

กรรมการบริษัทสตรี เครื่องสำอาง และผลการดำเนินงานของบริษัทในประเทศไทย



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วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต

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คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย

ปีการศึกษา 2553

ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

WOMEN DIRECTORS, NETWORK AND FIRM PERFORMANCE
IN THAILAND

Miss Phornthipha Sirisophonphong

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science Program in Finance

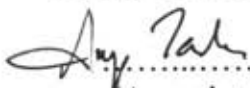
Department of Banking and Finance
Faculty of Commerce and Accountancy
Chulalongkorn University

Academic Year 2010


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Field of Study	Finance
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พรทิพา ศิริโสภณพงศ์ : กรรมการบริษัทสตรี เครือข่าย และผลการดำเนินการของ
บริษัทในประเทศไทย. (WOMEN DIRECTORS, NETWORK AND
FIRM PERFORMANCE IN THAILAND) อ. ที่ปรึกษาวิทยานิพนธ์
หลัก: รศ.ดร.สันติ อธิพัฒน์, 53 หน้า.

งานวิจัยชิ้นนี้มุ่งเน้นการศึกษาความสัมพันธ์ระหว่างกรรมการบริษัทสตรีและผลการดำเนินการ
ของบริษัทในประเทศไทย รวมทั้งมีการศึกษาผลกระทบของเครือข่ายทางครอบครัวและการศึกษาระหว่าง
กรรมการบริษัทสตรีและผู้ถือหุ้นรายใหญ่หรือคณะกรรมการของบริษัทต่อผลประกอบการของบริษัท กลุ่ม
ตัวอย่างประชากรที่ใช้ในงานวิจัยชิ้นนี้คือ บริษัทที่จดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย ในช่วงปี
พ.ศ. 2543 – 2552 จากกลุ่มตัวอย่างบริษัทในประเทศไทยพบว่า แนวโน้มของการมีกรรมการบริษัทสตรีใน
ห้องประชุมกรรมการบริษัทนั้นเป็นไปในแนวราบ สัดส่วนชาย/หญิงของคณะกรรมการบริษัทไม่มีความ
เปลี่ยนแปลงในระยะเวลา 10 ปีที่ผ่านมา จากการศึกษาวิจัยพบว่า กรรมการบริษัทสตรีมีผลกระทบแบบมี
นัยสำคัญต่อผลการดำเนินการของบริษัท โดยภาพรวม กรรมการบริษัทสตรีและผลประกอบการของบริษัทมี
ความสัมพันธ์กันในเชิงลบ อย่างไรก็ตาม กรรมการบริษัทสตรีช่วยพัฒนาผลการดำเนินการของบริษัทที่มี
กรรมการอิสระมากกว่ากึ่งหนึ่งของกรรมการอิสระทั้งหมดดำรงตำแหน่งกรรมการในบริษัทอย่างน้อย 3
แห่งในช่วงเวลาเดียวกัน ซึ่งโดยปกติ กรรมการอิสระเหล่านี้ ส่งผลในเชิงลบต่อผลการดำเนินการของ
บริษัทอย่างมีนัยสำคัญ นอกจากนี้กรรมการบริษัทสตรีที่มีเครือข่ายทางครอบครัวกับผู้ถือหุ้นรายใหญ่ของ
บริษัทมีผลกระทบในเชิงบวกอย่างมีนัยสำคัญ และช่วยพัฒนาผลการดำเนินการของบริษัท เช่นเดียวกัน
กรรมการบริษัทสตรีที่มีเครือข่ายทางการศึกษากับผู้ถือหุ้นรายใหญ่หรือคณะกรรมการของบริษัท ช่วยเพิ่ม
มูลค่าให้แก่บริษัท ผลการวิจัยแนะให้เห็นว่า เครือข่ายหรือความสัมพันธ์เป็นเครื่องมือที่มีประสิทธิภาพ ที่
นำมาซึ่งมูลค่า และช่วยยกระดับผลการดำเนินการของบริษัทในทางใดทางหนึ่ง

ภาควิชา...การธนาคารและการเงิน...ลายมือชื่อนิสิต.....*พิมพ์ภา สิริโสภณพงศ์*.....
สาขาวิชา...การเงิน.....ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์.....*สันติ อธิพัฒน์*.....
ปีการศึกษา ...2553.....

5282133926 : MAJOR FINANCE

KEYWORDS : BOARD OF DIRECTORS / GENDER / NETWORK / FIRM PERFORMANCE

PHORNTHIPHA SIRISOPHONPHONG: WOMEN DIRECTORS, NETWORK AND FIRM PERFORMANCE IN THAILAND. THESIS ADVISOR: ASSOC PROF. SUNTI TIRAPAT, PH.D., 53 pp.

This study focuses on the impact of female directors on firm performance in Thailand. The network between female directors and firm shareholders or board members are detected and tested against firm performance. The sample of this study is firms listed on Stock Exchange of Thailand (SET) during the year 2000-2009. In a sample of Thai firms, I find that the trend of having female directors in boardroom is flat. The pattern of gender composition or percentage of board seats held by female in boardroom is constant overtime. From this study, I show that female directors have a significant impact on firm performance. In general, female directors in boardrooms have negative impact on firm performance. Nevertheless, female directors help improve performance in firms that are classified as busy firm which normally have significant negative impact on firm performance. This result suggests that gender-diverse board allocate more effort to monitoring. Moreover, female directors who have family network with high control majority shareholders have significant positive impact that help improve firm performance. Also, Female directors who have alumni network add value to firm. The results suggest that the network or connection can be viewed as the effective tool that, in some way, bring value and help firm to enhance firm performance.

Department : Banking and Finance.....

Field of Study : Finance.....

Academic Year : 2010.....

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Advisor's Signature Sunti Tirapat

Acknowledgements

This thesis would not have been possible without the valuable supports of my advisor, Assoc Prof. Sunti Tirapat, whose encouragement, guidance and advice from the initial to the final level enabled me to develop and complete this thesis.

Besides my advisor, I would like to express my sincere thanks and respect to all the teachers in MsF faculty and all thesis committee members for insightful comments and kind suggestions for improving this thesis.

Importantly, I am heartily thankful to my beloved parents and sister, who always encourage and inspire me to be hard working and always stand beside me throughout the troublesome days writing thesis. Thanks are given to my friends who always keep their fingers cross for me. My special thanks also go to my classmates and staffs in MsF office and Financial Laboratory who help me in the processes of data collection.



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Contents

	Page
Abstract (Thai)	iv
Abstract (English).....	v
Acknowledgements.....	vi
Contents.....	vii
List of Tables.....	ix
List of Figures.....	x
Chapter I: Introduction.....	1
1.1 Background of study.....	1
1.2 Statement of problem.....	3
1.3 Objective of study.....	4
1.4 Scope of study.....	4
1.5 Contribution.....	4
1.6 Organization of study.....	5
Chapter II: Literature review and hypothesis development.....	6
2.1 The effect of board composition and overall performance.....	6
2.2 The effect of female directors on firm performance.....	6
2.3 Important of network support accessing board position.....	9
2.4 The effect of network support accessing board position on firm performance.....	10
2.4.1 Family network.....	11
2.4.2 Alumni network.....	11
2.5 Hypothesis development.....	12
Chapter III: Sample and methodology.....	14
3.1 Sample selection.....	14
3.2 Source of data.....	14
3.3 Definition of network.....	14
3.3.1 Family network.....	15
3.3.2 Alumni network.....	15
3.4 Data descriptive.....	16
3.4.1 Women in boardroom in Thailand: the basic facts	18
3.4.2 Firms with and without female directors: are they different?.....	20
3.5 Methodology.....	20
3.5.1 Regression equations.....	21
Chapter IV: Empirical result.....	30
4.1 Do female director improve firm performance in Thailand?.....	30
4.1.1 Female director characteristics: do they matter?.....	31
4.1.2 Do female directors help improve performance of “Busy firm”?.....	32
4.2 Network: Does it affect firm performance?.....	34
4.2.1 Family network: do female directors related to “family network” improve firm performance?.....	34

	Page
4.2.2 Alumni network: do female directors related to “alumni network” have positive impact on firm performance?.....	35
Chapter V: Conclusion.....	45
5.1 Conclusion.....	45
5.2 Suggestions for future studies.....	46
Reference.....	48
Appendix.....	51
Appendix A: Summary of female directorship classified by Sector (detail).....	52
Biography.....	53



ศูนย์วิทยพัทพยากร
จุฬาลงกรณ์มหาวิทยาลัย

List of Tables

Table		Page
1	Summary statistic.....	23
2	Summary of sample directorships.....	24
3	Number of unique directors in Thailand.....	25
4	Female directorship.....	25
5	Average number of female directorship classified by sector/industry..	26
6	Characteristic of female director.....	26
7	Busy female directorships.....	26
8	Comparison of firms with female directors to those without.....	27
9	Performance (Tobin's q and ROA) and gender diverse.....	37
10	Performance: Ln(Tobin's q) and characteristics of female directors...	38
11	Performance: ROA and characteristics of female directors.....	39
12	Performance, Busy firm by independent directors and female directors.....	40
13	Performance, Busy firm by CEO/Chairman and female directors.....	41
14	Performance and female directors with family network.....	42
15	Performance: Ln(Tobin's q) and female directors with alumni network.....	43
16	Performance: ROA and female directors with alumni network.....	44

List of Figures

Figure		Page
1	Family network identification.....	28
2	Alumni network identification.....	29



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER I

INTRODUCTION

Background of the Study

In 2009, world population stands at 6,790,062,216 (July 2009 est.) which is a slightly differences between male (50.26%) and female (49.74%) world population (Central Intelligence Agency, 2009). However, the representation of female in the top management position such as board of director and CEO is quite low relative to the proportion of total female population. In US., in 2008 and 2009 women held 15.2 % of board seats at Fortune 500¹ companies (Catalyst, 2009) which increased from 2007 (14.8%) (Catalyst, 2007). By the end of 2008, female directors in Europe, Australia, Germany, France, Spain, and Italy were 9.7%, 8.3%, 7.8%, 7.6%, 6.6%, and 2.1% respectively (EOWA-Equal Opportunity for Women in the Workplace Agency, 2008). These statistics show that there is a small proportion of female director relative to male director.

However, many countries concern the important of the gender diversity in boardroom and increase pressure on boards to increase female director in boardroom, especially the Scandinavian countries. The most extreme case occurred in Norway where 40% gender quota legislation for female board of director was introduced since 2002 (Forbes, 2006). Hence, the percentage of female director in Norway is 44.2% in 2008 (EOWA-Equal Opportunity for Women in the Workplace Agency, 2008) jumped from 28.8% in 2006 and 22% in 2004. By the end of 2008, the women on boards in Scandinavian countries continue to outperform the rest of European countries (EuropeanPWN - European Professional Women's Network, 2008). The percentage of female directors in Sweden (26.9%), Finland (25.7%) and Denmark (18.1%) increased from the previous years (Egon Zehnder International, 2008). Moreover, in Finland, the Finnish Corporate Governance Code (2008) stated that "Both genders shall be represented on the board". And from January 1st 2010 onward,

¹ The Fortune 500 company list is a ranking of the top 500 United States public corporations as measured by gross revenue, although eligible companies are any for which revenues are publicly available (which is a larger universe than "public companies," as the term is commonly understood, to mean "companies whose common stock trades on a stock exchange). Fortune magazine compiles and publishes the list of Fortune 500 companies annually.

listed companies in Finland need to have at least one woman in boardroom. If not, they need to explain the reason why (EuropeanPWN - European Professional Women's Network, 2010).

The important of female in boardroom is concerned more in the past few years. Most articles and researches on women as board member indicate the positive impact of gender diverse board in term of board inputs and firm outcomes (Adams and Ferreira, 2009; Bilimoria, 2000; Mattis, 1997; Maznevski, 1994 and Rosener, 1990). The Conference Board of Canada (2002) also provides the evidence that the service of women on board made a practical difference to the strength of its governance. Women, as a group, provide particular and identifiable benefits to board as women tend to display some characteristics such as broaden discussions, reduce unnecessary risks that a corporation takes on, and punish people who would increase foolish risks (Sweetman K., 2009).

Nevertheless, in Thailand, there is none of any study that shows the evidence of impact of women in boardroom on firm performance. Hence, I am motivated to study the impact of female board of director of the listed firms in the Stock Exchange of Thailand (SET) on their corporate performance.

