416)	(-0.707)	(-0.875)			
Log (TA)	-0.233	-0.2063	-0.1920	-1.5404	-1.1592	-1.1916
	(-2.390)**	(-2.019)**	(-1.795)*	(-4.727)***	(-4.998)***	(-4.607)***
LDEBTA	-0.0020	-0.0012	-0.0022	-0.0116	-0.0414	-0.0415
	(-0.040)	(-0.1813)	(-0.319)	(-0.885)	(-3.834797)	(-2.150)**
INSTIT	0.0013	-0.0033	-0.0014	0.0968	0.8716	-0.0033
	(2.113)**	(-0.267)	(-0.106)	(3.720)***	(3.188)***	(-1.249)
EBIT			0.0061			0.365
			(2.398**			(4.920)***
ROA	0.0396			0.133		
	(2.335)**			(3.407)***		
ROE		-0.0001			0.116	
		(-0.030)			(0.838)	
DIVP	0.0001	-0.0033	0.0009	0.6147	0.0036	0.0130
	(0.155)	(-0.267)	(0.7789)	(1.8925)	(3.652)***	(2.963)**
F value	3.2054	2.817208	2.651626	7.955727	10.055	8.9644
P value	0.009***	0.030**	0.036**	0.000***	0.000***	0.000***
R^2	0.3115	0.2345	0.2210	0.9557	0.9679	0.9196
Adj R^2	0.0530	0.0524	0.0421	0.8229	0.8716	0.8972

Table 25 (continued)

Panel A3: Firms in the Management Portfolio

Dependent Variable: Tobin's Q						
Independent Variables	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5	Regression 6
Constant	0.1563	0.1629	0.1418	0.752	0.770	0.873
	(0.427)	(0.489)	(0.500)	(0.893)	(1.072)	(0.370)
DERV				0.009	0.092	0.0017
				(0.985)	(1.017)	(1.591)
DERVDUM	0.816	0.790	1.121			
	(2.097)**	(2.089)**	(3.183)***			
Log (TA)	-0.346	-0.399	-0.524	-0.241	-0.323	-0.5045
	(-1.851)*	(-1.975)*	(-2.579)***	(-1.663)*	(-1.518)*	(-2.157)**
LDEBTA	0.014	0.011	-0.009	0.0246	0.0153	-0.018
	(0.571)	(0.577)	(-0.558)	(0.858)	(0.671)	(-0.944)
INSTIT	-0.012	-0.013	-0.028	0.0013	-0.0028	-0.0189
	(-2.643)**	(-0.742)	(-1.586)	(2.068)**	(-0.154)	(-0.939)
EBIT			0.021			0.037
			(2.762)***			(1.135)
ROA	0.072			0.1111		
	(1.647)			(2.651)***		
ROE		0.044			0.061	
		(2.132)**			(3.034)***	
DIVP	-0.0005	-0.002	-0.004	-0.001	-0.004	-0.009
	(-0.102)	(-0.521)	(-0.802)	(-0.199)	(-0.886)	(-1.368)
F value	4.2307	4.7787	3.4731	3.0924	3.5780	2.5991
P value	0.008***	0.004***	0.010***	0.030**	0.010***	0.010***
R^2	0.5018	0.5443	0.4526	0.4240	0.4721	0.2757
Adj R^2	0.3831	0.4304	0.3223	0.2869	0.3401	0.1033

Table 25 (Continued)

