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CORPORATE GOVERNANCE AND FIRM DIVERSIFICATION:
EVIDENCE FROM THAILAND

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การศึกษาฉบับนี้ได้มีวัตถุประสงค์เพื่อทดสอบความสัมพันธ์ระหว่างบรรษัทภิบาลและการ
กระจายการลงทุนตามทฤษฎีความขัดแย้งทางผลประโยชน์ของตัวแทน ในประเทศไทยตั้งแต่ปี พ.ศ.
2543-2550 การศึกษาครั้งนี้ใช้ดัชนีบรรษัทภิบาล ซึ่งครอบคลุมคุณสมบัติของบรรษัทภิบาลไว้อย่าง
ครบถ้วน ด้านการกระจายการลงทุนของบริษัทได้วัดออกมาในสองแง่ ได้แก่ ระดับและมูลค่าการ
ลงทุน สำหรับการวัดระดับการลงทุนได้ใช้ดัชนีเฮอฟินดาล และ จำนวนธุรกิจที่ลงทุนตามรายงาน
ของบริษัท มูลค่าการลงทุนนั้นวัดโดยมูลค่าส่วนเกินจากการกระจายการลงทุนการศึกษาบรรษัทภิ
บาลร่วมกับพฤติกรรมการลงทุนและผลการศึกษาพบว่าบรรษัทภิบาลส่งผลต่อการตัดสินใจลงทุน
ทำให้วิทยานิพนธ์ฉบับนี้สนับสนุนทฤษฎีการขัดแย้งทางผลประโยชน์ของตัวแทนที่มีต่อการตัดสินใจ
กระจายการลงทุนเท่านั้น แต่ไม่มีผลต่อมูลค่าของบริษัท นอกเหนือจากผลประโยชน์ทางวิชาการ
วิทยานิพนธ์ฉบับนี้ยังสามารถส่งสัญญาณเตือนให้แก่ผู้ที่มีส่วนได้เสียในบริษัทให้ระวังและสอดส่อง
พฤติกรรมการลงทุนของผู้จัดการ และ/หรือผู้บริหารในการลงทุนเพราะจะส่งผลต่อมูลค่าบริษัทและ
ฐานะของผู้ที่มีส่วนได้เสีย เพื่อเพิ่มระดับบรรษัทภิบาลในบริษัท/ประเทศไทย

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TANATIP POONSIN: COPORATE GOVERNANCE AND FIRM DIVERSIFICATION: EVIDENCE FROM THAILAND. THESIS ADVISOR: ASSOC. PROF. SUNTI TIRAPAT, Ph.D., 52 pp.

The primary objective of this paper is to investigate relationship between corporate governance and firm diversification based on agency theory. Samples are listed companies in Thailand during 2000 to 2007. I apply corporate governance index covered all issues related to corporate. Next are degree and value of diversification. The first one is measured by Herfindahl Index and number of reported segments while the latter is from Excess Value. Excess Value stems from firm excess value as a result from diversification. For corporate governance and decision to diversify, it identifies that corporate governance is responsible for decision to diversify bringing about a confirmation of agency but not affect value of diversification. Aside from academic benefits, this paper sends a signal for stakeholders/ monitors about severity of agency problem in corporate/Thailand to pay more attention in monitoring and controlling the firm in order to reduce agency problem and increase corporate governance in those firms/Thailand.

Department : ___Banking and Finance___   Student's Signature : _____

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CHAPTER I

INTRODUCTION

Background of the Study

Corporate diversification is now become an interesting issue for strategic management for practitioners and academic researchers since there are several roots and outcomes from it since it was first introduced by Schall (1972). Concerning firm diversification, there are questions raised about two main issues: value destruction and causes of value discount. Beginning with value of diversification, many empirical studies have verified that multi-segment firms have been discounted value compared to single-segment firms as a benchmark due to limitation to measure value of corporate diversification directly, for example, Berger and Ofek (1995) and Lang and Stulz (1994). On the contrary, there are disagreements especially from recent empirical studies such as Villalonga (2004). The author argues that the previous studies are deviated by disaggregated financial data from COMPUSTAT and ignorance in business units. Subsequently, causes of value destruction has been under consideration as diversification might not destroy firm value itself but affected by some other factors. For instance, acquisition already discounted firms, capital misallocation and information asymmetry. Recent papers tend to pay more attention on relationship between corporate governance and firm diversification to explain motivation to diversify and a decrease in value by agency theory. Agency theory informs that firms diversify because managers, who act in their self-interests, tend to invest beyond the optimal level for private benefits at the cost of shareholders. Most of the papers in the literature on this topic concentrate on the internal governance mechanism such as board composition and insider ownership.[1] To achieve better outcomes, some authors replace corporate governance index constructed by different basis.[2]

Statement of Problem

Concerning a case of Thailand after a crash from financial crisis in 1997 or Tom Yam Kung crisis, it has been obviously revealed a weak in corporate governance in Thai capital market and companies. Since then, corporate governance has become a widely discussed topic. It was obviously shown that weak corporate governance practices could have intensified the severity of the problems. At the time, most of poor governance companies were family-owned. This was a reason for a lack of discipline in financial behavior such as borrowing and investing. Asymmetric information also exists in the market as other developing markets between shareholders and managers because of an imperfect monitoring and hierarchy

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[1] To illustrate, Anderson and Lemmon (2000) investigate relationship between governance mechanisms such as CEO pay-for-performance sensitivity and CEO ownership associated with diversification decisions and find that diversified companies get similar to that in single-segment firms while Daniel et al (2004) employ disclosure quality as governance proxy tested against value of diversification and get the mixed result.

[2] One of the widely used indexes is GIM which measures the effectiveness of market for corporate control firstly introduced by Gompers, Ishii, and Metrick (2003).

ownership structure leading to an agency problem which is costly to shareholders. Developing capital markets are often incapable of acting as an effective monitor and disciplining company managers. Consequently, managers tend to act response for their private benefits. Financing by internal through diversification is such a good instance especially when there is high level of agency problem. A linkage between diversification and managers' benefits, if it exists in the study in Thailand, will frustrate stakeholders' interest and destroy firms' value which is not desirable for everyone in those companies. In order to prove the linkage among diversification and corporate governance, we do need empirical studies which my paper can contribute for this issue.

Objectives of the Study

There are two objectives in my study to test diversification on corporate governance. My first objective is to observe an existence of a relationship between corporate governance and managers' decision to diversify. Corporate governance mechanism would assist us to find out any existence of agency problem as a motive of diversification. My second objective is to highlight a relationship among corporate governance and firm value.

Scope of the Study

Observations are Thai listed companies on SET during 2000-2007 excluding financial industry, non-performing sector and funds.[3] I focus on Thailand because there are a small amount of the published papers regarding relationship between corporate governance and decision to diversify available for Thailand unlike developed countries to imply whether Thai firms are obviously confronting with severe agency problem or not. An extending of time period for the sample from 2000-2007 would come up with more reliable conclusion.

Contribution

My paper contributes the empirical studies in diversification and corporate governance. First of all, the existing works apply some fractions of corporate governance mechanism to represent overall corporate governance characters. This is absolutely easy but not appropriate. That is because such a fact that corporate governance consists of various components and those components must be combined together to capture the actual governance of each firms while my work constructs corporate governance index covered all corporate governance issues. Next, there is a lack of case studies in Thailand to answer questions about corporate diversification in and corporate governance; therefore, my paper will evidence a relationship among them in Thailand.

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[3] Based on literature works of several paper, for instance, Sheng, and Ho (2000), Anderson and Lemmon (2000), Berger and Ofek (1995) and Kamphaeng (2000) who exclude financial sector.

Methodology in Brief

To fulfill the gap from previous studies of corporate governance in Thailand, I construct corporate governance index based upon Ananchotikul (2006) by collecting all factors related to governance issue that is better qualified to capture governance than previously for listed companies on SET based upon regulation and guidance of Securities and Exchange Commission (SEC), and Stock Exchange of Thailand (SET). There are five main categories - Structure, Conflict of Interest, Board Responsibilities, Shareholder Rights, and Disclosure and Transparency -giving weight differently for a substantive result. Higher score implies lower agency problem. The index could use in further test in sub-categories against level of diversification to see what factor is the most influence to decision to diversify.The latter dimension in this paper is diversification in both value and level of diversification to investigate that value destruction hold in Thailand or not following by decision to diversify. For value, it is replaced by Berger and Ofek's excess value meanwhile Herfindahl index (HERF) and number of reported segments are for level of diversification. Lower excess value obviously expounds lower value from diversification and higher HERF close to 1 tells us that firm is operating in a few line of business. More explanatory variables beyond corporate governance components and overall rating are added to manifest their signification in the regression. In case that I find a significant relationship between diversification and governance, it implies agency problem is a reason of diversification. As a result, stakeholders should pay more attention on managers' behaviors in diversification and realize what the fact is behind managers' decision to diversify.

Organization of the Study

Each chapter has been organized as follows. The Chapter 2 is Literature Review which will be beneficial to learn about diversification from prior empirical studies together with relationship between corporate governance and firm diversification. Chapter 3 is Sample and Data Description to describe data's statistical information and my developed hypotheses. Methodology is obtained in Chapter 4 to answer how to measure corporate governance diversification in term of value and level, how to construct corporate governance index and regression analysis. Chapter 5 is Empirical Evidences. The last chapter is left for Conclusion.

CHAPTER II

LITERATURE REVIEWS

Firm Diversification

Diversification is an investment of individual corporate aside from their main business meaning that firms invest in more than one single line of business, called industrial diversification which is an issue in this paper. In a world of perfect capital markets, investors can fully diversify their own portfolios; hence, firms' diversification strategies are value neutral. This is the idea of Schall (1972) who first introduces diversification. Since then, the world of finance has discussed about the most heated debate of corporate diversification is whether corporate diversification enhances or destroys value.

Initially, researchers encourage diversification by indicating its advantages .To give examples; Chander (1977) cites greater operating efficiency by enhancing economies of scope and increasing managerial coordination. Lewellen (1971) argues that diversified firms have greater debt capacity than do single-segment firms which implies a larger debt tax shield and higher firm value. Furthermore, Majd and Myers (1987) conclude that diversification may further lower taxes by allowing the firm to offset immediately net operating losses generated by a particular segment against the profits of the remaining segments. Weston (1970) and Stein (1997) come up with the same summation that diversification may allow the firm to develop a set of efficient internal capital markets that can be used to mitigate potential underinvestment.

In contrast, several academic studies provide evidence on the destructive effect on firm value as a result from corporate diversification. For example, Comment and Jarrell (1995) proxy excess value by abnormal stock returns and find negative relationship among firm value and diversification. Lang and Stulz (1994) and Berger and Ofek (1995) , the two well-known articles, demonstrate that relative to a benchmark portfolio of single-segment firms, the typical diversified firm trades at a discount even though they had employed not the same methodology and sample periods. So, information asymmetry costs associated with diversification appear to exceed the tax and internal capital market benefits.

More recently, the debate has been advanced. New evidence presents that diversification may provide benefits or, at least, not value-destroying in the study of Villalonga (2004), Whited (2001), Campa and Kedia (2002), Mansi and Reeb (2002) and some others. Whited (2001) explains further that the difference between the former conclusions and recent might stem from miscalculations of Tobin's q leading to value destruction. Agency theory cannot describe a decision to diversify but it would diversify when the industry firm operates in faced negative demand shock according to Yang (2005).

Other researches try to answer why diversification could destroy firm value. Acquisition of already discounted subsidiaries is a reason from Myer, Milgrom and Roberts (1992). Stulz (1990) supported that diversified firms invest in poor business line. All of the rest causes of value destruction are to increase managerial private

benefits rather than shareholders' benefits such as to reduce undiversified employment risk regarding Amihud and Lev (1981).

Corporate Governance and Firm Diversification

Even if there are five possible perspectives to explain motivation to diversify further –market power perspective, strategic contingencies theory, resource-based view, other benefits such as economies scope and internal capital market , and last but not least, agency theory, the most theory that has been referenced to decision to diversify is the last one, agency theory. Several studies discover managers' benefits from diversification such as supervising the larger organization serves an increase in their power and prestige, becoming more valuable and indispensable to the firm, a reduction in their largely undiversified personal portfolio, easily accessing to capital through cross-subsidization as stated by Meyer, Milgrom and Roberts (1992), entrenching themselves by Shleifer and Vishny (1989), a rise in consumption and perquisite by Jensen (1986), and protect their human capital by Amihud and Lev (1981). Referring to all these reasons, there are no doubts why managers continue diversifying their businesses.

Anderson, Bates, Bizjak and Lemmon (2000) do not find any evidence that the failure of internal governance mechanisms is associated with diversification decisions consistence with Hyland and Diltz (2002) who document that block and insider ownership do not appear to affect firm's choice to diversify. Denis,Denis and Yost (2002) find a negative relation between levels of diversification and block ownership as well as insider ownership. Daniel and Monahan (2004) investigate disclosure quality as a representative of governance mechanism and excess value of diversification and suggest that they have positive relation. Somehow, Jiraporn, Kim, Davidson and Singh (2006) support agency theory to explain industrial than global diversification.

Dittmar and Shivdasani (2003) have found an evidence that diversification discount drops following a refocusing action as well as Burch and Nanda (2003). Their finding is robust when testing post-diversification because the diversification discount and investment inefficiency decrease after the refocusing. Therefore, my initial belief due to above literature is that corporate governance index and its components are related to value and level of diversification and then I set up two hypotheses to resolve my suspicion as I would describe you soon.

Focusing on literature in East-Asian region, on average, the studies identify that the cost of diversification exceed its benefit. They study a relationship between diversification with internal governance mechanisms to be governance proxy, such as managerial ownership of Kamphaeng (2000) in Thailand and Sheng, and Ho (2000) in Singapore find that diversification in their studies are affected by those governance mechanisms.

To achieve the answer thoroughly of the relation of diversification and governance, some researchers apply corporate governance index to capture corporate governance mechanism in fraction as well as a whole. One of the popular governance indexes which has been used to apply for various fields of studies related to corporate governance is proposed by in Gompers et al. (2003) namely GIM. It is approximated by number of take-over provisions adopted and data compiled by the Investor

Responsibility Research Center ("IRRC"). This index is contained of 24 indicators reflecting the quality of shareholder rights and is increasing in the weakness of these rights. The index ranges from a feasible low of 0 to a high of 24. Higher score means weak shareholder rights. One year later, Bebchuk, Cohen and Ferrell (2004) construct an Entrenchment Index based upon 6 of the 24 governance provisions in Gompers et al. (2003). This index uses a 6-provision subset of the G-Index or GIM using equally-weighted. The index ranges from 0 to 6. An increase of the Entrenchment Index focusing on the presence of a staggered board demonstrates the lower the firm value. They believe that Tobin's q (proxy for firm value) and stock returns can be better described by the index than the prior one. There are attempts to use corporate governance index proxy by those two indexes to find its magnitude and persistence of agency problem to diversification in developing region like Yang (2005) and Jiraporn et al.(2006) who apply GIM and GIN-DEX to their studies respectively. Yang(2005) gets an inverse results relative to Jiraporn et al.(2006) since he observes any significances of corporate governance in both diversification decision and rampancy in value loss. This might due to the length in sample period and sample selection. Yang (2005)'s period is between 1990 and 2002 excluding financial firms with sales less than $20 million while the periods of Jiraporn et al.(2006) is from 1993 to 1998 excluding financial and utility companies.