However, the low number of women on board in many countries may come from the inequality of genders, limited access or barrier that block women from being promoted in top position in firm, which is called "Glass Ceiling". The connection is the important factor in supporting the promotion as director and women need to develop strong network and alliances to support their promotion (Israeli and Talmud, 1998). If board members are promoted by the network support, they can be viewed as homogenous group who have similar socioeconomic background, hold degree from the same school, have similar educational background or professional training and, as a result, have very similar view about appropriate business practices (Domhoff, 1970). However, under the assumption that the greater diversity, the better board decision making leads to the increasingly pressure to appoint directors with different backgrounds (Useem, 1993). Therefore, my study also hypothesizes whether there are some different effects on firm performance if I take network between those female directors and firm stakeholders such as firms' board member and majority shareholders in consideration.

This study focuses on the network between the female directors and the firm shareholders and board members. I scope my study into the main two types of connection: „family network“ and „alumni network“. Family or family network is classified by surname name and marriage link (by law) between board members and firm majority shareholders. Alumni network is the connection of people who hold degree from the same school. In this study, female directors who graduated from or hold degree of the particular school with the firm board members and majority shareholders are classified as female director related to alumni network. Moreover, the characteristics of female directors, which are type of director (independent, audit director), little name and multiple board directors, are added to investigate the impact on firm performance.

Statement of Problem

The gender diversity of the board and the important of female in board room are highly concerned worldwide because there are evidences claim the positive impact of female directors on firm performance. However, in Thailand, there is no existing study on this issue. Due to the different firm characteristics and cultures in Thailand (family ownership, weak corporate governance, nepotism, glass ceiling, etc.), the effect of female directors on firm performance may differ from other countries and those results might not be appropriate to apply in Thailand. Therefore, I hypothesize that the positive association may not be observed in Thailand. In particular, women directors who are appointed by “Network” may yield different effect on firm performance. Moreover, the characteristic of female directors, such as type of director (independent, audit director), little name and multiple board directors, may have significant impact on firm performance according to special feature of each characteristic. In order to investigate the effect of female directors on firm performance, it is required to find the empirical results in the study.

Objective of the Study

The objectives of this study is to investigate the impact of women in boardroom on performance of firm listed on Stock Exchange of Thailand (SET) over the period 2000-2009. Also, this study seeks to investigate on the effect of women directors who are appointed from network supporting on firm performance.

Scope of the Study

For the empirical analysis, in order to investigate the impact of female directors on firm performance in Thailand, the sample of my study is all publicly traded firms listed on the Stock Exchange of Thailand (SET) for the period 2000 - 2009. Nevertheless, financial institution, real estate investment trusts, insurance sectors and closed-end mutual funds, will be excluded from this study.

Contribution

The composition of board is one of mechanisms that improve the corporate governance. If we know the impact of female directors on firm performance in Thailand, we can improve the board effectiveness and corporate governance in Thailand, which is currently considered as weak corporate governance. Therefore, my study seeks to address the issues of the impact of female directors on firm performance and make several contributions to the literature. First, I explore impact of women in boardroom on performance of firm listed on the Stock Exchange of Thailand by using both market and accounting performance measurements, which are Tobin's q^2 and return on assets (ROA)³ as proxies respectively. Second, I identify the network of female director on listed companies into alumni network and family network by gathering data of female directors of firms listed in the Stock Exchange of

² Tobin's q or Q ratio is firm's market value to its book value. A Tobin's Q ratio greater than 1 indicates the firm has done well with its investment decisions. Named after James Tobin, Yale University economist.

³ An indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings. Calculated by dividing a company's annual earnings by its total assets, ROA is displayed as a percentage. Sometimes this is referred to as "return on investment"

Thailand. Finally, I investigate the effect of women directors who have network on firm performance, using Tobin's q and return on assets.

In addition, the result from this study will help clarify and understand the role or importance of female directors in boardroom. Therefore, the result can be used as a guideline to the regulators to impose the regulations or enforcing gender quotas in boardroom in the way that help improve the firm's corporate governance.

Organization of the Study

This thesis proceeds as follows. The first chapter is the introduction part which contains the background, statement of problem, objectives, scope, contribution and brief methodology of this study. The next chapter reviews prior literature studied on the effect of board composition on overall performance, the effect of female directors on firm performance, the important of network support accessing board position and the effect of network on firm performance and process of developing hypothesis. Chapter 3 describes the sample selection, source of data, data descriptive, the identification of networks and methodology. Chapter 4 presents analyzes the result of the tests. The summaries of the finding and suggestions for future studies are shown in chapter 5.

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CHAPTER II

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

There are two parts consist in this chapter which are literature reviews and hypothesis development. The prior literatures are discussed to develop the hypotheses. First, the section begins with the overview of the effect of board composition on overall firm performance. Next, the effect of female directors on firm performance is discussed in detail. Then, the important of network in accessing board position and the effect of network on firm performance is discussed. After the reviewed literatures, the new hypotheses are created from the gap of those literatures.

2.1 The effect of board composition and overall performance

The board of directors is one of several internal governance mechanisms which is intended to ensure that the interests of shareholders and managers are closely aligned, and to discipline or remove ineffective management teams. Number of studies found board composition has been found to play a substantial role in corporate performance surrounding events where agency costs between shareholders and managers are severe (Kosnik, 1990; Weisbach, 1988; Cochran et al., 1985). Moreover, some empirical evidences imply that board composition is important when board of directors ratify decisions that may have a direct effect on managerial well-being (Lee et at., 1992). Baysinger and Butler (1985) claim that changes in board composition over a ten-year period appear to have a causal relationship with accounting performance. Barnhart et at. (1994) finds that board composition and overall performance, which is measured by market value-to-book value of common stock equity (MB), are curvilinear related.

2.2 The effect of female directors on firm performance

Most studies of women in boardroom claim the positive impact of having gender diverse board on firm performance. The main study I focus on is the study of Adams and Ferreira (2009) who investigate the issue of women in boardroom and

their corporate governance and performance, using data of Standard & Poor's (S&P) 500⁴, S&P MidCap⁵ and S&P SmallCap⁶ firms during 1996-2003. In perspective of corporate governance, they find that female directors are less likely to experience attendance problems than male directors. Also, male directors have fewer attendance problems in gender diverse board. Thus, these suggest that the presence of women could influence board behavior in the way that leads to better governance. Moreover, the more fraction female director on board leads to higher sensitivity of turnover to performance which suggests that female directors appear to be tougher monitors than male directors.

In perspective of corporate performance, they examined whether gender diverse impacts corporate performance by using two measures of performance: Tobin's q and ROA. They suggest that the diversity has a positive impact on performance in firms that otherwise have weak governance and enforcing gender quota in the boardroom could decrease shareholder value in well-governed firms. In conclusion of this study, it shows that female directors have a significant impact on board inputs and outcomes.

Moreover, there are many reasons of why women are needed in boardroom which mostly imply the positive or benefits of having gender diverse board on firm corporate governance and performance. For example, first, gender diverse board increases diversity of opinions in the board room (Catalyst, 1995). Second, female directors bring strategic input to the board (Bilimoria, 2000). Third, female directors improve company image with stakeholder groups (Mattis, 1997). Forth, women in boardroom ensure better boardroom behavior (Adams and Ferreira, 2009).

In addition, many researchers argue that having women in key position is being associated with long term company success and competitive advantage (Cassell,

⁴ The S&P 500® has been widely regarded as the best single gauge of the large cap U.S. equities market since the index was first published in 1957. The index has over US\$ 3.5 trillion benchmarked, with index assets comprising approximately US\$ 915 billion of this total. The index includes 500 leading companies in leading industries of the U.S. economy, capturing 75% coverage of U.S. equities.

⁵ The S&P MidCap 400 is the most widely used index for mid-sized companies. The S&P MidCap 400 covers over 7% of the U.S. equities market, and is part of a series of S&P U.S. indices that can be used as building blocks for portfolio construction.

⁶ The S&P SmallCap 600 covers approximately 3% of the domestic equities market. Measuring the small cap segment of the market that is typically renowned for poor trading liquidity and financial instability, the index is designed to be an efficient portfolio of companies that meet specific inclusion criteria to ensure that they are investable and financially viable.

1997), and adding value through women's distinctive set of skills (Green and Cassell, 1996). Moreover, increased profitability has been claimed to be associated with the appointment of female directors in the United States (Catalyst, 1995).

In Thailand, the percentage of women in senior management team of firm is 38% which is higher than other countries in Asia Pacific region as a whole and the global average which the percentage of women in senior management team of firm are 25 % and 24 % respectively (Grant Thornton's International Business Report (IBR), 2009). The study of Yukondi (2005) claims that the equalization of genders is promoted in Thailand for the past two decades, such as promoting equality in education and career opportunities. However, she finds that the inequality in workplace between genders (normally called "Glass Ceiling") still persists because discrimination, social norms, customs and culture are extremely difficult to change. I believe that this factor is one important factor that affects the impact of female directors in boardroom on firm performance. The true ability of female directors may be blocked by the glass ceiling. For example, the opinion of female may not be accepted as much as males'.

Moreover, the different characteristics of directors may make different impact on firm performance. For example, directors are classified as independent and dependent directors which are different in characteristics therefore their impact on firm performance should be different. Klein (1998) claims significant relation between firm performance and how boards are structured. He found a positive relation between the percentage of inside directors and stock market performance measures.

In addition, the characteristic of female directors such as multiple board of directors (called busy board) and director with little name (including ladies and royal family) may have significant impact on firm performance. These characteristics may support female directors' ability to access to board position without any positive impact on firm performance.

2.3 The Important of network support accessing board position

Female in boardroom is quite rare in the past decades and being concerned more in recent. The small number of female in boardroom is the consequence of limited access to or exclusion from informal interaction networks (Kanter, 1997). Women are seen as “too different” to the current incumbents of boards and as such too risky to employ in senior positions is consistent with the Kanter’s description (1977) of homo-social reproduction.

The study of Sheridan (2002) argues that the business contact or network is important in accessing board positions. Sheridan conducts the survey of women board members of publicly-listed companies in Australia by using questionnaires with both closed- and opened-ended questions in order to access women boards’ experiences directly. The survey result shows the nomination to board is primarily tied on the recommendation of CEO, board member and firm shareholders. For more detail, the boards on which directors have served longest indicate that they had been recommended by the CEO (35%), a board member of the company (33%) and a shareholder of the company (24%). Also, some of female directors indicate that their business contacts had been important to their nomination.

The responses of the survey suggest some of the difficulties women continue to face in accessing board position. The tendency for “like promote like” (Kanter, 1997) continues to limit women’s access to board position (Sheridan, 2001). As women are not seemed to be “like” those currently on boards, their opportunities are limited.

Moreover, many others claim the significance of “who you know”. The importance of networks for employment opportunities and career progression has been stated in previous studies (Cannings and Montmarquette, 1991 and Ibarra, 1993). There is evidence shows that the established social network of board director advantage men (Israeli and Talmud, 1998). Not only in Australia proved networks are valuable, but also in Canada where important of networks in accessing board position is significant (Bruke, 1997).

As the mentioned examples above, in Thailand, network or connection also seems to be one of the important factors in recruiting or nominating firm employee. The „know-whom“ is as valuable as „know-how“ in accessing firm position.

2.4 The effect of network support accessing board position on firm performance

According to Williams and O'Reilly (1998), the study shows that network members may be more able to use unique information when they are familiar instead of being strangers with one another. In other word, network helps facilitate the flow of knowledge between network members. The communication of network members is easier to understand among themselves. Therefore, it implies that members in network group can work together with lesser probability of conflict than working with other people who are not members of the network. Once management teams or board members work well together, the working flow will be smoothen.

However, there are some disadvantages behind the above advantages of network. Pelled et al. (1999) show that familiarity of network members reduces emotional conflict which is resulting from less demographic diversity. Therefore, homogeneous experiences or background among board members may not enhance the affective conflict (Useem, 1982). Thus, the ability of board to work may not increase. Hence, it may not lead to positive impact on firm performance.

Moreover, under the assumption that the greater diversity the better board decision making will lead to the increasing pressure to appoint directors with different backgrounds (Useem, 1993). If board members are promoted by the network support, they can be viewed as homogenous group who have very similar views about appropriate business practices (Domhoff, 1970). This perspective is consistent with the view presented in the top management team literature that exposure to different beliefs about what strategies lead to high performance through greater diversity of backgrounds and experience. Therefore, the ability to facilitate adaptation in complex environments will be enhanced by stimulating debate about the appropriateness of a current strategy and about the feasibility of strategic alternatives (Boeker, 1997).

These studies imply that the similarity of boards' educational backgrounds and professional training trend to have similar way of thinking, perspective and business practice. Thus, the network between director and management teams such as CEO, shareholders and among board members themselves, which leads to the lower diversification, may lead to lower ability to improve board decision making. Hence, the firm performance may not be enhanced.

