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Corporate Governance and the Cost of Capital of the Companies Listed in the Stock Exchange of Thailand

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กิตติธัช ตันนิรันดร : บรรษัทภิบาลและต้นทุนเงินทุนของบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย. (CORPORATE GOVERNANCE AND THE COST OF CAPITAL OF THE COMPANIES LISTED IN THE STOCK EXCHANGE OF THAILAND) อ.ที่ปรึกษาวิทยานิพนธ์หลัก : รศ.ดร.สันติ ถิรพัฒน์, 51 หน้า.

วิทยานิพนธ์ฉบับนี้มีวัตถุประสงค์เพื่อศึกษาเกี่ยวกับความสัมพันธ์ระหว่างบรรษัทภิบาลและต้นทุนเงินทุนของบริษัทจดทะเบียนในบริษัทหลักทรัพย์แห่งประเทศไทยในระหว่างปี พ.ศ.2543 – พ.ศ.2550 การศึกษาฉบับนี้ใช้ดัชนีชี้วัดระดับธรรมาภิบาลที่ครอบคลุมแง่มุมหลักของบรรษัทภิบาลอย่างครบถ้วน ซึ่งได้แก่ โครงสร้างของคณะกรรมการ การขัดแย้งทางผลประโยชน์ บทบาทของคณะกรรมการ สิทธิของผู้ถือหุ้น และการเปิดเผยข้อมูลและความโปร่งใส ต้นทุนหนี้สินประมาณค่าโดยการทำนายอันดับเครดิตซึ่งทำนายโดยใช้แบบจำลอง Altman แบบจำลอง Blume แบบจำลอง Campbell แบบจำลอง Shumway และแบบจำลอง Zmijewskiและถูกแปลงให้เป็นต้นทุนหนี้สินโดยใช้เทคนิคช่วงว่างของผลตอบแทน ต้นทุนผู้ถือหุ้นคำนวณจาก CAPM แบบจำลองสามตัวแปร DDM และแบบจำลอง Easton

หลังจากที่ละทิ้งแบบจำลองที่ไม่มีประสิทธิภาพซึ่งได้แก่ CAPM และ DDM ซึ่ง CAPM ขึ้นอยู่กับอัตราผลตอบแทนที่ปราศจากความเสี่ยง betaและส่วนชดเชยความเสี่ยง ด้าน DDM ขึ้นอยู่กับราคาหลักทรัพย์ การพยากรณ์เงินปันผลและอัตราการเจริญเติบโต ผลลัพธ์ของสมการถดถอยแสดงให้เห็นถึงความสัมพันธ์เชิงลบระหว่างบรรษัทภิบาล ต้นทุนหนี้สิน ต้นทุนผู้ถือหุ้นและต้นทุนเงินทุนในทุกแบบจำลอง ผลการทดลองแสดงให้เห็นว่า บรรษัทภิบาลสามารถลดต้นทุนหนี้สิน ต้นทุนผู้ถือหุ้น รวมไปถึงต้นทุนเงินทุนได้

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KITTITUCH TANNIRANDORN: CORPORATE GOVERNANCE AND THE COST OF CAPITAL OF THE COMPANIES LISTED IN THE STOCK EXCHANGE OF THAILAND. THESIS ADVISOR: ASSOC. PROF SUNTI TIRAPAT, Ph.D., 51 pp.

This thesis investigates the relationship between corporate governance and cost of capital of the companies listed in the Stock Exchange of Thailand (SET) during 2000-2007. This study uses corporate governance index (CGI) which capture major aspects of corporate governance that are board structure, conflict of interest, board responsibility, shareholder rights, and disclosure and transparency. The cost of debt is estimated by predicting the credit rating which estimated by Altman model, Blume model, Campbell model, Shumway model and Zmijewski model and being converted in to the cost of debt by using the yield spread technique. The cost of equity calculated from CAPM, three-factor model, DDM and Easton model.

After ignoring invalid model namely CAPM and DDM, the regression result shows a negative relationship between corporate governance, the cost of debt, the cost of equity and the cost of capital. The result can be interpreted that corporate governance can reduce the cost of capital.

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Chapter I
Introduction

1.1 Background of the Study

Due to the separation of ownership and control in corporate organizations which is shown by the agency theory framework (Jensen and Meckling, 1976), information asymmetry which stakeholders (shareholders and debtholders) cannot perfectly monitor managers' behavior arises and potentially create moral hazard problem. This occurs when managers have incentives to pursue their own interests at shareholders expense. Self-interested managerial behavior can take several forms including shrinking, consumption of perquisites, over compensation, and empire building. All of these behaviors increase the agency risk faced by external stakeholders and decrease the expected cash flows to the firm and its external stakeholders. Therefore, the default risk of bondholders increases leading to lower credit ratings or greater the cost of debt. Moreover, information asymmetry also creates adverse selection problem when investors cannot accurately evaluate the true economic value of the firm. If the financial information lacks transparency and quality, there are greater information risks being imposed on the investors. Consequently, the rational investors will price-protect against this problem, raising the firm's cost of equity capital. Besides, debtholders still have conflict of interest issues with shareholders. In levered firms, shareholders have incentives to undertake actions that can transfer wealth from debtholders to themselves. Shareholders may demand direct payouts of firm assets in terms of dividend payouts or share repurchases as opposed to supporting manager's investment in positive net present value projects that increase a firm's future cash flows. The reduction in a firm's expected future cash flows will increase debtholders' default risk. Additionally shareholders may influence managers to invest in riskier projects that increase the variance of the firms' future cash flows resulting in debtholders facing greater default risk. In both examples, bondholders bear greater risk that their fixed contractual claims on the firm's cash flow will not be paid while shareholders potentially are better off. The greater default risk results in higher firm's cost of debt capital.

Corporate governance will play a role to mitigate agency costs and information asymmetry resulting in reducing cost of capital in several channels. Firstly, corporate governance can limit degrees of expropriation. Managers tend to expropriate more when there is a market downturn and less when the market is booming. This negative relation between the degree of expropriation and market conditions can magnify the non-diversifiable risk of a firm, which must be compensated by a greater required rate of return of stakeholders. Therefore, decreasing the degree of expropriation by improving corporate governance can reduce the firm's cost of capital.

Secondly, better corporate governance can lower the cost of capital by reducing the cost of external monitoring by outside stakeholders. Expenditure of external monitoring arises when stakeholders monitor on managers to ensure that managers are acting in their best interests. Consequently, outside stakeholders demand a higher required rate of return to compensate for these their external monitoring costs.

Thirdly, corporate governance also reduces the cost of capital by lessening information asymmetry between managers and outside stakeholders. There are several prior studies focused on the relationship between information asymmetry and the cost of capital. Merton (1987) shows that, in an imperfect capital market, when managers have more information than outsiders, rational investors would price-protect or penalize the firm by demanding a higher risk premium to compensate information risk. To alleviate this information risk, companies should increase information quality (Leuz and Verrecchia, 2005; Botosan, 1997). Botosan and Plumlee (2002), Barth and Landsman (2003) find that good governance in term of disclosure quality or earning transparency lower the cost of equity while Sengupta (1998) finds the negative relationship between disclosure and cost of issuing debt.

The benefit of understanding the effect of corporate governance on the cost of capital is important to many accessories. In the cost of equity component, there are many researches showing that corporate governance enhances firm valuation or equity price (e.g., Gomper et al., 2003; Durnev and Kim, 2005). However these researches assume that corporate governance affects firm valuation by improving shareholders' expected cash flows because corporate governance can mitigate the degree of

expropriation by insiders. It is still largely unknown that those mechanisms also affect the other determinant of firm value (i.e. the cost of equity). In the cost of debt capital component, whether corporate governance can mitigate the cost of debt is an interesting topic for managers. In general, debt is a major source of fund for publicly traded firm. If corporate governance can reduce the cost of debt, managers will have an incentive to follow corporate governance practices. Therefore, many practitioners, researchers including managers are concerned the effect of corporate governance on the cost of capital.