The latest research that constructs corporate governance index in Thailand is presented by Ananchotikul (2006). She concentrates on foreign direct investment versus corporate governance index. This corporate governance index captures all major aspects of corporate governance: board structure, board responsibility, conflict of interest, shareholder rights, and disclosure and transparency using information from various publicly-available sources of listed companies on SET. She forms binary questions based upon essential corporate governance's characters and weighted differently. Her index can be a good start to construct corporate governance in Thailand.

Even though there are several empirical studies on diversification for both issues against corporate governance; causes and value, diversification still has been a heated debate in the corporate finance without perfect conclusion. My paper, at least, will show up a linkage among diversification and all issues related to corporate governance in Thailand that no one has ever done before in Thailand and will benefit to corporate finance and economics.

CHAPTER III

SAMPLE AND DATA DESCRIPTIONS

Sample Selection

This paper examines only listed companies on SET in 2000-2007. The exclusive sample groups are financial industry; banking, insurance, and securities and funds similar other empirical studies. Those are Sheng, and Ho (2000), Anderson and Lemmon (2000), Berger and Ofek (1995) and Kamphaeng (2000).The first reason for the exception is that their investment policies are regulated and controlled under government regulation .Second is the characteristics of financial information are hard to compare with those of other industries. Non-performing sector is also left out of my sample. After an elimination of some sample groups, I have nine major groups remained in my study; Agro and Food, Consumer Products, Industrials, Property and Construction, Resources, Services, Technology, MAI and delisted firms to avoid selection bias.

Sources of Data

I use data from publicly available sources to construct corporate governance index; company annual reports, the mandatory Annual Disclosure Report (Form 56-1), corporate websites, the web-based SET Market Analysis and Reporting Tool (SETSMART), and the SET's Director Database. Other information regarding corporate violations of the Stock Exchange rules is obtained from the Securities and Exchange Commission (SEC)'s database. The financial data would be collected from annual reports and DataStream.

Data Descriptive

Collected data is shown in statistics in Table 1.Those are gathered from 2000 to 2007 excluding financial, non-performing and funds. To erase bias from died firms, I add up delisted companies into my sample set. Regarding Table 1, there are approximately 3,000 companies for whole sample, saying roughly, and 300 companies in each year to the test. The statistics can remark the overall picture of Thai stock market which is very tiny compared to other developed capital market.

Table 2 provides summary statistics on control variables adjusted from DataStream as reported on Table 1. All control variables are collected to capture suspicious factors to diversification. Eights control materials are natural log of total assets, natural log of years listed on SET, total debts divided by total assets, standard deviation of monthly stock return, EBIT divided by total sales, dummy of dividend payment, dummy of diversified degree and dummy of industrial diversification. The first five factors have been applied in Equation 4 and 5 regressed degree of diversification (Herfindahl index – HERF) on corporate governance index (CGI) and corporate governance sun-index shown in section 4.4 Regression Analysis, Chapter 4. Adding three more factors up in Equation 6 is to a test between values of

diversification (excess value – EXVAL) and again, corporate governance index (CGI).

Research Hypotheses

H_1: There is a negative relationship between corporate governance and decision to diversify.

This is the test to solve a risen question about determinants of decision to diversify. If agency theory is applicable for diversification, there should be a positive relationship between corporate governance proxy by corporate governance index (CGI) and decision to diversify proxy by Herfindahl index (HERF) because higher corporate governance should be more concentrate on a few lines of businesses while corporate governance and number of reported segments should have negative relationship.

H_2: There is a positive relationship between corporate governance and diversification value.

To test a cause of value distortion, if agency-motivated reason is applicable to express value distortion associated with corporate diversification, there should yield a positive relationship. That is because good corporate governance firms reflected less agency problem should have more firm value from diversification while bad corporate governance firms would be punished by value discount. Corporate governance index (CGI) would be a proxy for corporate governance together with Berger and Ofek's excess value would represent value from diversification.

Table 1: Descriptive statistic of sample firms

Data is collected from DataStream focusing on corporate listed during 2000 to 2007 cutting financial industry, non-performing and funds. Delisted companies have been collected to eliminate survivorship. Total capitals are shown in trillion baht. Unit of years listed on SET are number of years and dividend per share shows in unit of per share. All of the rest are reported in billion baht.

Year	2000	2001	2002	2003	2004	2005	2006	2007	Full Sample
Years listed on SET									
Mean	10.15	10.85	11.14	11.30	10.88	10.60	11.15	11.80	11.02
Median	9.17	9.92	10.83	11.75	11.29	11.42	12.25	13.04	11.00
Observation	*302*	*305*	*315*	*335*	*376*	*413*	*429*	*442*	*2,917*
Dividend per share									
Mean	0.64	0.69	0.84	0.91	0.93	0.97	1.04	1.03	0.90
Median	0.00	0.00	0.00	0.10	0.15	0.16	0.18	0.20	0.08
Observation	*266*	*268*	*271*	*284*	*301*	*332*	*361*	*376*	*2,459*
Market value									
Mean	4.31	2.77	3.62	4.54	10.64	9.07	9.59	9.24	7.14
Median	0.44	0.42	0.56	0.95	1.97	1.59	1.23	1.36	1.03
Observation	*265*	*267*	*273*	*288*	*310*	*355*	*399*	*415*	*2,572*
Total assets									
Mean	9.11	8.76	8.62	8.33	9.53	10.51	11.20	12.32	9.93
Median	2.00	1.87	1.75	1.65	1.86	2.06	2.19	2.33	1.96
Observation	*270*	*294*	*338*	*399*	*421*	*425*	*426*	*427*	*3,000*
Total debts									
Mean	5.36	4.44	3.92	3.55	3.71	3.83	3.62	3.65	3.93
Median	0.69	0.49	0.37	0.36	0.38	0.42	0.44	0.46	0.44
Observation	*270*	*294*	*338*	*399*	*421*	*424*	*426*	*427*	*2,999*
Total sales									
Mean	6.13	6.25	6.42	6.71	8.10	9.60	11.20	12.31	8.62
Median	1.45	1.46	1.53	1.54	1.71	1.96	2.11	2.03	1.73
Observation	*270*	*293*	*336*	*397*	*421*	*425*	*426*	*427*	*2,995*
Earnings before interest and taxes									
Mean	0.39	0.68	0.86	1.04	1.41	1.54	1.62	1.57	1.19
Median	0.10	0.13	0.14	0.18	0.22	0.17	0.20	0.17	0.16
Observation	*211.00*	*222.00*	*245.00*	*274.00*	*290.00*	*289.00*	*294.00*	*296.00*	*2,121*
Total capitals									
Mean	4.32	2.77	3.62	4.55	10.65	9.07	9.59	9.24	7.14
Median	0.44	0.42	0.56	0.96	1.97	1.59	1.23	1.36	1.04
Observation	*265*	*267*	*273*	*288*	*310*	*355*	*399*	*415*	*2,572*

Note: All raw materials' unit is billion baht except years listed on SET, dividend per share and total capitals.Total capitals' unit is in term of trillion baht.

Table 2: Descriptive statistic for control variables

For this table, it shows eight control variables using to test my two hypotheses. The first six variables from natural log of total assets to dummy of dividend payment is for Equation 4 and 5 to test degree of diversification and corporate governance. The difference between Equation 4 and 5 is that Equation 5 applies corporate governance sub-index instead of corporate governance index. Next two control factors in dummy of diversified degree and dummy of industrial diversification respectively are built for Equation 6 in form of $D_{8i,t}$ and $D_{9i,t}$ for diversified degree and industrial diversification.

Year	2000	2001	2002	2003	2004	2005	2006	2007	Full Sample
Natural log of total assets									
Mean	7.84	7.73	7.66	7.60	7.74	7.85	7.91	7.97	7.79
Median	7.60	7.54	7.47	7.41	7.53	7.63	7.69	7.75	7.58
Observation	*270*	*294*	*338*	*399*	*421*	*425*	*426*	*427*	*3,000*
Note : Total assets using in this calcualtion is in million baht.									
Natural log of years listed on SET									
Mean	2.18	2.23	2.21	2.14	1.92	1.95	1.98	2.13	2.08
Median	2.22	2.30	2.38	2.46	2.44	2.45	2.51	2.57	2.42
Observation	*267*	*272*	*285*	*305*	*349*	*381*	*413*	*423*	*2,695*
Total debts divided by total assets									
Mean	0.55	0.50	0.35	0.32	0.28	0.27	0.25	0.24	0.33
Median	0.39	0.30	0.28	0.26	0.25	0.24	0.25	0.23	0.26
Observation	*270*	*294*	*338*	*399*	*421*	*424*	*426*	*427*	*2,999*
Standard deviation of monthly return									
Mean	16.27	20.54	25.86		24.07	22.29	16.04	27.80	21.13
Median	4.27	6.70	8.69	3.55	6.86	7.37	3.86	8.53	5.77
Observation	*268*	*272*	*284*	*270*	*276*	*290*	*270*	*278*	*2,208*
EBIT divided by total sales									
Mean	-0.34	-10.07	0.19	0.17	0.13	0.22	0.09	0.07	-0.96
Median	0.07	0.08	0.09	0.10	0.10	0.09	0.08	0.08	0.09
Observation	*206*	*218*	*241*	*271*	*289*	*287*	*292*	*295*	*2,099*
Dummy of dividend payment									
Mean	0.53	0.56	0.59	0.65	0.67	0.64	0.66	0.68	0.62
Median	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Observation	*376*	*376*	*376*	*376*	*376*	*376*	*376*	*376*	*3,008*
Dummy of diversified degree									
Mean	0.17	0.13	0.13	0.14	0.06	0.14	0.08	0.15	0.12
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Observation	*293*	*306*	*308*	*337*	*373*	*406*	*430*	*433*	*2,886*
Dummy of industrial diversification									
Mean	0.04	0.03	0.03	0.03	0.01	0.03	0.02	0.03	0.03
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Observation	*294*	*305*	*307*	*332*	*370*	*405*	*429*	*433*	*2,875*

CHAPTER IV

METHODOLOGY

How to Measure Corporate Diversification

<u>Excess Value</u>

In calculating excess value, there are also many methods available such as Tobin's q (Lang and Stulz (1994)) and abnormal stock returns (Comment and Jarrell (1994)). Anyhow, the paper of Berger and Ofek is the most widely accepted and used procedure as a benchmark. I apply Berger and Ofek (1995) to compute excess value from diversification which could be compared directly to the single-segment firms within the same industry as a benchmark unlike Tobin's q .That's because Tobin's Q needs assumptions about rates of depreciation and inflation to estimate the firm's replacement value. The first step in calculation of Berger and Ofek, it requires an imputed value which is calculated for each division by multiplying each segment's accounting items (sales, EBIT and assets) by the multiple of the median ratio of single-segment firms in the same industry to total. Berger and Ofek (1995) mentioned that they emphasize medians rather than means due to skewness in the distribution. These benchmark multipliers are based on all single-segment firms, including those that are removed due to merger, acquisition, bankruptcy, or other reasons. Next, the excess value is calculated as the natural log of the ratio of the firm's actual market value, which is the sum of market value of common equity and book value of debt, to the sum of its divisions' imputed values getting form the first procedure. To deal with negative EBIT, Berger and Ofek adjust this multiplier by replacing the EBIT multiplier imputed value with segment's -plus-depreciation (EBITD) multiplier imputed value, if positive, or with the segment's sales multiplier imputed value. Furthermore, calculation by asset multiplier is problematic since it is related to purchase versus pooling accounting method. According to John R. Graham, Michael Lemmon, and Jack G. Wolf (2002), they use sales multiplier only in calculating excess value to avoid a problem due to accounting method. Consequently, sales multiplier would be the most appropriate proxy to calculate excess value because it could not be manipulated by accounting method as asset multiplier and hardly ever face negative sales unlike EBIT.Also, firms report business structure by each segment sales only in Thailand. Thereby, I would consider only sales multiplier in this study to compute excess value.

$$I(V) \qquad = \sum_{i=1}^{n} AI_i * (Ind_i (V/AI)_{mf}) \qquad\qquad (1)$$

$$EXVAL \qquad = \ln(V/I(V)) \qquad\qquad\qquad (2)$$

Where

I(V)   = imputed value of the sum of a firm's segments as stand-alone firms

AI_i = segments i's value of the accounting item (sales) used in the valuation multiple

Ind$_i$ (V/AI)$_{mf}$	= multiple of the total capital to an accounting item for the median single-segment firm in the segment i's industry
EXVAL	= firm's excess value
V	= firm's total capital
	(Market value of common equity plus book value of debt)
n	= total number of segments in segment i's firm

Positive excess value indicates that the entire firm is worth as a whole more than the sum of its segments whereas a negative excess value shows that the firm as a whole is worth less than the sum of its segments. Thus, a positive excess value implies a premium while a negative excess value indicates a discount associated with diversification.

In this section, it could be used to compare to previous studies to justify diversification's effect in corporate value; decrease, increase or no effects and to test a causation of value distortion by incentive problem in regression analysis.

Table 3 Panel A reports statistics for excess value in 2000 to 2007. Since in excess value calculation needs individual total capital to compute imputed value, some firms in sample with uncompleted data are removed and the remaining amount of full sample is, then, become 2,506. Descriptive statistics are mean, median, maximum, minimum, standard deviation and number of observations explained from 2000 to 2007 respectively. Mean of yearly excess value are -0.16,-0.08, 0.07,-0.12,-0.13,-0.07,-0.04 and -0.08. Median are -0.06, -0.02, 0.00, 0.00, 0.00, 0.00, 0.00 and –0.02. Maximum are 6.76, 6.17, 9.29, 6.25, 3.88, 7.80, 7.58 and 4.74. For minimum, there are -7.41, -7.59, -3.59, -7.62, -6.90, -7.39,-7.69 and -7.59 Concerning Panel E, the maximum excess value in mean falls into mining industry and the minimum is a delisted company.