The effect of network on firm performance is complicated and cannot make the conclusion. Nevertheless, all the literature reviews above suggest the significance impact of network on firm performance. As I stated above that the network is one of the important factors of recruiting employees, the network should also have significant impact on firm performance as well. And „Network“ as it was mentioned in the introduction part is the relation of directors with firm shareholders and board members which are classified as alumni network and family network.

2.4.1 Family network

The connection between director and majority shareholder through bloodline or marriage-linked may support the ability to access to the board position. The family involvement in firm reduces firm agency costs and help to improve monitoring of the firm managers (Fama and Jansen, 1983). Anderson and Reeb(2004) claim that most valuable public firms are firms in which independent directors balance family board representation. They also find that a moderate family board presence provides substantial benefits to the firm.

2.4.2 Alumni network

McNamara and McLoughlin state that the degree of access that a potential employee has to other networks needs to be considered when hiring an individual. Therefore, networking is playing an increasingly important role as the „know-whom“ is nearly deemed as valuable as the „know-how“. Since accessing to these networks and the development of social ties can be determined by the work/education/academic path history of the individual, corporate alumni networks are emerging as an

interesting topic in networking and knowledge management research as it is clear from several online articles that corporate alumni networks facilitate several important processes which encourage knowledge flows.

2.5 Hypothesis development

From literature reviews above, there are evidences claim that female directors have positive impact on firm performance. However, there is no existing study on the impact of female directors on firm performance in Thailand. It is possible that female directors, in Thailand, may not provide the positive impact or have the significant impact on their firm corporate performance as the female directors in the US and other countries. The main reason is because the characteristic of Thai firms are differences of characteristic of other countries firms, such as family ownership, weak corporate governance and nepotism. Also, I believe that there is the existence of “Glass Ceiling” or the inequality of genders in workplace in Thailand. The true ability of female directors in Thailand may be blocked and not be utilized at most effective way. Therefore, I hypothesize that the positive association may not be observed in Thailand.

Hypothesis 1: Female directors do not improve firm performance in Thailand.

According to the literatures discuss in the early of this chapter, the network plays important role in accessing to firm board position. Many previous studies find the significant impact of directors related to network on firm performance. However, the impact of network in accessing board position on firm performance is unclear. Therefore, I identify network into two types which are “family network” and “alumni network” to investigate the impact of each type of network separately. I hypothesize that the directors who access to board position through “family network” do not improve firm performance but the directors who access to board position through “alumni network” have positive impact.

Hypothesis 2: Female directors related to “family network” do not improve to firm performance.

Hypothesis 3: Female director related to “alumni network” have positive impact on firm performance.

Moreover, the different characteristics of female directors will be addressed in order to investigate the impact on firm performance. Since the characteristics of dependent and independent directors are different, hence their impact on firm performance should be different. Therefore, I also test whether these groups of directors have similar or difference impact on firm performance.

In addition, the characteristic of female directors, which are director with little name and multiple board directors (called busy board), will be considered as well. The female directors who entitled as royal/noble family or have title name may have significant impact on firm performance. Also, the female directors who sit in multiple boards, specifically female directors who sit in more than 3 boards, may have positive impact on firm performance as they are viewed as outperformed directors.



CHAPTER III

SAMPLE AND METHODOLOGY

3.1 Sample Selection

The sample of my study is all firms listed on the Stock Exchange of Thailand (SET) for the period 2000 - 2009. Nevertheless, the business sectors which are highly regulated and have unique business activities, such as financial institution, real estate investment trusts, insurance sectors and closed-end mutual funds, will be excluded from this study. Also, firms with negative equity are excluded from the sample in order to eliminate the potential outliers. All listed firms that will be used in the studies should pass the following criteria: there is no missing data, which need to be used as variables in the study. From these criteria, I got 386 firms or 3,161 firm-years.

3.2 Sources of data

The financial data (e.g. sales, net income/loss, book value and market value) and some other data such as number of business segment are retrieved from two major sources which are DataStream and SetSmart database. The director information (e.g., number of male/female director, classified directors by types and director turnover) is collected from SetSmart database. In order to identify network, I need the name lists of directors who are certified but 3 institutions which are Capital Market Academy, National Defence College and Director Certification Program. The director name lists are manually collected from the official website of three institutions which are www.cma.in.th, www.thaindc.org and www.thai-iod.com.

3.3 Definition of network

In this study, I scope and classify network into two types of network as I hypothesize that the different type of network leads to different impact on firm performance. The two types of network are Family network and Alumni network.

3.3.1 Family network

Family network, in this study, is classified by the surname and marriage (by law) between board members and firm majority shareholders. The family-relations include in this study are parents, husband-wife and children. In more particular, the family network between directors and majority shareholders is look up for only 1 level. If the target firm majority shareholders are not the person, it is excluded. If the female director has at least one of family relationship with firm majority shareholders or board members, the “family network” exists. The process of family network identification can be summarized as Figure 1.

In family network identification, firm shareholder is the classified as majority shareholder by the percentage of firm share holding. This study uses two benchmarks which are 10 and 25 percent share holding. The 25 percent level is the definition for controlling shareholders of the Stock Exchange of Thailand. At this level of share holding represents high control on firm operation. Also, as the Public Limited Companies Act, at 25 percent level of share holding, a shareholder has a sufficient voting power that lead to the significant influence on firm operation as following: 1) nullifying corporate decision, 2) demanding to inspect financial condition, business operation decision and conducting board and 3) able to call an extraordinary general meeting at any time (Wiwattanakantang Y., 2010). The 10 percent level is the level that most papers use as proxy for majority shareholder.

3.3.2 Alumni network

Alumni network is the connection of people who hold degree from the same school. In my study, if female directors who graduated from the same school as firm directors and majority shareholders before that female director is appointed, this is called alumni network. Female director has to meet two conditions to be classified as female director related to alumni network. First, female director had attended in the course in Capital Market Academy (CMA), Director Certification Program (DCP) or National Defence College (NDC) before appointed to the board position. Second, there is at least one of majority shareholders or board members who held the degree from the same institution before the female director is appointed. Only these two

conditions are met, the alumni network exists. The process of alumni network identification can be summarized Figure 2.

3.4 Data Descriptive

The final sample of complete firm-level data consists of 3,161 firm-years on 386 firms. Table 1 shows descriptive statistics of sample for selected firm, board and director characteristics including number of observation, mean, standard deviation, minimum and maximum. In my analysis, I use a market-based measure of performance, a proxy for Tobin's q , as well as an accounting-based measure, return on assets (ROA). The proxy for Tobin's q is the ration of firm market value to its book value. In practical aspect, market value is book value of assets subtract book value of equity plus market value of equity. ROA is net income divided by book value of assets. Net income I used is net income before extraordinary items and preferred and common dividends but after operating and non-operating income⁷ and expense, reserves, income taxes, minority interest and equity in earnings.

In board characteristic, Board size is the number of firm directorship which is, on average, 11.03 a year per firm, with minimum of 5 and maximum of 25 directorships. Fraction of female director is the proportion of female directors divided by board size. On average of 10 years, female director is about 16% of total board. The maximum fraction of female on board is at 75%. In this paper, female director will be counted as 1 female directorship only if that female director sits in board room more than 180 days a year. The reason behind this condition is because if I count number of female at a particular point of time, some will not be detected and disappear from the sample which lead to too small and biased data.

⁷ Non-operating income will be included in net income If a company reports discontinued operations it is treated as follows:

- a. If the discontinued operations are purely an operating gain or loss on a business segment the company is discontinuing, income including the discontinued operations will be shown.
- b. If the discontinued operations include disposal (gain or loss on a sale), then earnings per share is examined. If a separate per share amount is shown for discontinued operations and a separate per share amount is shown for disposal, the discontinued operations portion is included in net income and the disposal portion is treated as an extraordinary charge or credit. If one per share amount for discontinued operations is reported and it includes disposal, then net income before discontinued operations is shown and the discontinued operations is treated as an extraordinary item.

From the sample, Proportion of firm that has (at least one) female directors shows that approximately 77% of sample firms has at least one female directors. Proportion of firm that has (at least one) female directors is a dummy variable that is one if firm has AT LEAST one female director, zero otherwise. 27% of sample firms have only one female director as shown in Proportion of firm that has only one female director which is a dummy variable that is one if firm has ONLY one female director, zero otherwise. And Proportion of firm that has audit female directors is a dummy variable that is one if firm has at least one audit female director, zero otherwise. It shows that about 13% of sample firms have female director as audit committee.

Moreover, there are some other variables, such as characteristic and type of director, included in this study to help explaining the effect of female director on firm performance. Proportion of firm that has female busy board is dummy variable that is one if firm has female directorship who sit in boardroom of at least 3 companies at the same time, zero otherwise. This variable shows that only 9% of sample firms have busy female directors. Proportion of royal/noble female director dummy variable that is one if firm has female director who entitled as Lady or Princess (royal family), zero otherwise. Specifically, royal/noble female director includes the female directors who entitles as PRINCESS, DR.M.R, MAJ.GEN.M.R, H.S.H. PRINCE, H.H.PRINCE, Adm.M.L., GEN. M.L., ACM., M.R., M.L., MOM and Thanphuying. There is approximately 2% of total sample firms that has royal/noble female directors.

Proportion of firm that has female directors who have family network (10%) and (25%) are the dummy variables that are one if female director has family relationship (classified by surname and in-law relationship) with firm majority shareholders. Majority shareholders separate into 1) held more than 10% and 2) held more than 25% of total shares. These variables show that more than 20% out of 3,306 firm-year samples have female directors who have family network with firm majority shareholders.

In this study, alumni network focuses on the alumni of three institutions which are Capital Market Academy (CMA), National Defence College (NDC) and Director Certification Program (DCP). Proportion of firm that has female director who has CMA, NDC and DCP alumni network are dummy variables that is one if

female director had attended Capital Market Academy (CMA), National Defence College (NDC) and Director Certification Program (DCP), respectively, before appointed as director AND at least one of majority shareholders or board members had attended the any courses from those institutions before that female director is appointed, zero otherwise. From these three alumni network variables, I detected only small proportion of firms that have female directors that have alumni network (approximately 1%).

Also, the percentage of share holding by female director will be compared with those of male director. Female directors share holding is the percentage of firm share that female director hold.

There are 6 control variables in this study which are board size, log(sales), number of business segment, leverage, volatility and lagged(ROA). Board size is the total number of directors in a given year. Sales or revenue represent gross sales and other operating revenue less discounts, returns and allowances. Number of business segment is the number of reported business segment of firm. Leverage is the firm total debt over its total assets. Volatility is the standard deviation of previous 60-month stock returns. Lagged(ROA) is the ROA of pervious year (ROA of time t-1). The summary of the descriptive statistic is shown in the Table 1.

3.4.1 Women in boardroom in Thailand: the basic facts

To provide a boarder picture of female representation in the boardroom in Thailand, I start with the basic information of female directors. From Table 2 and Table 3, the samples from SetSmart database used in this study consist of information on 3,283 unique directors holding a total of 36,455 directorships (firm-year board position), for the period 2000 - 2009. Women represent 585 or 17.82% of unique directors, holding 5,808 or 15.93% of total directorships. There are 4,254 or 73.24% of female directorships act as insider, and 1,554 or 26.76% of female directorships act as independent directors. These facts show that most female directors in boardroom are insider.

In this sample, the percentage of board seats occupied by female directors is approximately 16%. The proportion of female directors in boardroom is slightly increased over time, rising from 15.43% in 2000 to 16.28% in 2009. This percentage of female director in boardroom is considering as high level compare to other countries, such as Europe, Australia, Germany, France, Spain, and Italy, which percentage of female directors were 9.7%, 8.3%, 7.8%, 7.6%, 6.6%, and 2.1% respectively by the end of 2008 (EOWA-Equal Opportunity for Women in the Workplace Agency, 2008). Nevertheless, according to Egon Zehnder International report (2008), this level is still relatively low compare to some countries such as Norway (44.2%), Sweden (26.9%), Finland (25.7%) and Denmark (18.1%) which have significantly increase from previous years. However, the small change in percentage of female directors in Thailand indicates that he pattern of gender diverse board has not changed much over time.

Table 4 shows, in the past 10 years, most of firms have 0-2 female directorships. Numbers of firm that has more than 4 female directorships are very low. And this pattern is quite consistent over time. This is the evidence support that gender diverse board in Thailand has not changed for the past 10 years. In Table 5, I summarize the average number of female directorship in each sector (see Appendix A for more details). Firm in Consumer product industry has highest number of female directorship, on average, over the past 10 years (2.59 female directorship/firm). The second highest is Agro & food industry at 2.02 female directorship/firm.

