## **Corporate Hedging Behavior: Evidence from Thailand**

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#### Abstract:

Traditional financial economics theory, based on shareholder's wealth maximization, suggests that hedging benefits a firm for three reasons: (1) by reducing expected taxes if the firm's tax schedule is convex, (2) by reducing the cost of financial distress, or (3) by mitigating the *underinvestment* agency problem. Another prominent hedging theory, based on managerial risk aversion, put forward by Smith and Stulz (1985) and Tufano (1996) indicates that managerial risk aversion is the reason a firm hedges. That is, firms with a large proportion of assets held by management tend to hedge. This paper empirically tests both the shareholder's wealth maximization and managerial risk aversion theories by analyzing the hedging behavior of the 83 largest non-financial companies comprising the SET100 Index. The empirical results support the two theories. More specifically, companies hedge in order to reduce the cost of financial distress, to mitigate the underinvestment problem, or as a result of the firm's managers' risk aversion. To date, this is the first study on corporate hedging behavior in Thailand and is the first corporate hedging study to include family management as factor affecting corporate hedging decisions.

Keywords: Risk management, Corporate hedging, Derivatives, Managerial ownership

# I. Overview of Thailand's Capital Markets (i) Thailand's Derivatives Markets

While the use of financial derivative instruments for risk management is extensive in the world's developed markets, it is much less widespread in Thailand. The Chicago Board of Exchange (CBOE), which lists and trades options on equities, indexes and futures, reported the trading volume of 944.5 million options contracts, which accounted for one-third of the industry's 2.8 billion contracts in 2007. The dollar value of all options contracts traded on the CBOE totaled USD 609,419 million. Combined with other exchanges (i.e., AMEX, PHLX, NYSE Arca, ISE, and BOX), the dollar value of all traded options was USD 2,863 million. The Thailand Futures Exchange (TFEX) reported in 2007 the combined trading volume of 2.47 million contracts for futures and options, corresponding to BHT 1,412,637 million, or approximately USD 40,360 million<sup>1</sup>. The Agricultural Futures Exchange of Thailand (AFET) reported in 2007 that 89,966 agricultural commodity futures contracts were traded, corresponding to BHT 29,932.77 million or USD 855.2 million in value. These facts indicate the very early stage of Thailand's derivatives markets.

There are currently a handful of financial derivative instruments available for trade through Thai derivatives exchanges. The TFEX makes available the SET50 Index Futures, SET50 Index Options, three single-stock futures (PTT, PTTEP, and ADVANC), the gold futures, and the ThaiDEX SET50 exchange-traded funds. The first TFEX derivative instrument, the SET50 Index Futures, was launched on April 28, 2006<sup>2</sup>. The AFET makes available agricultural commodity derivatives including rubber, white rice, Hom Mali rice, and tapioca futures contracts. The first AFET futures contract, the Natural Rubber Ribbed Smoked Sheet No. 3 (RSS3), started trading on May 20, 2004<sup>3</sup>.

<sup>&</sup>lt;sup>1</sup> The Stock Exchange of Thailand Factbook 2007

<sup>&</sup>lt;sup>2</sup> Other TFEX derivative contracts were listed subsequently. The SET50 Index Options were launched on October 29, 2007. The three single stock futures (PTT, PTTEP, ADVANC) started trading on November 24, 2008 and the gold futures were listed on February 2, 2009. The ThaiDEX SET50 ETF first traded in September 2007.
<sup>3</sup> Other AFET futures contracts, the White Rice 5% Both Options (BWR5), Hom Mali Rice 100% Grade B Both Options (BHMR), and Tapioca Chip Both Options (TC) first listed in April 2007, July 2008, and July 2009, respectively.

Although fixed-income derivatives such as interest-rate futures and options have been a subject of discussion among Thai regulators, practitioners, and academics, they are currently not in existence. There are only several issues of corporate convertible debentures.