<u>Level of Diversification</u>

In this study, I would concern diversification in term of its degrees and this topic would elucidate for the second hypothesis. The selected diversification index in my study is Herfindahl index (HERF) since this method could indicate degree of level of diversification for individual firms in the sample set. There are some other methods to use as proxies for diversification such as the fraction of firms with multiple segments and number of reported segments. The index is calculated for all firms based on the distribution of the firm's sales across its various business segments as follows.

$$HERF_{i,t} = \sum_{i=1}^{n} (SSALE_{i,t} / SALE_t)^2 \qquad (3)$$

Where

HERF$_{i,t}$	= Herfindahl index from firm i in year t
SSALE$_{i,t}$	= segment i's sales of the firm
SALE$_t$	= firm's total sales of all reported segment in year t

The highest HERF equals to 1 representing firms' concentration in business segments rather than multi-segment. On the contrary, the lower HERF demonstrates high diversification. To simplify the understanding, we can say alternatively that the

higher HERF, the more corporate business concentration or lower diversification. This index could present degree of Thai firms' concentration in their business lines.

Aside from using HERF as degree of diversification, I employ number of reported segments to see their consistence to explain the first hypothesis. Control variables in the regression are the same as testing HERF and CGI. If both HERF and number of reported segments offer the same result, such a relationship among corporate governance and degree of diversification exists ensuring that the first hypothesis is hold.

Table 4 displays degree of diversification in Thailand in various formats. Panel A describes number of reported segments in sample since 2000-2007. Full sample size is 2,995. Its mean, median, maximum and minimum are 1.17, 1.00, 6.00 and 1.00 respectively. Panel B isolates sample firms by diversification; single and multi-segment. It makes clear evidence that most of Thai companies still focus on their single line of business. Approximately, one-fifth of yearly data is multi-segment companies. Total number of observations is 2,996. Panel C is Herfindahl index (HERF) which mean, median, maximum and minimum are 0.97, 1.00, 2.00 and 0.00 with 2,996 observations for 2000-2007. Number of observations is 350 and 2,536 for multi and single-segment firms respectively for all sample periods.

Corporate Governance Index Construction

A construction in corporate governance index (CGI), I employ five major components of corporate governance: Board Structure, Conflict of Interest, Board Responsibilities, Shareholder Rights, and Disclosure and Transparency almost the same as Ananchotikul (2006) weighted for 20,25,20,10 and 25 percent respectively but eliminated some questions to make them more comparable annually. The amount of remaining question is 62. Each sector has its own qualitative sub-questions to reach the most accuracy and correction in rating. Those questions are weighted differently when translating into score which is more explainable and correlated to quality of corporate governance in overall. The test of index's quality between equal and different weighted has been done by Ananchotikul (2006). She constructs two indexes of two sample data in 2000 and 2004 respectively. Referring to the first index, in 2000, she constructs by assigning equal-weighted for each fraction and finds out that the result is lesser correlated to corporate governance quality than based on the amount of information obtained in each component. Henceforth, I use the latter scheme-weighted based on public information available- in corporate governance scoring. To illustrate, I demonstrate a few questions for Board Structure sector: what is the size of board of directors? And what is the size of executive board? The total score that has been used in running regression is 100 percent. Appendix B presents all using questions in the construction.

Table 5 presents corporate governance index in two categories. Panel A is annual corporate governance index and Panel B is its sub-index. The total score is converted into 100 percent as well as for each sub-index. Observation is 2,991. Corporate governance index's mean, median, maximum and minimum are 46.01, 46.14, 87.98 and 3.75.Index A is Board Structure with mean and median at 48.32 and 50.00. Conflict of Interest represents by Index B having 47.32 and 31.50 for mean and median. Next is Index C for Board Responsibilities with mean and median at

40.41and 40.24. Index D is Shareholder Rights come up with 40.10 and 42.38 of mean and median and the last Index, E, is Disclosure and Transparency. Mean and median for Index E are 55.99 and 60.00. Panel C to E provide statistic based upon size, profit and industry. To sum up, corporate governance has an increasing trend in every year and impacts by firm size positively. Consider industry mean in Panel D, the best governance performance is paper and printing material and unsurprisingly, delisted companies are in the worst governance ranking by corporate governance index.

Regression Analysis

As I mentioned earlier, this paper would apply single-segment firms as a benchmark, so each hypotheses would differentiate corporate governance's impact in diversification for both single-segment and multi-segment firms using dummy of diversification status but not for the tests between HERF and CGI. The reason is that HERF can reflect concentration of diversification and distinguish between single and multi business companies.

H_1: Corporate Governance and Decision to Diversify

To find a confirmation of a primary cause of division that agency theorem could describe such the matter, I would do a test between corporate governance and degree of diversification or decision to diversify. If firm division is the 'pet' of an influential manager as agency theory, such a case, degree of diversification (Herfindahl index -HERF) would be affected by firm governance (CGI). I expect to see a positive relationship between HERF and CGI to approve agency theory. The higher CGI, it should be the more HERF (lower degree of diversification).
I collect other related six factors from relevant literature works regarding diversification to become control factors. First, several prior studies cite that firm size impacts the extent of corporate diversification. For instance, Denis et al. (1997) show evidence that the number of reported business segments is positively related to firm size. Likewise, Singh, Mathur and Gleason (2004) provide evidence that firm size is a positive predictor of firm diversification because larger firms have greater propensity to be diversified. Therefore, I employ size replaced by natural log of book value of assets. Next is to control for firm's age. Younger firms may face more capacity constraint into other lines of business while book value of total debts/book value of total assets implies firm's leverage. To capture firm's specific risk, Ronald and Lemmon (2000) replace it by standard deviation of weekly stock returns which would be applied to become annual data for my study. Ronald and Lemmon (2000) stated in their study that they fail to find any reliable association between the governance characteristics of the firm and the Berger and Ofek measure of the value loss from diversification in multi-segment firms. EBIT/sales is a substantiation for profitability. The use of a dividend dummy to capture a firm's ability to access financial markets was first used in Fazzari et al. (1988).I use CGI to be a symbol of corporate governance index. According to my expectation, I have to test as follows.

$$\text{HERF} = f(\text{CGI, Other control variables})$$
$$\text{HERF}_{i,t} = \beta_0 + \beta_1 \text{CGI}_{i,t} + \beta_2 \text{SIZE}_{i,t} + \beta_3 \text{AGE}_{i,t} + \beta_4 \text{LEV}_{i,t} + \beta_5 \text{STD}_{i,t}$$
$$+ \beta_6 \text{PRO}_{i,t} + \beta_7 D_{7i,t} + \varepsilon_{i,t} \quad (4)$$

Where

Dependent Variable

$\text{HERF}_{i,t}$ = Herfindahl index

Independent Variable

$\text{CGI}_{i,t}$ = corporate governance index

Control Variables

$\text{SIZE}_{i,t}$ = firm size

$\text{AGE}_{i,t}$ = firm age

$\text{LEV}_{i,t}$ = firm leverage

$\text{STD}_{i,t}$ = firm specific risk

$\text{PRO}_{i,t}$ = firm profitability

$D_{7i,t}$ = firm constrain in capital market

See Appendices for control variables summary which includes calculation.

Next is to investigate which component of CGI is the most influence to diversification.

$$\text{HERF} = f(\text{Individual CGI sub-index, Other control variables})$$
$$\text{HERF}_{i,t} = \beta_0 + \beta_{11} \text{B\_ST}_{i,t} + \beta_{12} \text{CON}_{i,t} + \beta_{13} \text{B\_RES}_{i,t} + \beta_{14} \text{SHA}_{i,t} + \beta_{15} \text{DIS}_{i,t} +$$
$$\beta_2 \text{SIZE}_{i,t} + \beta_3 \text{AGE}_{i,t} + \beta_4 \text{LEV}_{i,t} + \beta_5 \text{STD}_{i,t} + \beta_6 \text{PRO}_{i,t} + \beta_7 D_{7i,t} + \varepsilon_{i,t} \quad (5)$$

The coefficients of each components of CGI would be subscripted by number 1 to notice that they are parts of CGI and the next number would be indicators for the sub-index. For example, β_{11} is for the first sub-index (board structure – $\text{B\_ST}_{i,t}$) and β_{12} is for the second sub-index (conflict of interest - $\text{CON}_{i,t}$).

Similar to my former regression, I have to find out which components of CGI introducing to more decision to diversify by looking at significance of coefficients and correlation. Establishment of an additional regression is a must among each component of CGI. This test would be useful for stakeholders to solve for agency problem in the correct way. For example, unless board structure is the least factor for decision to diversify, stakeholders have to re-structure or pay more attention on this factor to reduce the problem.

H_2: Corporate Governance and Excess Value

Its purpose is to answer the second hypothesis that if good corporate governance firms which no agency problem persist have been diversified, the excess value would have lesser or no effect relative to bad corporate governance firms where agency problem remains. I set CGI as a representative for governance policy could be tested against firm's value owing to diversification. The equation would have CGI as an independent variable and excess value as a dependent variable. The control variables for this section is slightly different from the first hypothesis because it needs two more explanatory variables, diversification status using a dummy variable and

industrial diversification's effect by dummy variable in the regression. The diversification dummy is employed to distinguish between diversified and non-diversified firms and also change this dummy into HERF to check robustness in the test. The purpose of adding the next dummy, industrial diversification, is to seek for value distortion caused by related or non-related diversification since Berger and Ofek (1995) have got evidence of more value-discount in related diversification than non-related diversification observations.

According to this test, I would see an overall frame between excess value and corporate governance. The summary expounds a source of diversification discount or premium which attributable from agency problem if such a relation.

$$EXVAL = f(CGI, \text{Other control variables})$$
$$EXVAL_{i,t} = \beta_0 + \beta_1 CGI_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 AGE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 STD_{i,t} +$$
$$\beta_6 PRO_{i,t} + \beta_7 D_{7i,t} + \beta_8 D_{8i,t} + \beta_9 D_{9i,t} + \varepsilon_{i,t} \qquad (6)$$

Where
Dependent Variable
$EXVAL_{i,t}$ = firm excess value from Berger and Ofek method
Independent Variable
$CGI_{i,t}$ = corporate governance index
Control Variables
$SIZE_{i,t}$ = firm size
$AGE_{i,t}$ = firm age
$LEV_{i,t}$ = firm leverage
$STD_{i,t}$ = firm specific risk
$PRO_{i,t}$ = firm profitability
$D_{7i,t}$ = firm constrain in capital market
$D_{8i,t}$ = diversification status
$D_{9i,t}$ = industrial diversification

See Appendices for control variables calculation.
If corporate governance is significant in the regression, I can imply that agency problem is a cause of value loss or not.

Table 3: Value of diversification (Excess value)

Excess value is calculated in sales basis to avoid accounting manipulation existing on assets and negative EBIT when calculating excess value. Value of diversification is to test the second hypothesis to see a relationship between corporate governance and value of diversification in Equation 4 and 5. Excess value is the natural logarithm of the ratio of each firm's actual value to its imputed value. The firm's imputed value is the sum of the imputed value of its segments. Each segment's imputed value is the segment's sales (AI_i) multiplied by its industry median ratio of total capital to sales. The use of median can avoid skewness of mean. Ranging from Panel A to E, excess value is categorized by all samples, size, profit, CGI and industry respectively.

Year	2000	2001	2002	2003	2004	2005	2006	2007	Full Sample
Panel A : Excess value of all samples									
Mean	-0.16	-0.08	0.07	-0.12	-0.13	-0.07	-0.04	-0.08	-0.08
Median	-0.06	-0.02	0.00	0.00	0.00	0.00	0.00	-0.02	0.00
Maximum	6.76	6.17	9.29	6.25	3.88	7.80	7.58	4.74	9.29
Minimum	-7.41	-7.59	-3.59	-7.62	-6.90	-7.39	-7.69	-7.57	-7.69
Standard Deviation	1.52	1.59	1.39	1.60	1.30	1.30	1.66	1.09	1.43
Observation	*257*	*262*	*264*	*282*	*298*	*342*	*391*	*410*	*2,506*

	Group 1 0-10	Group 2 11-20	Group 3 21-30	Group 4 31-40	Group 5 41-50	Group 6 Over 51			
Panel B : Excess value classified by size setting total assets as proxy. (Total assets is in billion Baht.)									
Mean	-0.16	0.07	0.31	0.28	0.49	0.65			
Median	-0.03	0.10	0.00	0.44	0.51	0.30			
Maximum	9.29	6.25	7.77	2.28	4.85	7.93			
Minimum	-7.62	-7.69	-3.16	-2.45	-2.63	-3.68			
Standard Deviation	1.39	1.36	1.70	1.18	1.25	1.84			
Observation	*2,066*	*176*	*81*	*32*	*26*	*114*			

	Group 1 Up to 0	Group 2 0.01-2	Group 3 2.01-4	Group 4 4.01-6	Group 5 6.01-8	Group 6 Over 8			
Panel C : Excess value classified by profit setting EBIT as proxy. (EBIT is in billion Baht.)									
Mean	-0.20	-0.09	0.48	0.52	0.87	0.68			
Median	-0.16	0.00	0.20	0.04	0.28	0.36			
Maximum	9.29	7.15	7.77	4.85	7.80	7.93			
Minimum	-7.57	-7.62	-3.19	-1.00	-0.38	-1.54			
Standard Deviation	1.58	1.33	1.59	1.43	1.79	2.11			
Observation	*320*	*1,333*	*70*	*22*	*21*	*46*			

	Group 1 0-20	Group 2 21-40	Group 3 41-60	Group 4 61-80	Group 5 81-100				
Panel D : Excess value classified by CGI. (Full score is 100. The higher score,the better corporate governance.)									
Mean	-0.86	-0.12	-0.07	0.06	0.41				
Median	-0.67	-0.05	0.00	0.00	0.20				
Maximum	1.88	9.29	7.93	7.80	4.51				
Minimum	-7.06	-7.43	-7.69	-7.11	-2.45				
Standard Deviation	1.44	1.58	1.31	1.42	1.63				
Observation	*38*	*810*	*1208*	*403*	*17*				

Table 3: Value of diversification (Excess value) (Continue)

Industry	Business	Mean	Median	Max	Min	Stdev	Obs
Panel E : Excess value classified by industry.							
Agro&food	Agribusiness	-0.45	-0.36	5.82	-6.37	1.50	155
	Food&Beverage	-0.37	-0.22	5.00	-7.55	1.35	166
Consumer Product	Fashion	0.29	0.36	5.30	-7.31	1.46	183
	Home&Office Product	-0.53	-0.36	4.38	-8.26	1.54	75
	personal and phamaceuticals	-0.17	-0.06	3.42	-4.84	1.36	29
Industrual	Automotive	-0.67	-0.50	1.58	-7.03	1.53	110
	Industrial Material&Machine	-0.02	0.00	6.11	-8.10	1.60	110
	Packaging	-0.12	0.00	0.32	-1.05	0.47	10
	Paper&Printing Material	-0.39	-0.38	6.03	-8.29	1.76	78
	Petrochemicals&Chemicals	-0.30	-0.13	3.31	-7.40	1.38	175
Property&Construction	Construction Material	-0.14	-0.01	8.06	-7.45	1.48	323
	Property Development	-0.37	-0.18	8.83	-5.39	2.11	124
Resources	Energy&Utilities	-0.37	-0.18	8.83	-5.39	2.11	124
	Mining	0.49	-0.06	3.61	-1.67	1.29	15
Services	Commerce	0.20	0.00	3.57	-2.12	1.09	91
	Healthcare Services	0.13	0.10	6.54	-7.00	1.28	88
	Media&Publishing	0.52	0.53	4.94	-6.92	1.45	160
	Professional Services	-0.30	0.00	0.00	-1.13	0.46	9
	Tourism&Leisure	-0.03	-0.02	5.80	-6.22	1.55	95
	Transportation&Logistics	0.80	0.97	7.42	-6.16	2.20	101
Technology	Electronic Components	0.64	0.20	7.77	-1.25	1.35	66
	Info&Communication	-0.33	-0.28	7.99	-5.47	1.96	146
MAI		-0.32	-0.42	4.16	-7.52	1.44	106
Delisted		-4.27	-4.27	-4.27	-4.27	0.00	1