In order to have better understanding in characteristic of female directors, Table 6 shows the summary of unique female directors in each characteristic in year 2000-2009. Number of unique female directors, on average, is approximately 500 people as shown in Table 3. I find that only few, 20 people on average, are entitled as Lady of Princess, which is called royal/noble female directors. Also, it is remarkable that the female directors who have family network and alumni are in increasing trend as well as the higher number of unique female directors from year 2000-2009. This fact may suggest that network is one of the factors that help promote female director to access position in boardroom. The last characteristic I focus on is busy female directors. Table 7 shows that approximately 90% of total sample firm have zero busy female director on board. About 10% total sample firms have 1 busy female director in their boardroom and only few companies have busy female directors in boardroom.

3.4.2 Firms with and without female directors: are they different?

In Table 8, the means of several firm characteristics are compared across firm-years between firms with female directors and those without female directors for the sample. There are 2,550 firm-years with female directors and 756 firm-years without female directors. The comparisons shows that in years in which firms have female directors in boardroom significantly have lower leverage, less business segments, worse performance in term of Tobin's q. Nevertheless, those firms with female directors have slightly and insignificantly better performance in term of ROA and have larger board size. These comparisons suggest that firm choices to appoint female directors might be influenced by firm characteristics. Therefore, these characteristics are important to control in the analysis.

3.5 Methodology

In order to investigate the impact of female directors on firm performance, in analyze the regression the market-based and accounting-based measurements of performance will be used: Tobin's q and ROA. Also, the methods used by Adams and Ferreira (2009) are replicated. To investigate the impact of female director on firm performance, using Tobin's q and ROA as performance measurement, I estimate a sample model of performance that includes the female dummy, board size, number of business segment, leverage, volatility and log (sales). There will be 2 regression types used, which are Ordinary Least Square (OLS) and Fixed effect. Year dummies are added to all regression to control economic change each year. Also, I will correct the standard error for group correlation within the firms and heteroskedasticity.

When analyzing the effect of female director on firm performance, some omitted unobservable firm characteristics may cause endogeneity problem. Omitted factors that affect both selection of female directors and governance choices may lead to correlation between gender diversity of board and performance. Adams and Ferreira (2009) claim the plausible example that the more aggressive firms have better governance as well as more female directors. Therefore, I assume that the corporate culture dose not vary over time. So, I use firm fixed effects to address the omitted factors that may drive the result. In order to make sure the strong conclusion of female

directors' effect on performance, I also use cross-section weight to address the assumption that each cross section is not equally weighted.

3.5.1 Regression equations

In order to examine whether gender diverse board impacts corporate performance (Hypothesis1), two measurements of performance will be used: Tobin's q and ROA. The concept of regression for hypothesis is the equation 1.

$$Performance_t = f(\text{female dummy; Board size, Log (Sales), no. of business segment, leverage, volatility, lagged (ROA)}) \quad (1)$$

Where, $Performance_t$ = Tobin's q and ROA

Female dummy = dummy variable that is one if firm has female director, zero otherwise

Board size = number of directors

No. of business segments = number of firm reported segments

Leverage = total debt to total assets

Volatility = S.D. of previous 60-month stock returns

Lagged (ROA) = ROA of previous year

The dependent variable is performance which is Tobin's q and ROA. Tobin's q is firm market value to its book value. ROA is return over total assets. The first independent is female dummy. Female dummy is vary and classified into several female director groups which are; dummy at least one female directors, dummy only one female director, dummy 1-2 female directors and dummy more than 2 female directors. There are 6 control variables which are board size, log(sales), number of business segment, leverage, volatility and lagged(ROA). Also, year dummies and Industry dummies are added to all regression.

Female director, in this study, will be counted only if she sat on board at least 180 days a year. Also, female dummy will be classified into several groups as stated above. The reason behind is to investigate whether particular number of female directors in boardroom is significantly affect firm performance and may suggest some stronger effect of female directors on performance than general female dummy, that concern only present of absent of female directors in boardroom.

In addition, I take the characteristics of female directors, which are dependent/independent director, title name (called royal/noble female director) and

busy board into account. Female dummy is replaced by particular female characteristic dummy to investigate the impact of each character of female directors on firm performance.

In order to examine the effect of network on firm performance (hypothesis 2 and 3), I will follow the same methodology as the test of hypothesis 1 and the interaction term (female director*network) is added to the equation (see equation 2).

$$\text{Performance} = f(\text{female dummy} * \text{network dummy}; \text{Board size}, \text{Log (Sales)}, \text{no. of business segment}, \text{leverage}, \text{volatility}, \text{lagged (ROA)}) \quad (2)$$

Where, Performance = Tobin's q and ROA

Female dummy = dummy variable that is one if firm has female director, zero otherwise

Network dummy = dummy variable that is one if network exists, zero otherwise

Board size = number of directors

No. of business segments = number of firm reported segments

Leverage = total debt to total assets

Volatility = S.D. of previous 60-month stock returns

Lagged (ROA) = ROA of previous year

The performance measurements are Tobin's q and ROA. The network dummy will be classified into two kinds of network, which are family and alumni network dummy, to test each hypothesis separately. In order to test hypothesis 2: Female directors related to "family network" do not improve to firm performance, the network dummy will be 1, if female directors have family network with majority shareholders or board member (according to the condition in section 3.3.1). In order to test hypothesis 3: Female director related to "alumni network" have positive impact on firm performance, the network dummy will be 1, if female directors meet all alumni network conditions in section 3.3.2.

The empirical result from regression analysis and hypothesis testing result are shown and discussed in chapter 4.

Table1: Summary statistic

The sample consists of 386 firms listed on the Stock Exchange of Thailand (SET), excluding firms in financial sector, for the period 2000-2009. Tobin's q is the ratio of the company's market value to book value of assets. Market value is book value of assets subtract book value of equity plus market value of equity. ROA is net income divided by book value of assets. Leverage is the firm's total debt over its total assets. Volatility is the standard deviation of previous 60-month stock returns. Board size is the number of directorship. Fraction of female directors is the proportion of female directorship to firm board size. Proportion of firm that has (at least one) female directors is a dummy variable that is one if the firm has at least female director, zero otherwise. Proportion of firm that has only one female director is percentage of firms that have only one female directorship. Proportion of firm that has audit female directors is the percentage of sample firms that have at least one audit female directorship. Proportion of firm that has female busy board is a dummy variable that is the percentage of sample firms that have at least one female director who sit in boardroom of at least 3 companies at the same time. Proportion of firm that has royal/noble female director is the percentage of sample firms that have at least one female director who entitled as Lady or Princess. Proportion of firm that has female director who has family network (10%) and (25%) are the percentage of sample firms that have female director who has family network with firm majority shareholders in either by sharing same surname or by law. 10% and 25% are level of share holding that is used for classifying firm majority shareholders. Proportion of firm that has female director who has CMA, NDC and DCP alumni network are the percentage of firms that have female directors who have CMA, NDC and DCP alumni network. Female directors share holding is the percentage of firm's share that female director hold.

Variable	Number of observation	Mean	Standard deviation	Min	Max
Firm Characteristic					
Sales (millions Baht)	3161	11779	66820	24	2000816
Log(sales)	3161	3.38	0.66	1.38	6.30
# Business segments	3161	1.18	0.54	1	6
Tobin's q	3161	1.13	0.58	0.11	5.93
ROA	3161	0.12	0.54	-1.84	3.77
Leverage	3161	0.44	0.22	0.00	0.99
Volatility	3161	0.59	0.37	0.10	2.81
Board Characteristic					
Board size	3306	11.03	3.04	5	25
Fraction female directors	3306	0.16	0.14	0	0.75
Proportion of firm that has (at least one) female directors	3306	0.77	0.42	0	1
Proportion of firm that has only one female director	3306	0.27	0.44	0	1
Proportion of firm that has audit female directors	3306	0.13	0.34	0	1
Proportion of firm that has female busy board	3306	0.09	0.29	0	1
Proportion of firm that has Royal/Noble female director	3306	0.02	0.14	0	1
Proportion of firm that has female directors related who have family network (10%)	3306	0.27	0.44	0	1
Proportion of firm that has female directors related who have family network (25%)	3306	0.21	0.41	0	1
Proportion of firm that has female directors related who have CMA (alumni) network	3306	0.00	0.06	0	1
Proportion of firm that has female directors related who have NDC (alumni) network	3306	0.01	0.09	0	1
Proportion of firm that has female directors related who have DCP (alumni) network	3306	0.01	0.08	0	1
Female directors share holding	3306	0.03	0.07	0	0.60

Table2: Summary of sample directorships

This table shows the yearly summary of firm's gender diverse, board size and fraction of female and male directors. The sample consists of 386 listed firms for 2000-2009. Female/Male directorship is the total number of female/male directorships, which is counted by number of position held by female/male directors, who sit in boardroom for more than 180days consecutively within a given year. Also, this table shows the number of directorship classified by type and gender of directors: Inside and Independent directors. The type of director classification is followed the rule of Securities and Exchange Commission (SEC). Proportion (%) of female/male directorship (under Inside and Independent directorship columns) is calculated by number of inside and independent female/male directorship divided by total female/male directorship. Proportion (%) of total directorship (under total female/male directorship) is calculated by number of total female/male directorship divided by total directorship. Total directorship is the number of total directorship of all samples within a given year.

Year	No. of firm	Female Directorship						Male Directorship						Total Directorship
		Inside directorship		Independent directorship		Total Female directorship		Inside directorship		Independent directorship		Total Male directorship		
		#	% of Female directorship	#	% of Female directorship	#	% Total directorship	#	% of Male directorship	#	% of Male directorship	#	% of Total directorship	
2000	261	357	75.48%	116	24.52%	473	15.43%	1850	71.37%	742	28.63%	2592	84.57%	3065
2001	265	347	73.67%	124	26.33%	471	15.40%	1861	71.91%	727	28.09%	2588	84.60%	3059
2002	280	368	73.75%	131	26.25%	499	15.73%	1924	71.95%	750	28.05%	2674	84.27%	3173
2003	297	380	74.51%	130	25.49%	510	15.40%	1977	70.58%	824	29.42%	2801	84.60%	3311
2004	328	435	76.05%	137	23.95%	572	15.77%	2132	69.79%	923	30.21%	3055	84.23%	3627
2005	358	472	74.57%	161	25.43%	633	16.19%	2252	68.70%	1026	31.30%	3278	83.81%	3911
2006	370	468	73.35%	170	26.65%	638	15.86%	2312	68.30%	1073	31.70%	3385	84.14%	4023
2007	377	493	72.82%	184	27.18%	677	16.67%	2285	67.52%	1099	32.48%	3384	83.33%	4061
2008	386	482	71.83%	189	28.17%	671	16.18%	2316	66.63%	1160	33.37%	3476	83.82%	4147
2009	384	452	68.07%	212	31.93%	664	16.28%	2252	65.96%	1162	34.04%	3414	83.72%	4078

Table 3: Number of unique directors in Thailand

This table shows the overall number of unique directors in Thailand in 2000-2009. The Under Female director column is the number of female director counted by person, not directorship, as well as Male and Total director columns. New is the number of directors who have starting date being as director of any company within a given year and are not in the director list of previous year. Exit is the number of directors who have ending date or no longer sit in any boardroom of any company within and before 31 December of a given year. Total is the number of total directors who are currently being director of any company at 31 December of a given year.

Year	Female Director			Male Director			Total Director		
	New	Exit	Total	New	Exit	Total	New	Exit	Total
2000	55	-23	401	183	-152	2047	238	-175	2448
2001	24	-10	415	148	-143	2052	172	-153	2467
2002	40	-23	432	164	-97	2119	204	-120	2551
2003	30	-29	433	196	-128	2187	226	-157	2620
2004	61	-8	486	281	-72	2396	342	-80	2882
2005	46	-1	531	242	-103	2535	288	-104	3066
2006	36	-23	544	254	-215	2574	290	-238	3118
2007	56	-22	578	224	-146	2652	280	-168	3230
2008	38	-51	565	253	-230	2675	291	-281	3240
2009	48	-28	585	248	-225	2698	296	-253	3283

Table 4: Female directorship

From the sample used, this table shows the number of firms at a given number of female directorships for the year 2000-2009. Number of female directorship is the number of female directorship of firm counted by position. Average is the average number of firm at each level of female directorship in past 10 years (2000-2009). Total firms are the total number of sample firm in each year.

Number of Female Directorship	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Avg.
0	51	58	65	76	80	82	87	82	88	87	75.6
1	78	73	75	77	86	98	99	100	98	100	88.4
2	67	67	65	72	81	87	94	96	107	103	83.9
3	27	32	35	31	34	41	41	49	48	47	38.5
4	23	21	25	24	28	30	32	26	23	29	26.1
5	8	6	8	10	11	10	9	17	15	11	10.5
≥ 6	7	8	7	7	8	10	8	7	7	7	7.6
Total Firms	261	265	280	297	328	358	370	377	386	384	331

Table 5: Average number of female directorship classified by sector/industry

This table shows the summary of average number of female directorship classified by firm sector or industry at the given year. The numbers in this table is the average number of female directorship per firm, which is calculated by total female directorship in a particular sector divided by number of firm in that sector. For more details, see Appendix A.