Panel B1: Firms across the G index Deciles

Dependent Variable: Excess Market value						
Independent Variables	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5	Regression 6
Constant	0.249	0.718	0.668	0.306	0.790	0.656
	(0.565)	(0.998)	(0.994)	(0.121)	(0.991)	(0.690)
DERV				0.1250	0.0891	0.092
				(1.502)*	(1.480)*	(1.550)*
DERVDUM	0.263	0.2605	0.2671			
	(2.124)**	(2.105)**	(2.139)**			
Log (TA)	-0.297	-0.308	-0.3186	-0.2884	-0.2976	-0.3006
	(-3.634)***	(-3.762)***	(-3.863)***	(-3.531)***	(-3.643)***	(-3.674)***
LDEBTA	0.0061	0.0007	0.0038	0.0054	-0.0001	0.0022
	(0.756)	(0.092)	(0.484)	(0.662)	(-0.036)	(0.293)
INSTIT	-0.0221	-0.0235	-0.0232	-0.022	-0.0234	-0.0231
	(-2.501)**	(-2.651)***	(-2.630)***	(-2.485)***	(-2.641)***	(-2.617)***
EBIT			0.0055			0.0043
			(1.690)*			(0.535)
ROA	0.0286			0.0273		
	(1.512)**			(1.436)*		
ROE		0.0010			-0.0009	
		(0.201)			(-0.174)	
DIVP	-0.0005	-0.0006	-0.0006	-0.0006	-0.0007	-0.597
	(-0.427)	(-0.497)	(-0.500)	(-0.519)	(-0.575)	(-2.103)**
F value	3.6757	3.2682	3.3606	3.7010	3.3506	4.0715
P value	0.001***	0.003***	0.002***	0.001***	0.003***	0.000***
R^2	0.04662	0.04184	0.04271	0.0469	0.0428	0.0520
Adj R^2	0.03393	0.02904	0.03006	0.0342	0.0300	0.0392

Table 25 (continued)

Panel B2: Firms in the Shareholder Portfolio

Dependent Variable: Excess Market value						
Independent Variables	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5	Regression 6
Constant	0.4001	0.756	0.626	0.4008	0.1294	0.0506
	(0.338)	(0.358)	(0.877)	(0.349)	(0.126)	(0.105)
DERV				0.2432	0.0149	0.2056
				(1.123)	(1.126)	(1.221)
DERVDUM	-0.1266	0.1462	0.0389			
	(-0.283)	(0.319)	(0.079)			
Log (TA)	0.2286	0.1999	0.0628	0.7826	0.6958	0.6373
	(1.502)*	(1.831)**	(2.3400)**	(2.239)**	(4.961)***	(2.300)**
LDEBTA	0.0061	-0.0072	-0.0018	-0.0418	-0.0312	-0.0370
	(0.572)	(-0.588)	(-0.149)	(-1.024)	(-2.354)**	(-1.432)
INSTIT	0.0012	-0.0187	-0.0018	0.0112	0.0407	0.0125
	(0.067)	(-0.971)	(-0.089)	(0.465)	(2.321)**	(0.569)
EBIT			0.6799			0.3484
			(2.794)**			(0.338)
ROA	0.1361			0.0003		
	(2.884)***			(0.004)		
ROE		0.3700			0.0099	
		(1.398)			(2.453)**	
DIVP	-0.0005	-0.004	0.00179	0.0013	0.0004	0.0017
	(-0.239)	(-0.823)	(0.8396)	(0.850)	(0.484)	(0.981)
F value	2.16191	1.9238	2.181953	2.1365	7.4260	2.2373
P value	0.048**	0.061*	0.053*	0.080*	0.001***	0.055*
R^2	0.3709	0.2170	0.2437	0.1803	0.9369	0.1171
Adj R^2	0.1993	0.1017	0.0375	0.0331	0.8107	0.0521

Table 25 (Continued)