Many researchers (e.g., Ashbaugh-Skaife et al., 2006; Reverte, 2007) provide the evidence of the benefits received from improving the level of corporate governance in developed markets. However, the evidence from those researchers may not hold up in the Thai market because this market is one of the emerging markets where regulations or governance standards are not fully developed. As a result, Anuchitworawong (2008) aspires to assess the relationship between corporate governance and the cost of capital in the Thai market. His evidence is still similar to previous recorded evidence. However, the result from Anuchitworawong (2008) may be biased due to its short study period (2002 and 2004) and irrelevant the cost of debt estimated methods. From those biases, it is worthwhile to reinvestigate the effects of corporate governance and cost of capital by lengthen sample period to 2000-2007 and providing appropriate method to estimate the firms' the cost of equity and the cost of debt.

1.2 Statement of Problem

Does corporate governance affect cost of capital and its components in Thai equity market?

1.3 Objectives

The main objective of this paper is to investigate the extent to which corporate governance attributes that affect firms' the cost of capital in non-financial publicly traded Thai firms by extending sample periods to measure corporate governance index and using more relevant methods to evaluate the cost of debt. Moreover, this

paper also investigates the relationship between components of the cost of capital (i.e., the cost of debt and the cost of equity) and corporate governance.

1.4 Contribution

Anuchitworawong (2008) tries to investigate the relationship between corporate governance and the cost of capital in the Thai market. However, that research still has some drawbacks. First, he uses the ratio of interest expense to total outstanding short-term and long-term borrowings as a proxy of cost of debt. This cost of debt may be biased because the cost of debt can be affected by the borrowing terms, the borrowing amount, structure of debt and the year which the firm borrows the money. In addition, this research use only year 2002 and 2004 as a sample period. Therefore it is worthwhile to reinvestigate the effect of corporate governance toward cost of capital by extending the sample period and using other techniques to estimate the cost of debt and the cost of equity. This author believes that the relationship between corporate governance and cost of capital may different in this research.

1.5 Organization of the Study

This research is organized as follows. Chapter 1 introduces the research background, statement of problem, objectives of the study, and contribution. Chapter 2 reviews the literature which is relevant to this study and also hypotheses development. Chapter 3 represents data description, sample selection and sources. Chapter 4 is devoted to the research methodology. It includes corporate governance index construction, estimation of the cost of debt, the cost of equity, the cost of capital, the validation of the resulting estimates, univariate tests as well as regression equations. Chapter 5 presents the univariate results, the regression results and analysis. Finally, Chapter 6 is the conclusion and interpretation.

Chapter II
Literature Reviews and Hypotheses Development

2.1 Information Asymmetry, Corporate Governance and Cost of Capital

Within the Jensen and Meckling (1976) agency theory framework, there are two types of agency conflicts between agent and principal. The first is the conflict between management and all external stakeholders-both debtholders and shareholders. Separation of ownership and control in corporate organizations creates information asymmetry problems between managers and external stakeholders which external stakeholders cannot properly observe managers' behavior. Information asymmetry potentially creates moral hazard problems when managers have incentive to extract wealth from external stakeholder to them by pursuing their own interests at the expense of external stakeholders. Information asymmetry also creates adverse selection problems which investors cannot evaluate the true economic value of the firm. Moral hazards and adverse selection problems result in agency costs that rational investors will price-protect against resulting in higher the cost of capital.

Second agency conflict is the conflict between debtholders and shareholders. Shareholders have incentives to transfer wealth from debtholders to themselves via dividend or stock repurchase instead of investing in positive net present value projects. The debtholders will bear greater of default risk. Likewise, if shareholders influence managers to invest in riskier projects that potentially increase the variance of the firms' future cash flows. The debtholders will face greater default and cause increasing in the cost of debt.

La Porta et al. (2000) defines corporate governance as a set of mechanisms through which outside investors can protect themselves against expropriation by insider. These mechanisms can reduce cost of capital in three ways.

First, good corporate governance can reduce the non-diversifiable risk of expropriation by corporate insiders. Degrees of expropriation by corporate insiders depend on the investment opportunity and the cost of expropriation. Investment opportunity is a systematic factor that depends on macroeconomic condition. Corporate insiders tend to expropriate more when the market is in recession and less

when the market is booming. (Johnson et al., 2000; Durnev and Kim, 2005) Therefore, degrees of expropriation are a negatively systematic factor with market conditions, and this systematic risk must be compensated by a higher required rate of return. However, good corporate governance can reduce the negative effect between the degree of expropriation and market condition, as a result lower required rate of return by external stakeholders.

Second, good corporate governance also lessen the cost of capital by reducing the cost of external monitoring by outside stakeholder. To ensure a given return from firm's management team, the stakeholders must monitor closely to firm's management action that create external monitoring cost as suggest by Lombardo and Pagano (2002). This monitoring cost must be compensated by a high require rate of return of stakeholders. Better corporate governance can reduce time and resources spend on monitoring firm's management team, as a result lower cost of capital.

Third, better corporate governance can reduce cost of capital by reducing information asymmetry. Many studies present that agency costs that result from information asymmetries can be alleviated by a set of mechanisms of corporate governance especially in the aspect of disclosure of quality financial information and other firm-related information. Diamond and Verrecchia (1991), Leuz and Verrecchia (2000) propose that the firms' commitment to the disclosure of quality information diminishes investors' risk of loss from trading with informed investors, thereby attracting more funds into a capital market. Moreover, Botosan (1997) and Sengupta (1998) uncover that greater disclosure level lower cost of equity capital and cost of debt respectively.

Since three explanations why improving corporate governance practice can reduce the cost of capital as mentioned above, there are many researches finding the negative relationship between corporate governance level and cost of capital including cost of equity capital and cost of capital. In cost of equity component, Reverte (2007) indicate that the better governed firms will enjoy a lower cost of equity capital in Spanish capital market after controlling for well-known Fama and French (1992)'s risk factors (i.e. beta, size and market-to-book). In emerging markets, Chen et al. (2009) find the evidence that firm-level corporate governance has a significantly negative effect on the cost of equity capital. In cost of debt component, Ashbaugh-

Skaife et al. (2006) find that weak governance can result in firms incurring higher debt financing costs after controlling for firm-specific risk characteristics.

From all of these researches, we can recognize the effect of corporate governance to the cost of capital. However, the result from these researches may not consistent in Thailand. Because, Thailand is an emerging market and has weak investor protection as well as few listed firms in the stock exchange. Anuchitworawong (2008) tries to examine the relationship between corporate governance and the cost of capital in the Thai capital market by using the ratio of interest expense to total outstanding short-term and long-term borrowings as a proxy of cost of debt and using DDM along with ROE to assess cost of equity of the firm. Although the result of this study is similar to previous researches, there are some drawbacks in it. Using the ratio of interest expense to total outstanding short-term and long-term borrowings as a proxy of the cost of debt may be biased due to the amount of debt, year that the firm borrows the money, borrowing terms and type of debt: secured debt and unsecured debt. Moreover, that research use only year 2002 and 2004 as a sample period. Therefore this author will reinvestigate the relationship between corporate governance and cost of capital by using credit-rating techniques to estimate cost of debt. Four models namely CAPM, Three-factor model, DDM and Easton model measure cost of equity. Finally, I also extend the sample to the period of 2000-2007.

2.2 Hypotheses Development

The hypotheses are stated in null form as follows:

H_1: There is no relationship between corporate governance and the cost of debt.

There are several researchers examine the association between corporate governance and the cost of debt. For example, Ashbaugh-Skaife et al. (2006) shows that the credit ratings which is a proxy of the cost of debt capital are positively associated with the degree of corporate governance. The reason behind this association is that effective corporate governance can reduce the degree of expropriation by insiders and as a result, the firm can create more future cash flow to stakeholders. The more future cash flows the lower the likelihood of firm defaults or

higher credit ratings (lower cost of debt). Therefore, this author expects to find a negative relationship between corporate governance and cost of debt.

H_2: There is no relationship between corporate governance and the cost of equity.

Many researchers demonstrate evidence between corporate governance and the cost of equity. Reverte (2007) indicates that stronger governance firms enjoy a reduction in the cost of equity in the Spanish capital market after controlling beta, size and market-to-book. However, Reverte's results may not hold true in the Thai capital market because Thailand has underdeveloped corporate governance practice as well as a smaller number of investors and listed companies compare to mature markets. Consequently, I reinvestigate the relationship between corporate governance and the cost of equity. Nevertheless, I still posit a negative association between corporate governance and the cost of equity.