Sector/Industry	Female directorship / firm										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Avg.
Property & Construction	1.67	1.69	1.67	1.52	1.62	1.59	1.55	1.65	1.63	1.61	1.62
Technology	1.72	1.75	1.68	1.46	1.40	1.50	1.38	1.37	1.19	1.25	1.47
Consumer Products	2.65	2.65	2.61	2.61	2.76	2.76	2.55	2.55	2.44	2.33	2.59
Industrials	1.84	1.79	1.82	1.72	1.87	1.97	1.94	1.96	1.84	1.84	1.86
Services	1.50	1.41	1.54	1.52	1.55	1.60	1.67	1.76	1.72	1.76	1.60
Resources	0.92	0.85	0.69	0.71	0.50	0.64	0.78	1.00	1.07	1.07	0.82
Agro & Food Industry	1.94	1.97	2.03	2.13	2.13	2.05	1.85	2.00	2.05	2.02	2.02

Table 6: Characteristic of female director

This table shows the number of unique female directors, count by person, who have special characteristics in each given year. Royal/Noble female director is the number of female director who entitled as Lady and Princess. Family network is the number of female directors which are classified as having family network. CMA, NDC and DCP network are the number of female directors which are classified as having alumni network.

Characteristics of Female Director	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Royal/Noble female director	24	18	16	19	18	17	21	21	20	17
Family network	144	140	146	151	168	186	188	193	185	178
CMA network	8	7	6	8	7	10	11	16	18	19
NDC network	8	9	7	8	6	11	11	10	10	14
DCP network	0	0	0	0	0	1	4	7	14	0

Table 7: Busy female directorships

This table shows the number of firms at the given number of busy female directorships in each year. Female directorship is classified as busy female directorship when female director sit in at least 3 boards at the same time.

Number of Busy Female Directorship	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	238	243	255	271	298	325	338	338	344	348
1	19	18	21	19	25	26	26	35	39	35
2	2	2	2	5	3	4	3	3	3	1
≥ 3	2	2	2	2	2	3	3	1	0	0
Total Company	261	265	280	297	328	358	370	377	386	384

Table 8: Comparison of firms with female directors to those without

This table presents comparisons of means of firm-level characteristics for firm-year between firms with female directors and firms without female directors. The data is obtained from DataStream, SetSmart website and firms' official websites. Tobin's q is the ratio of the company's market value to book value of assets. Market value is book value of assets minus book value of equity plus market value of equity. ROA is net income before extraordinary items and preferred and common dividends but after operating and non-operating income and expense, reserves, income taxes, minority interest and equity in earnings divided by book value of assets. ** and *** indicate significance level at 5% and 1% level respectively.

Firm Characteristic	Mean for firm-year with female directors, n = 2,550	Mean for firm-year without female directors, n = 756	Difference
Log(sales)	3.35	3.42	-0.08***
# Business segments	1.17	1.22	-0.05**
Leverage	0.48	0.69	-0.21***
Tobin's q	1.18	1.34	-0.15**
ROA	0.10	0.11	0.00
Board size	11.19	10.48	0.71

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Figure 1: Family network identification

This figure shows the process of identifying the family network. First, I start with female director. Then I check whether that female director has the family link with firm's board members or majority shareholders by surname and by law or marriage-linked. If that female has the same surname or has family relationship by law, such as marriage or parent-child, with firm's board member or majority shareholders, the female director will be classified as "Family network" and the dummy variable for family network will be 1. If not, the female director will be classified as "Non family network" and the dummy variable for family network will be 0. The majority shareholders' criterion is set by the share holding percentage.

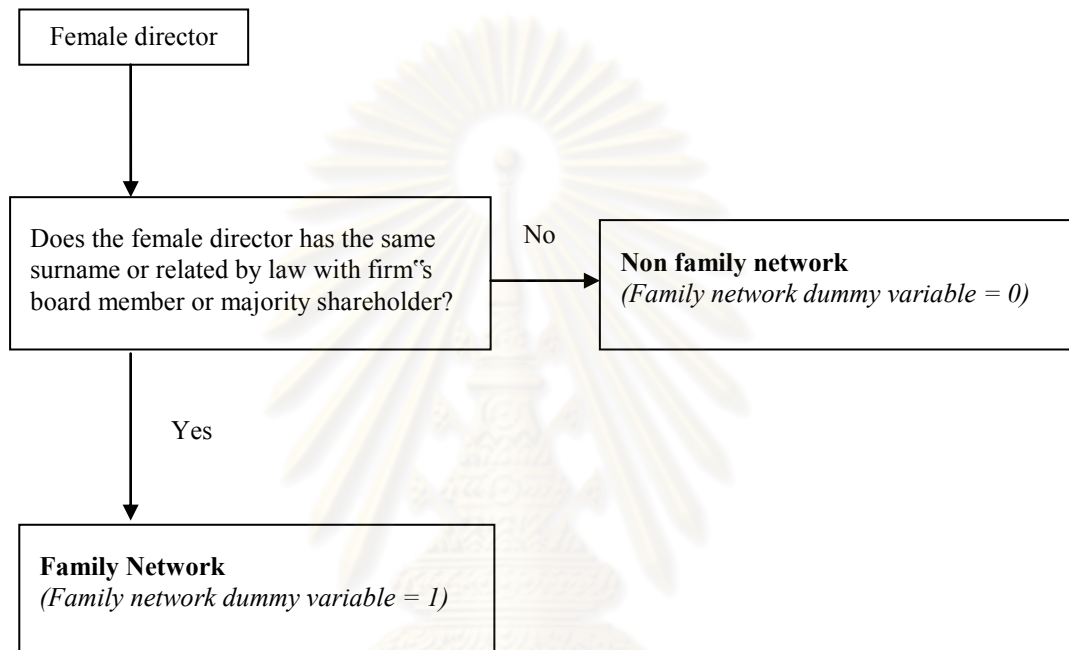
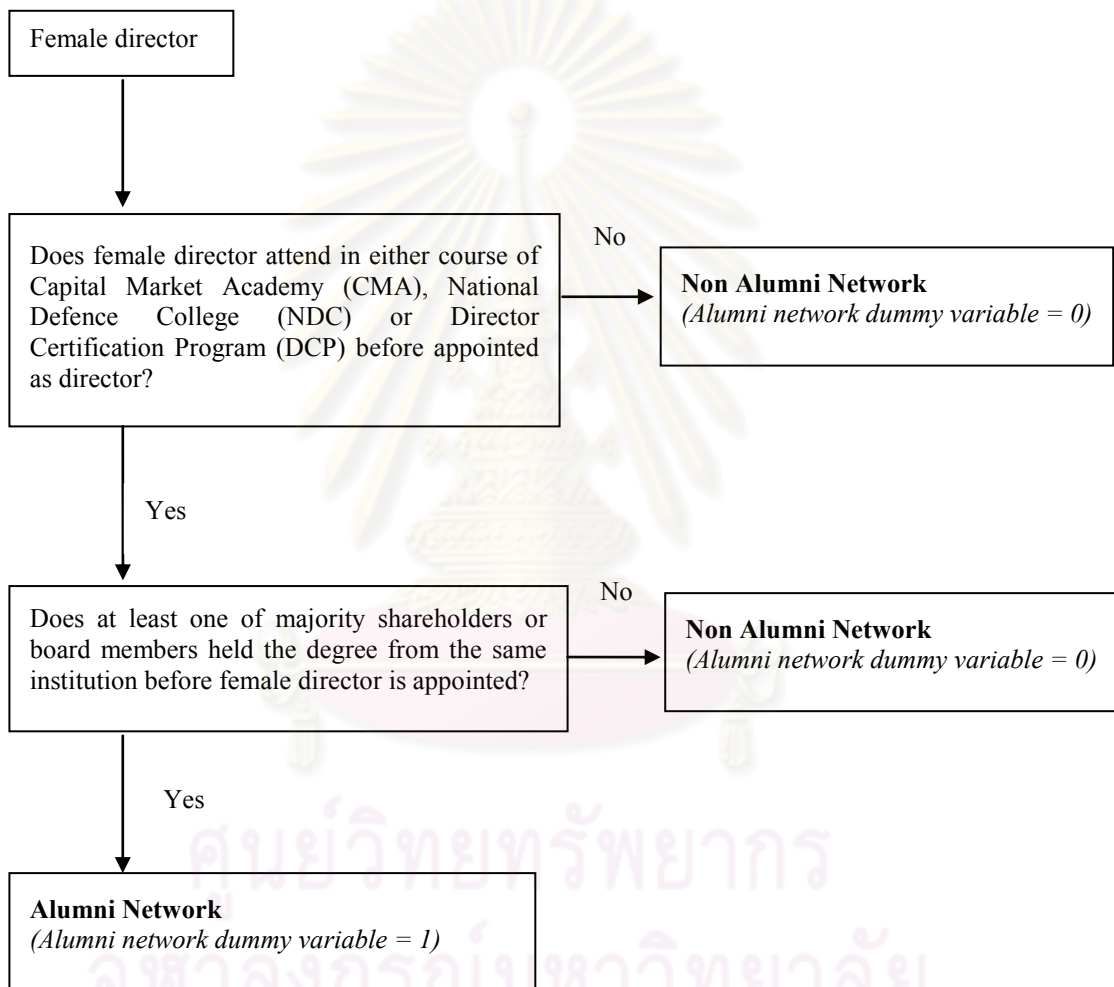


Figure 2: Alumni network identification

This figure presents the process of identifying the alumni network. First, I start with female director. Then I check whether that female director has ever attended in either course of Capital Market Academy (CMA), National Defence College (NDC) or Director Certification Program (DCP) before appointed as director. If that female director held the degree from either one of those institutions, the process will continue to next step. If not, the female director will be classified as “Non alumni network” and the dummy variable for family network will be 0. Next step, I will check whether at least one of majority shareholders or board members held the degree from the same institution before that female director is appointed. If yes, the female director will be classified as “Alumni network” and the dummy variable for alumni network will be 1. If not, the female director will be classified as “Non alumni network” and the dummy variable for family network will be 0.



CHAPTER IV

EMPIRICAL RESULT

In order to examine whether gender diversity of board matter in term of firm performance, I examine whether the performance of boards that are more diverse differ from those that are less diverse. I examine whether network is one of the factors that affects firm performance. Also, the characteristics of female directors are addressed to investigate the selection of female director and their effects on firm performance.

4.1 Do female director improve firm performance in Thailand?

In this section I examine whether gender diversity impact firm performance. There are evidences claim the positive impact of gender diverse board on firm performance. According to the literature reviews in chapter 2, there are many reasons of why women are needed in boardroom which mostly imply the positive or benefits of having gender diverse board on firm corporate governance and performance (Catalyst, 1995; Bilimoria, 2000; Mattis, 1997; Adams and Ferreira, 2009; Cassell, 1997; Green and Cassell, 1996). However, Adums and Ferreira (2009) claim that the positive impact of gender diverse board will be true only in firm with strong governance. Hence, in Thailand, I expect the different result from previous studies I have reviewed.

I estimate a simple model of performance that includes female directors variable, board size, number of business segments, log(sales), leverage, volatility and lagged(ROA). The regression types used are Ordinary Least Square (OLS) and Fixed effect. All specifications include year dummies. I adjust the standard error for potential heteroskedasticity. I use two measures of performance: Tobin's q and ROA.

I report results in Table 9. The first female director variable is dummy female directors which is one if firm has at least one female director in a given year and zero otherwise. In Columns 1-2, I find that the coefficient on female dummy is negative and statistically significant, for both OLS and Fixed effect regressions, which suggest that female directors, in general, do not improve firm performance in term of market

value as proxy by Tobin's q. Therefore, I use the same model but replace number of female for dummy female directors. In Columns 3-4, the dependent variable is Tobin's q and I find that the coefficients of number of female directors are not statistically significant for both OLS and Fixed effect. The impact of female directors in term of dummy variables on ROA is totally insignificant in Columns 5-8.