## (ii) Characteristics of the SET100 Companies

The companies comprising the SET100 Index are the top 100 companies in terms of market capitalization, liquidity, and compliance with the Stock Exchange of Thailand's requirements. The top three industries comprising the SET100 Index are the property development (20 companies), energy and utilities (13 companies), and banking (11 companies).

The largest company by asset is Bangkok Bank (BBL), with total assets worth over BHT 1,677 billion or approximately USD 50 billion. The largest non-financial company by asset is PTT Group (PTT), with total assets worth over BHT 885 billion or USD 26 billion. The smallest company by asset is Thai Yuan Metal (TYM), with total assets worth over BHT 1.6 billion or USD 0.05 billion. On the other hand, the largest company by market capitalization is PTT Group (PTT), with total market capitalization of THB 494 billion or approximately USD 14.5 billion. The smallest company by market capitalization is EMC Corporation (EMC), with total market capitalization of THB 0.76 billion or USD 0.02 billion<sup>4</sup>.

Thai companies are generally family-dominated, either by holding posts in the board of directors or by owning a large block of shares<sup>5</sup>. It is not uncommon that a company's executives are related by blood or by marriage. The author finds that 41 out of 83 non-financial companies comprising the SET100 Index are managed and governed by related managers and directors while 23 out of 83 non-financial companies are owned by related block shareholders<sup>6</sup>. Moreover, 34 out of 83 non-financial companies distribute employee stock option program (ESOP) warrants to its management and employees as a form of compensation. This strengthens managerial ownership in these companies.

<sup>&</sup>lt;sup>4</sup> 2008 figures

<sup>&</sup>lt;sup>5</sup> A block shareholder or a blockholder is an individual or a group of related individuals owning 25 percent or more of the company's stock.

<sup>&</sup>lt;sup>6</sup> The author defines relatedness as the use of the same last name among two or more individuals. This is rather a conservative measure as managers and/or directors may be related through marriage without sharing the same last name.

Companies listed on the Stock Exchange of Thailand are required by law to comply with the Thai Accounting Standards. Most, if not all, Thai Accounting Standards correspond to the International Financial Reporting Standards (IFRS). Under the Thai Accounting Standard No. 48 (TAS 48) "Financial Instruments: Disclosure and Presentations", companies must describe the financial risks arising from their use of financial instruments and how the risks are managed in the notes to financial statements. Moreover, all types of financial instruments must be recorded at fair value.

# (iii) Types of Risks Faced by the SET100 Non-Financial Companies and the Usage of Derivative Instruments

The 83 SET100 non-financial companies are exposed to mainly six types of risks, namely interest-rate risk, foreign-exchange risk, commodity-price risk, credit risk, liquidity risk, and capital risk. Three types of risks—interest-rate risk, foreign-exchange risk, and commodity-price risk—are hedged by using financial derivative instruments. The remaining types of risk—credit risk, liquidity risk, and capital risk—are managed using preventative measures such as careful assessment and monitoring.

Interest-rate risk is the variability of a firm value associated with the change in interest rate. All 83 non-financial companies declare interest rate exposure. However, only 29 out of 83 companies use interest-rate derivative instruments to hedge such exposure. Interest-rate derivatives most frequently used by the companies are interest rate swaps, interest rate caps, and cross-currency interest rate swaps. More sophisticated derivative instruments are also used by a few companies for interest-rate hedging. These instruments include structured products such as government bond linked asset swaps and target redemption swaps. Those companies that do not use interest-rate derivatives manage their exposure by balancing the amount of fixed and floating debt or by refinancing their fixed-rate borrowing with a floating-rate borrowing. Some non-hedgers state non-existence of domestic market for interest-rate derivatives as a reason for not using such securities for hedging.

Foreign-exchange risk is the variability of a firm value due to a change in currency exchange rates. All but a few companies declare foreign exchange exposure. 53 out of 83 companies SET100 non-financial companies use currency derivatives to hedge. The currency

derivative instruments most frequently used are currency forwards, currency swaps, and crosscurrency interest rate swaps. Only a few companies use currency options. Among the currency derivatives non-users, some utilize foreign currency denominated debt to manage foreign exchange exposure, others reason that they do not hedge foreign-exchange risk because their operations and transactions are not denominated in foreign currencies.