H_3: There is no relationship between corporate governance and the cost of capital.

Many researches discover the improving of corporate governance can reduce both the cost of equity and the cost of debt as mentioned in previous paragraphs. Therefore, improving of corporate governance must reduce the cost of capital because the cost of capital is the weighted average of cost of debt and cost of equity. In other words, both cost of debt and equity are sub-components of the cost of capital. As a result, my hypothesis is that there is a negative relationship between corporate governance and the cost of capital.

Chapter III
Sample and Data Description

3.1 Sample Selection

This research sample is companies listed in the Stock Exchange of Thailand (SET) over the period 2000 – 2007 while year 2008 is an out of sample for the credit-rating accuracy test. This author eliminates all the companies that do not have corporate governance index data, accounting data and financial data. As a result, there are 411 stocks or 2548 observations left in the regression analysis.

3.2 Source of Data

Corporate governance index (CGI) data is obtained from Eamsherangkoon (2009) based on Ananchotikul (2006) approach. Following this approach, CGI is divided into five factors which are: 1.Board Structure 2.Conflicts of Interest. 3.Board Responsibility. 4.Shareholder Rights and 5.Disclose and Transparency. This index is constructed from the Annual Disclosure Report (Form 56-1), the company annual reports, corporate websites, the web-based on SET Market Analysis and Reporting Tool (SETSMART), and the SET's Director Database. Accounting data is obtained from DATASTREAM. The missing data from DATASTREAM is fulfilled by SETSMART database. I also convert accounting data from fiscal year format into calendar year format by using information from Securities and Exchange Commissions (SEC). Financial data is gathered from DATASTREAM. Credit rating data is obtained from TRISRATING website.

3.3 Data Description

Table 1 shows the descriptive statistics of control variables used in the regression model. These variables are beta, size, market to book ratio, leverage, return on asset and interest coverage ratio. This table provides important statistics of the sample including mean, median, maximum, minimum and standard deviation. The sample characteristics cover the period 2000 - 2007.

Table 1
Descriptive Statistics of Control Variables

This table represents mean, median, maximum, minimum and standard deviation of the control variables which are beta, size, market to book ratio, leverage, return on asset and interest coverage ratio over the period 2000-2007. Each control variable has 2548 observations. Beta is the sensitivity to the risk premium in CAPM. Size is the natural logarithm of market capitalization. Market to book ratio (MB) is the ratio of market value to the book value of equity of the firm. Leverage (LEV) is the ratio of long term debt to the market value of equity. Return of asset (ROA) is the ratio of earning before extraordinary items to the total asset. Finally, interest coverage ratio (INTCOV) is the ratio of earnings before interest and tax to the interest expense. All variables are winsorized at the bottom 5% level and top 5% level.

Variables	Mean	Median	Max	Min	Std. Dev.
BETA	0.601	0.502	1.510	-0.011	0.009
SIZE	7.209	7.136	10.350	4.325	0.032
MB	1.275	0.971	3.839	-0.005	0.020
LEV	0.514	0.112	3.836	0.000	0.019
ROA	0.082	0.082	0.347	-0.097	0.002
INTCOV	563.037	6.267	7698.737	-5.887	35.853

Chapter IV
Methodology

4.1 Corporate Governance Index Construction

Corporate Governance Index (CGI) is constructed based on the approach of Ananchotikul (2006). To avoid the bias from self-evaluated questionnaires, this index uses information from publicly source, including the mandatory Annual Disclosure Report (Form 56-1), company annual reports, corporate websites, the web-based SET Market Analysis and Reporting Tool (SETSMART), and the SET's Director Database. The firm-specific corporate governance data is obtained from 87 questions and will be grouped in to five governance components: 1.Board Structure 2.Conflict of Interest 3.Board Responsibilities 4.Shareholder Rights, and 5.Disclosure and Transparency. Scores are given to each of the governance items and taking a weighted average of the sub indexes to create CGI. The weighted are 20%, 25%, 20%, 10% and 25%, respectively. As the result, CGI ranges from zero to one with higher values indicating better corporate governance. Full details of the questionnaire are showed on Appendix B.

4.2 Cost of Debt Estimation

Cost of debt represents the effective rate that a company finances a new debt instruments. For my research, there are four-steps to estimate the cost of debt of the firm. First, gathering the credit rating of the companies. Credit ratings are defined as a creditworthiness of a company. Generally, those with a high-credit rating have less default probability on debt instruments than low-credit rating firms. They are ordered, with AAA best, AA+ second best and so on. However, in my sample, credit ratings are grouped into four categories, AAA, AA, A and BBB (AA+, AA, AA- are grouped into AA and so on), because there are yield spreads for AAA, A, A and BBB which can convert credit rating into cost of debt. These credit ratings are acquired from TRIS's website and Newscenter. Normally, TRIS Rating reviews credit rating of each firm annually. However, TRIS Rating can inform the public of developments more than once a year by distributing two types of announcements: CreditAlert and

CreditUpdate. CreditAlert is a warning when significant events occur that might affect the current credit rating of the firm or when business conditions change. CreditUpdate is an update of the current credit rating which arises when the firm issues a new bond and when the credit rating is changed. Because I gather credit ratings on a quarterly basis, there are some quarters that TRIS do not announce the credit rating of some firms. I assume that the credit rating of the firm is the same as the latest announcement. If the credit rating of the firm is changed, TRIS Rating should change that credit rating in CreditAlert. Because of the small credit-rating sample, I have to replicate the credit rating of the firms that TRIS do not review and lead to the next step.

Second, I estimate credit rating of companies by using the logistic ordered model. The following equation represents the formula.

$$Z_{it} = \beta X_{it} + \varepsilon_{it} \quad (1)$$

where Z_{it} is the credit rating of company i at time t (AAA = 4, AA = 3, A =2 and BBB =1) the companies' credit ratings are gathered from TRISRATING agency and mapped into a quarterly basis. X_{it} is the vector of explanatory variable, which effect Z_{it} of company i at time t.

Six models are used to estimate credit ratings. The first five models are Altman model, Blume model, Shumway model, Campbell model and Zmijewski model. These models are different based on the set of explanatory variables. These explanatory variables are shown in Appendix A and can be widely divided into two categories, accounting variables and market variables. The accounting variables are based on calendar year format. I also lagged market variables for three months, to ensure that accounting information is incorporated into market data. Once the credit ratings are estimated by five models, the last model is the median of these previous five models. For example, the credit ratings of company X which are estimated by five models are A, A, AAA, BBB and AA. The last model or the median of five models can estimate the credit rating of the company X equal to A.

Third, the accuracy of the credit rating estimations must be verified since one does not know which model is the best to estimate the credit rating of the firm. If credit-rating estimation model is not accurate enough to estimate the firms' credit

rating, the firms' estimated credit rating will be unreliable and lead to defective cost of debt. The result of accuracy testing is shown in chapter 5.

Finally, a company's credit rating is converted into cost of debt capital by adding credit spread of each rating categories on the yield of Thai government bond at a specific time.

Table 3 panel A represents the descriptive statistics of the cost of debt during the period 2000 to 2007, and classified each year. The cost of debt of the firm is getting lower from 2000-2003 and getting back higher after that until 2006. Table 3 panel B shows the descriptive statistic of the cost of debt classified by size of the firm. Size is the market value of equity of the firm at the end of the year. From table 4, big firms tend to have lower cost of debt than small firms. Table 3 panel C represents the descriptive statistics of the cost of debt classified by sector of the firm. The average cost of debt for property & construction firms is the highest while the average cost of debt is the lowest for agro & food industry firms and technology firms.