My conclusion is that, as I hypothesize, having gender diverse board in Thailand does not improve overall firm performance in term of market value. The negative impact of female directors in Thailand may arise from the characteristics of Thai firm, weak corporate governance or glass ceiling effect, which are different from other countries. The inequality between genders in workplace (which referred to "Glass ceiling") may block the female directors from utilizing their true potential in workplace. Female directors may not be as accepted as male directors in workplace so that the benefits of having female directors in boardroom are not observed in Thailand. Another possible explanation of the negative impact of female directors on market-based performance is that female directors may over-monitor firm activities. As Adams and Ferreira (2009) find that female directors bring significant impact on board input such as female directors have less attendance problem than male directors and male directors have fewer attendance problems in gender diverse board. Also, they find that having gender diverse board may bring negative impact or decrease shareholder value due to the over-monitoring of female directors.

4.1.1 Female director characteristics: do they matter?

In general, female directors in boardroom do not improve firm market-based performance as shown in pervious section. Nevertheless, I take some characteristics of those female directors into account in order to investigate the different impact of each characteristic of female directors. I focus on 4 characteristics which are busy female directors, royal/noble female directors, audit female directors and independent female directors. Performance measures are Tobin's q and ROA. The results are in Table 10-11.

In Table 10, I examine whether characteristics of female director impact firm performance in term of market value. Female characteristics are tested against firm

market-based performance, Tobin's q . Columns 1-2 in Table 10 show the coefficient of busy female directors on firm performance and I find the positive coefficient but not statistically significant. The coefficients of royal/noble female directors are negative statistically significant at 1% level for both regression types as in Column 3-4. Royal/noble female directors do not improve firm performance. In Column 5, audit female directors are taken into account and I find that the coefficient is negative and significant at 1% level. However, the coefficient of audit female directors and Tobin's q is not statistically significant when address fixed effect. The last characteristic is independent female directors; dummy independent female directors which results are in Columns 7-8. The coefficient of dummy female directors is negative and statistically significant at 1% level in Column 7. However, the coefficients of dummy independent female directors are not statistically significant when using firm fixed effect as in Columns 8.

The characteristics of female director are tested against firm ROA or accounting-based performance and the results are in Table 11. I find that the busy and royal/noble female directors have negative and significant impact on ROA only when using simple OLS model (as in Columns 1 and 3), and not statistically significant when using fixed effect model (as in Columns 2 and 4). Columns 5 - 6 show the insignificant coefficient of audit female directors and ROA. In Column 8, independent female directors have negative and significant impact on firm ROA.

As in Section 4.1, the impact of female directors on firm market-based performance is negative. Also, Female directors who are entitled as Princess or Lady do not help improve firm performance, as they have negatively significant impact on firm performance (Tobin's q) which is robust with the negative impact of general female directors' impact. Other than Royal/noble female directors, independent female directors do not improve firm performance (ROA) as well. The impact of busy and audit female directors on firm performance are inconclusive.

4.1.2 Do female directors help improve performance of "busy firm"?

In previous section, I take only characteristics of female director into account. So, I want to address some firm characteristic in order to investigate the impact of

female directors on a particular firm characteristic. The characteristic of firm I add is “Busy firm”. In my study, I use two types of busy firms which are; 1) busy firm classified by independent directors and 2) busy firm classified by CEO and chairman. The first type of busy firm is classified by firm independent directors. If more than 50% of firm directors are busy board (sit in boardroom of more than 3 firms at the same time), that firm is classified as “Busy firm classified by independent directors”. The second type of busy firm is classified by firm CEO and chairman. If firm has at least one busy CEO or chairman, firm is called “Busy firm classified by CEO and chairman”. At first stage, I investigate the impact of busy firms on performance. Then I add interaction term of busy firm and female directors in to the same equation in order to investigate the marginal effect of female director on busy firm performance. The results are in Table 12 and Table 13.

Table 12 shows results of busy firm by independent directors. I find that the coefficient of busy firm and Tobin’s q is negative and significant at 1% level in Column 1 but there is no significance found in fixed effect regression in Column 2. After I add the interaction term in to the regression, the marginal impact of female directors on firm Tobin’s q is positive and significant at 1% level as in Column 4. This suggests that female directors bring some benefit to firms that have busy independent directors. However, there is no significance relationship between busy firm and firm ROA.

In Table 13, the results of busy firm classified by CEO and chairman are shown. Column 2 in Table 13 shows that the coefficients of dummy busy firm and Tobin’s q are statistically significant when addresses fixed effect. Nevertheless, in Columns 3 - 4, after interaction term of busy firm by CEO/chairman and female directors is added, the coefficient of dummy busy firm by CEO/chairman is positive and statistically significant at 1% level. However, the marginal effect of female directors is negative and statistically significant. For ROA, the coefficients of dummy busy firm by CEO/chairman are not significant in both regression types as in Column 5 - 6. The negative and significant coefficient is also found after I add the interaction term into the equation as shown in Columns 7 - 8.

These results suggest that female directors can help improve firm market-based performance in firms that have busy independent directors more than half of

total independent directors. The negative effect of busy independent director may cause by the lagging of time to participate in their job as they sit in more than 3 boardrooms at the same time and they have more duty to responsible for. After I take female directors into account, I find that the marginal effect is positive. Therefore, my conclusion is that the female directors in boardrooms may help monitoring those busy independent directors to participate more on their board duty.

4.2 Network: Does it affect firm performance?

I investigate the impact of female directors who have family network and alumni network with firm majority shareholders and among board members themselves in order to get better explanations of female directors' impact on firm performance. The networks I focus on are Family and Alumni network. To investigate impact of female directors who have family or alumni network, I use the same model as in section 4.1 but the female dummy is replaced by each type network dummy. Performance measures are Tobin's q and ROA.

4.2.1 Family network: Do female directors related to "family network" improve to firm performance?

To identify family network between female directors and firm majority shareholders, I use two levels of shareholding to classify firm majority shareholders; 10% and 25% shareholding. The results are in Table 14.

The first family dummy is dummy family network with 10%-shareholding as majority shareholders. The results for dummy family network (10%) and firm Tobin's q are in Columns 1-2. Column 1 shows that the coefficient of dummy family network is negative and significant at 5% level but the result is not robust after addressing fixed effect for omitted variables as in Column 2. The results for dummy family network (10%) and firm ROA are in Columns 5 - 6. I found that the coefficient of dummy family network (10%) and ROA is positive and significant at 10% level in Column 5 but the coefficient is not significant when addressing firm fixed effect in

Column 6. Therefore, the significant positive and negative coefficient may cause by the omitted unobserved variables.

Another family dummy is dummy family network with 25%-shareholding as majority shareholders. The coefficient of dummy family network (25%) and Tobin's q is positive and statistically significant at 1% after addressing firm fixed effect as in Column 4. Also, I find that the coefficient of dummy family network and ROA is robust. The coefficients are positive and statistically significant at 10% and 1% level in both OLS and fixed effect regression as in Columns 7 and 8 respectively.

The result suggests that family links between female directors and firm majority shareholders have positive impact on firm performance. The possible explanation is the lower agency problem when firm shareholders and directors have family relationship. These female directors may put more ability to help protect shareholders' benefit than those who do not have family link with firm shareholders. Shareholders can have more effort to monitor firm operations through these female directors. This may result in better performance of firm directors or lower agency problem as well as agency costs. The operations may move in line with the objective of maximizing shareholders' value as some members of shareholders sit in boardroom. The positive impact is stronger and more robust at higher level of control over firm, as level of majority shareholders' shareholding is higher (25% level shareholding represent high control over company).

2.4.2 Alumni network: Do female directors related to "alumni network" have positive impact on firm performance?

Another type of network I focus on is alumni network. I investigate the impact of female directors who have alumni network with firm majority shareholders and board members. There are 4 alumni network variables. The first one is the dummy alumni network which represents overall alumni network which includes all alumni of 3 institutions which are Capital Market Academy (CMA), National Defence College (NDC) and Director Certification Program (DCP). The second alumni network variable is the dummy CMA which represents only Capital Market Academy (CMA) alumni network. Next is dummy NDC which represent only National Defence College

(NDC) alumni network. And the last one is dummy DCP which represents only Director Certification Program (DCP) alumni network. The results of alumni network on firm performance are in Table 15 - 16.

In Table 15, the coefficient of alumni network and firm Tobin's q are shown. The coefficients of overall dummy alumni network and performance are positive but not statistically significant as in Columns 1 - 2. As the results of 3-institution combined variable are not significant, I break down the alumni network into each specific institution alumni network. Therefore, I find that the coefficients of dummy CMA are positive and significant at 10% in simple OLS regression (in Column 3) and 1% level when addressing firm fixed effect (in Column 4). The results are robust and strong. However, the coefficient of dummy NDC is positive but not significant as in Columns 5 - 6. In Column 7, the coefficient of dummy DCP is positive and significant at 10% level in simple OLS model but the coefficient becomes insignificant when using firm fixed effect model in Column 8.

The results of the impact of alumni network on ROA are shown in Table 16. The same 4 alumni network variables are tested against firm ROA. I find that the coefficients of every alumni network variable in both regression types are positive. However, they are not significant at all as in Columns 1-8 of Table 16. Alumni network does not have significant impact on firm ROA.

My conclusion is that Capital Market Academy alumni network can help improve firm market-based performance. The possible explanation is that this institution is aimed to enhance knowledge to be more specialized in capital market field and help broaden director viewpoint and knowledge which lead to potential improvement of firm directors. And the alumni network facilitates the connection between these directors. Also together with the characteristics of female directors, female directors who have CAM alumni network can utilize their knowledge and ability and bring value to firm and improve shareholder value.

Table 9: Performance (Tobin's q and ROA) and gender diverse

The sample consists of unbalanced panel of firm-year data from 386 firms which are listed on Stock Exchange of Thailand (SET) for the period 2000-2009. Tobin's q is the ratio of the company's market value to book value of assets. Market value is book value of assets subtract book value of equity plus market value of equity. ROA is net income before extraordinary items and preferred and common dividends but after operating and non-operating income and expense, reserves, income taxes, minority interest and equity in earnings divided by book value of assets. Remaining sample characteristics are as in Table 1. The dependent variable for columns 1-4 is Ln(Tobin's q) or the natural logarithm of Tobin's q. The dependent variable for columns 5-8 is ROA. The specification in columns 1, 3, 5 and 7 report ordinary least square regression includes industrial classification industry dummies. The specification in Column 2, 4, 6 and 8 report ordinary least square includes firm fixed effect. All specifications include year dummies. Standard errors are adjusted for potential heteroskedasticity in all columns. Absolute values of t-statistics or z-statistics are in brackets. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.1 (*) level.

Independent variable	Dependent variable							
	Ln(Tobin's q)				ROA			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dummy female directors	-0.02** [2.39]	-0.04* [1.85]			-0.00 [0.99]	-0.01 [0.68]		
Number of female			-0.00 [0.64]	0.01 [0.94]			0.01 [1.18]	0.00 [0.07]
Number of female ²			-0.01** [2.56]	-0.01*** [2.75]			-0.02 [1.13]	-0.02 [1.10]
Board size	-0.01*** [6.32]	-0.00 [0.79]	-0.02*** [6.40]	-0.01 [1.22]	-0.00** [2.19]	-0.01* [1.89]	-0.00** [2.14]	-0.01 [1.50]
# business segment	0.03* [1.92]	-0.02 [1.29]	-0.03* [1.90]	-0.02 [1.28]	-0.03* [1.70]	-0.03* [1.79]	-0.03** [1.71]	-0.02* [1.74]
Log(Sales)	0.15*** [18.63]	0.26*** [9.76]	0.14*** [17.89]	0.26*** [10.40]	0.08*** [2.77]	0.14*** [3.86]	0.08*** [2.73]	0.14*** [3.67]
Leverage	0.24*** [5.13]	0.18*** [2.90]	0.25*** [5.41]	0.19*** [3.29]	0.23*** [5.39]	-0.32*** [3.28]	0.22*** [6.14]	0.30*** [3.67]
Volatility	-0.04 [1.15]	0.00 [0.09]	-0.05 [1.32]	0.00 [0.01]	0.02 [0.55]	0.13 [1.40]	0.02 [0.49]	0.13 [1.41]
Lagged(ROA)					-0.07 [0.73]	-0.13 [1.01]	-0.08 [0.78]	-0.14 [1.04]
Number of observations	2948	2948	2948	2949	2883	2883	2883	2883
R ²	0.10	0.66	0.10	0.67	0.12	0.20	0.13	0.22
Industry dummies	Yes	No	Yes	No	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Regression type	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect

Table 10: Performance: Ln(Tobin's q) and characteristics of female directors

The sample consists of unbalanced panel sample of firm-year data from 386 firms which are listed on Stock Exchange of Thailand (SET) for 2000-2009. The dependent variable is Ln(Tobin's q) or the natural logarithm of Tobin's q. Tobin's q is the ratio of the company's market value to book value of assets. Market value is book value of assets subtract book value of equity plus market value of equity. Remaining sample characteristics are as in Table 1. The specification in columns 1, 3, 5, 7 and 9 report ordinary least square regression includes industrial classification industry dummies. The specification in Column 2, 4, 6, 8 and 10 report ordinary least square includes firm fixed effect. All specifications include year dummies. Standard errors are adjusted for potential heteroskedasticity in all columns. Absolute values of t-statistics or z-statistics are in brackets. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.1 (*) level.