Commodity-price risk is the variability of a firm value due to a change in certain commodity prices. 8 out of 83 SET100 non-financial companies use commodity derivatives to manage commodity-price exposure. Commodity derivatives most frequently used by the companies are commodity forwards and commodity swaps. Despite the availability of agricultural commodity futures in the Agricultural Futures Exchange of Thailand (AFET), none of the companies in the agribusiness hedges using such futures contracts. Moreover, none of the companies uses the SET50 Index futures and options made available by the Thailand Futures Exchange (TFEX) for hedging purposes. ESSO, a non-hedger, reasons that because of its large size and the long-term nature of its business, the company expects that the risk from fluctuations of market prices for crude oil, petroleum and petrochemical products will be moderated in the long run.

Credit risk is the risk in the event of default by a company's counterparty. All SET100 non-financial companies manage credit risk through precautionary measures such as carefully assessing the credit worthiness of customers, defining credit limits, asking for bank guarantees and/or personnel guarantees, credit terms, controlling credit utilization and reviewing collections.

Liquidity risk arises when a company does not possess sufficient liquid assets such as cash and cash equivalents for normal operating and financing activities of the company. Some of the SET100 companies manage their liquidity risk by maintaining an adequate level of cash and marketable securities in order to finance their operations and mitigate the effects of cash flow fluctuations. Others optimize the mix in their borrowing facilities to maintain financial flexibility while minimizing financing costs.

Capital risk is the risk associated with a company's ability to continue as a going concern in order to provide the maximum profits and benefits to shareholders. All SET100 non-financial companies manage capital risk through sound dividend policy, Most SET100 companies state that they plan ahead and adjust the amount of dividend paid to shareholders annually in order to maintain an appropriate capital structure. A large number of companies does not use financial derivatives to hedge; instead they use on balance sheet instruments such as warrants, Employee Stock Option Program (ESOP) warrants, convertible debentures, and preferred stocks as alternative means of hedging. A few companies issue convertible bonds.

The property development industry, comprising the largest portion of the SET100 Index, has the lowest percentage of hedgers (25 percent). The majority of companies either manages risks using on balance sheet measures or does not hedge entirely.

#### II. Literature Review

Traditional financial economics theory based on shareholder's wealth maximization suggests that hedging benefits a company for three reasons: (1) by reducing expected taxes, (2) by reducing the cost of financial distress, or (3) by mitigating the *underinvestment* agency problem. Although empirical evidence of these theories illustrates mixed results, two theories—that hedging is carried out to reduce the costs of financial distress and that it helps mitigate the underinvestment problem—seem to have received most empirical support<sup>7</sup>.

The reduction in expected taxes hypothesis states that hedging reduces expected taxes if a company's effective tax schedule is progressive (convex)<sup>8</sup> and the more progressive the tax schedule, the more benefit a company gains from hedging. However, this research will disregard taxes as a determinant for corporate hedging because the tax schedule for Thai companies is not progressive<sup>9</sup>.

The reduction in financial distress costs hypothesis reasons that, because the probability that a company will default is directly related to the size of its debt liabilities, as debt liabilities increase, the probability of the company going bankrupt is higher. Thus, in order to reduce the probability of going bankrupt, companies with high debt should hedge because hedging decreases the variability of the their cash flows. As a result, hedgers normally are companies with large proportion of debt in their capital structure.

<sup>&</sup>lt;sup>7</sup> See Knopf, Nam, and Thornton, Jr. (2002).

<sup>&</sup>lt;sup>8</sup> See Mayers and Smith (1982) and Smith and Stulz (1985).

<sup>&</sup>lt;sup>9</sup> Corporate taxes in Thailand are fixed at 30 percent.