4.3 Cost of Equity Estimation

Four different methods are used to assess the firms' cost of equity. The first two methods are based on asset pricing models. My first one is the capital asset pricing model (CAPM) of Sharpe (1964) and Lintner (1965). In the CAPM, the expected return on stock i or, equivalently, the cost of equity for firm i is as follows.

$$CE1_{i,t} = R_{f,t} + \beta_{i,t}[E(R_m) - R_{f,t}] \quad (2)$$

where $CE1_{i,t}$ is the cost of equity of firm i at year t based on the CAPM model. $R_{f,t}$ is the risk-free interest rate at year t. $E(R_m)$ is the expected return on the market index (SET) and is calculated from ten year historical returns of SET index. $\beta_{i,t}$, the CAPM risk of stock i at time t, is the slope in the regression of its excess return the market's excess return in last three years. The regression equation is run on a weekly basis and is shown as below.

$$R_i - R_f = \gamma_i + \beta_i[R_m - R_f] + \varepsilon_i \quad (3)$$

However, recent empirical work suggests that the CAPM is not a good explanation of expected returns. Specifically, many papers argue that the market beta (β) does not show reliable power to explain the expected stock return (Fama and

French (1992)). Fama and French (1993) propose a three-factor pricing model as an alternative choice to excess stock expected returns or cost of equity. Since there is no consensus about which asset pricing model is best, I also use a three-factor pricing model as a second approach to estimate firm costs of equity. Three-factor pricing model is shown as follow.

$$CE2_{i,t} = R_{f,t} + b_{i,t}\left[E(R_m) - R_{f,t}\right] + s_{i,t}E(SMB) + h_{i,t}E(HML) \quad (4)$$

where $CE2_{i,t}$ is the cost of equity of firm i at year t based on three-factor pricing model. $R_{f,t}$, $E(R_m)$ are the same as above. $E(SMB)$ is the expected difference between the returns in a portfolio of small stocks and a portfolio of big stocks. $E(HML)$ is the expected difference between the returns on a portfolio of high book-to-market stocks and a portfolio of low book-to-market stocks. Both $E(SMB)$ and $E(HML)$ are calculated from ten year historical records as the same as $E(R_m)$. The SMB and HML portfolios are rebalanced at the end of June each year. $b_{i,t}$, $s_{i,t}$ and $h_{i,t}$ are the slopes in the following regression.

$$R_i - R_f = a_i + b_i\left[R_m - R_f\right] + s_i SMB + h_i HML + \varepsilon_i \quad (5)$$

The other two methods are based on implied cost of equity models. Implied cost of equity is the discount rate the market applies to a firm's expected future cash flow to arrive at current stock. In this research, two models have been used to assess the firm's cost of capital. The first implied model or my third approach is the traditional method which is derived from a constant growth dividend discount model (DDM). I estimate the cost of equity from the following equation.

$$CE3_{i,t} = \frac{DPS_{i,t+1}}{P_{i,t}} + g_i \quad (6)$$

where $DPS_{i,t+1}$ represents the analysts' consensus forecast of expected dividend per share for firm i for one-year ahead. $DPS_{i,t+1}$ is obtained from I/B/E/S database. $CE3_{i,t}$ is the cost of equity for firm i at year t. $P_{i,t}$ represents stock price of the firm i at year t. g_i is the constant growth rate of dividend for the firm i. It is calculated from the median of the historical five years DPS of the firms.

Besides a traditional constant growth DDM, there are other models to estimate implied cost of equity (e.g., Easton (2004), Claus and Thomas (2001), and Gebhardt, Lee and Swaminathan (2001)) which are hinged on the residual valuation model.

Later, Botosan and Plumlee (2005) assess the relative reliability of five methods of estimating implied or ex ante cost of equity capital by examining the relationship between each method's ex ante cost of equity capital and firm-specific risks (e.g., unlevered beta, size, book to market ratio). They find that ex ante cost of equity capital derived from Easton (2004) and Botosan and Plumlee (2002) methods are associated with firm-specific risks in a consistent and predictable manner. Nevertheless, data requirement for Botosan and Plumlee (2002) method is limited by my sample. Consequently, I use Easton (2004) model as the last approach to assess the ex ante cost of equity. This approach is analogous to residual income model where future residual income is non-zero if the stock price is not equal to book value of the firm (future residual income which represents the future earnings adjustment for normal growth in book value is used to capture the difference between price and book value) and the growth of future abnormal earnings is the different between the accounting earnings and economic earnings in the next period. This model which the cost of equity is implied by prices and three elements of the forecast of the earnings (forecast of next period earnings, short-term earnings growth and change in the growth rate beyond the forecast horizon) is based on Ohlson and Jeutter-Nauroth (2000) after imposing two additional assumptions: no next period's dividend per share and no growth in abnormal earnings beyond the forecast horizon. This approach derives the cost of equity from following equation.

$$CE4_{i,t} = \sqrt{\frac{EPS_{i,t+2} - EPS_{i,t+1}}{P_{i,t}}} \quad (7)$$

where $EPS_{i,t+1}$ and $EPS_{i,t+2}$ are earnings per share forecasts by analysts for the firm i for one-year and two-year ahead from year t. These variables are obtained from I/B/E/S. $CE4_{i,t}$ is the cost of equity for firm i at year t. $P_{i,t}$ represents stock price of the firm i at year t.

Table 4 presents descriptive statistics of the cost of equity during the period 2000 to 2007, and classified each year. I also present another version of descriptive statistics of the cost of equity that is classified by size of the firm and put into three groups namely big size, medium size and small size. Size is the market value of the firm at the end of the year. In addition, the descriptive statistics of the cost of equity is represented by sector of the firm. Firms in my sample are consisted of seven sectors

namely Agro & Food Industry, Consumer Products, Industrials, Property & Construction, Resources, Services and Technology. Cost of equity is calculated from four models namely, CAPM, three-factor, DDM and Easton.

4.4 Validation of the Cost of Equity Measures

Botosan and Plumlee (2005) indicate that a good measure of implied cost of equity or expected return on equity investment will have a relationship with risk factors (i.e., beta, size and market-to-book ratio) as same as in literatures. With respect to beta, Sharpe (1964) formalize the prediction that the firm's expected return should positively relate with its beta and develop this relationship into CAPM. Later on, Fama and French (1992) develop a three-factor asset pricing model which including three risk factors (i.e., beta, size and market-to-book ratio) and convince that their asset pricing model outperforms the CAPM. Therefore, I validate my implied cost of equity measures by documenting the relationship between implied cost of equity and these risk proxies. I estimate the following regression equation.

$$CEn_{i,t} = \beta_0 + \beta_1 BETA_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 MB_{i,t} + \varepsilon_{i,t} \quad (8)$$

where, $CEn_{i,t}$ is the cost of equity measures for the firm i at time t estimated by method k; 1 means estimated by CAPM, 2 means estimated by three-factor pricing model, 3 means estimated by traditional constant growth DDM and 4 means estimated by Easton (2004) model. $BETA_{i,t}$ is the market model beta for the firm i at time t estimated by regressing individual weekly stock returns on the SET index return for the last three years. $MB_{i,t}$ is measured as the ratio of market value of equity to book value of equity of the firm i at time t. $SIZE_{i,t}$ is measure as the natural logarithm of the market value of common stocks in millions baht of the firm i at time t.

4.5 Cost of Capital Estimation

Cost of capital is the weighted average of the after-tax cost of debt capital and cost of equity capital based on the proportion of debt and equity in capital structure of the firm (WACC) method to estimate cost of capital. The formula is represented as follows.

$$CCn_{i,t} = \left(\frac{E_{i,t}}{D_{i,t}+E_{i,t}}\right) CEn_{i,t} + \left(\frac{D_{i,t}}{D_{i,t}+E_{i,t}}\right) CD_{i,t}\,(1-t) \quad (9)$$

where $CCn_{i,t}$ is the cost of capital for the firm i at time t which cost of equity component is estimate by method n; 1 means estimated by CAPM, 2 means estimated by three-factor pricing model, 3 means estimated by traditional constant growth DDM and 4 means estimated by Easton (2004) model. $CEn_{i,t}$ and $CD_{i,t}$ are the same as above. For the market value of equity ($E_{i,t}$), I measure it by taking an average of market value of firm i between year t. Interest-bearing debt for the firm i in year t ($D_{i,t}$) is measured by take average of interest-bearing debt between which reported in quarterly financial statement. (t) is tax rate

Table 7 shows the descriptive statistics of the cost of capital during the period 2000 to 2007, and classified each year. Table 8 represents the descriptive statistics of the cost of capital which classified into three groups by size of the firm. Size is the market value of the firm at the end of the year. Moreover, the descriptive statistics of the cost of capital is also represented by the sector of the firm in table 9. Firms in my sample consisted of seven sectors namely Agro & Food Industry, Consumer Products, Industrials, Property & Construction, Resources, Services and Technology Cost of capital is calculated from four models namely, CAPM, three-factor, DDM and Easton.