Table 4: Degree of diversification

Table 4 exhibits three types of data description; number of reported segment, number of diversified firms in the sample and Herfindahl index in Panel A,B and C. Each Panel contains eight years data in 2000-2007 of listed companies on SET excluding financial industry, non-performing and funds. Remaining observation is 2,885-2,886.Panel C is calculated on sales basis across a firm's all business lines as the sum of the square of each segment's sales ($SSALE_{i,t}$) as a proportion of total sales($SALE_t$). The closer value to 1 notifies the more business concentration for a firm. This is directly opposite to lower HERF that explains high degree of diversification. Panel E to G, HERF is categorized by size, profit, CGI and industry respectively. Panel E to G

Year	2000	2001	2002	2003	2004	2005	2006	2007	Full Sample
Panel A : Number of reported segments									
Mean	1.25	1.20	1.16	1.19	1.08	1.22	1.13	1.18	1.17
Median	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Maximum	5.00	4.00	4.00	6.00	5.00	6.00	5.00	5.00	6.00
Minimum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Standard Deviation	0.63	0.59	0.47	0.59	0.35	0.66	0.51	0.51	0.55
Observation	*293*	*306*	*308*	*337*	*373*	*406*	*430*	*433*	*2,886*
Panel B : Number of diversified firms in sample set									
Single-segment firms	244	267	269	291	350	349	396	370	2536
Multi-segment firms	49	39	39	46	23	57	34	63	350
Observation	*293*	*306*	*308*	*337*	*373*	*406*	*430*	*433*	*2,886*
Panel C : Herfindahl index									
Mean	0.95	0.96	0.97	0.96	0.98	0.96	0.98	0.97	0.97
Median	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Maximum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Minimum	0.33	0.00	0.00	0.00	0.00	0.26	0.32	0.35	0.00
Standard Deviation	0.13	0.13	0.12	0.15	0.10	0.12	0.08	0.10	0.12
Observation	*293*	*306*	*308*	*337*	*373*	*406*	*430*	*433*	*2,886*

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6			
	0-10	11-20	21-30	31-40	41-50	Over 51			
Panel D : HERF classified by size setting total assets as proxy. (Total assets is in billion Baht.)									
Mean	0.98	0.90	0.97	0.97	0.99	0.95			
Median	1.00	1.00	1.00	1.00	1.00	1.00			
Maximum	1.00	1.00	1.00	1.00	1.00	1.00			
Minimum	0.27	0.31	0.42	0.66	0.83	0.26			
Standard Deviation	0.09	0.20	0.10	0.07	0.04	0.15			
Observation	*2,248*	*188*	*85*	*33*	*27*	*123*			

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6			
	Up to 0	0.01-2	2.01-4	4.01-6	6.01-8	Over 8			
Panel E : HERF classified by profit setting EBIT as proxy. (EBIT is in billion Baht.)									
Mean	0.97	0.97	0.98	1.00	1.00	0.96			
Median	1.00	1.00	1.00	1.00	1.00	1.00			
Maximum	1.00	1.00	1.00	1.00	1.00	1.00			
Minimum	0.38	0.27	0.42	1.00	1.00	0.26			
Standard Deviation	0.11	0.11	0.08	0.00	0.03	0.16			
Observation	*326*	*1434*	*72*	*23*	*22*	*49*			

Table 4: Degree of diversification (Continue)

	Group 1 0-20	Group 2 21-40	Group 3 41-60	Group 4 61-80	Group 5 81-100				
Panel F : HERF classified by CGI. (Full score is 100. The higher score,the better corporate governance.)									
Mean	0.95	0.97	0.98	0.99	1.00				
Median	1.00	1.00	1.00	1.00	1.00				
Maximum	1.00	1.00	1.00	1.00	1.00				
Minimum	0.50	0.31	0.45	0.68	0.99				
Standard Deviation	0.13	0.12	5.57	4.98•	0.00				
Observation	*52*	*927*	*1409*	*450*	*17*				

Industry	Business	Mean	Median	Max	Min	Stdev	Obs
Panel G : CGI classified by industry.							
Agro&food	Agribusiness	0.98	1.00	1.00	0.94	0.11	*165*
	Food&Beverage	0.97	1.00	1.00	0.39	0.11	*176*
Consumer Product	Fashion	0.97	1.00	1.00	0.42	0.09	*182*
	Home&Office Product	0.98	1.00	1.00	0.42	0.08	*83*
	personal and phamaceuticals	0.91	1.00	1.00	0.52	0.17	*32*
Industrual	Automotive	1.00	1.00	1.00	0.78	0.02	*119*
	Industrial Material&Machine	1.00	1.00	1.00	0.63	0.03	*125*
	Packaging	0.97	1.00	1.00	0.50	0.11	*96*
	Paper&Printing Material	1.00	1.00	1.00	1.00	0.00	*10*
	Petrochemicals&Chemicals	0.98	1.00	1.00	0.67	0.07	*81*
Property&Construction	Construction Material	0.98	1.00	1.00	0.26	0.10	*192*
	Property Development	0.96	1.00	1.00	0.27	0.12	*373*
Resources	Energy&Utilities	0.97	1.00	1.00	0.50	0.09	*136*
	Mining	1.00	1.00	1.00	1.00	0.00	*16*
Services	Commerce	0.87	1.00	1.00	0.31	0.23	*94*
	Healthcare Services	0.99	1.00	1.00	0.86	0.02	*97*
	Media&Publishing	0.99	1.00	1.00	0.66	0.04	*181*
	Professional Services	0.96	1.00	1.00	0.83	0.06	*13*
	Tourism&Leisure	0.86	1.00	1.00	0.33	0.21	*107*
	Transportation&Logistics	0.99	1.00	1.00	0.80	0.05	*106*
Technology	Electronic Components	0.98	1.00	1.00	0.43	0.10	*72*
	Info&Communication	0.99	1.00	1.00	0.66	0.05	*158*
MAI		0.97	1.00	1.00	0.41	0.10	*163*
Delisted		0.99	1.00	1.00	0.44	0.10	*189*

Table 5: Corporate governance index

For corporate governance index construction; there are five major components of corporate governance: Board Structure, Conflict of Interest, Board Responsibilities, Shareholder Rights, and Disclosure and Transparency weighted at 20,25,20,10 and 25 percent respectively. Each sector contains its own qualitative sub-questions related to those five issues. (See Appendix B for questions in corporate governance index construction.) Each question is given different credits from .17 to 3. Those components are weighted differently when translating into corporate governance index as stated above. The total score that has been used in running regression is 100 percent for both corporate governance index and sub-index. Panel A is corporate governance index annually. Panel B is corporate governance sub-index called A, B, C, D and E to act for Board Structure, Conflict of Interest, Board Responsibilities, Shareholder Rights, and Disclosure and Transparency respectively.

Year	2000	2001	2002	2003	2004	2005	2006	2007	Full Sample
Panel A : Annual corporate governance index									
Mean	27.68	36.22	37.42	43.38	50.07	52.03	54.55	55.48	46.01
Median	27.93	37.55	37.51	43.13	51.05	52.85	55.39	55.77	46.14
Maximum	42.54	62.07	66.15	78.84	82.64	85.98	87.98	83.21	87.98
Minimum	10.39	3.75	8.13	9.63	14.75	11.79	16.42	18.47	3.75
Standard Deviation	4.99	8.56	9.09	10.25	12.05	10.83	11.89	11.71	13.87
Observation	*286*	*306*	*309*	*334*	*375*	*405*	*430*	*436*	*2,881*

Index	Index A	Index B	Index C	Index D	Index E	CGI
Panel B : Corporate governance sub-index						
Mean	48.32	41.02	40.41	40.10	55.99	46.01
Median	50.00	37.50	40.24	42.38	60.00	46.14
Maximum	100.00	100.00	80.93	96.43	100.00	87.98
Minimum	0.00	0.00	0.00	0.00	0.00	3.75
Standard Deviation	20.54	15.94	16.76	20.01	19.78	13.87
Observation	*2,881*	*2,881*	*2,881*	*2,881*	*2,881*	*2,881*

	Group 1 0-10	Group 2 11-20	Group 3 21-30	Group 4 31-40	Group 5 41-50	Group 6 Over 51
Panel C : Corporate governance index classified by size setting total assets as proxy (Total assets is in billion Baht.)						
Mean	45.28	49.91	50.98	59.79	54.63	55.48
Median	45.51	51.24	50.49	61.18	55.63	60.01
Maximum	83.79	82.24	77.19	87.35	85.98	87.98
Minimum	3.75	8.13	15.60	28.52	22.21	13.74
Standard Deviation	12.90	13.35	14.44	17.07	16.89	18.50
Observation	*2,253*	*188*	*83*	*33*	*26*	*119*

	Group 1 Up to 0	Group 2 0.01-2	Group 3 2.01-4	Group 4 4.01-6	Group 5 6.01-8	Group 6 Over 8
Panel D : CGI classified by profit setting EBIT as proxy. (EBIT is in billion Baht.)						
Mean	41.27	46.31	53.87	53.31	57.39	62.81
Median	40.45	46.21	53.44	61.27	58.55	66.57
Maximum	80.58	87.35	81.53	73.75	78.79	82.59
Minimum	3.75	14.62	13.74	15.63	24.91	24.83
Standard Deviation	13.69	13.48	14.91	18.23	15.52	16.36
Observation	*321*	*1,441*	*72*	*22*	*21*	*47*

Table 5: Corporate governance index (Continue)

Panel D : CGI classified by industry.							
Agro&food	Agribusiness	45.83	45.21	77.33	19.92	13.87	*165*
	Food&Beverage	46.00	44.95	76.93	21.75	12.62	*176*
Consumer Product	Fashion	40.63	39.23	76.61	15.91	13.41	*184*
	Home&Office Product	39.10	38.97	66.13	20.39	10.85	*83*
	personal and phamaceuticals	48.92	47.73	74.04	18.27	13.05	*30*
Industrual	Automotive	46.45	45.08	72.46	16.35	12.26	*120*
	Industrial Material&Machine	41.29	42.37	83.21	9.63	13.74	*120*
	Packaging	44.57	44.33	67.16	18.59	9.81	*96*
	Paper&Printing Material	52.83	52.34	75.69	22.02	16.11	*10*
	Petrochemicals&Chemicals	43.01	42.90	73.33	14.62	13.45	*83*
Property&Construction	Construction Material	48.22	49.16	77.95	22.11	12.31	*191*
	Property Development	46.35	47.03	82.24	3.75	14.53	*365*
Resources	Energy&Utilities	53.92	54.74	87.98	13.74	17.86	*125*
	Mining	45.53	51.95	62.37	10.39	14.81	*16*
Services	Commerce	45.76	46.04	72.01	18.04	12.68	*94*
	Healthcare Services	42.91	45.42	63.44	18.70	10.77	*97*
	Media&Publishing	45.52	43.70	79.10	17.42	14.53	*173*
	Professional Services	51.78	51.83	71.82	28.61	12.24	*14*
	Tourism&Leisure	44.92	45.30	83.79	16.48	12.83	*106*
	Transportation&Logistics	51.12	51.56	75.91	24.29	14.50	*108*
Technology	Electronic Components	47.08	47.36	68.24	25.73	11.81	*64*
	Info&Communication	54.41	54.61	83.17	20.79	13.68	*147*
MAI		52.37	53.19	73.43	19.16	8.25	*160*
Delisted		35.45	31.25	72.98	12.96	13.56	*130*

CHAPTER V

EMPIRICAL EVIDENCES

Follow the methodology in Chapter IV, the empirical evidences to examine my first and second hypothesis are provided in this chapter together with robustness tests to see the reliability of in Equation 4 to 6. For robustness tests, I categorize into two kinds; testing by size and year for individual Equation. A proxy for degree of diversification in robust tests is HERF. Regarding firm size, it is sub-divided into three groups; small with 0-3, medium with 3.01-6 and large with over 6 in term total assets in term of billion Baht. I expect to see consistence result for all groups that corporate governance influence HERF and EXVAL. Next is year basis, it portions observations into two groups; before corporate governance reformation (2000-2003) and after corporate governance reformation (2004-2007). In 2005, Thailand had substantially increased governance standard after participated World Bank corporate governance reform guided in OECD Principle in 2004. Since the participation in 2004, it brought better corporate governance reference and become the year of corporate governance development into international standard of Thailand. I expect that periods before corporate governance reformation would encounter agency problem because after the reformation, firm should have lessen agency problem. As a consequence, the after corporate improvement should lessen or absent corporate governance in decision to diversify as well as diversification value.

To sum up, this chapter would combine empirical evidences as well as robust checks organized by empirical evidences and then robustness checks for the first and second hypothesis respectively.

Corporate Governance and Decision to Diversify

H_1: There is a negative relationship between corporate governance and decision to diversify.