Panel B3: Firms in the Management Portfolio

Dependent Variable: Excess Market value						
Independent Variables	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5	Regression 6
Constant	1.8611	1.352	1.724	0.3873	1.166	1.1932
	(0.956)	(0.190)	(0.198	(0.199)	(0.619)	(0.287)
DERV				.00075	0.0031	0.0006
				(0.089)	(0.158)	(0.745)
DERVDUM	0.6121	0.682	0.822			
	(1.947)**	(2.044)**	(2.844)***			
Log (TA)	-0.103	-0.1555	-0.1810	-0.0173	-0.074	-0.1211
	(-0.709)	(-2.071)**	(-2.271)**	(-2.115)**	(-2.487)***	(-2.748)***
LDEBTA	0.0145	0.0133	0.005	0.015	0.0117	-0.0034
	(0.994)	(1.039)	(0.532)	(0.924)	(0.756)	(-0.267)
INSTIT	-0.0103	-0.0125	-0.016	0.0031	-0.0001	-0.0060
	(-0.684)	(-0.868)	(-1.163)	(0.213)	(-0.008)	(-0.386)
EBIT			0.0218			0.0310
			(0.931)			(1.1366)
ROA	0.0474			0.080		
	(1.350)			(2.456)***		
ROE		0.0226			0.0399	
		(1.272)			(2.308)**	
DIVP	0.001	0.0003	-0.0003	0.007	-0.001	-0.004
	(0.268)	(0.089)	(-0.328)	(0.173)	(-0.296)	(-0.807)
F value	2.382	2.4040	2.11008	2.4732	2.3139	2.4798
P value	0.030**	0.020**	0.001***	0.020**	0.029**	0.070*
R^2	0.3512	0.3640	0.3241	0.2508	0.2382	0.2138
Adj R^2	0.2031	0.2126	0.1705	0.0805	0.0569	0.0983

Appendix A

The Corporate Governance Provisions

This appendix describes the provisions, laws and regulations used as components of the Governance Index. The shorthand title of each provision is given in bold. These descriptions are taken from Gompers, Ishii and Metrick (2001).

Antigreenmail – Greenmail refers to the agreement between a large shareholder and a company in which the shareholder agrees to sell his stock back to the company, usually at a premium, in exchange for the promise not to seek control of the company for a specified period of time. Antigreenmail provisions prevent such arrangements unless the same repurchase offer is made to all shareholders or the transaction is approved by shareholders through a vote. They are thought to discourage accumulation of large blocks of stock because one source of exit for the stake is closed, but the net effect on shareholder wealth is unclear. Five states have specific antigreenmail laws, and two other states have "recapture of profits" laws, which enable firms to recapture raiders' profits earned in the secondary market. Recapture of profits laws are considered to be a version of antigreenmail laws (albeit a stronger one). The
antigreenmail category includes both firms with the provision and those incorporated in states with either antigreenmail or recapture of profits laws.

Blank check preferred stock – This is preferred stock over which the board of directors has broad authority to determine voting, dividend, conversion, and other rights. While it can be used to enable a company to meet changing financial needs, it can also be used to implement poison pills or to prevent takeover by placement of this stock with friendly investors. Companies who have this type of preferred stock but who have required shareholder approval before it can be used as a takeover defense are *not* coded as having this provision.

Business Combination laws – These laws impose a moratorium on certain kinds of transactions (e.g., asset sales, mergers) between a large shareholder and the firm for a period usually ranging between three and five years after the shareholder's stake passes a pre-specified (minority) threshold.

Bylaw and **Charter** amendment limitations – These provisions limit shareholders' ability to amend the governing documents of the corporation. This might take the form of a supermajority vote requirement for charter or bylaw amendments, total elimination of the ability of shareholders to amend the bylaws, or the ability of directors beyond the provisions of state law to amend the bylaws without shareholder approval.

Classified board – A classified board is one in which the directors are placed into different classes and serve overlapping terms. Since only part of the board can be replaced each year, an outsider who gains control of a corporation may have to wait a few years before being able to gain control of the board. This provision may also deter proxy contests, since fewer seats on the board are open each year.

Compensation plans with changes in control provisions – These plans allow participants in incentive bonus plans to cash out options or accelerate the payout of bonuses should there be a change in control. The details may be a written part of the compensation agreement, or discretion may be given to the compensation committee.

Director indemnification contracts – These are contracts between the company and particular officers and directors indemnifying them from certain legal expenses and judgments resulting from lawsuits pertaining to their conduct. Some firms have both "indemnification" in their bylaw/charter and these additional indemnification "contracts".