Underinvestment is an agency problem described by Myers (1977) as the situation in which shareholders have an incentive to give up projects with positive NPV. Such underinvestment problem is more pronounced in companies with large amount of debt. As a highly leveraged company take on more risky projects, the company's probability of default increases. When the company defaults, debtholders will have the first claim on the company's assets while shareholders are entitled to the residual firm value. Therefore, shareholders of high debt company are likely to forego positive NPV projects if the benefit accrues mainly to the debtholders. The mitigation of underinvestment agency problem states that companies with more growth options in their investment opportunity set are more likely to undertake a hedging program in order to reduce the variability of its cash flows<sup>10</sup>.

Alternatives means of hedging also affect the company's decisions to hedge. Convertible debt helps reduce agency problem by aligning the interests of shareholders and debtholders. Convertible debt gives the debtholders the option to convert their debt claim into equity and thereby making the debtholders' wealth more sensitive to variability in firm value. Therefore, convertible debt helps reduce the conflict of interests between the debtholders and shareholders. On the other hand, preferred stock, unlike straight debt, can reduce the probability of a company going bankrupt in that the company can pause the distribution of dividend without having to file for bankruptcy. Other than convertible debt and preferred stock, a company can keep a large portion of current assets or pay out small value of dividend in order to maintain liquidity. These hedging alternatives help mitigate the agency problem and reduce the costs of financial distress. Thus, if hedging purposes. Therefore, companies issuing convertible debt or preferred stock or maintaining a large portion of current assets are less likely to use derivatives for hedging.

On another note, hedging theory based on managerial risk aversion seems to gain significant support following the studies by Tufano (1996). Managers typically invest a large portion of their wealth in the company. Consequently, managers have more incentive than unaffiliated and diversified shareholders to reduce the company's risk by hedging. Therefore, companies with higher management ownership are more likely to hedge.

<sup>&</sup>lt;sup>10</sup> See Nance, Smith, and Smithson (1993).

#### III. Data

Hedging information is hand collected from the financial footnotes of the 83 SET100 non-financial companies. A firm is considered a hedger if it uses one or more types of financial derivatives to hedge its exposure. Dummy variable is used to represent hedging. That is, a firm is assigned the value "1" if it hedges by using derivative instruments and "0" otherwise. Other variables are obtained from the companies' financial statements supplemented by information from SETSMART database and the Stock Exchange of Thailand website.

The author chooses not to collect data from survey for there has been evidence that surveys normally lead to two biases: (1) non-response bias, and (2) reliability of information bias. Many of the previous studies on corporate hedging, such as Block and Ballagher (1986), Nance, Smith, and Smithson (1993), Jalilvand (1999), Haushalter (2000) and Bodnar, Jon and Macrae (2003), used survey data in conducting hedging behavior tests. All of them faced non-response bias. That is, approximately 30 percents of the companies surveyed returned a completed questionnaire and the majority of the respondents were hedgers. On another note, answers to hedging surveys are usually answered by the firm's CEO, CFO, or treasurer. Therefore, the answers will reflect their perception of the firm's risk management activities. In most cases, there is no way to verify the reliability of the information provided by the survey. That being said, survey data contain significant sampling and informational biases.

# IV. Research Methodology (i) Variables

The **dependent variable** is corporate hedging which takes on binary values. The corporate hedging dummy takes the value "1" for companies which manage risk as demonstrated in their use of derivative instruments for hedging. For those companies which do not use derivative securities to hedge, the corporate hedging dummy variable takes the value "0." Hedgers are further categorized into interest-rate hedgers, foreign-exchange hedgers, commodity-price hedgers and overall hedgers (which hedge all three types of risk).

The **independent variables** are company characteristics indicated as having effects on the company's decision to hedge according to both the shareholder's wealth maximization and managerial risk aversion hedging theories. Such company characteristics are categorized as follows:

#### 1. Managerial Ownership

Three variables are constructed to reflect managerial ownership. These variables are family management, family ownership, and ESOP warrants/share.