4.6 Investigation of the Relationship between Corporate Governance and the Cost of Capital

The relationship between corporate governance and cost of capital is investigated by using two methods; univariate test and regression analysis. Univariate test is a simple test where one can see an overview of the relationship between corporate governance and cost of capital. Moreover, one should apply regression analysis to ensure that corporate governance is correlated to cost of capital. The details of both methods are described as follow.

4.6.1 Univariate Test

I rank the firms by corporate governance index level and split them into three groups; high CGI, medium CGI and low CGI. Then, I calculate mean and median of the CGI, CGI sub-indices, control variables, the cost of debt and the cost of equity and the cost of capital in each model to see whether these variables differ among three groups.

4.6.2 Regression Analysis

To investigate empirically the extent to which governance attributes that affect firms' cost of equity capital, cost of debt capital, and cost of capital. I use fixed-effect regression model to investigate the relationship between these dependent variables (CD_{it}, CEk_{it} and CCk_{it}) and CGI_{it}

$$CD_{i,t} = \beta_0 + \beta_1 CGI_{i,t} + \sum_{j=2}^{k} \beta_j Control_{j,i,t} + \varepsilon_{i,t} \quad (10)$$

$$CEn_{i,t} = \beta_0 + \beta_1 CGI_{i,t} + \sum_{j=2}^{k} \beta_j Control_{j,i,t} + \varepsilon_{it} \quad (11)$$

$$CCn_{i,t} = \beta_0 + \beta_1 CGI_{i,t} + \sum_{j=2}^{k} \beta_j Control_{j,i,t} + \varepsilon_{i,t} \quad (12)$$

where $CEn_{i,t}$, $CD_{i,t}$ and $CCn_{i,t}$ are the same as above. $CGI_{i,t}$ is Corporate Governance Index for the firm i in year t. $Control_{j,i,t}$ is the set of control variables j for the firm i in year t. β_j is coefficient of the control variable j.

Table 2
Descriptive Statistics of Overall Corporate Governance Index (CGI) and Sub-Corporate Governance Indices

This table represents the descriptive statistics of corporate governance index (CGI) and sub-corporate governance indices in each sample period. The sub-indices are shown in percentage of maximum raw score of each index. These sub-indices are 1.Board Structure, 2.Conflicts of Interest, 3.Board Responsibility, 4.Shareholder Rights and 5.Disclosure and Transparency. CGI is the weighted average of sub-indices. The weighted are 20%, 25%, 20%, 10% and 25%, respectively. As a result, CGI ranges from zero to one. The higher score indicates the better corporate governance level.

	2000	2001	2002	2003	2004	2005	2006	2007	2000-2007
Panel A: Corporate Governance Index (CGI)									
Mean	0.280	0.371	0.410	0.463	0.532	0.523	0.563	0.575	0.477
Median	0.279	0.378	0.408	0.464	0.540	0.532	0.570	0.580	0.475
Maximum	0.433	0.641	0.696	0.809	0.855	0.813	0.920	0.875	0.920
Minimum	0.131	0.069	0.121	0.096	0.148	0.116	0.134	0.185	0.069
Std. Dev.	0.054	0.078	0.093	0.107	0.126	0.110	0.129	0.128	0.143
Panel B: Board Structure									
Mean	0.400	0.394	0.338	0.358	0.461	0.523	0.586	0.612	0.471
Median	0.333	0.333	0.333	0.333	0.500	0.500	0.500	0.667	0.500
Maximum	0.667	0.833	0.833	0.833	1.000	1.000	1.000	1.000	1.000
Minimum	0.000	0.000	0.000	0.000	0.000	0.000	0.167	0.000	0.000
Std. Dev.	0.133	0.150	0.158	0.164	0.201	0.200	0.206	0.199	0.207
Panel C: Conflict of Interest									
Mean	0.311	0.379	0.357	0.391	0.423	0.417	0.463	0.488	0.411
Median	0.334	0.371	0.355	0.355	0.376	0.376	0.436	0.461	0.371
Maximum	0.561	0.646	0.856	0.878	0.878	0.918	1.003	1.003	1.003
Minimum	0.084	0.125	0.105	0.105	0.125	0.125	0.016	0.125	0.016
Std. Dev.	0.090	0.096	0.121	0.130	0.150	0.150	0.161	0.185	0.152
Panel D: Board Responsibilities									
Mean	0.184	0.306	0.491	0.560	0.637	0.572	0.636	0.586	0.514
Median	0.200	0.333	0.486	0.533	0.633	0.575	0.644	0.611	0.533
Maximum	0.600	0.700	0.848	0.902	0.960	0.947	0.984	0.960	0.984
Minimum	0.000	0.000	0.133	0.033	0.033	0.100	0.000	0.100	0.000
Std. Dev.	0.077	0.125	0.147	0.158	0.167	0.137	0.215	0.188	0.217
Panel E: Shareholder Rights									
Mean	0.075	0.277	0.398	0.415	0.433	0.429	0.462	0.564	0.398
Median	0.071	0.333	0.429	0.429	0.450	0.429	0.490	0.595	0.424
Maximum	0.133	0.571	0.723	0.771	0.771	0.806	0.832	1.073	1.073
Minimum	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Std. Dev.	0.040	0.150	0.181	0.176	0.173	0.161	0.167	0.148	0.204
Panel F: Disclosure and Transparency									
Mean	0.313	0.436	0.461	0.561	0.651	0.629	0.627	0.627	0.552
Median	0.300	0.400	0.500	0.600	0.700	0.600	0.600	0.600	0.600
Maximum	0.600	0.900	0.900	1.000	1.000	1.000	1.000	1.000	1.000
Minimum	0.000	0.000	0.100	0.100	0.100	0.000	0.100	0.100	0.000
Std. Dev.	0.110	0.180	0.138	0.173	0.183	0.169	0.177	0.166	0.197

Table 3
Descriptive Statistics of the Cost of Debt by Year, Size and Sector of the Firm

This table represents the descriptive statistics of the cost of debt during the period 2000 to 2007, and classified each year. The descriptive statistics of the cost of debt is also classified into three groups by size of the firm. Size is the market value of the firm at the end of the year. Moreover, the descriptive statistics is classified by the sector of the firm. Firms in my sample are grouped in seven sectors namely Agro & Food Industry, Consumer Products, Industrials, Property & Construction, Resources, Services and Technology. Cost of debt is measured by adding yield spread of each company's credit rating to the risk-free rate.

Panel A: Descriptive statistic of the cost of debt classified by year

	2000	2001	2002	2003	2004	2005	2006	2007	2000-2007
Mean	0.050	0.046	0.040	0.021	0.033	0.050	0.056	0.056	0.045
Median	0.054	0.052	0.047	0.023	0.035	0.050	0.057	0.059	0.050
Maximum	0.054	0.052	0.047	0.023	0.035	0.050	0.057	0.059	0.059
Minimum	0.034	0.029	0.025	0.017	0.026	0.047	0.052	0.043	0.017
Std. Dev.	0.007	0.008	0.008	0.003	0.003	0.001	0.001	0.003	0.012

Panel B: Descriptive statistic of the cost of debt classified by size

	Big Size	Medium Size	Small Size	All Size
Mean	0.042	0.045	0.047	0.045
Median	0.049	0.050	0.052	0.050
Maximum	0.059	0.059	0.059	0.059
Minimum	0.017	0.017	0.017	0.017
Std. Dev.	0.013	0.013	0.011	0.012

Panel C: Descriptive statistic of the cost of debt classified by sector of the firm

	Agro & Food Industry	Consumer Products	Industrials	Property & Construction	Resources	Services	Technology	All Sectors
Mean	0.043	0.044	0.046	0.046	0.044	0.045	0.043	0.045
Median	0.049	0.050	0.050	0.052	0.049	0.050	0.049	0.050
Maximum	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059
Minimum	0.018	0.017	0.017	0.017	0.017	0.017	0.017	0.017
Std. Dev.	0.012	0.013	0.012	0.012	0.012	0.012	0.013	0.012

Table 4

Descriptive Statistics of the Cost of Equity by Year

This table represents the descriptive statistics of the cost of equity during the period 2000 to 2007, and classified each year. The cost of equity is calculated from four models namely, CAPM, three-factor, DDM and Easton. Additionally, the cost of equity is also winsorized at the bottom 5% level and top 5% level.