Control-share cash-out laws enable shareholders to sell their stakes to a "controlling" shareholder at a price based on the highest price of recently acquired shares. This works something like fair-price provisions (see below) extended to non-takeover situations.

Cumulative voting – Cumulative voting allows a shareholder to allocate his total votes in any manner desired, where the total number of votes is the product of the number of shares owned and the number of directors to be elected. By enabling them to concentrate their votes, this practice helps enable minority shareholders to elect favored directors. Cumulative voting and secret ballot (see below), are the only two provisions whose presence is coded as an *increase* in shareholder rights, with an additional point to *G* if the provision is absent.

Directors' duties allow directors to consider constituencies other than shareholders when considering a merger. These constituencies may include, for example, employees, host communities, or suppliers. This provision provides boards of directors with a legal basis for rejecting a takeover that would have been beneficial to shareholders. 31 states also have laws with language allowing an expansion of directors' duties, but in only two of these states (Indiana and Pennsylvania) are the laws explicit that the claims of shareholders should not be held above those of other stakeholders [Pinnell (2000)]. Firms in these two states are treated as though they had an expanded directors' duty provision unless the firm has explicitly opted out of coverage under the law.

Fair-Price Requirements – These provisions limit the range of prices a bidder can pay in two-tier offers. They typically require a bidder to pay to all shareholders the highest price paid to any during a specified period of time before the commencement of a tender offer and do not apply if the deal is approved by the board of directors or a supermajority of the target's shareholders. The goal of this provision is to prevent pressure on the target's shareholders to tender their shares in the front end of a two-tiered tender offer, and they have the result of making such an acquisition more expensive. This category includes both the firms with this provision and the firms incorporated in states with a fair price law.

Golden parachutes – These are severance agreements which provide cash and non-cash compensation to senior executives upon a triggering event such as termination, demotion, or resignation following a change in control. They do not require shareholder approval.

Director indemnification – This provision uses the bylaws and/or charter to indemnify officers and directors from certain legal expenses and judgments resulting from lawsuits pertaining to their conduct. Some firms have both this "indemnification" in their bylaws/charter and additional indemnification "contracts". The cost of such protection can be used as a market measure of the quality of corporate governance [Core (2000)].

Limitations on director liability – These charter amendments limit directors' personal liability to the extent allowed by state law. They often eliminate personal liability for breaches of the duty of care, but not for breaches of the duty of loyalty or for acts of intentional misconduct or knowing violation of the law.

Pension parachute – This provision prevents an acquirer from using surplus cash in the pension fund of the target in order to finance an acquisition. Surplus funds are required to remain the property of the pension fund and to be used for plan participants' benefits.

Poison pills – These securities provide their holders with special rights in the case of a triggering event such as a hostile takeover bid. If a deal is approved by the board of directors, the poison pill can be revoked, but if the deal is not approved and the bidder proceeds, the pill is triggered. In this case, typical poison pills give the holders of the target's stock other than the bidder the right to purchase stock in the target or the bidder's company at a steep discount, making the target unattractive or diluting the acquirer's voting power. The early adopters of poison pills also called them "shareholder rights" plans, ostensibly since they give current shareholders the "rights" to buy additional shares, but more likely as an attempt to influence public perceptions. A raider-shareholder might disagree with this nomenclature.

Secret ballot – Under secret ballot (also called confidential voting), either an independent third party or employees sworn to secrecy are used to count proxy votes, and the management usually agrees not to look at individual proxy cards. This can help eliminate potential conflicts of interest for fiduciaries voting shares on behalf of others, or can reduce pressure by management on shareholder-employees or shareholder-partners. Cumulative voting (see above) and secret ballot, are the only two provisions whose presence is coded as an *increase* in shareholder rights, with an additional point to *G* if the provision is absent.

Executive severance agreements – These agreements assure high-level executives of their positions or some compensation and are not contingent upon a change in control (unlike Golden or Silver parachutes).

Silver parachutes – These are similar to golden parachutes in that they provide severance payments upon a change in corporate control, but unlike golden parachutes, a large number of a firm's employees are eligible for these benefits.