*Family management* is a continuous variable with values ranging from 0 to 1. It is calculated by dividing the number of related individuals holding posts in the board of directors by the total number of positions in the board of directors. Relatedness is determined by two or more individuals sharing the same last name.

*Family ownership* is a dummy variable taking on the value "1" if the company has an individual blockholder or a group of related blockholders and "0" if otherwise. Blockholders are shareholders who own 25 percent or more of the company's stock. Likewise, relatedness is determined by two or more individuals sharing the same last name.

*ESOP warrants/share* is a continuous variable constructed by dividing the total number of warrants issued to employees of the company by the company's total number of shares outstanding.

## 2. Growth

Growth is measured by two variables, namely the market-to-book ratio and the dividend payout ratio.

*Market-to-book* is the ratio of the company's market value to its book value. Companies with high market-to-book ratio have more growth options in its investment opportunity set.

*Dividend payout* is the ratio of the company's dividend to its net income. Companies distributing lower amount of income as dividend to shareholders have higher growth potential.

#### 3. Leverage

Leverage is measured by four variables. These variables include interest coverage ratio, debt-to-equity ratio, debt-to-asset ratio, and debt-to-firm-value ratio.

*Interest coverage* is the ratio of the company earnings before interest and taxes (EBIT) to its interest expense. The higher the value of interest coverage, the lower leverage a company has.

*Debt-to-equity* is the ratio of the company's book value of debt to its book value of equity. The higher the ratio, the more leveraged is the company.

*Debt-to-asset* is the ratio of the company's book value of debt to its book value of total assets. The higher the ratio, the more leveraged is the company.

*Debt-to-firm-value* is the ratio of the company's book value of debt to its firm value. Firm value is the sum of the company's total market capitalization and its book value of debt. The higher the ratio, the more leveraged is the company.

#### 4. Liquidity

Liquidity is measured by two variables which are liquidity ratio and long-term-debt-todebt-value ratio.

*Liquidity ratio* is the ratio of the company's current assets to its current liabilities. The higher the ratio, the more liquid the company is.

*Long-term-debt-to-debt-value* is the proportion of the company's long-term debt to its total debt value. The higher the ratio, the less liquid the company is.

### 5. Alternatives to hedging

Instead of using derivatives for hedging, companies may hedge buy using on-balancesheet instruments such as convertible debt, preferred stock, warrants, or distributing lower dividend to shareholders. Variables representing the hedging alternatives are:

*Convertible debt/value* is the ratio of the company's book value of convertible debt to its value. The company's value is the sum of the company's total market capitalization and its book value of debt

*Preferred stock/value* is the ratio of the company's book value of preferred stock to its value.

*Warrants/share* is the ratio of the company's number of warrants to its total number of shares outstanding.

Dividend yield is the ratio of the company's dividend per share to its price per share.

#### (ii) Univariate Analysis

In univariate analysis, companies are categorized into overall hedgers and overall nonhedgers. The mean value of each characteristic is calculated and compared for hedgers and nonhedgers. The t-statistic and p-value are reported for significance of the difference between the means.

## (iii) Logistic (LOGIT) Regression Analysis

The logistic (LOGIT) regression analysis is carried out in which the dependent variable is the corporate hedging dummy variable and the independent variables are company characteristics affecting corporate hedging. According to the risk categorization mentioned earlier, there will be four LOGIT regression equations in this study whose dependent variables are overall hedgers, interest-rate hedgers, foreign-exchange hedgers, and commodity-price hedgers, respectively.

## V. Empirical Evidence

In testing corporate hedging theories, the author excludes financial companies because these companies regularly use derivative instruments for both hedging and speculative trading purposes. Moreover, the expected taxes hypothesis is not tested as it is inapplicable to Thai companies due to the non-progressive nature of Thai corporate taxes. Through the investigation of the 83 non-financial companies' 2007-2008 annual reports and footnotes, hedgers are identified by their use of derivative instruments for hedging. Three types of market risks, namely interest-rate risk, foreign-exchange risk, and commodity-price risk, are hedged by the companies using derivative instruments.