<u>Hypothesis Test</u>

Table 6 presents regression result of 4 models based on Equation 4 to test degree of diversification and corporate governance index by panel regression. Model 1 is result of all control variables but not corporate governance index to see their impacts on diversification. Three terms are significance at the same level, 1%. Significant variables are natural log of total assets ($SIZE_{i,t}$),natural log of years listed on SET($AGE_{i,t}$) and constant term (β_0) with coefficient at -0.01166 (p-value=0), -0.01736 (p-value=0.0024) and 1.10268 (p-value=0) respectively. Its probability of F-statistic is 0 and adjusted R-squared is 2.515%. Model 1 notifies us that without corporate governance, firm size and firm age influences decision to diversify by 1.166% and 1.736% if there is an increase in those two factors by 1%. Model 2 adds up corporate governance index ($CGI_{i,t}$) which is significance at 5% confident level. Its coefficient is 0.00529 (p-value=0.0185). Other significant variables are natural log of total assets ($SIZE_{i,t}$) and natural log of years listed on SET($AGE_{i,t}$) at 1% confident

level. They yields coefficients at -0.013184(p-value=0) and -0.019929(p-value =0.0006). Probability (F-statistic) of Model 2 is 0 and adjusted R-squared is 2.7456%. Model 3 and 4 try to maintain significant factors from Model 2 but add some more factors up in each model, firm-specific risk ($STD_{i,t}$)and constraint in capital constraint ($D_{7i,t}$) to see if there is any changes in their regression results. However, regression result has not changed at all since significant factors still are corporate governance, firm size and firm age. Observations in model 1 to 4 are 1,589, 1,576, 2,119 and 2,102 after adjustment. All three models, 2-4, support agency problem, size and age effect to diversification which is consistence to prior studies that diversification is a result from conflict of interest between managers and stakeholders, larger firms have higher propensity to diversify and younger firms face barriers to access new line of businesses. Referred to Anderson and Lemmon (2000), Chen and Ho (2000), they find a link between corporate governance and diversification using HERF for degree of diversification as well. As a consequence, I subscribe and confirm financial theory, agency problem, to explain diversification in Thailand. In turn, I can summarize that the more segments of the firms imply that the firms operating inefficiently because managers intend to take their own advantages not interested in stakeholders' benefits representing an existence of agency problem. Then, investors could avoid investing for such firms and stakeholders should play more roles in monitoring and controlling managers' decision.

Table 7 is regression result between number of reported segments and corporate governance index to see the consistence of the test if I change a representative of degree of diversification from HERF in Equation 4. All four models are imitated based on Table 6. Regarding Model 2 in Table 7 which provides all control variables,there are four significant variables in the test; constant term, corporate governance index, firm size and firm age at different confident level. Corporate governance index is significant at 10% confident level at -0.00195 of coefficient and -1.72978 of t-stat (p-value=0.08930). Other three variables are significant at 1% confident level. Coefficient of constant term is 0.49711 (t-stat=4.25338 and p-value=0.00000). Firm size yields 0.05867 of coefficient (t-stat=5.17985 and p-value=0.00000) and firm age's coefficient is 0.11424 (t-stat=3.93494 and p-value=0.00010). Adjusted R-square is 3.248% and F-stat is 8.54847 (F-prob=0.00000).

Therefore, this test is consistence to the test that have been used HERF for degree of diversification meaning that corporate governance effects degree of diversification as well as firm size and firm age which these two come up with different sign; from negative to positive. The first hypothesis holds true.

Table 8 is panel regression result of degree of diversification ($HERF_{i,t}$) and five corporate governance sub indices; Board Structure, Conflict of Interest, Board Responsibilities, Shareholder Rights, and Disclosure and Transparency to replace corporate governance index but other variables is remained in the regression. The objective of this test is to see the most effective corporate governance topic to degree of diversification .Model 1 has five corporate governance indices with full control variables as Equation 5 is shown. There are three variables significance at 1% confidence level and these variables are same as Model 1 in Equation 4; firm size ($SIZE_{i,t}$), firm age ($AGE_{i,t}$)and constant term (β_0). Coefficients for firm size ,firm age ($AGE_{i,t}$),constant term (β_0) are -0.01266 (p-value=0), -0.02038 (p-value=0.00050) and

1.09799 (p-value=0) respectively. Adjusted R-squared stands at 2.617% and probability (F-stat) is 0. Model 2 offers one more significant variable at 10% confident level which is Board responsibility (B_RES$_{i,t}$), one of five corporate governance sub-index. Its coefficient is 0.00029 (p-value=0.09360). Constant term and firm size are significance at the same confident level, 1%, with 1.03354 (p-value=0) and -0.00927 (p-value=0) of coefficients orderly. Firm age has changed its confident level to become 1% at -0.00405 (p-value=0.05570) of its coefficient. Adjusted R-squared is 1.765% and F-statistic probability is 0. Model 3 is to confirm an existence of Board responsibility by cutting firm age out. It attests that Board responsibility exists with coefficient at 0.00028 (p-value=0.09900) and 10% confident level. Firm size and constant term are, again, significance at 1% confident level. The Model 3's adjusted R-square is 1.562% and 0 for F-probability. Numbers of observations for the three models are 1,576, 2,274 and 2,668 after adjustment. To sum up for Equation 5, Board responsibility is the only one of corporate governance fractions that has been affected decision to diversify. An increase in one percent of Board responsibility will cause a rise in business concentration. This agrees with Equation 4 that better corporate governance even corporate governance index or sub-index; Board responsibility, would deduct diversification or raise business concentration. As a consequence, my first hypothesis is applicable and attributable to agency theory against propensity to diversify.

Table 9 is results for Equation 5 changing HERF to number of reported segments. Model 1 in this table achieves the same result as Model 1 in Table 8 that only constant term, firm size and firm age influence to degree of diversification but coefficients' signs for firm size and firm age are reversed to become positive unlike using HERF as proxy. The further test in Model 2 and 3 do not get the results close to Model 2 and 3 in table 8 since they do not find any corporate governance index impacts degree of diversification at any confident level.

Hence, the summation of Equation 5 would be that none of corporate sub-index is significance to degree of diversification.

Robustness Tests

Table 10 is robust checks among HERF and corporate governance index by size. Concerning table 10, since I control firm size by sizing distribution, I would be able to subtract firm size in control variable. The remaining control variables are the same as Equation 4. It finds that only large firm faces corporate governance impacts in diversification at 10% confident level unlike small and medium ones. Consequently, corporate governance cannot explain diversification in all observations regarding Table 10 but only large firms.

Table 11 is robustness tests between HERF and corporate governance index classified by year; before and after corporate governance reformed. Periods before the reformation had encountered agency problem in decision to diversify unlike after reformation. It agrees with my expectation that after the reformation, firms should not let corporate governance to hit diversification. Furthermore, firm size and firm age encourage diversification by an increase in size/age leading to a rise in diversification.

Table 12 is robustness test between HERF and corporate governance sub-index classified by size and it finds out that only large group gets corporate

governance production through its sub-index, conflict of interest with coefficient equaled to -0.001091 (t-stat=-2.01454 and p-value=0.04460) meaning that lower trouble in conflict of interest would bring higher degree of diversification. This does not support my expectation that any better corporate governance sub-index should come up with lower degree of diversification and it does not in the same line same Table 8: Regression analysis between HERF and corporate governance sub-index which board responsibility is the only factor in diversification among other sub-index. Firm age affects small and large firms in diversification.

Table 13 is robustness test between HERF and corporate governance sub-index classified by year; before (2000-2003) and after corporate governance reformed (2004-2007). None of corporate governance index impacts diversification while firm age and firm size do.

After robust checks for an existence in relationship of corporate governance index /sub-index and degree of diversification, I would come up with the conclusion that diversification is a result from agency problem in large firm and it happened before the period of corporate governance improvement in 2004. None of corporate governance sub-index influences diversification reliably and consistency. Thus, my first hypothesis is partially true since it appears in large size group not all groups. Other influential factors are still firm size and firm age.

Corporate Governance and Excess Value

H_2: There is a positive relationship between corporate governance and diversification value.

Hypothesis Test

Table 14 exposes regression result of ordinary least square (OLS) between value of diversification (EXVAL) and corporate governance index (CGI). Added variables to see diversification and industrial outcome to diversification value are $D_{8i,t}$ and $D_{9i,t}$ orderly using dummies. Diversification status, $D_{8i,t}$, equals to 1 for diversified firms and 0 otherwise. Industrial diversification, $D_{9i,t}$, is 1 for related diversification and 0 otherwise. Model 1 includes all control effects except corporate governance index and the result is that constant term, firm size, firm-specific risk and constraint in capital market are statistically significance at 1% confident level while firm age and firm leverage are significance at 5% confident level. Beginning with constant term, it shows coefficient at -0.7995 (p-value=0.00820). Firm size has coefficient equaled to 0.11359 (p-value=0). Firm age possesses -0.17980 of coefficient (p-value=0.02070). Leverage yields coefficient at -0.06845 (p-value=0.05750). Firm specific risk and constraint in capital market have coefficients at 0.00387 (p-value=0.00040) and 0.38584 (p-value=0). This model has adjusted 5.467% R-squared and 0 F-statistic probabilities. Model 2 adapts from Model 1 by increasing the most important variable, corporate governance index ($CGI_{i,t}$) but it is not significance at any confident level. The remained significant variables are at the same confident level as Model 1 excluding firm leverage which is not significance at all. Adjusted R-square is 5.395% with probability (F-stat) is 0. Model 3 is adjusted based on Model 2 which is cut insignificant variable from Model 2 off, firm leverage.

Corporate governance has not yet become significance while other maintained variables are significant at the same level as Model 1 and 2. Adjusted R-square becomes 5.8267% as 0 probability (F-stat).The last model, Model 4, investigates a change to regression result applied from Model 1 if diversification status, dummy format, is swapped into Herfindahl index. Consistence to Model 1-3, there is no changes in significant variables. The only one difference is that firm age turns to significant at 10% confident level from 5%. Probability (F-stat) is 0 and adjusted R-squared is 5.542%. After adjustment, amount of observations are 1,571, 1,558, 2,063 and 1,558 ranging for Model 1-4. Therefore, Equation 6 rejects my second hypothesis saying that corporate governance is a cause of value distortion from diversification. Other factors that are able to pull excess value regarding Table 14 are firm size, firm age, firm specific risk and constraint in capital market. Increase in size leads to value enhancement unlike firm age that older firm would face value discount. Firm with high specific risk will have more excess value which is to compensate for their high risk. If firms have constraint in capital market, for example, have to pay dividend, they will affect excess value positively.

Robustness Tests

Similar to robustness checks in the first hypothesis, these robust checks would be divided into two types, by size and year with the same criteria as prior robust tests. If regression results in both robust checks inform that corporate governance is insignificant to excess value, it would confirm that agency theory cannot explain value distortion supported my regression result in Table 14. Table 15 of robustness test between excess value and corporate governance classified by size confirms the rejection of my second hypothesis that corporate governance is a source of value distortion in diversification for all groups, small to large size. Other significant variables are varied among firm size. Significant variables for small size are firm age, firm specific risk and constraint in capital market. For medium size, significant ones are leverage and firm specific risk. The last group, large, significant factors are firm age, firm leverage and firm specific risk.

Table 16 presents Robustness test between excess value and corporate governance index classified by year; before and after corporate governance reformed which corporate governance is sustainable insignificance to excess value. It ensures that my second hypothesis is not true as well as table 14 to 15 even though I use different criteria to set up the models and categorize observations.

Table 6: Regression analysis between HERF and corporate governance index

The table shows the results of the test between degree of diversification (HERF) and corporate governance (CGI) for Equation 4 due to the first hypothesis with control variables. The regression method is panel regression for identical sample firms denoting by subscripted i and timing effects denoting by subscripted t to degree of diversification. The t-statistics is applied in testing the significance of each coefficient presented with ***, ** and * denoting statistical significance at the 1%, 5% and 10% confident level respectively. Two-sided t-test is used to compute significance levels. P-values in parentheses shown below t-stat column represent the result of null hypothesis that individual variable is indifferent to 0 or insignificant to interested dependent variable, HERF in this case.

Symbol	Description	Model 1		Model 2		Model 3		Model 4	
		Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Dependent Variable									
$HERF_{i,t}$									
Independent Variables									
β	Constant	1.10268***	47.72775	1.09915***	47.18955	1.06232*	55.88871	1.07091***	54.48262
		(0.00000)		(0.00000)		(0.00000)		(0.00000)	
$CGI_{i,t}$	Corporate governance index			0.00053**	2.35725	0.00043**	2.30250	0.00046**	2.36487
				(0.01850)		(0.02140)		(0.01810)	
$SIZE_{i,t}$	Size	-0.01166***	-5.48742	-0.01318***	-5.84029	-0.01096*	-5.81331	-0.01152***	-6.01979
		(0.00000)		(0.00000)		(0.00000)		(0.00000)	
$AGE_{i,t}$	Age	-0.01736***	-3.03943	-0.01993***	-3.44459	-0.01116**	-2.29262	-0.01304*	-2.58361
		(0.00240)		(0.00060)		(0.02200)		(0.00980)	
$LEV_{i,t}$	Leverage	-0.00314	-1.06224	-0.00258	-0.87309				
		(0.28830)		(0.38270)					
$STD_{i,t}$	Firm-specific risk	-0.00008	-0.88167	-0.00006	-0.66188	0.00000	0.02227	0.00002	0.24098
		(0.37810)		(0.50810)		(0.98220)		(0.80960)	
$PRO_{i,t}$	Profitability	0.00000	0.34822	0.00000	0.41760				
		(0.72770)		(0.67630)					
$D_{7i,t}$	Constraint in capital market	0.00446	0.73856	0.00027	0.04283			-0.00154	-0.28708
		(0.46030)		(0.96580)				(0.77410)	
Note : See variables' measurement in Appendix									
R-squared		0.02883		0.03178		0.01883		0.02023	
Adjusted R-squared		0.02515		0.02746		0.01698		0.01789	
F-statistic		7.82725		7.35199		10.14425		8.65332	
Prob(F-statistic)		0.00000		0.00000		0.00000		0.00000	
Observations after adjustment		1,589		1,576		2,119		2,102	

Table 7: Regression analysis between number of segment reports and corporate governance index

This table has been used number of reported segments instead of HERF for Equation 4 to test against corporate governance index while other control variables are remained in this test. Number of reported segments is counted from amount of firm investment in business (sectors) as reported by each firm. Notice that ***, ** and * is for 1%, 5% and 10% confident level respectively. P-values are in the parentheses under t-stat of each factor. Regression method is panel regression.

Symbol	Description	Model 1		Model 2		Model 3		Model 4	
		Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	Dependent Variable								
	Number of reported segments								
	Independent Variables								
β	Constant	0.49167***	4.25653	0.49711***	4.25338	0.62317***	6.56315	0.59286***	6.02793
			(0.00000)		(0.00000)		(0.00000)		(0.00000)
$CGI_{i,t}$	Corporate governance index			-0.00195*	-1.72978	-0.00122	-1.29669	-0.00136	-1.38769
					(0.08390)		(0.19490)		(0.16540)
$SIZE_{i,t}$	Size	0.05172***	4.86768	0.05867***	5.17985	0.05142***	5.46109	0.05329***	5.56389
			(0.00000)		(0.00000)		(0.00000)		(0.00000)
$AGE_{i,t}$	Age	0.10563***	3.69949	0.11424***	3.93494	0.08065***	3.31722	0.08744***	3.46313
			(0.00020)		(0.00010)		(0.00090)		(0.00050)
$LEV_{i,t}$	Leverage	0.01640	1.11010	0.01438	0.96902				
			(0.53040)		(0.33270)				
$STD_{i,t}$	Firm-specific risk	0.00101**	2.28733	0.00094	2.10161	0.00026	0.81349	0.00019	0.59135
			(0.02230)		(0.03570)		(0.41600)		(0.55440)
$PRO_{i,t}$	Profitability	0.00000	-0.33392	0.00000	-0.38833				
			(0.73850)		(0.69780)				
$D_{7i,t}$	Constraint in capital market	-0.01897	-0.62756	-0.00451	-0.14361			0.01007	0.37546
			(0.53040)		(0.88580)				(0.70740)
Note : See variables' measurement in Appendix									
R-squared		0.03476		0.03678		0.02208		0.02270	
Adjusted R-squared		0.03109		0.03248		0.02023		0.02037	
F-statistic		9.48793		8.54847		11.92835		9.73269	
Prob(F-statistic)		0.00000		0.00000		0.00000		0.00000	
Observations after adjustment		1,588		1,575		2,118		2,102	

Table 8: Regression analysis between HERF and corporate governance sub-index

The underlying equation is Equation 5 to observe the most influence part of corporate governance to degree of diversification developed from Equation 4. It replaces corporate governance index with its five sub-indices. Those are Board structure,Conflict of interest, Board responsibility, Shareholder right, Disclosure and transparency. Likewise, it applies panel regression to the test. Symbol of ***, ** and * denoting statistical significance at the 1%, 5% and 10% level.