Special meeting requirements – These provisions either increase the level of shareholder support required to call a special meeting beyond that specified by state law or eliminate

the ability to call one entirely.

Supermajority requirements for approval of mergers – These charter provisions establish voting requirements for mergers or other business combinations that are higher than the threshold requirements of state law. They are typically 66.7, 75, or 85 percent, and often exceed attendance at the annual meeting. This category includes both the firms with this provision and the firms incorporated in states with a "control-share acquisition" law. These laws require a majority of disinterested shareholders to vote on whether a newly qualifying large shareholder has voting rights. In practice, such laws work much like supermajority requirements.

Unequal voting rights – These provisions limit the voting rights of some shareholders and expand those of others. Under time-phased voting, shareholders who have held the stock for a given period of time are given more votes per share than recent purchasers. Another variety is the substantial-shareholder provision, which limits the voting power of shareholders who have exceeded a certain threshold of ownership.

Limitations on action by written consent – These limitations can take the form of the establishment of majority thresholds beyond the level of state law, the requirement of unanimous consent, or the elimination of the right to take action by written consent.

Appendix B

List and Definition of Variables

G Index: is the corporate governance index. It is the sum of one point for the existence of provisions (see appendix A) that increase managerial power and limit shareholder's rights in the firm. The index ranges from 0-24.

Tobin's Q: is computed as market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long term debt divided by total assets of the firm.

Excess market value: is defined as the market value of equity less book value of equity normalized by total sales

Notional value of foreign currency derivatives: is the contract amount of any foreign currency forward, futures, swap or option made by the firm, it represents the future cash flows under the contract. (obtained from 10-K annual reports)

Foreign exchange derivative dummy: is a dummy variable that takes the value of 1 if the firm hedges its foreign currency exposure and equal zero otherwise.

Total Assets: is defined as current assets plus net property, plant and equipment plus other non current assets of the firm in millions of dollars.

Long-term debt: is defined as Debt obligation due in more than one year from firm's balance sheet (in millions).

Long-term debt/total assets: is the ratio of the firm's long term debt to its total assets.

Return on assets: is defined as the income before depreciation and other extraordinary items divided by total assets.

Return on Equity: is defined as Income before depreciation and other extraordinary items divided by common Equity.

EBIT margin: is defined as operating income after depreciation less cost of goods sold, Selling, General & administrative expenses divided by net sales.

Dividend pay out ratio: is defined as the percentage of the total amount of dividends declared on the common stock divided by income before extraordinary items and discounted operations less preferred dividend requirements.

Institutional ownership: is defined as the percentage of the firm's aggregate number of shares held by institutions to the common shares outstanding.

Foreign sales to Total sales Ratio: The percentage of foreign sales (from all foreign segments of the firm) divided by total sales of the firm.

Regional Foreign sales to Total sales Ratio: The percentage of foreign sales (from the crisis region) divided by total sales of the firm. (obtained from the 10K annual Reports and/or the Directory of American Firms Operating in Foreign Countries)

Number of Countries of Operations: The total number of countries that the firm operates in the crisis region. (obtained from the Directory of American Firms Operating in Foreign Countries)

Except for the Corporate Governance Index, the notional value of derivatives, the hedge dummy, all other variables are obtained from the annual data files of the COMPUSTAT database.

Appendix C

Distribution of S&P 500 firms across the G index and across industries

The appendix shows the number of firms in each industry based on the 2- digit SIC code and in each decile of the corporate governance index (G index). The sample consists of 1422 US. Firm years from the S&P 500 during the years 1993, 1995 and 1998. Appendix C1 shows the distribution of the firms in 1993. Appendix C2 ands C3 shows the distribution in years 1995 and 1998 respectively.