	2000	2001	2002	2003	2004	2005	2006	2007	2000-2007
Panel A: CAPM									
Mean	0.055	0.058	0.059	0.058	0.064	0.072	0.075	0.067	0.065
Median	0.048	0.050	0.050	0.050	0.057	0.068	0.072	0.062	0.060
Maximum	0.127	0.132	0.127	0.136	0.125	0.123	0.117	0.117	0.127
Minimum	0.016	0.014	0.016	0.005	0.019	0.037	0.043	0.003	0.003
Std. Dev.	0.032	0.035	0.035	0.040	0.033	0.026	0.022	0.026	0.031
Panel B: Three-factor model									
Mean	0.104	0.111	0.123	0.121	0.120	0.136	0.112	0.126	0.120
Median	0.080	0.089	0.096	0.097	0.103	0.112	0.105	0.111	0.101
Maximum	0.296	0.297	0.362	0.347	0.339	0.344	0.263	0.311	0.362
Minimum	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Std. Dev.	0.084	0.087	0.103	0.102	0.099	0.102	0.073	0.086	0.093
Panel C: DDM									
Mean	0.081	0.111	0.127	0.190	0.226	0.169	0.185	0.145	0.157
Median	0.060	0.098	0.121	0.117	0.149	0.144	0.153	0.127	0.131
Maximum	0.267	0.297	0.335	0.808	0.913	0.397	0.566	0.367	0.913
Minimum	0.000	0.000	0.000	0.000	0.011	0.015	0.049	0.019	0.000
Std. Dev.	0.086	0.101	0.105	0.214	0.221	0.100	0.127	0.084	0.128
Panel D: Easton model									
Mean	0.200	0.179	0.179	0.139	0.136	0.138	0.123	0.123	0.145
Median	0.181	0.157	0.154	0.131	0.128	0.122	0.117	0.117	0.130
Maximum	0.375	0.366	0.360	0.242	0.241	0.260	0.252	0.224	0.309
Minimum	0.050	0.064	0.075	0.072	0.060	0.058	0.019	0.049	0.019
Std. Dev.	0.096	0.088	0.082	0.046	0.052	0.056	0.058	0.047	0.066

Table 5

Descriptive Statistics of the Cost of Equity by Size

This table represents the descriptive statistic of the cost of equity during the period 2000 to 2007, and classified into three groups by size of the firm. Size is the market value of the firm at the end of the year. The cost of equity is calculated from four models namely, CAPM, three-factor, DDM and Easton. Additionally, the cost of equity is also winsorized at the bottom 5% level and top 5% level.

	Big Size	Medium Size	Small Size	All Size
Panel A: CAPM				
Mean	0.076	0.065	0.052	0.065
Median	0.074	0.060	0.047	0.060
Maximum	0.127	0.115	0.111	0.127
Minimum	0.029	0.020	0.003	0.003
Std. Dev.	0.031	0.030	0.029	0.031
Panel B: Three-factor model				
Mean	0.118	0.120	0.121	0.120
Median	0.104	0.098	0.098	0.101
Maximum	0.308	0.333	0.362	0.362
Minimum	0.000	0.000	0.000	0.000
Std. Dev.	0.084	0.095	0.097	0.093
Panel C: DDM				
Mean	0.201	0.148	0.147	0.157
Median	0.183	0.131	0.120	0.131
Maximum	0.913	0.397	0.545	0.913
Minimum	0.000	0.000	0.000	0.000
Std. Dev.	0.126	0.107	0.138	0.128
Panel D: Easton model				
Mean	0.116	0.139	0.180	0.145
Median	0.108	0.131	0.159	0.130
Maximum	0.203	0.212	0.309	0.309
Minimum	0.019	0.028	0.045	0.019
Std. Dev.	0.046	0.051	0.084	0.066

Table 6

Descriptive Statistics of the Cost of Equity by Sector

This table represents the descriptive statistics of the cost of equity during the period 2000 to 2007, and classified by the sector of the firm. Firms in my sample are grouped in seven sectors namely Agro & Food Industry, Consumer Products, Industrials, Property & Construction, Resources, Services and Technology. The cost of equity is calculated from four models namely, CAPM, three-factor, DDM and Easton. Additionally, the cost of equity is also winsorized at the bottom 5% level and top 5% level.

	Agro & Food Industry	Consumer Products	Industrials	Property & Construction	Resources	Services	Technology	All Sectors
Panel A: CAPM								
Mean	0.045	0.044	0.061	0.085	0.076	0.085	0.059	0.065
Median	0.044	0.043	0.058	0.089	0.077	0.083	0.055	0.060
Maximum	0.075	0.078	0.114	0.127	0.114	0.125	0.116	0.127
Minimum	0.003	0.016	0.016	0.016	0.018	0.039	0.018	0.003
Std. Dev.	0.017	0.017	0.028	0.034	0.031	0.029	0.027	0.031
Panel B: Three-factor model								
Mean	0.082	0.094	0.126	0.172	0.102	0.113	0.109	0.120
Median	0.068	0.082	0.108	0.167	0.088	0.099	0.089	0.101
Maximum	0.229	0.250	0.351	0.362	0.260	0.297	0.287	0.362
Minimum	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Std. Dev.	0.062	0.069	0.098	0.108	0.078	0.086	0.082	0.093
Panel C: DDM								
Mean	0.156	0.210	0.170	0.143	0.149	0.139	0.175	0.157
Median	0.139	0.190	0.142	0.121	0.159	0.143	0.112	0.131
Maximum	0.292	0.545	0.468	0.498	0.334	0.335	0.913	0.913
Minimum	0.055	0.021	0.000	0.000	0.000	0.000	0.001	0.000
Std. Dev.	0.066	0.134	0.129	0.130	0.085	0.092	0.184	0.128
Panel D: Easton model								
Mean	0.144	0.134	0.157	0.147	0.149	0.136	0.140	0.145
Median	0.134	0.120	0.144	0.132	0.120	0.136	0.124	0.130
Maximum	0.302	0.264	0.306	0.296	0.309	0.264	0.309	0.309
Minimum	0.068	0.084	0.019	0.049	0.047	0.019	0.067	0.019
Std. Dev.	0.064	0.050	0.073	0.066	0.096	0.065	0.063	0.066

Table 7

Descriptive Statistics of the Cost of Capital by Year

This table shows the descriptive statistics of the cost of capital during the period 2000 to 2007, and classified each year. The cost of capital is calculated from four models namely, CAPM, three-factor, DDM and Easton. Moreover, the cost of capital is also winsorized at the bottom 5% level and top 5% level.

	2000	2001	2002	2003	2004	2005	2006	2007	2000-2007
Panel A: CAPM									
Mean	0.040	0.041	0.042	0.043	0.047	0.056	0.060	0.055	0.049
Median	0.039	0.038	0.037	0.036	0.041	0.052	0.056	0.051	0.045
Maximum	0.078	0.091	0.111	0.121	0.123	0.117	0.121	0.120	0.123
Minimum	0.018	0.017	0.017	0.015	0.017	0.028	0.019	0.019	0.015
Std. Dev.	0.011	0.014	0.018	0.025	0.021	0.017	0.015	0.017	0.019
Panel B: Three-factor model									
Mean	0.049	0.057	0.071	0.081	0.078	0.090	0.080	0.085	0.075
Median	0.044	0.049	0.056	0.061	0.064	0.078	0.071	0.076	0.061
Maximum	0.181	0.279	0.297	0.291	0.300	0.320	0.291	0.323	0.323
Minimum	0.002	0.000	0.001	0.000	0.002	0.001	0.002	0.000	0.000
Std. Dev.	0.025	0.036	0.053	0.066	0.061	0.063	0.047	0.051	0.054
Panel C: DDM									
Mean	0.067	0.079	0.084	0.119	0.127	0.118	0.127	0.115	0.109
Median	0.044	0.061	0.072	0.078	0.095	0.097	0.101	0.095	0.089
Maximum	0.232	0.222	0.383	0.440	0.470	0.430	0.509	0.507	0.509
Minimum	0.006	0.010	0.006	0.001	0.001	0.003	0.019	0.026	0.001
Std. Dev.	0.055	0.058	0.066	0.109	0.094	0.079	0.088	0.077	0.084
Panel D: Easton model									
Mean	0.102	0.100	0.101	0.100	0.096	0.094	0.094	0.091	0.096
Median	0.086	0.093	0.091	0.095	0.090	0.089	0.088	0.086	0.089
Maximum	0.279	0.273	0.280	0.236	0.275	0.213	0.258	0.211	0.280
Minimum	0.035	0.038	0.035	0.035	0.034	0.039	0.042	0.044	0.034
Std. Dev.	0.051	0.044	0.050	0.039	0.043	0.034	0.040	0.033	0.041

Table 8

Descriptive Statistics of the Cost of Capital by Size

This table represents the descriptive statistics of the cost of capital during the period 2000 to 2007, and classified into three groups by size of the firm. Size is the market value of the firm at the end of the year. The cost of capital is calculated from four models namely, CAPM, three-factor, DDM and Easton. Moreover, the cost of capital is also winsorized at the bottom 5% level and top 5% level.