Symbol	Description	Model 1 Coefficient	Model 1 t-stat	Model 2 Coefficient	Model 2 t-stat	Model 3 Coefficient	Model 3 t-stat
Dependent Variable							
$HERF_{i,t}$							
Independent Variables							
β	Constant	1.09799***	46.10037	1.03354***	74.85217	1.02145***	79.61126
		(0.00000)		(0.00000)		(0.00000)	
$B\_ST_{i,t}$	Board structure	0.00012	0.76431	0.00015	1.26889	0.00017	1.55134
		(0.44480)		(0.20460)		(0.12090)	
$CON_{i,t}$	Conflict of interest	-0.00016	-0.70456	-0.00006	-0.36069	-0.00010	-0.61730
		(0.48120)		(0.71840)		(0.53710)	
$B\_RES_{i,t}$	Board responsibilities	0.00025	1.00700	0.00029*	1.67758	0.00028*	1.65006
		(0.31410)		(0.09360)		(0.09900)	
$SHA_{i,t}$	Shareholder rights	0.00015	0.79937	-0.00009	-0.62998	-0.00011	-0.80313
		(0.42420)		(0.5288)		(0.42200)	
$DIS_{i,t}$	Disclosure and transparency	0.00014	0.69771	0.00008	0.54431	0.00014	0.95827
		(0.48550)		(0.58630)		(0.33800)	
$SIZE_{i,t}$	Size	-0.01266***	-5.46532	-0.00927***	-5.73314	-0.00902***	-5.81502
		(0.00000)		(0.00000)		(0.00000)	
$AGE_{i,t}$	Age	-0.02038***	-3.47701	-0.00405*	-1.91415		
		(0.00050)		(0.05570)			
$LEV_{i,t}$	Leverage	-0.00247	-0.83301				
		(0.40500)					
$STD_{i,t}$	Firm-specific risk	-0.00006	-0.67535				
		(0.49960)					
$PRO_{i,t}$	Profitability	0.00000	0.45162				
		(0.65160)					
$D_{7i,t}$	Constraint in capital market	-0.00081	-0.12625				
		(0.89960)					

Note : See variables' measurement in Appendix

	Model 1	Model 2	Model 3
R-squared	0.03297	0.02032	0.01784
Adjusted R-squared	0.02617	0.01765	0.01562
F-statistic	4.84760	7.60421	8.05492
Prob(F-statistic)	0.00000	0.00000	0.00000
Observations after adjustment	1,576	2,574	2,668

Table 9: Regression analysis between number of segment reports and corporate governance sub-index

This table changes degree of diversification from HERF to number of reported segments to prove whether Equation 5 holds when we change diversification's proxy. Symbol of ***, ** and * denoting statistical significance at the 1%, 5% and 10% level for panel regression. Model 1 to 3 in this table is mimicked from table 8 to see the differences in the results.

		Model 1		Model 2		Model 3	
Symbol	Description	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Dependent Variable							
Number of reported segments							
Independent Variables							
β	Constant	0.47211***	3.95223	0.75230***	10.72255	0.80970***	12.35514
		(0.00010)		(0.00000)		(0.00000)	
$B\_ST_{i,t}$	Board structure	0.00074	0.92102	-0.00005	-0.08937	-0.00031	-0.54032
		(0.35720)		(0.92880)		(0.58900)	
$CON_{i,t}$	Conflict of interest	0.00013	0.11183	0.00052	0.60542	0.00060	0.71557
		(0.91100)		(0.54500)		(0.47430)	
$B\_RES_{i,t}$	Board responsibilities	-0.00143	-1.17207	-0.00121	-1.36416	-0.00116	-1.32531
		(0.24130)		(0.17260)		(0.18520)	
$SHA_{i,t}$	Shareholder rights	-0.00085	-0.88007	0.00029	0.41625	0.00047	0.67618
		(0.37900)		(0.67730)		(0.49900)	
$DIS_{i,t}$	Disclosure and transparency	-0.00059	-0.57074	-0.00026	-0.33612	-0.00047	-0.62282
		(0.56830)		(0.73680)		(0.53350)	
$SIZE_{i,t}$	Size	0.05812***	5.00239	0.05052***	6.14585	0.05160***	6.51315
		(0.00000)		(0.00000)		(0.00000)	
$AGE_{i,t}$	Age	0.12151***	4.13412	0.02554**	2.37672		
		(0.00000)		(0.01750)			
$LEV_{i,t}$	Leverage	0.01339	0.89978				
		(0.36840)					
$STD_{i,t}$	Firm-specific risk	0.00097	2.17132				
		(0.03010)					
$PRO_{i,t}$	Profitability	0.00000	-0.37214				
		(0.70980)					
$D_{7i,t}$	Constraint in capital market	0.00780	0.24187				
		(0.80890)					

Note : See variables' measurement in Appendix

R-squared		0.03888	0.02214	0.01970
Adjusted R-squared		0.03211	0.01947	0.01749
F-statistic		5.74739	8.30138	8.91770
Prob(F-statistic)		0.00000	0.00000	0.00000
Observations after adjustment		1,575	2,575	2,669

Table 10: Robustness test between HERF and corporate governance index classified by size

This table are robust checks for Equation 4 ; HERF and corporate governance index. It divides observations in each model by firm size into three groups; small, medium and large. The criteria is that the size ranging from small to large firm would be observations fallen into values of total assets at 0-3, 3.01-6 and over 6 billion Baht respectively. Other control variables are set as shown in Equation 4. Symbol of ***, ** and * denoting statistical significance at the 1%, 5% and 10% level for these panel regression.

Symbol	Description	Small Size Total assets : 0-3 billion Baht		Medium Size Total assets : 3.01-6 billion Baht		Large Size Total assets : Over 6.01 billion Baht	
		Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	Dependent Variable						
	$HERF_{i,t}$						
	Independent Variables						
β	Constant	0.99917***	76.55729	0.91757***	17.50854	1.02552***	20.95342
		(0.00000)		(0.00000)		(0.00000)	
$CGI_{i,t}$	Corporate governance index	0.00019	0.95501	0.00094	1.53255	0.00099*	1.83923
		(0.33980)		(0.12660)		(0.06660)	
$AGE_{i,t}$	Age	-0.00970**	-2.07334	-0.00892	-0.49926	0.04496***	-2.84940
		(0.03840)		(0.61800)		(0.00460)	
$LEV_{i,t}$	Leverage	-0.00172	-0.92123	-0.00988	-0.30811	-0.03712	-0.93880
		(0.35720)		(0.75820)		(0.34840)	
$STD_{i,t}$	Firm-specific risk	0.00007	0.52674	0.00026	0.82972	-0.00004	-0.29074
		(0.59850)		(0.40750)		(0.77140)	
$PRO_{i,t}$	Profitability	-0.00027	-0.21326	0.02987**	1.99052	0.00000	0.38634
		(0.83120)		(0.04760)		(0.69940)	
$D_{7i,t}$	Constraint in capital market	-0.00127	-0.24254	0.03529	2.10714	1.02552	-1.33182
		(0.80840)		(0.88580)		(0.18360)	
Note : See variables' measurement in Appendix							
R-squared		0.00643		0.05685		0.03443	
Adjusted R-squared		-0.00039		0.03466		0.02083	
F-statistic		0.94257		2.56177		2.53168	
Prob(F-statistic)		0.46351		0.01994		0.02029	
Observations after adjustment		881		262		433	

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Table 11: Robustness test between HERF and corporate governance index classified by year; before and after corporate governance reformed

In this panel regression followed Equation 4, there are two observation groups in this table categorized on year basis after there was corporate governance improvement in 2004. The cut-off year is then become 2004. The period before corporate governance reformation would be 2000-2003 while the period after that would be 2004-2007. Statistically significance notifies by ***, ** and * for 1%, 5% and 10%.

Symbol	Description	Before reformation		After reformation	
		Year 2000-2003		Year 2004-2007	
		Coefficient	t-stat	Coefficient	t-stat
Dependent Variable					
HERF					
Independent Variables					
β	Constant	1.10138***	30.49600	1.14022***	28.28143
		(0.00000)		(0.00000)	
$CGI_{i,t}$	Corporate governance index	0.00074*	1.67833	-0.00012	-0.36350
		(0.09370)		(0.76130)	
$SIZE_{i,t}$	Size	-0.01419***	-4.08229	-0.01139***	-3.52747
		(0.00000)		(0.00040)	
$AGE_{i,t}$	Age	-0.02409***	-3.09478	-0.02539**	-2.44134
		(0.00200)		(0.01490)	
$LEV_{i,t}$	Leverage	-0.00205	-0.63804	-0.00315	-0.15931
		(0.52360)		(0.87350)	
$STD_{i,t}$	Firm-specific risk	0.00005	0.35235	-0.00009	-0.79894
		(0.72470)		(0.42460)	
$PRO_{i,t}$	Profitability	0.00000	-0.02319	0.00066	0.24212
		(0.66320)		(0.80880)	
$D_{7i,t}$	Constraint in capital market	-0.00022	-0.02319	-0.00203	-0.23300
		(0.98150)		(0.81580)	
Note : See variables' measurement in Appendix					
R-squared		0.03534		0.03616	
Adjusted R-squared		0.02656		0.02763	
F-statistic		4.02510		4.23958	
Prob(F-statistic)		0.00024		0.00013	
Observations after adjustment		777		799	

Table 12: Robustness test between HERF and corporate governance sub-index classified by size

This table is for Equation 5 to test HERF and five corporate governance sub-index; Board structure, Conflict of interest, Board responsibility, Shareholder right, Disclosure and transparency. Observations are classified by size ranging from small to large. The width of total assets in each group is 3 billion Baht. Symbol of ***, ** and * denoting statistical significance at the 1%, 5% and 10% level for these panel regression.

Symbol	Description	Small Size Total assets : 0-3 billion Baht		Medium Size Total assets : 3.01-6 billion Baht		Large Size Total assets : Over 6.01 billion Baht	
		Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	Dependent Variable						
$HERF_{i,t}$							
	Independent Variables						
β	Constant	1.00095***	72.84197	0.91521***	16.95676	1.02151***	20.87416
		(0.00000)		(0.00000)		(0.00000)	
$B\_ST_{i,t}$	Board structure	-0.00005	-0.38255	-0.00013	-0.30079	0.00066	1.59219
		(0.70210)		(0.76380)		(0.11210)	
$CON_{i,t}$	Conflict of interest	0.00032	1.49858	0.00030	0.43678	-0.001091**	-2.01454
		(0.13430)		(0.66260)		(0.04460)	
$B\_RES_{i,}$	Board responsibilities	-0.00018	-0.88327	-0.00004	-0.05614	0.00079	1.14908
		(0.37730)		(0.95530)		(0.25120)	
$SHA_{i,t}$	Shareholder rights	0.00023	1.44213	-0.00007	-0.13050	0.00042	0.74735
		(0.14960)		(0.89630)		(0.45530)	
$DIS_{i,t}$	Disclosure and transparency	-0.00006	-0.36817	0.00078	1.36812	0.00035	0.64367
		(0.71280)		(0.17250)		(0.52010)	
$AGE_{i,t}$	Age	-0.01019**	-2.14944	-0.00934	-0.50374	-0.04790***	-3.02928
		(0.03190)		(0.61490)		(0.00260)	
$LEV_{i,t}$	Leverage	-0.00181	-0.96742	-0.00684	-0.20949	-0.02231	-0.55652
		(0.33360)		(0.83420)		(0.57810)	
$STD_{i,t}$	Firm-specific risk	0.00004	0.32631	0.00027	0.83981	-0.00004	-0.24325
		(0.74430)		(0.40180)		(0.80790)	
$PRO_{i,t}$	Profitability	-0.00021	-0.16893	0.02939*	1.93014	0.00000	0.54241
		(0.86590)		(0.05470)		(0.58780)	
$D_{7i,t}$	Constraint in capital market	-0.00173	-0.31878	0.03446**	1.99854	-0.02383	-1.21231
		(0.75000)		(0.04670)		(0.22610)	

Note : See variables' measurement in Appendix

	Small	Medium	Large
R-squared	0.01142	0.06174	0.05025
Adjusted R-squared	0.00005	0.02436	0.02774
F-statistic	1.00467	1.65168	2.23261
Prob(F-statistic)	0.43743	0.09273	0.01531
Observations after adjustment	881	262	433

Table 13: Robustness test between HERF and corporate governance sub-index classified by year; before and after corporate governance reformed

This table is for robust check in Equation 5, there are two observation groups in this table categorized on year basis after there was corporate governance improvement in 2004. Statistically significance notifies by ***, ** and * for 1%, 5% and 10%.