Independent variable	Dependent variable							
	Ln(Tobin's q)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dummy busy female directors	0.01 [0.79]	0.03 [0.97]						
Dummy royal/noble female directors			-0.08*** [4.02]	-0.14*** [3.41]				
Dummy audit female directors					-0.10*** [7.59]	-0.00 [0.10]		
Dummy independent female directors							-0.05*** [6.66]	0.00 [0.05]
Board size	-0.02*** [5.80]	-0.00 [1.18]	-0.02*** [6.78]	-0.00 [1.05]	-0.02*** [6.67]	-0.00 [1.18]	-0.02*** [7.05]	-0.00 [1.20]
# business segment	0.01 [0.91]	-0.03 [1.33]	-0.02* [1.87]	-0.02 [1.27]	-0.03* [1.88]	-0.03 [1.30]	0.03* [1.91]	-0.03 [1.29]
Log(Sales)	0.15*** [14.35]	0.26*** [9.79]	0.15*** [18.49]	0.26*** [9.88]	0.14*** [17.57]	0.26*** [9.82]	0.15*** [18.17]	0.26*** [9.86]
Leverage	0.12*** [7.56]	0.17*** [2.88]	0.24*** [5.37]	0.18*** [2.89]	0.25*** [5.62]	0.18*** [2.90]	0.24*** [5.31]	0.18*** [2.87]
Volatility	0.04 [0.83]	0.00 [0.09]	-0.05 [1.26]	0.00 [0.06]	-0.05 [1.35]	0.00 [0.07]	-0.04 [1.13]	0.00 [0.07]
Number of observations	2948	2948	2948	2948	2948	2948	2948	2948
R ²	0.11	0.66	0.10	0.66	0.10	0.66	0.10	0.66
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	No	Yes	No	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Regression type	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect

Table 11: Performance: ROA and characteristics of female directors

The sample consists of unbalanced panel sample of firm-year data from 386 firms which are listed on Stock Exchange of Thailand (SET) for 2000-209. The dependent variable is ROA. ROA is net income before extraordinary items and preferred and common dividends but after operating and non-operating income and expense, reserves, income taxes, minority interest and equity in earnings divided by book value of assets. Remaining sample characteristics are as in Table 1. The specification in columns 1, 3, 5, 7 and 9 report ordinary least square regression includes industrial classification industry dummies. The specification in Column 2, 4, 6, 8 and 10 report ordinary least square includes firm fixed effect. All specifications include year dummies. Standard errors are adjusted for potential heteroskedasticity in all columns. Absolute values of t-statistics or z-statistics are in brackets. Asterisks indicate significance at 0.01 (***) , 0.05 (**) and 0.1 (*) level.

<i>Independent variable</i>	<i>Dependent variable</i>							
	ROA							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dummy busy female directors	-0.02*	-0.04						
	[1.82]	[1.20]						
Dummy royal/noble female directors			-0.05*	-0.08				
			[1.83]	[1.31]				
Dummy audit female directors					0.00	-0.00		
					[0.26]	[0.12]		
Dummy independent female directors							0.00	-0.03*
							[0.66]	[1.93]
Board size	-0.00**	-0.01*	-0.00**	-0.01*	-0.00**	-0.01*	-0.00**	-0.01*
	[2.17]	[1.83]	[2.16]	[1.82]	[2.14]	[1.80]	[2.15]	[1.82]
# business segment	-0.03*	-0.03*	-0.03*	-0.03*	-0.03*	-0.03*	-0.03*	-0.03*
	[1.71]	[1.80]	[1.72]	[1.83]	[1.71]	[1.80]	[1.71]	[1.79]
Log(Sales)	0.08***	0.14***	0.08***	0.14***	0.08*	0.14***	0.08**	0.14***
	[5.37]	[3.93]	[2.77]	[3.91]	[1.71]	[3.89]	[2.76]	[3.87]
Leverage	-0.23***	-0.03***	-0.23***	-0.32***	-0.23***	-0.32***	-0.23***	-0.32***
	[5.37]	[3.24]	[5.43]	[3.29]	[5.50]	[3.27]	[5.51]	[3.29]
Volatility	0.02	0.13	0.02	0.13	0.02	0.13	0.02	0.13
	[0.50]	[1.02]	[0.73]	[1.40]	[0.54]	[1.40]	[0.53]	[1.41]
Lagged(ROA)	-0.07	-0.13	-0.07	-0.13	-0.07	-0.13	-0.07	-0.13
	[0.73]	[1.02]	[0.73]	[1.02]	[0.73]	[1.01]	[0.73]	[1.02]
Number of observations	2883	2883	2883	2883	2883	2883	2883	2883
R ²	0.12	0.20	0.12	0.20	0.12	0.20	0.12	0.20
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	No	Yes	No	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Regression type	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect

Table 12: Performance, Busy firm by independent directors and female directors

The sample consists of unbalanced panel of firm-year data from 386 firms which are listed on Stock Exchange of Thailand (SET) for the period 2000-2009. Tobin's q is the ratio of the company's market value to book value of assets. Market value is book value of assets subtract book value of equity plus market value of equity. ROA is net income before extraordinary items and preferred and common dividends but after operating and non-operating income and expense, reserves, income taxes, minority interest and equity in earnings divided by book value of assets. Remaining sample characteristics are as in Table 1. The dependent variable for columns 1-4 is Ln(Tobin's q) or the natural logarithm of Tobin's q. The dependent variable for columns 5-8 is ROA. The specification in columns 1, 3, 5 and 7 report ordinary least square regression includes industrial classification industry dummies. The specification in Column 2, 4, 6 and 8 report ordinary least square includes firm fixed effect. All specifications include year dummies. Standard errors are adjusted for potential heteroskedasticity in all columns. Absolute values of t-statistics or z-statistics are in brackets. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.1 (*) level.

Independent variable	Dependent variable							
	Ln(Tobin's q)				ROA			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Busy firm by independent directors	-0.08***	0.04	0.00	-0.09*	-0.02*	0.02	-0.04	-0.02
	[4.52]	[1.41]	[0.06]	[1.87]	[1.66]	[1.25]	[0.83]	[-0.70]
Busy firm by independent directors*dummy female			-0.10	0.17***			0.03	0.05
			[1.46]	[4.07]			[0.57]	[1.12]
Board size	-0.02***	-0.00	-0.02***	-0.01	-0.00**	-0.01*	-0.00**	-0.01*
	[6.23]	[1.17]	[6.02]	[1.40]	[2.15]	[1.82]	[2.10]	[1.79]
# business segment	-0.03*	-0.03	-0.03*	-0.03	-0.03*	-0.03*	-0.03*	-0.03*
	[1.74]	[1.32]	[1.81]	[1.37]	[1.70]	[1.79]	[1.73]	[1.79]
Log(Sales)	0.15***	0.26***	0.15***	0.26***	0.08***	0.14***	0.08***	0.14***
	[18.72]	[9.81]	[18.31]	[9.95]	[2.76]	[3.88]	[2.74]	[3.86]
Leverage	0.23***	0.17***	0.23***	0.17***	-0.23***	-0.32***	-0.23***	0.32***
	[5.34]	[2.81]	[5.30]	[2.76]	[5.46]	[3.27]	[5.47]	[3.27]
Volatility	-0.05	0.00	-0.05	0.00	0.02	0.13	0.02	0.13
	[1.29]	[0.07]	[1.29]	[0.05]	[0.53]	[1.40]	[0.53]	[1.40]
Lagged(ROA)					-0.07	-0.13	-0.07	-0.13
					[0.73]	[1.01]	[0.73]	[1.02]
Number of observations	2948	2948	2948	2948	2883	2883	2883	2883
R ²	0.10	0.66	0.10	0.66	0.12	0.20	0.12	0.20
Industry dummies	Yes	No	Yes	No	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Regression type	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect

Table 13: Performance, Busy firm by CEO/Chairman and female directors

The sample consists of unbalanced panel of firm-year data from 386 firms which are listed on Stock Exchange of Thailand (SET) for the period 2000-2009. Tobin's q is the ratio of the company's market value to book value of assets. Market value is book value of assets subtract book value of equity plus market value of equity. ROA is net income before extraordinary items and preferred and common dividends but after operating and non-operating income and expense, reserves, income taxes, minority interest and equity in earnings divided by book value of assets. Remaining sample characteristics are as in Table 1. The dependent variable for columns 1-4 is Ln(Tobin's q) or the natural logarithm of Tobin's q. The dependent variable for columns 5-8 is ROA. The specification in columns 1, 3, 5 and 7 report ordinary least square regression includes industrial classification industry dummies. The specification in Column 2, 4, 6 and 8 report ordinary least square includes firm fixed effect. All specifications include year dummies. Standard errors are adjusted for potential heteroskedasticity in all columns. Absolute values of t-statistics or z-statistics are in brackets. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.1 (*) level.

Independent variable	Dependent variable							
	Ln(Tobin's q)				ROA			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Busy firm by CEO/Chairman	0.03	0.04**	0.08***	0.00	-0.01	0.02	0.01	0.04*
	[1.52]	[2.10]	[4.96]	[1.61]	[0.93]	[1.15]	[0.96]	[1.65]
Busy firm by CEO /Chairman*dummy female			-0.07***	-0.06**			-0.02***	-0.04*
			[3.09]	[2.25]			[3.43]	[1.77]
Board size	-0.02***	-0.00	-0.02***	-0.00	-0.00**	-0.01*	-0.00**	-0.01*
	[6.45]	[1.02]	[6.00]	[0.75]	[2.26]	[1.82]	[2.17]	[1.82]
# business segment	-0.03**	-0.03	-0.03**	-0.02	-0.03*	-0.03*	-0.03*	-0.03*
	[2.06]	[1.30]	[2.04]	[1.22]	[1.72]	[1.80]	[1.72]	[1.77]
Log(Sales)	0.15***	0.26***	0.15***	0.26***	0.08***	0.14***	0.08***	0.14***
	[18.41]	[10.00]	[18.40]	[9.87]	[2.75]	[3.91]	[2.73]	[3.92]
Leverage	0.24***	0.17***	0.24***	0.17***	-0.23***	0.32***	-0.23***	-0.32***
	[5.44]	[2.80]	[5.42]	[2.84]	[5.49]	[3.31]	[5.49]	[3.32]
Volatility	-0.04	0.00	-0.04	0.01	0.02	0.13	0.02	0.13
	[1.15]	[0.08]	[1.11]	[0.11]	[0.53]	[1.40]	[0.54]	[1.40]
Lagged(ROA)					-0.07	-0.13	-0.07	-0.13
					[0.73]	[1.01]	[0.73]	[1.02]
Number of observations	2948	2948	2948	2948	2883	2883	2883	2883
R ²	0.10	0.66	0.10	0.66	0.12	0.20	0.12	0.20
Industry dummies	Yes	No	Yes	No	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Regression type	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect

Table 14: Performance and female directors with family network

The sample consists of unbalanced panel sample of firm-year data from 386 firms which are listed on Stock Exchange of Thailand (SET) for 2000-209. Tobin's q is the ratio of the company's market value to book value of assets. Market value is book value of assets subtract book value of equity plus market value of equity. ROA is net income before extraordinary items and preferred and common dividends but after operating and non-operating income and expense, reserves, income taxes, minority interest and equity in earnings divided by book value of assets. Remaining sample characteristics are as in Table 1. The dependent variable for columns 1-4 is Ln(Tobin's q) or the natural logarithm of Tobin's q. The dependent variable for columns 5-8 is ROA. The independent variable; dummy family network (10%) is dummy variable for family network which 10% shareholding is classified as majority shareholders. The independent variable; dummy family network (25%) is dummy variable for family network which 25% shareholding is classified as majority shareholders. The specification in columns 1, 3, 5 and 7 report ordinary least square regression includes industrial classification industry dummies. The specification in Column 2, 4, 6 and 8 report ordinary least square includes firm fixed effect. All specifications include year dummies. Standard errors are adjusted for potential heteroskedasticity in all columns. Absolute values of t-statistics or z-statistics are in brackets. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.1 (*) level.