	Big Size	Medium Size	Small Size	All Size
Panel A: CAPM				
Mean	0.058	0.048	0.040	0.049
Median	0.055	0.047	0.039	0.045
Maximum	0.123	0.085	0.066	0.123
Minimum	0.027	0.022	0.015	0.015
Std. Dev.	0.021	0.017	0.012	0.019
Panel B: Three-factor model				
Mean	0.082	0.075	0.064	0.075
Median	0.072	0.066	0.051	0.061
Maximum	0.323	0.196	0.162	0.323
Minimum	0.008	0.000	0.016	0.000
Std. Dev.	0.052	0.060	0.040	0.054
Panel C: DDM				
Mean	0.121	0.107	0.099	0.109
Median	0.097	0.089	0.076	0.089
Maximum	0.344	0.302	0.509	0.509
Minimum	0.026	0.020	0.001	0.001
Std. Dev.	0.091	0.073	0.082	0.084
Panel D: Easton model				
Mean	0.084	0.096	0.107	0.096
Median	0.081	0.091	0.097	0.089
Maximum	0.143	0.180	0.280	0.280
Minimum	0.041	0.045	0.034	0.034
Std. Dev.	0.027	0.034	0.046	0.041

Table 9

Descriptive Statistics of the Cost of Capital by Sector

This table represents the descriptive statistics of the cost of capital during the period 2000 to 2007, and classified by the sector of the firm. Firms in my sample are grouped in seven sectors namely Agro & Food Industry, Consumer Products, Industrials, Property & Construction, Resources, Services and Technology. The cost of capital is calculated from four models namely, CAPM, three-factor, DDM and Easton. Moreover, the cost of capital is also winsorized at the bottom 5% level and top 5% level.

	Agro & Food Industry	Consumer Products	Industrials	Property & Construction	Resources	Services	Technology	All Sectors
Panel A: CAPM								
Mean	0.038	0.039	0.046	0.059	0.056	0.060	0.047	0.049
Median	0.038	0.039	0.045	0.058	0.055	0.056	0.044	0.045
Maximum	0.059	0.058	0.075	0.123	0.091	0.093	0.086	0.123
Minimum	0.015	0.021	0.022	0.024	0.027	0.035	0.020	0.015
Std. Dev.	0.010	0.010	0.015	0.020	0.018	0.017	0.018	0.019
Panel B: Three-factor model								
Mean	0.055	0.064	0.075	0.095	0.069	0.072	0.073	0.075
Median	0.051	0.053	0.065	0.083	0.055	0.065	0.062	0.061
Maximum	0.115	0.166	0.185	0.323	0.174	0.181	0.196	0.323
Minimum	0.012	0.013	0.013	0.016	0.013	0.007	0.000	0.000
Std. Dev.	0.029	0.041	0.047	0.059	0.044	0.048	0.049	0.054
Panel C: DDM								
Mean	0.103	0.148	0.111	0.103	0.107	0.102	0.125	0.109
Median	0.102	0.114	0.093	0.086	0.097	0.098	0.073	0.089
Maximum	0.192	0.349	0.264	0.324	0.223	0.222	0.509	0.509
Minimum	0.041	0.019	0.019	0.001	0.031	0.023	0.020	0.001
Std. Dev.	0.044	0.093	0.069	0.082	0.058	0.059	0.134	0.084
Panel D: Easton model								
Mean	0.091	0.098	0.105	0.094	0.104	0.097	0.091	0.096
Median	0.084	0.095	0.100	0.089	0.080	0.092	0.084	0.089
Maximum	0.174	0.141	0.191	0.187	0.280	0.184	0.174	0.280
Minimum	0.046	0.056	0.049	0.042	0.037	0.034	0.048	0.034
Std. Dev.	0.033	0.024	0.036	0.037	0.064	0.040	0.033	0.041

Chapter V

Empirical Result

There are two sub-chapters in this chapter. The first shows the result of the univariate test. The second contains the regression analysis. The regression analysis consists of the empirical results of the credit-rating accuracy test and validity of the cost of equity measures. Moreover, this sub-chapter also represents the relationship between corporate governance level, the cost of debt, the cost of equity and the cost of capital. The dependent variables of three regression equations are the cost of debt, the cost of equity and the cost of capital. The cost of debt estimated based on a yield spread approach. The cost of equity calculated from four models; CAPM, three-factor, DDM and Easton. The cost of capital is the weighted average of the cost of debt and the cost of equity by source of fund. The independent variable is corporate governance level which is estimated by using corporate governance index as a proxy.

5.1 Univariate Test

Table 10, panel A shows mean and median of the CGI and its sub-indices in each tercile, panel B shows mean and median of control variables in each group, panel C represents mean and median of the cost of debt, panel D expresses mean and median of the cost of equity for each model in each tercile, lastly panel E shows mean and median of the cost of capital for each model in each group.

The result shows that corporate governance may not be associated with the cost of debt. The cost of equity and the cost of capital have a negative relation to the corporate governance only in Easton model. In conclusion, the univariate test result may not support the idea that corporate governance can mitigate the cost of capital. However, one could not necessarily concure with that statement because the variation of the cost of capital could be affected by other variables such as market-to-book of the firm. Therefore, one must consider using the regression analysis to investigate the relationship between corporate governance and the cost of capital as follows.

5.2 Regression Analysis

This sub-chapter can be grouped into five sections. The first section is the credit-rating accuracy test. It will show which model should be used to estimate the cost of debt of the firm. The second section is the validation of the cost of equity measures. This section will tell us whether the cost of equity models is valid in Thailand. Only the model that passes a validity test is used as a proxy of cost of equity of the firm. The third to the fifth section are regression results of corporate governance to the cost of debt, the cost of equity and the cost of capital respectively.

5.2.1 Credit-Rating Accuracy Test

Table 11 shows the accuracy testing of credit rating estimation models. From the test result, Altman model is the best and Blume model is the worst when compare among five models, however the median of five models is able to predict the most correct of credit ratings. It can predict approximately 73% correct. Because of the highest correction rate, This author use the median of five models to estimate the credit rating of the firms in this research.

5.2.2 Validation of the Cost of Equity Measures

Table 12 shows the validity result of the cost of equity models. The models are CAPM, three-factor model, DDM model and Easton model. The outcome shows that three-factor asset pricing model (CE2) and Easton model (CE4) have a relationship with all variables in line with the theory at 1% significance level. They have a positive relationship with beta whilst having a negative relationship with size and market to book ratio (MB). CAPM (CE1) has a positive relationship with size, which is consistent with the theory, but size and MB are not in line with the theory. CAPM (CE1) has a positive relationship with MB and not statistically significant relationship with size. DDM (CE3) has no in line with the theory relationship with all independent variables. DDM (CE3) has positive relationship with size and not statistically significant relationship with beta and MB.

In conclusion, since CE2 and CE4 are the models that pass the validity test in the Thai capital market, they are only used to estimate the cost of equity and the cost of capital of the firm.