Symbol	Description	Before reformation Year 2000-2003		After reformation Year 2004-2007	
		Coefficient	t-stat	Coefficient	t-stat
Dependent Variable					
$HERF_{i,t}$					
Independent Variables					
β	Constant	1.11484***	28.70211	1.13140***	27.35399
		(0.00000)		(0.00000)	
$B\_ST_{i,t}$	Board structure	0.00008	0.25733	0.00011	0.53234
		(0.79700)		(0.59460)	
$CON_{i,t}$	Conflict of interest	-0.00022	-0.51449	-0.00016	-0.58505
		(0.60710)		(0.55870)	
$B\_RES_{i,t}$	Board responsibilities	-0.00007	-0.16416	0.00038	1.24228
		(0.86970)		(0.21450)	
$SHA_{i,t}$	Shareholder rights	0.00041	1.45794	-0.00033	-1.18070
		(0.14530)		(0.23810)	
$DIS_{i,t}$	Disclosure and transparency	0.00028	0.88665	-0.00019	-0.66133
		(37550)		(0.50860)	
$SIZE_{i,t}$	Size	-0.01429***	-4.07761	-0.00967***	-2.84688
		(0.00010)		(0.00450)	
$AGE_{i,t}$	Age	-0.02484***	-3.13210	-0.02488**	-2.35657
		(0.00180)		(0.01870)	
$LEV_{i,t}$	Leverage	-0.00237	-0.73246	-0.00767	-0.38338
		(0.46410)		(0.70150)	
$STD_{i,t}$	Firm-specific risk	0.00006	0.38583	-0.00009	-0.79814
		(0.69970)		(0.42500)	
$PRO_{i,t}$	Profitability	0.00000	0.43463	0.00072	0.26481
		(0.66400)		(0.79120)	
$D_{7i,t}$	Constraint in capital market	-0.00196	-0.20086	-0.00178	-0.19853
		(0.84090)		(0.84270)	

Note : See variables' measurement in Appendix

R-squared		0.03825	0.04039
Adjusted R-squared		0.02442	0.02697
F-statistic		2.76592	3.01104
Prob(F-statistic)		0.00158	0.00060
Observations after adjustment		777	799

Table 14: Regression analysis between value of diversification and corporate governance index

These models are to observe value of diversification (EXVAL) and corporate governance index (CGI) under Equation 6 by panel regression raising up two more control variables in form of dummies to differentiate between single and multi-segment firm denoted by $D_{8i,t}$ and the next one is to isolate related and unrelated business diversification denoted by $D_{9i,t}$. Model 1-3 are almost the same but Model 4 removes dummy of diversification status by Herfindahl index. These two variables are substitute for degree of diversification and the removal will show the change in significance of these variables to the test. Statistically significance notifies by ***, ** and * for 1%, 5% and 10%.

Symbol	Description	Model 1 Coefficient	t-stat	Model 2 Coefficient	t-stat	Model 3 Coefficient	t-stat	Model 4 Coefficient	t-stat
	Dependent Variable								
$EXVAL_{i,t}$									
	Independent Variables								
β	Constant	-0.79955***	-2.64597	-0.82892***	-2.71230	-0.90662***	-3.44724	-1.43948***	-2.94447
		(0.00820)		(0.00680)		(0.00060)		(0.00330)	
$CGI_{i,t}$	Corporate governance index			0.00053	0.19277	0.00033	0.13354	0.00029	0.10473
				(0.84720)		(0.89380)		(0.91660)	
$SIZE_{i,t}$	Size	0.11359***	4.30667	0.11505***	4.07481	0.10357***	4.27588	0.12047***	4.25537
		(0.00000)		(0.00000)		(0.00000)		(0.00000)	
$AGE_{i,t}$	Age	-0.17980**	-2.31578	-0.18116**	-2.29007	-0.15118**	-2.14201	-0.17607*	-2.22703
		(0.02070)		(0.02220)		(0.03230)		(0.02610)	
$LEV_{i,t}$	Leverage	-0.06845**	-1.90077	-0.06618	-1.82898			-0.06523	-1.80388
		(0.05750)		(0.06760)				(0.07140)	
$STD_{i,t}$	Firm-specific risk	0.00387***	3.54307	0.00384***	3.49098	0.00387***	4.69365	0.00379***	3.45454
		(0.00040)		(0.00050)		(0.00000)		(0.00060)	
$PRO_{i,t}$	Profitability	0.00000	-0.18584	0.00000	-0.18186			0.00000	-0.19451
		(0.85260)		(0.85570)				(0.84580)	
$D_{7i,t}$	Constraint in capital market	0.38584***	5.20410	0.37988***	4.93251	0.44732***	6.62577	0.38265***	4.97099
		(0.00000)		(0.00000)		(0.00000)		(0.00000)	
$D_{8i,t}$	Diversification status	-0.08059	-0.64384	-0.05868	-0.46381				
		(0.51980)		(0.64280)					
$D_{9i,t}$	Industrial diversification	-0.17542	-0.77229	-0.19721	-0.86435			-0.07305	-0.32213
		(0.44010)		(0.38750)				(0.74740)	
$HERF_9$	Herfindahl index							0.57265	1.62260
								(0.10490)	

Note : See variables' measurement in Appendix

	Model 1	Model 2	Model 3	Model 4
R-squared	0.05949	0.05942	0.060551	0.06088
Adjusted R-squared	0.05467	0.05395	0.058267	0.05542
F-statistic	12.34911	10.86527	26.51628	11.15084
Prob(F-statistic)	0.00000	0.00000	0.000000	0.00000
Observations after adjustment	1,571	1,558	2,063	1,558

Table 15: Robustness test between excess value and corporate governance classified by size

This table is for Equation 6 to test EXVAL and corporate. Observations are classified by size ranging from small to large. The width of total assets in each group is 3 billion Baht. Symbol of ***, ** and * denoting statistical significance at the 1%, 5% and 10% level for these panel regression.

Symbol	Description	Small Size		Medium Size		Large Size	
		Total assets : 0-3 billion Baht		Total assets : 3.01-6 billion Baht		Total assets : Over 6.01 billion Baht	
		Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	Dependent Variable						
$EXVAL_{i,t}$							
	Independent Variables						
β	Constant	0.35319***	1.17422	-0.20389	-0.46702	0.71424	1.57254
		(0.00820)		(0.64090)		(0.11660)	
$CGI_{i,t}$	Corporate governance index	0.00340	0.84266	0.00539	1.04462	-0.00156	-0.30959
		(0.39970)		(0.29720)		(0.75700)	
$AGE_{i,t}$	Age	-0.42456***	-3.72469	0.07637	0.51370	-0.05761**	-0.39226
		(0.02070)		(0.60790)		(0.69510)	
$LEV_{i,t}$	Leverage	-0.04174	-1.11745	-1.17836***	-4.35556	0.98296***	-2.66218
		(0.05750)		(0.00000)		(0.00810)	
$STD_{i,t}$	Firm-specific risk	0.00767***	2.84538	0.00641**	2.44234	0.00264*	1.88976
		(0.00040)		(0.01530)		(0.05950)	
$PRO_{i,t}$	Profitability	-0.00422	-0.16973	-0.04238	-0.33799	0.00000	-0.17138
		(0.85260)		(0.73570)		(0.86400)	
$D_{7i,t}$	Constraint in capital market	0.45247***	4.27602	0.03749	0.26363	0.11755	0.65916
		(0.00000)		(0.79230)		(0.51020)	
$D_{8i,t}$	Diversification status	0.13793	0.66663	-0.16856	-0.72428	-0.26330	-1.26590
		(0.51980)		(0.46960)		(0.20630)	
$D_{9i,t}$	Industrial diversification	-0.24078	-0.67521	0.35398	0.81530	-0.20364	-0.52006
		(0.44010)		(0.41570)		(0.60330)	
Note : See variables' measurement in Appendix							
R-squared		0.05902		0.12482		0.04281	
Adjusted R-squared		0.05025		0.09703		0.024621	
F-statistic		6.72675		4.49242		2.353613	
Prob(F-statistic)		0.00000		0.00004		0.017457	
Observations after adjustment		867		261		430	

Table 16: Robustness test between excess value and corporate governance index classified by year; before and after corporate governance reformed

        This table is for robust check by panel regression in Equation 6, there are two observation groups in this table categorized on year basis after there was corporate governance improvement in 2004. Statistically significance notifies by ***, ** and * for 1%, 5% and 10%.

| | | Before reformation | | After reformation | |
| | | Year 2000-2003 | | Year 2004-2007 | |
Symbol	Description	Coefficient	t-stat	Coefficient	t-stat
	Dependent Variable				
EXVAL$_{i,t}$					
	Independent Variables				
β	Constant	-0.90785*	-1.95855	-1.14216**	-2.21232
		(0.05050)		(0.02720)	
CGI$_{i,t}$	Corporate governance index	-0.00040	-0.07513	0.00546	1.29709
		(0.94010)		(19500)	
SIZE$_{i,t}$	Size	0.10612**	2.53505	0.15851***	3.82759
		(0.011400		(0.00010)	
AGE$_{i,t}$	Age	-0.11186	-1.03022	-0.18775	-1.41023
		(0.30320)		(0.15890)	
LEV$_{i,t}$	Leverage	-0.04754	-1.25910	-0.76644***	-3.04518
		(0.20840)		(0.00240)	
STD$_{i,t}$	Firm-specific risk	0.00658***	3.75298	0.00121	0.84722
		(0.00020)		(0.39710)	
PRO$_{i,t}$	Profitability	0.00000	-0.24548	0.02170	0.63240
		(0.80610)		(0.52730)	
D$_{7i,t}$	Constraint in capital market	0.49199***	4.42066	0.20181*	1.81593
		(0.00000)		(0.06980)	
D$_{8i,t}$	Diversification status	-0.25570	-1.38510	0.07845	0.45388
		(0.16640)		(0.65000)	
D$_{9i,t}$	Industrial diversification	-0.19745	-0.62704	-0.01967	-0.05839
		(0.53080)		(0.95350)	

Note : See variables' measurement in Appendix

R-squared		0.08189	0.06675
Adjusted R-squared		0.07095	0.05602
F-statistic		7.48258	6.22271
Prob(F-statistic)		0.00000	0.00000
Observations after adjustment		765	793

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CHAPTER VI

CONCLUSION

Based on agency theory, managers may increase firms' investment in other business lines to gain their own benefits where cost of the investment will be in stakeholders' hands. This is undesirable for stakeholders who want to increase their wealth. However, agency theory is still in doubt whether it is an actual cause for diversification or not until after a long discussion for decades. Therefore, my paper could demonstrate empirical evidences of this topic to answer diversification in term of agency perspective since it investigates the effects of corporate governance on firm diversification in value and degree of listed companies in the stock exchange market in Thailand excluding financial firms and non-performing firms. The sample period is from 2000 to 2007.

There are two developed hypotheses to prove a relationship between diversification and agency problem. The first hypothesis is to test an existence of agency problem to decision to diversify. This could contribute to see a root of managers' actions to diversify. The second is to observe a linkage between value of diversification and agency theory. The above test describes a source of value reduction through agency problem not if there is a relationship between excess value and corporate governance index (CGI).

To investigate firm's value from diversification, I apply Berger and Ofek excess value. A positive excess value implies a diversification premium while a negative excess value indicates a diversification discount. Concerning level of diversification, I employ Herfindahl index (HERF) and number of reported segments. The closer HERF to 1 offers the fact that firms are concentrated in their business segments rather than high degree in diversification. On the contrary, the lower HERF is high diversification. Lastly, measurement of corporate governance is constructed by a modified index from Ananchotikul (2006) .The index would be split into five main components ; Board Structure, Conflict of Interest, Board Responsibilities, Shareholder Rights, and Disclosure and Transparency based on Thai listed companies structure given different weight for each component. It has the advantage of being transparent and easily reproducible.

Referring to regression analysis, the result is that my study does support agency theory using corporate governance as its proxy to explain diversification on decision to diversify only in large size firm during 2000-2003 which are years before corporate governance improvement. The influential factor of corporate governance sub-index to propensity to diversify is not consistence leading to disability in specification its result for this test. All tests to concerning degree of diversification (HERF)/number of reported segments and corporate governance index (CGI) accept my first hypothesis related to decision to diversify telling that it is a result from an increase in agency problem consistence to robustness tests. Other influential factors are firm size and firm age which resembles to other researchers, for example, Kamphaeng (2000) remark that larger and older firms tend to diversify than smaller and younger ones. Conversely, my second hypothesis regarding a link among value of diversification (EXVAL) and corporate governance index is rejected since corporate

governance is not statistically significant for all the tests in this section agreed with robustness checks. Firm size is sustainable significance positively to firm value after robust checks that greater firm size will introduce value-enhancing to companies. Other variables beyond size are not strongly significance to impact excess value.

A special feature of my paper is that I apply CGI to test for agency problem while most of other papers try to focus on a few of governance mechanism which could not cover all related important fractions of governance. Furthermore, there is no evidence on this topic in Thailand before even though it could help to improve firm operating efficiency in the future.

There are some limitations in my study as well. As a consequence, there might be some other variables related to diversification which is not included in my study caused trouble in omitted factor. Next, some corporate governance questions need information on corporate website for every year but we cannot track that information back for all sample periods (eight years). That is because corporate website have adapted annually while we need the past information in the website. Thus, we have to leave those questions in the index construction. The existing limitation is that firms tend to have strategic management in reporting their investment in business line; therefore, validity of segment sales report is still in doubt.

Even though my paper finds an evidence to support agency theory in degree of diversification, it does not appear on firms' value. For further study in Thailand, the other basis in calculating excess value (For example, EBIT and assets) and degree of diversification (For example, numbers of reported segments) will probably bring a change in the regression result. Furthermore, available information on corporate website in the index should be included if researchers can collect that information to achieve the best corporate governance index in their studies. Last but not least SET should make a clear criterion to justify firms' operating business rather than resort board definitions. To illustrate, the US has provided SIC that precisely state corporate industry in both narrow (sector) and board (industry) classification.

REFERENCES

Amihud, Y.; and Lev, B. (1981). Risk Reduction as a Managerial Motive for Conglomerate Mergers. The Bell Journal of Economics 12: 605-617.

Ananchotikul, Sudarat (2006). Does Foreign Investment Really Improve Corporate Governance? Evidence from Thailand. Doctorial Dissertion. Department of Economics, University of California, Berkeley.

Anderson, R. C.; Bates, T. W.; Bizjak , J. M.; and Lemmon, M. L. (2000). Corporate Governance and Firm Diversification. Financial Management Association 29.

Bebchuk, L.; Cohen, A.; and Ferrell, A. (2004). What Matters in Corporate Governance?. Review of Financial Studies 22: 783-827

Berger, P. G.; and Ofek, Eli (1995). Diversification's Effects on Firm Value. Journal of Financial Economics 37: 39-65.

Bhagat, S.; and Bolton,B (2008). Corporate Governance and Firm Performance. Journal of Corporate Finance 41: 359-400.

Burch, T. R.; and Nanda, V. K. (2003). Divisional Diversity and the Conglomerate Discount: The Evidence from Spin-Offs, Forthcoming. Journal of Economic Finance 70: 69-98.

Comment, R.; and Jarrell, G. A. (1995). Corporate Focus and Stock Returns. Journal of Financial Economics 37: 67-87.

Campa, J. M.; and Kedia, S. (2002). Explaining the Diversification Discount. Journal of Finance 57: 1731-1762.

Daniel, A. B.; and Steven, J. M. (2004). Disclosure Quality and the Excess Value of Diversification. Journal of Accounting Research 42: 691-730.

Denis, J. D.; Denis, D. K.; and Sarin, A. (1997). Agency Problems, Equity Ownership, and Corporate Diversification. Journal of Finance 52: 135-160.

Denis, J. D.; Denis, D. K.; and Yost, K. (2002). Global Diversification, Industrial Diversification, and Firm Value. Journal of Finance 57: 1951–1979.