Out of 83 companies, 55 companies are hedgers, using one or more types of derivative instruments to hedge financial risks. 29 companies are identified as interest rate hedgers, 53 companies are foreign exchange hedgers, and 8 companies are commodity hedgers. Table I

provides the number of hedgers and non-hedgers by industry and type of risk being hedged. Table II reports percentages of hedgers and non-hedgers in percentages by industry.

Consistent with both the shareholder's wealth maximization and managerial risk aversion hedging theories, companies with higher leverage, more growth options, lower liquidity, and higher managerial ownership are more likely to hedge. Table III presents the mean values and comparison of the mean values between overall hedgers and overall non-hedgers. Table IV illustrates the mean values and comparison of the mean values between interest-rate hedgers and interest-rate non-hedgers. Table V reports the mean values and comparison of the mean values between foreign-exchange hedgers and foreign-exchange non-hedgers. Lastly, Table V reports the mean values and comparison of the mean values between commodity-price hedgers and commodity-price non-hedgers.

It is worth noting that companies having family members in its management are more likely to hedge than those having family members as blockholders.

			No. o			
Industry	No. of	No. of		Foreign	Commodity	No. of Non-
	Companies	Hedgers	Interest-rate	Exchange	Price	hedger
Agribusiness	2	2	1	2	0	0
Food and Beverages	4	4	2	4	0	0
Automotive	2	2	0	2	0	0
Industrial Materials &	3	2	1	2	0	1
Machinery						
Packaging	1	1	1	1	0	0
Petrochemicals &	2	2	1	2	0	0
Chemicals						
Construction Materials	7	6	1	6	0	1
Property Development	20	5	2	4	0	20
Energy & Utilities	13	11	9	11	6	2
Commerce	6	3	0	3	0	3
Health Care Services	3	2	1	1	0	1
Media & Publishing	3	1	0	1	0	2
Tourism & Leisure	1	0	0	0	0	1
Transportation &	6	4	4	4	2	2
Logistics						
Electronic	3	3	2	3	0	0
Components						
Information &	7	7	4	7	0	0
Communication						

 Table I

 Hedging by Industry

 Number of hedgers and non-hedger among 83 SET100 non-financial companies in 2008

Technology						
Total	83	55	29	53	8	28

# Table II Hedging by Industry Percentage of hedgers and non-hedger among 83 SET100 non-financial companies in 2008

			Percentage by Types of Hedgers			
	No. of	Percentage		Foreign	Commodity	Percentage of
Industry	Companies	of Hedgers	Interest-rate	Exchange	Price	Non-hedger
Agribusiness	2	100	50	100	0	0
Food and Beverages	4	100	50	100	0	0
Automotive	2	100	0	100	0	0
Industrial Materials &						
Machinery	3	67	33	67	0	33
Packaging	1	100	100	100	0	0
Petrochemicals &						
Chemicals	2	100	50	100	0	0
Construction						
Materials	7	86	14	86	0	24
Property Development	20	25	10	20	0	75
Energy & Utilities	13	85	69	85	46	15
Commerce	6	50	0	50	0	50
Health Care Services	3	67	33	33	0	33
Media & Publishing	3	33	0	33	0	67
Tourism & Leisure	1	0	0	0	0	100
Transportation &						
Logistics	6	67	67	67	33	33
Electronic						
Components	3	100	67	100	0	0
Information &						
Communication						
Technology	7	100	57	100	0	0

 Table III

 Differences between Overall Hedgers and Non-hedgers

 A comparison of the mean values for 83 SET100 non-financial companies in 2008

<b>Overall Hedgers</b>						
	Hypothesized	Hypothesized Means		Differences in Means		
Variable	Relation between Hedgers & Non- hedgers	Hedgers	Non- Hedgers	H-NH	t-Statistic	
Number of companies		55	28			
Managerial ownership variables						