Appendix C1: 1993

2 Digit Sic Code	Title & Description of Industry	G≤5	G=6	G=7	G=8	G=9	G=10	G=11	G=12	G=13	G≥14
13	Oil and Gas Extraction	0	0	4	6	0	0	9	1	2	1
20	Food and Kindered Products	6	0	0	2	3	4	4	0	0	0
24	Lumber and Wood Products, Except Furniture	0	0	0	0	0	0	2	3	0	0
25	Furniture and Fixtures	0	0	0	0	0	2	2	0	0	0
26	Paper and Allied Products	0	0	0	2	0	0	2	2	4	5
27	Printing, Publishing and Allied Industries	0	0	0	2	2	0	0	2	2	0
28	Chemicals and Allied Products	2	4	4	2	9	9	18	8	2	4
29	Petroleum Refining and Related Industries	0	1	0	0	2	0	2	0	0	0
30	Rubber and Miscellaneous Plastic Products	0	3	3	0	6	0	0	1	0	2
33	Primary Metal Products	0	0	0	0	0	2	4	0	0	0
34	Fabricated Metal Products. Except Machinery and Transportation Equipment	0	0	0	0	0	0	9	7	0	0
35	Industrial and Commercial Machinery and Computer Equipment	7	5	3	5	3	9	5	2	2	2
36	Electronics and Other Electronic Equipment	4	4	8	10	4	0	6	3	3	3
37	Transportation Equipment	0	4	0	4	0	0	4	9	0	3
38	Measuring, Analyzing and Controlling Instruments	0	0	4	6	4	4	0	14	2	0
39	Miscellaneous Manufacturing Industries	0	0	0	2	2	0	0	0	3	2
42	Motor Freight Transportation, Warehousing	0	0	0	0	0	0	1	0	0	1
45	Air Transportation	0	0	0	0	2	0	2	0	0	0
48	Communications	0	0	7	0	6	0	6	0	0	0
49	Electric, Gas and Sanitary Services	1	2	1	0	0	0	0	0	0	0
50	Whole Sale Trade- Durable Goods	2	0	0	3	0	0	0	0	0	0
51	Whole Sale Trade – Non Durable Goods	0	1	1	0	0	0	0	0	0	0
55	Automotive Dealers, Gas Service Stations	4	0	0	0	0	1	0	0	1	0
58	Eating and Drinking Places	1	0	0	0	0	0	0	0	1	0
59	Miscellaneous Retail	1	0	0	0	4	0	0	0	0	0
73	Business Services	0	16	0	8	4	3	3	4	4	0
75	Automotive Repair Services and Parking	0	0	0	0	0	1	0	0	0	1
87	Engineering, Accounting	3	0	0	0	0	1	0	0	0	0

Appendix C2: 1995

2 Digit Sic Code	Title & Description of Industry	G≤5	G=6	G=7	G=8	G=9	G=10	G=11	G=12	G=13	G≥14
13	Oil and Gas Extraction	0	4	0	6	0	2	8	1	1	2
20	Food and Kindered Products	7	0	0	3	6	3	0	2	0	0
24	Lumber and Wood Products, Except Furniture	0	0	0	0	0	0	2	3	0	0
25	Furniture and Fixtures	0	0	0	0	0	2	3	0	0	0
26	Paper and Allied Products	0	0	0	3	0	0	3	6	2	2
27	Printing, Publishing and Allied Industries	0	0	0	2	2	0	0	4	2	0
28	Chemicals and Allied Products	0	8	8	4	4	10	15	10	8	6
29	Petroleum Refining and Related Industries	0	2	0	2	2	0	3	0	0	0
30	Rubber and Miscellaneous Plastic Products	0	4	0	2	6	0	0	2	0	2
33	Primary Metal Products	0	0	0	0	0	2	4	0	0	0
34	Fabricated Metal Products. Except Machinery and Transportation Equipment	0	0	0	0	0	0	8	8	0	0
35	Industrial and Commercial Machinery and Computer Equipment	10	8	2	4	2	6	4	2	4	2
36	Electronics and Other Electronic Equipment	0	8	10	4	6	0	8	3	4	4
37	Transportation Equipment	0	4	0	4	4	2	3	2	2	2
38	Measuring, Analyzing and Controlling Instruments	0	0	5	0	10	4	0	9	5	0
39	Miscellaneous Manufacturing Industries	0	0	0	0	3	2	0	2	2	0
42	Motor Freight Transportation, Warehousing	0	0	0	0	0	0	2	0	0	0
45	Air Transportation	0	0	0	0	2	3	0	0	0	0
48	Communications	5	0	0	5	0	5	0	5	0	0
49	Electric, Gas and Sanitary Services	2	1	1	1	1	0	0	0	0	0
50	Whole Sale Trade- Durable Goods	1	0	0	0	0	0	0	0	4	0
51	Whole Sale Trade – Non Durable Goods	0	0	2	0	1	0	0	2	0	2
55	Automotive Dealers, Gas Service Stations	0	0	0	0	0	2	0	0	0	0
58	Eating and Drinking Places	0	3	0	0	0	0	0	2	0	0
59	Miscellaneous Retail	4	0	0	0	3	0	2	0	0	0
73	Business Services	0	9	6	4	6	2	2	2	0	0
75	Automotive Repair Services and Parking	0	0	0	0	0	2	0	0	0	0
87	Engineering, Accounting	2	0	0	0	0	0	0	0	0	0