Independent variable	Dependent variable							
	ln(Tobin's q)				ROA			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dummy family network (10%)	-0.04**	-0.01			0.01*	-0.01		
	[2.57]	[0.33]			[1.93]	[0.94]		
Dummy family network (25%)			0.00	0.07***			0.01***	0.01*
			[0.26]	[3.07]			[2.71]	[1.76]
Board size	-0.02***	-0.00	-0.02***	-0.01	-0.00**	-0.01*	-0.00**	-0.00
	[6.29]	[1.08]	[6.84]	[1.40]	[2.20]	[1.80]	[2.17]	[1.18]
# business segment	-0.03*	-0.03	-0.03*	-0.03	-0.03*	-0.03*	-0.03*	-0.01
	[1.93]	[1.29]	[1.89]	[1.40]	[1.70]	[1.80]	[1.71]	[0.92]
Log(Sales)	0.14***	0.26***	0.15***	0.26***	0.08***	0.14***	0.08***	0.16***
	[17.26]	[9.87]	[18.49]	[10.04]	[2.79]	[3.88]	[2.78]	[3.02]
Leverage	0.24***	0.18***	0.24***	0.18***	-0.23***	0.32***	-0.23***	-0.24***
	[5.55]	[2.87]	[5.47]	[2.92]	[5.52]	[3.26]	[5.51]	[4.09]
Volatility	-0.05	0.00	-0.05	0.00	0.02	0.13	0.02	0.15
	[1.27]	[0.08]	[1.24]	[0.06]	[0.54]	[1.40]	[0.55]	[1.32]
Lagged(ROA)					-0.07	0.13	-0.07	-0.17
					[0.73]	[1.02]	[0.73]	[1.09]
Number of observations	2948	2948	2948	2948	2883	2883	2883	2883
R ²	0.10	0.66	0.09	0.66	0.12	0.20	0.12	0.26
Industry dummies	Yes	No	Yes	No	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Regression type	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect

Table 15: Performance: Ln(Tobin's q) and female directors with family network

The sample consists of unbalanced panel sample of firm-year data from 386 firms which are listed on Stock Exchange of Thailand (SET) for 2000-209. The dependent variable is Ln(Tobin's q) or the natural logarithm of Tobin's q. Tobin's q is the ratio of the company's market value to book value of assets. Market value is book value of assets subtract book value of equity plus market value of equity. Remaining sample characteristics are as in Table 1. The specification in columns 1, 3, 5 and 7 report ordinary least square regression includes industrial classification industry dummies. The specification in Column 2, 4, 6 and 8 report ordinary least square includes firm fixed effect. All specifications include year dummies. Standard errors are adjusted for potential heteroskedasticity in all columns. Absolute values of t-statistics or z-statistics are in brackets. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.1 (*) level.

Independent variable	Dependent variable							
	Ln(Tobin's q)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dummy alumni network	0.05 [1.46]	0.02 [0.49]						
Dummy CMA network			0.06* [1.87]	0.19*** [3.68]				
Dummy NDC network					0.09 [1.41]	0.03 [0.49]		
Dummy DCP network							0.04* [1.70]	0.07 [1.42]
Board size	-0.02*** [6.94]	-0.00 [1.19]	-0.02*** [6.90]	-0.01 [1.25]	-0.02*** [6.97]	-0.00 [1.18]	-0.02*** [6.45]	-0.00 [1.17]
# business segment	-0.03* [1.93]	-0.03 [1.29]	-0.03* [1.90]	-0.02 [1.22]	-0.03* [1.90]	-0.03 [1.30]	-0.03** [2.11]	-0.02 [1.28]
Log(Sales)	0.15*** [18.60]	0.26*** [9.86]	0.15*** [18.64]	0.26*** [9.70]	0.15*** [18.69]	0.26 [1.30]	0.15*** [11.64]	0.25*** [9.93]
Leverage	0.24*** [5.43]	0.18*** [2.86]	0.24*** [5.45]	0.17*** [2.84]	0.24*** [5.46]	0.18*** [2.87]	0.24*** [1.95]	0.18*** [2.89]
Volatility	-0.05 [1.23]	0.00 [0.07]	-0.05 [1.22]	0.00 [0.07]	-0.05 [1.24]	0.00 [0.51]	-0.05* [1.95]	0.00 [0.09]
Number of observations	2948	2948	2948	2948	2948	2948	2948	2948
R ²	0.09	0.66	0.09	0.66	0.09	0.66	0.09	0.66
Industry dummies	Yes	No	Yes	No	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Regression type	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect

Table 16: Performance: ROA and female directors with family network

The sample consists of unbalanced panel sample of firm-year data from 386 firms which are listed on Stock Exchange of Thailand (SET) for 2000-209. The dependent variable is ROA. ROA is net income before extraordinary items and preferred and common dividends but after operating and non-operating income and expense, reserves, income taxes, minority interest and equity in earnings divided by book value of assets. Remaining sample characteristics are as in Table 1. The specification in columns 1, 3, 5 and 7 report ordinary least square regression includes industrial classification industry dummies. The specification in Column 2, 4, 6 and 8 report ordinary least square includes firm fixed effect. All specifications include year dummies. Standard errors are adjusted for potential heteroskedasticity in all columns. Absolute values of t-statistics or z-statistics are in brackets. Asterisks indicate significance at 0.01 (***), 0.05 (**) and 0.1 (*) level.

<i>Independent variable</i>	<i>Dependent variable</i>							
	ROA							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dummy alumni network	0.02 [0.81]	0.00 [0.10]						
Dummy CMA network			-0.00 [0.18]	0.03 [0.55]				
Dummy NDC network					0.02 [1.27]	-0.01 [0.19]		
Dummy DCP network							0.02 [0.92]	0.02 [0.59]
Board size	-0.00** [2.14]	-0.01* [1.83]	-0.00** [2.14]	-0.01* [1.83]	-0.00** [2.15]	-0.01* [1.82]	-0.00** [2.15]	-0.01* [1.82]
# business segment	-0.03* [1.71]	-0.03* [1.79]	-0.03* [1.71]	-0.03* [1.76]	-0.03* [1.71]	-0.03* [1.80]	-0.03* [1.71]	-0.03* [1.80]
Log(Sales)	0.08*** [2.76]	0.14*** [3.89]	0.08*** [2.76]	0.14*** [3.93]	0.08*** [2.77]	0.14*** [3.89]	0.08*** [2.76]	0.14*** [3.89]
Leverage	-0.23*** [5.50]	-0.32*** [3.28]	-0.23*** [2.76]	-0.32*** [3.27]	-0.23*** [5.50]	-0.32*** [3.28]	-0.23*** [5.51]	-0.32*** [3.28]
Volatility	0.02 [0.54]	0.13 [1.40]	0.02 [0.53]	0.13 [1.40]	0.02 [0.53]	0.13 [1.40]	0.02 [0.53]	0.13 [1.40]
Lagged(ROA)	-0.07 [0.73]	-0.13 [1.01]	-0.07 [0.73]	-0.13 [1.01]	-0.07 [0.73]	-0.13 [1.01]	-0.07 [0.72]	-0.13 [1.01]
Number of observations	2883	2883	2883	2883	2883	2883	2883	2883
R ²	0.12	0.20	0.12	0.20	0.12	0.20	0.12	0.20
Industry dummies	Yes	No	Yes	No	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Regression type	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect

CHAPTER V

CONCLUSION

5.1 Conclusion

The composition of board is one of the important factors that helps improve firm corporate governance. Many studies in foreign countries emphasize and encourage firms to have gender diverse board as there are many evidences claim positive impact of female directors on firm performance. In some countries, such as Norway, the quota seat for female directors in boardroom is imposed as regulation. However, various countries have different in nature of operation, characteristics of firm and culture. Therefore, the impact of having gender diverse board may be different across countries, especially countries in Asia and Europe or America. So, understanding impact of female directors on firm performance in each country is important.

In order to investigate the impact of female directors on firm performance in Thailand, the sample of this study is firms listed on SET form during the period 2000-2009. My study seeks for more understanding about female board of directors in Thailand and the impact of those female directors on firm performance in order to be a guild line to improve corporate governance in Thailand.

As of some characteristics of Thai firm, in general, the gender diverse board in Thailand does not help improve firm market-based performance but accounting performance. The possible explanation is the inequality between genders. Female directors in Thai firms may have some barriers that block female directors from utilizing their true potential, which is refereed to Glass ceiling. Or female directors may over-monitor which does not help enhancing firm performance.

After I scope down the female directors into several groups based on their characteristic, I found that two characteristics of female directors, which are royal/noble female directors and independent female directors, have negative impact on firm performance. The other two characteristics (busy female directors and audit female directors) have no significant impact on firm performance.

In addition, there is an evidence claim that gender diverse board helps improve firm performance in firms that have busy independent directors. This suggests that

having female directors in boardroom bring some benefit to boardroom which help improve firm value. Female directors may help monitoring those busy independent directors which is a plus to firm.

Also, in Thailand which is considered as high nepotism culture, network helps boost shareholder value especially when female directors have family network with high control firm shareholders. This group of female directors may potentially help monitoring firm, put more effort to protect benefit of shareholders and reduce agency problem as well as agency costs. Moreover, the alumni network of particular institution, Capital Market Academy, bring value to firm as this institution aims to improve ability of top managements of firm to utilize their knowledge and experiences to enhance their organization value. The benefits of network, such as facilitates the flow of knowledge, sharing the similar background and connection among board members, help them to work with each other easier.

From this study, there is no evidence suggests that gender diverse board or quota-based policy should or should not be promote or impose as regulation. To support the gender diverse board or quota-based policy, the stronger evidences and more precise impact of female directors are needed. However, I find that there are some benefits or value that female directors bring to their organization.

5.2 Suggestions for future studies

There is little understanding and study of impact of female directors on firm performance in Thailand as the there is very few existing studies about this topic in Thailand. Therefore, I would like to point out some areas that could be challenge for future investigation in this field of study.

From my study, there are benefits that some groups of female directors bring to firms and help firm to enhance performance. But, form my study alone, the way they add value to firm or how they generate positive impact in firm is still indeterminate. If we can figure out how female directors can bring value to firm, it will be useful to enhance firm corporate governance in Thailand and improve performance of Thai firms.

For example: The firms with more gender diverse board have less attendance problem than those with less gender diverse board.

My study suggests only the general impact of female directors on overall listed firm performance in Thailand. To be able to broaden the understanding of the impact of female directors, focusing on each sector or business industry may be useful. For example: The impact of female directors on firm performance in each sector or industry. Female directors may outstandingly help improve performance in some business industries and may not help in some others.

Also, I find the incremental benefits that female directors bring to this kind of firms. Therefore, the future study can broaden the scope of firm characteristic to investigate the impact of female directors on each type or characteristic of firm. For example: the impact of female directors on private company and state enterprises company.

Above suggestions for future studies are recommended to be investigated in order to enhance the understanding of the impact gender diverse board on firm performance. Importantly, the more understandings in this topic will help firms in Thailand to improve corporate governance and they will be useful for the regulators to impose rules or regulations in the future.

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APPENDIX

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Appendix A: Summary of female directorship classified by Sector (detail)

These two tables show the number of firms and number of female directorships of each sector or industry in a given year. # Firm is the number of firms in each sector. Female directorship is the number of total female directorship of each sector.

Sector/Industry	2000		2001		2002		2003		2004	
	# Firm	Female Directorship	# Firm	Female Directorship	# Firm	Female Directorship	# Firm	Female Directorship	# Firm	Female Directorship
Property & Construction	55	92	55	93	60	100	63	96	73	118
Technology	18	31	20	35	22	37	26	38	30	42
Consumer Products	37	98	37	98	38	99	38	99	37	102
Industrials	43	79	43	77	44	80	46	79	53	99
Services	60	90	61	86	63	97	69	105	76	118
Resources	12	11	13	11	16	11	17	12	20	10
Agro & Food Industry	36	70	36	71	37	75	38	81	39	83
Total	261	471	265	471	280	499	297	510	328	572

Sector/Industry	2005		2006		2007		2008		2009	
	# Firm	Female Directorship	# Firm	Female Directorship	# Firm	Female Directorship	# Firm	Female Directorship	# Firm	Female Directorship
Property & Construction	82	130	84	130	89	147	89	145	89	143
Technology	32	48	34	47	35	48	36	43	36	45
Consumer Products	38	105	40	102	40	102	41	100	40	93
Industrials	64	126	68	132	68	133	69	127	68	125
Services	80	128	81	135	82	144	83	143	83	146
Resources	22	14	23	18	23	23	27	29	27	29
Agro & Food Industry	40	82	40	74	40	80	41	84	41	83
Total	358	633	370	638	377	677	386	671	384	664

BIOGRAPHY

My name is Phornthipha Sirisophonphong. I was born in August 5th, 1986 in Bangkok. In 2009, I graduated from Bachelor Degree of Business Administration, majoring in Finance and banking with the second class honor (Magna Cum laude), from Assumption University, Thailand.



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