Family management <sup>11</sup>	H > NH	0.137	0.119	0.018	0.517
Family ownership <sup>12</sup>	H > NH	0.636	0.786	-0.149	-1.386
ESOP warrants/share	H > NH	0.008	0.003	0.005	1.480
Growth					
Market to book (Growth)	H > NH	620.825	485.837	134.988	0.919
Dividend payout ratio (%)	H < NH	41.231	46.653	-5.422	-0.656
Leverage					
Interest coverage (EBIT/Interest)	H < NH	28.268	21.087	7.181	0.340
Debt-to-equity ratio	H > NH	1.585	1.091	0.492	0.942
Debt-to-asset ratio	H > NH	0.491	0.474	0.018	0.456
Debt-to-firm value ratio	H > NH	0.002	0.002	.0005	0.801
Liquidity					
Liquidity ratio (CA/CL)	H < NH	2.228	1.744	0.483	0.805
Long-term debt/debt value	H > NH	0.594	0.400	0.194	2.884
Alternatives to hedging					
Convertible debt/value	H < NH	0.031	0.121	-0.090	-1.511
Preferred stock/value	H < NH	0.016	0.000	0.016	0.785
Warrants/share	H < NH	0.028	0.033	-0.005	-0.282
Dividend yield (%)	H < NH	7.859	8.818	-0.959	-0.623

## Table IV Differences between Interest-Rate Hedgers and Non-hedgers

A comparison of the mean values for 83 SET100 non-financial companies in 2008

Interest-Rate Hedgers					
	Hedgers	Non-Hedgers			
Number of companies	29	54			
Family firm variables					
Family management	0.098	0.148			
Family ownership	0.333	0.571			
ESOP warrants/share	0.010	0.004			
Growth					
Market to book (Growth)	473.481	629.960			
Dividend payout Ratio (%)	43.457	42.847			
Leverage					
Interest coverage (EBIT/Interest)	30.416	23.391			
Debt-to-equity ratio	1.997	1.107			

 <sup>&</sup>lt;sup>11</sup> Family management is the ratio of the number of related individuals (having the same last name) who are board member to total number of board positions
 <sup>12</sup> Family ownership is a dummy variable that equals to 1 if an individual or a group of related individuals owns 25%

or more of the firm's outstanding shares.

Debt-to-asset ratio	0.523	0.465
Debt-to-firm value ratio	0.003	0.002
Liquidity		
Liquidity ratio (CA/CL)	1.616	2.305
Long-term debt/debt value	0.698	0.437
Alternatives to hedging		
Convertible debt/value	0.045	0.070
Preferred stock/value	0.028	0.001
Warrants/share	0.008	0.042
Dividend yield (%)	9.914	9.351

 Table V

 Differences between Foreign-Exchange Hedgers and Non-hedgers

	0	0	0	0
A comparison of the mean	values for 83	SET100 not	n-financial	companies in 2008

Foreign-Exchange Hedgers				
	Hedgers	Non-Hedgers		
Number of companies	53	30		
Family firm variables				
Family management	0.131	0.130		
Family ownership	0.394	0.625		
ESOP warrants/share	0.008	0.003		
Growth				
Market to book (Growth)	616.036	503.297		
Dividend payout Ratio (%)	41.551	45.727		
Leverage				
Interest coverage (EBIT/Interest)	29.175	19.963		
Debt-to-equity ratio	1.585	1.124		
Debt-to-asset ratio	0.487	0.482		
Debt-to-firm value ratio	0.002	0.002		
Liquidity				
Liquidity ratio (CA/CL)	2.289	1.668		
Long-term debt/debt value	0.585	0.428		
Alternatives to hedging				
Convertible debt/value	0.028	0.119		
Preferred stock/value	0.017	0.000		
Warrants/share	0.029	0.031		
Dividend yield (%)	9.492	9.692		