Dittmar, A.; and Shivdasani A. (2003). Divestitures and Divisional Investment Policies. Journal of Finance 58: 2711-2744.

Fazzari, S. M.; Hubbard, R. G.; and Petersen, B. C. (1988). Financing Constraints and Corporate Investment. Brookings Papers on Economic Activity 1: 141-195.

Gompers, P. A.; Joy L. I.; and Andrew M. (2003). Corporate Governance and Equity Prices. Quarterly Journal of Economics 118: 107-155.

Graham, J. R.; Lemmon, M. L.; and Wolf, J. G. (2002). Does Corporate Diversification Destroy Value?. Journal of Finance 57: 695-720.

Hoskisson, R. E.; and Hitt, M. A. (1990). Antecedents and Performance Outcomes of Diversification: A Review and Critique of Theoretical Perspectives. Journal of Management 16: 461-509.

Hyland, D. C.; and Dilitz, J. D. (2002). Why Firms Diversity: An Empirical Examination. Financial management 31: 51-81.

Jensen, M. C.; and William H. M. (1986). Theory of the Firm, Managerial Behavior, Agency Costs, and Ownership Structure. Journal of Financial Economics 3: 305-360.

Jiraporn, P; Kim, Y. S.; Davidson, W. N.; and Singh, M. (2006). Corporate Governance, Shareholder Rights and Firm Diversification: An Empirical Analysis. Journal of Banking and Finance 30: 947–963.

Kamphaeng, Nawakan (2000). The Relation between Corporate Diversification and Managerial Equity Ownership in Thailand. Master's Thesis. Department of Banking and Finance, Faculty of Commerce and Accountancy, Chulalongkorn University

Kang, J. K.; and Stulz, R. M. (1996). How Different Is Japanese Corporate Finance? An Investigation of the Information Content of New Security Issues. Review of Financial Studies 9: 109-139.

Khanna, T.; and Palepu, K. (2000). Is Group Affiliation Profitable in Emerging Markets? An Analysis of Diversified Indian Business Groups. Journal of Finance 55: 867-891.

Lang, L. H. P.; and Stulz, R. (1994). Tobin's q, Corporate Diversification and Firm Performance. Journal of Political Economy 102: 1248–1280.

Lewellen, W. G. (1971). A Pure Financial Rationale for the Conglomerate Merger. Journal of Finance 26: 521–537.

Majd , S.; and Myers , S. C. (1987). Tax Asymmetries and Corporate Income Tax Reform in Effects of Taxation on Capital Accumulation. University of Chicago Press 3: 343–373.

Mansi, S.; and Reeb, D. M. (2002). Corporate Diversification: What Gets Discounted?. Journal of Finance 57: 2167–2184.

McConnell, J.; and Servaes, H. (1990). Additional Evidence on Equity Ownership Corporate Value. Journal of Financial Economics 27: 595–612.

Meyer, M.; Milgrom, P.; and Roberts, J. (1992). Organizational Prospects, Influence Costs and Ownership Changes. Journal of Economics and Management Strategy 1: 9–35.

Morck, R.; Shleifer, A.; and Vishny, R. W. (1990). Do managerial objectives drive bad acquisitions?. Journal of Finance 45: 31-48.

Montgomery, C. A. (1994). Corporate diversification. Journal of Economic Perspectives 8: 163-178.

Schall, L. D. (1972). Asset Valuation, Firm Investment and Firm Diversification. Journal of Business 45: 11–28.

Sheng-Syan, C.; and Kim-Wai, H. (2000). Corporate Diversification, Ownership Structure, and Firm Value: The Singapore Evidence. International Review of Financial Analysis 9: 315-326.

Singh, M.; Mathur, I.; and Gleason, K. C. (2004). An Analysis of Interrelationship among Corporate Governance, Ownership Structure and Diversification Strategies. Financial Review 39: 489–526.

Stein , J. C. (1997). Internal Capital Markets and the Competition for Corporate Resources. Journal of Finance 52: 111–133.

Villalonga, B. (2004). Does Diversification Cause the Diversification Discount?. Financial Management 33: 5–27.

Villalonga, B. (2004). Diversification Discount or Premium? New Evidence from the Business Information Tracking Series. Journal of Finance 59: 475–502.

Westin, J. F. (1970). The Nature and Significance of Conglomerate Firms. St. John's Law Review 44: 66–80.

Whited, T. (2001). Is It Efficient Investment That Causes the Diversification Discount?. Journal of Finance 56: 1667–1692.

Yang, Liu (2005). What Has Motivated Diversification: Evidence from Corporate Governance. Doctorial Dissertion. University of Maryland.

APPENDICES

APPENDIX A

VARIABLES SUMMARY

A1. Excess Value

Factors	Description	Measurement
I(V)	Imputed value	Summation of a firm's segments as stand-alone firms
AI_i	Segment i's sale	segments i's value of sales
$Ind_i (V/AI)_{mf}$	Multiple of total capital to sales	Multiple of the total capital to sales for the median single-segment firm in the segment i's industry
EXVAL	Excess value	Natural log of ratio of firm's actual value to its imputed value
V	Firm's total capital	Market value of common equity plus book value of debt
n	Number of segments	total number of segments in segment i's firm

A2. Level of Diversification

Factors	Description	Measurement
$HERF_{i,t}$	Herfindahl index	Summation of the squares of each segment i's sales to total sales
SSALE	Segment i's sales	Segment i's sales of the firm
SALE	Firm's total sales	Firm's total sales of all reported segment in year t

A3. Corporate Governance and Decision to Diversify

Factors	Description	Measurement
Dependent variable		
$HERF_{i,t}$	Herfindahl index	Summation of the squares of each segment i's sales to total sales
Independent Variables		
$CGI_{i,t}$	Corporate governance index	See Corporate governance index construction
$B\_ST_{i,t}$	Board Structure	See Corporate governance index construction
$CON_{i,t}$	Conflict of Interest	See Corporate governance index construction
$B\_RES_{i,t}$	Board responsibilities	See Corporate governance index construction
$SHA_{i,t}$	Shareholder rights	See Corporate governance index construction
$DIS_{i,t}$	Disclosure and transparency	See Corporate governance index construction
Control variables		
$SIZE_{i,t}$	Size	Natural log of book value of assets
$AGE_{i,t}$	Age	Natural log of years running business
$LEV_{i,t}$	Leverage	Book value of total debts/book value of total assets
$STD_{i,t}$	Firm-specific risk	Standard deviation of annual stock returns
$PRO_{i,t}$	Profitability	EBIT/Sales
$D_{7i,t}$	Constraint in capital market	Dividend dummy - 1 in case of paying dividend 0 otherwise.

A4. Corporate Governance and Excess Value

Factors	Description	Measurement
Dependent variable		
$EXVAL_{i,t}$	Firm's excess value	See excess value in
		4.1 How to measure corporate diversification
Independent Variables		
$CGI_{i,t}$	Corporate governance index	See 4.2 Corporate governance index construction
Control variables		
$SIZE_{i,t}$	Size	Natural log of book value of assets
$AGE_{i,t}$	Age	Natural log of years running business
$LEV_{i,t}$	Leverage	Book value of total debts/book value of total assets
$STD_{i,t}$	Firm-specific risk	Standard deviation of annual stock returns
$PRO_{i,t}$	Profitability	EBIT/Sales
$D_{7i,t}$	Constraint in capital market	Dividend dummy -
		1 in case of paying dividend
		0 otherwise.
$D_{8i,t}$	Diversification status	Degree of diversification dummy -
		1 for multi-segment
		0 otherwise.
$D_{9i,t}$	Industrial diversification	Characters of diversification dummy -
		1 for related business
		0 otherwise.

APPENDIX B

QUESTIONS FOR
CORPORATE GOVERNANCE INDEX CONSTRUCTION

Code	Questions	Scoring Rule		Max. Score	Weight
A. Board Structure				**6**	**20%**
A1	What is the size of the board of directors?	1 if 5 <=a1<=12;	;0 otherwise	1	
A2	What is the size of executive board?	1 if a2 <= 12	;0 otherwise	1	
A3	How many directors are also managers?	1 if a3/a1 < 1/3	;0 otherwise	1	
A4	How many directors are dependent?	1 if a4/a1 > 1/3	;0 otherwise	1	
A5	Does the firm state the definition of independence in the disclosure report?	1 if a5=1	;0 otherwise	1	
A6	How many directors have attended director training programs by the Thai Institution of Directors Association?	1 if a6/a1 >1/2	;0 otherwise	1	
B. Conflict of Interest				**8**	**25%**
B1	Is the chairman is the same person as CEO?	1 if b1=1	;0 otherwise		
B2	Is the chairman independent?	1 if b2=1	;0 otherwise		
B3	How many public companies dose the chairman currently serve as a director or a manager?	1 if b3<=3	;0 otherwise		
B4	Does an audit committee exist?	1/2 if b4=1	;0 otherwise		
B5	- Chair by independent	1/6 if b5=1	;0 otherwise		
B6	- Role and responsibilities clearly stated?	1/6 if b6=1	;0 otherwise		
B7	- Performance or meeting attendance disclosure?	1/6 if b7=1	;0 otherwise		
B8	Does a nominating committee exist?	1/2 if b8=1	;0 otherwise		
B9	- Chair by independent director?	1/6 if b9=1	;0 otherwise		
B10	- Role and responsibilities clearly stated?	1/6 if b10=1	;0 otherwise		
B11	- Performance or meeting attendance	1/6 if b11=1	;0 otherwise		

Code	Questions	Scoring Rule		Max. Score	Weight
B. Conflict of Interest				**8**	**25%**
B12	Does a remuneration committee exist?	1/2 if b12=1	;0 otherwise		
B13	- Chair by independent director?	1/6 if b13=1	;0 otherwise		
B14	- Role and responsibilities clearly stated?	1/6 if b14=1	;0 otherwise		
B15	- Performance or meeting attendance disclosure?	1/6 if b15=1	;0 otherwise		
B16	Does a corporate governance committee exist?	1/2 if b16=1	;0 otherwise		
B17	- Chair by independent director?	1/6 if b17=1	;0 otherwise		
B18	- Role and responsibilities clearly stated?	1/6 if b18=1	;0 otherwise		
B19	- Performance or meeting attendance disclosure?	1/6 if b19=1	;0 otherwise		
B20	Does the firm has a policy that specifies a minimum number of independent directors?	1/3 if b20=1	;0 otherwise		
	Does the firm discuss the following internal-control issues in the disclosure report?				
B21	- Organization and control environment	2/15 if b21=1	;0 otherwise		
B22	- Risk management	2/15 if b22=1	;0 otherwise		
B23	- Management control activities	2/15 if b23=1	;0 otherwise		
B24	- Information and communication	2/15 if b24=1	;0 otherwise		
B25	- Monitoring and evaluation	2/15 if b25=1	;0 otherwise		
C. Board Responsibilities				**10**	**20%**
C1	Number of board meeting per year	1 if c1>4	;0 otherwise	1	
C2	Average director's meeting attendance	c2/c1	;0 otherwise	1	
C3	Average independent directors meeting attendance	c3/c1	;0 otherwise	1	
C4	Is there a board meeting solely for independent directors?	1 if c4=1	;0 otherwise	1	
C5	Number of audit committee meeting per year	1 if c5=>4	;0 otherwise	1	

Code	Questions	Scoring Rule		Max. Score	Weight
C. Board Responsibilities				**10**	**20%**
C6	Average audit committee meeting attendance	$c6/c5$	;0 otherwise	1	
C7	Is there at least one accounting expert on the audit committee?	1 if $c7=1$	;0 otherwise	1	
C8	How many public companies does the chairman of audit committee serve as a director or manager?	1 if $c8<=3$	;0 otherwise	1	
C9	Does the firm clearly distinguish the role and responsibilities of the board and management?	$1/3$ if $c9=1$	;0 otherwise	0.33	
C10	Does the firm disclose that directors evaluation system exists?	$1/3$ if $c10=1$	;0 otherwise	0.33	
C11	Does the firm have an option scheme which incentivizes management?	$1/3$ if $c11=1$	;0 otherwise	0.33	
C12	Has there been any legal dispute where the firm was claimed to be a fault during the past year?	1 if $c12=0$	;0 otherwise	1	
D. Shareholder Rights				**7**	**10%**
D1	Does the firm hold an annual general shareholder meeting?	1 if $d1=1$	;0 otherwise		
D2	Does the firm employ one-share-one-vote rule?	1 if $d2=1$	;0 otherwise		
D3	Is cumulative voting allowed in electing directors?	1 if $d3=1$	;0 otherwise		
D4	Is voting by mail allow?	1 if $d4=1$	;0 otherwise		
D5	How many days in advance does the company send out a notice of general meetings to shareholders?	$d5/14$	;0 otherwise		
D6	Is proxy voting allowed?	1 if $d6=1$	;0 otherwise		
D7	Does the firm disclosure a dividend policy?	$1/3$ if $d7=1$	;0 otherwise		
D8	What is the minimum dividend (as a percentage of net profit) according to the dividend policy?	$1/3*d8/100$	;0 otherwise		

Code	Questions	Scoring Rule		Max. Score	Weight
D. Shareholder Rights				**7**	**10%**
D9	Does the firm provide an explanation/rationale for setting dividend at the specified level?	1/3 if d9=1	;0 otherwise		
E. Disclosure and Transparency				**10**	**25%**
	Does the firm disclose the following information in the disclosure report?				
E1	- Board meeting attendance of individual directors	1 if e1=1	;0 otherwise	1	
E2	- Board compensation and/or benefits of individual directors	1 if e2=1	;0 otherwise	1	
E3	- Directors shareholding	1 if e3=1	;0 otherwise	1	
E4	- Management shareholding	1 if e4=1	;0 otherwise	1	
E5	- Related party transaction in detail	1 if e5=1	;0 otherwise	1	
E6	- Corporate group structure	1 if e6=1	;0 otherwise	1	
E7	- Grouping of major shareholding who belong to the same family/economics unit	1 if e7=1	;0 otherwise	1	
E8	Does investor relation unit exist?	1 if e8=1	;0 otherwise	1	
E9	Does the firm mention its investor relations activity carried out during the past year?	1 if e9=1	;0 otherwise	1	
E10	Does the firm's Annual Report include a section devoted to corporate governance principles and implementations?	1 if e10=1	;0 otherwise	1	

BIOGRAPHY

Miss Tanatip Poonsin graduated from Faculty of Economics, Chulalongkorn University majoring in Monetary Economics and minoring in Labor and Human Resource with Grade Average Point (GPA) equaled to 3.37, achieved Second Class Honor in 2007. In the same year, she entered to Full-Time program in Master of Science in Finance (MS Finance) at Faculty of Commerce and Accountancy, Chulalongkorn University. She graduated in academic year 2009 with GPA of 3.63.