Appendix C3: 1998

2 Digit Sic Code	Title & Description of Industry	G≤5	G=6	G=7	G=8	G=9	G=10	G=11	G=12	G=13	G≥14
13	Oil and Gas Extraction	2	2	2	6	2	4	4	0	0	2
20	Food and Kindered Products	6	0	0	0	10	0	5	0	0	0
24	Lumber and Wood Products, Except Furniture	0	0	0	0	0	0	0	5	0	0
25	Furniture and Fixtures	0	0	0	0	0	3	2	0	0	0
26	Paper and Allied Products	0	0	0	4	0	0	4	8	0	0
27	Printing, Publishing and Allied Industries	0	0	0	3	3	0	0	2	2	0
28	Chemicals and Allied Products	3	4	3	4	4	14	10	9	10	4
29	Petroleum Refining and Related Industries	0	2	0	2	0	2	3	0	0	0
30	Rubber and Miscellaneous Plastic Products	0	0	0	2	2	2	0	6	0	4
33	Primary Metal Products	0	0	0	0	0	3	4	0	0	0
34	Fabricated Metal Products. Except Machinery and Transportation Equipment	0	0	0	0	0	2	6	4	4	0
35	Industrial and Commercial Machinery and Computer Equipment	6	8	4	6	6	10	1	1	2	2
36	Electronics and Other Electronic Equipment	6	3	10	5	5	6	6	0	3	3
37	Transportation Equipment	0	9	0	0	2	4	0	5	4	5
38	Measuring, Analyzing and Controlling Instruments	0	0	4	4	10	4	0	10	5	4
39	Miscellaneous Manufacturing Industries	0	0	0	0	0	4	0	0	2	3
42	Motor Freight Transportation, Warehousing	0	0	0	0	0	0	2	0	0	0
45	Air Transportation	0	0	0	0	0	3	2	0	0	0
48	Communications	0	4	0	0	4	4	4	0	0	4
49	Electric, Gas and Sanitary Services	3	1	0	1	1	1	0	0	0	0
50	Whole Sale Trade- Durable Goods	0	0	3	0	1	0	0	1	0	1
51	Whole Sale Trade – Non Durable Goods	0	0	0	0	0	0	0	0	1	1
55	Automotive Dealers, Gas Service Stations	4	2	0	0	0	2	0	0	1	0
58	Eating and Drinking Places	0	2	0	1	0	0	0	1	0	0
59	Miscellaneous Retail	4	2	0	2	0	0	3	0	0	0
73	Business Services	11	9	7	0	6	6	5	4	3	0
75	Automotive Repair Services and Parking	0	0	0	0	0	2	0	0	0	0
87	Engineering, Accounting	0	0	0	0	0	1	1	0	0	0