# Table VI **Differences between Commodity-Price Hedgers and Non-hedgers** A comparison of the mean values for 83 SET100 non-financial companies in 2008

Commodity Price Hedgers					
	Hedgers	Non-Hedgers			
Number of companies	8	75			
Family firm variables					
Family management	0.064	0.138			
Family ownership	0.000	0.535			
ESOP warrants/share	0.014	0.005			
Growth					
Market to book (Growth)	360.547	598.192			
Dividend payout Ratio (%)	48.180	42.514			
Leverage					
Interest coverage (EBIT/Interest)	2.159	28.372			
Debt-to-equity ratio	1.510	1.408			
Debt-to-asset ratio	0.534	0.480			
Debt-to-firm value ratio	0.003	0.002			
Liquidity					
Liquidity ratio (CA/CL)	1.480	2.127			
Long-term debt/debt value	0.705	0.510			
Alternatives to hedging					
Convertible debt/value	0.040	0.063			
Preferred stock/value	0.000	0.012			
Warrants/share	0.000	0.033			
Dividend yield (%)	10.563	9.438			

#### **VI. References**

Borokhovich, Kenneth, Brunarski, Kelly, Crutchley, Claire, and Simkins, Betty, 2004, Board Composition and Corporate Use of Interest Rate Derivatives, *Journal of Financial Research*, Vol. 27, Iss. 2, 199-216.

Dionne, Georges and Triki, Thouraya, 2004, On Risk Management Determinants: What Really Matters?, Working Paper 04-04, Canada Research Chair in Risk Management and HEC Montreal.

Dionne, Georges and Triki, Thouraya, 2005, Risk Management and Corporate Governance: The Importance of Independence and Financial Knowledge for the Board and the Audit Committee, Working Paper 05-03, Canada Research Chair in Risk Management and HEC Montreal.

Knopf, John D., Nam, Jouahn, and Thornton John H., Jr., 2002, The Volatility and Price Sensitivities of Managerial Stock Option Portfolios and Corporate Hedging, *Journal of Finance*, Vol. 57, No. 2, 801-813.

Lel, Ugur, Currency Hedging and Corporate Governance: A Cross-Country Analysis (January 21, 2009), FEDS Discussion Paper No. 858; Indiana University Working Paper.

Marsden, Alastair and Prevost, Andrew, 2005, Derivatives Use, Corporate Governance, and Legislative Change: An Empirical Analysis on New Zealand Listed Companies, *Journal of Business Finance and Accounting*, Vol. 32, Iss. 1, 255-295.

Mian, Shehzad L., 1996, Evidence on Corporate Hedging Policy, *Journal of Financial and Quantitative Analysis*, Vol. 31, No. 3, 419-439.

Myers, Stewart, and Majluf, Nicholas, 1984, Corporate Financing and Investment Decisions when Companies Have Information that Investors Do Not Have, *Journal of Financial Economics*, 3 (1984), 187-221.

Nance, Deana R., Smith, Clifford W., Jr., and Smithson, Charles W., 1993, On the Determinants of Corporate Hedging, *Journal of Finance*, Vol. 48, No. 1, 267-284.

Schmid, Thomas, Ampenberger, Markus, Kaserer, Christoph, and Achleitner Ann-Kristin, 2008, Family Firms, Agency Costs, Risk Aversion – Empirical Evidence from Diversification and Hedging Decisions, Center for Entrepreneurial and Financial Studies, Technische Universitat Munchen Working Paper.

Spano, Marcello, 2007, Managerial Ownership and Corporate Hedging, *Journal of Business Finance and Accounting*, 34(7) & (8), 1245-1280.

Stulz, Rene M., 1996, Rethinking Risk Management, *Journal of Applied Corporate Finance*, Vol. 9, No. 3, 8-24.

Triki, Thouraya, Research on Corporate Hedging Theories: A Critical Review of the Evidence to Date, Canada Research Chair in Risk Management and HEC Montreal.