5.2.3 Corporate Governance and the Cost of Debt

Table 13 represents the regression result between corporate governance level and the cost of debt. The result shows that CGI is negatively significant at 5% level. The adjusted R^2 is 0.86. This is evidence supporting an idea that improving corporate governance levels can reduce the cost of debt of the firm.

For other independent variables, the relationship between the cost of debt and all explanatory variables are consistent with prior researches. Leverage (LEV) is positively significant at 1% level. This relationship can be interpreted that the firm with high leverage will face high probability of default. As a result, debtholder will require high return to bear that risk. In other words, the more leverage the higher cost of debt. Return on asset (ROA) and interest coverage ratio (INTCOV) are negatively significant at 1% level. Normally, the firms with high ROA and INTCOV will have an excellent capability to pay the interest. Consequently, the firm has low cost of debt.

5.2.4 Corporate Governance and the Cost of Equity

The evidence that emphasizes the relationship between corporate governance and the cost of equity is shown in table 14. This table shows estimates of the time-series cross-sectional firm-level regression with the data over the period 2000-2007 The regression reports the result from equation 11 that cost of equity measures are dependent variables. Due to invalid CAPM (CE1) and DDM (CE3), three-factor asset pricing model (CE2) and Easton model (CE4) are only used in the regression analysis as a proxy of cost of equity. In addition, corporate governance index is the key independent variable. Control variables are beta, size and market-to-book ratio

From table 16, the coefficient of CGI is negatively related to cost of equity in both three-factor asset pricing model (CE2) and Easton model (CE4) at 1% significant level. The adjusted R^2 is ranged from 0.25 to 0.34. This is strong support for the idea that good corporate governance can reduce the cost of equity.

For control variables, both sign and significant level from the regression result is the same as the previous section. The relationship between the cost of equity estimated from both three-factor model (CE2) and Easton model (CE4) and all control variables is in line with the prior research (Fama and French (1992)). The result supports that size and market to book ratio (MB) show a negative effect on the cost of

equity while beta shows positive effect. All control variables are significant at 1 % level.

5.2.5 Corporate Governance and the Cost of Capital

Table 15 shows the evidence that emphasizes the relationship between corporate governance and the cost of capital. This table presents estimates of the time-series cross-sectional firm-level regression with the data over the period 2000-2007 The regression reports the result from equation 12 that the cost of capital measures are dependent variables. Three-factor model (CE2) and Easton (CE4) are only used to estimate cost of capital for the same reason in the previous section. Corporate governance index is the key independent variable as well as full version with the complete set of control variables.

The regression result shows that CGI has a significant negative relationship with the cost of capital in both Easton (CC4) at 1% level and three-factor (CC2) at 10% level. The adjusted R^2 is ranged from 0.17 to 0.23. From the evidence from regression result, the result can be concluded that the cost of capital can be mitigated by improving the level of corporate governance.

For other independent variables, BETA is positively related to the cost of capital at 1% significant level in both methods. The positive sign of beta is consisted with the theory. The firms with high beta will be riskier than low beta firms in the sense of high sensitivity to the risk premium, as a result high beta firms should have high cost of equity which reflect in high cost of capital. MB is another factor that has positive relationship with cost of capital. MB is positively significant in CC4, but statistically different from zero in CC2. However, the positive relationship between MB and cost of capital is opposed to the theory. The intuitive reason is that investors like to trade the stock with low probability of default or low cost of debt. Therefore, the price of that firm will be high when compared to book value of equity. INTCOV also shows positive sign on cost of capital but the positive sign is not statistically different from zero.

On the other hand, SIZE, leverage (LEV) and return on asset (ROA) show the negative effect on cost of capital. The negative coefficient of SIZE is in line with the previous research by Fama and French (1992). They assert that size is one of the three

factors providing a good description of the cross-section of average returns. The returns of small firms outperform big firms. Therefore, expected return or the cost of equity of the small-cap firms is higher than big-cap firms. However, the relationship between LEV and the cost capital is unusual and opposed to the theory. In spite of the positive relationship between LEV, the cost of debt and the cost of equity, there is a negative correlation between LEV and the cost of capital. The probable explanation of this phenomenon is that as a big difference between the cost of debt and the cost of equity, the cost of capital of the low LEV firm is highly weighted on the cost of equity, while the cost of capital of the high LEV firm is highly weighted on the cost of debt, therefore the firm with high LEV will have a low cost of capital. The cost of capital has a negative relationship with ROA at 5% level for CC2 and 10% level for CC4. The firm with high ROA can generate high return to both debtholder and shareholder alike which respect to asset. As a result, high ROA has low bankruptcy risk and lead to the low cost of capital.

I also presented the results of the relationship between the cost of capital and sub-indices of corporate governance level. Table 16 represents the relationship between sub-indices and the cost of capital. Table 16 is divided into two panels. Panel A uses three-factor model (CC2) as a proxy of the cost of capital while Panel B uses Easton model (CC4) to estimate the cost of capital. There are six regression equations in each panel – fives of each sub-index in the equation and all sub-indices in one equation. Control variables are beta, size, market-to-book ratio, leverage, return on asset and interest coverage ratio.

When three-factor model (CC2) is used as a proxy of the cost of capital, the coefficient of Board Responsibilities in the third column shows a negative sign at 10% significant level and the estimate of Disclosure & Transparency in the fifth column provides a negative sign at 1% level. The other sub-indices of CGI do not show any significant relationship with the cost of capital. And in the time that Easton model (CC4) is utilized as the cost of capital, Board Responsibility, Shareholder Rights and Disclosure & Transparency show the negative relationship with the cost of capital at 1% significant level in the third column to the fifth column respectively while the coefficient of Board Structure in the first column shows a negative sign at 5% level. However, when all sub-indices are added in the equation as shown in the

last column of each panel, some sun-indices lose their significant power because of an autocorrelation problem. There is only Disclosure & Transparency shows the negative sign on the cost of capital in panel A, while Board Responsibilities have a negative relationship with the cost of capital at 1% level in panel B.

Table 10

Descriptive Statistics Classified by Level of Corporate Governance Index

This table shows the descriptive statistics classified by Level of Corporate governance index providing the means and median of our estimates parameters for the high, medium and low corporate governance index, to test whether the individual parameter estimates tend to be lower or higher. The parameters are the level of CGI includes sub-indices of corporate governance, Control variables, Cost of debt, Cost of equity and also Cost of capital.

	High CGI		Medium CGI		Low CGI	
	Mean	Median	Mean	Median	Mean	Median
Panel A: Corporate Governance Index and its Sub-indices						
CGI	0.637	0.621	0.476	0.475	0.319	0.327
Board Structure	0.631	0.667	0.433	0.500	0.348	0.333
Conflict of Interest	0.531	0.504	0.389	0.366	0.312	0.334
Board Responsibility	0.704	0.708	0.532	0.533	0.304	0.300
Shareholder rights	0.546	0.567	0.435	0.429	0.212	0.143
Disclosure and Transparency	0.731	0.700	0.567	0.600	0.357	0.400
Panel B: Control Variables						
BETA	0.734	0.679	0.574	0.470	0.503	0.373
SIZE	8.031	7.781	7.107	7.086	6.528	6.471
MB	1.394	1.298	1.368	0.976	0.994	0.698
LEV	0.314	0.119	0.422	0.086	0.808	0.151
ROA	0.097	0.093	0.083	0.078	0.068	0.070
INTCOV	624.681	8.266	571.269	6.943	493.088	3.510
Panel C: Cost of Debt						
Cost of Debt	0.047	0.052	0.042	0.049	0.044	0.048
Panel D: Cost of Equity						
CAPM	0.075	0.072	0.063	0.057	0.056	0.048
Three-factor	0.125	0.110	0.131	0.107	0.115	0.084
DDM	0.189	0.148	0.167	0.130	0.154	0.107
Easton	0.123	0.115	0.143	0.131	0.172	0.147
Panel E: Cost of Capital						
CAPM	0.058	0.055	0.047	0.045	0.042	0.039
Three-factor	0.084	0.075	0.079	0.066	0.062	0.046
DDM	0.123	0.100	0.112	0.089	0.091	0.068
Easton	0.091	0.081	0.097	0.092	0.101	0.093

Table 11

The Accuracy of Credit Rating Estimated by Each Model

This table shows the result of the accuracy testing of the credit rating estimated by each model and their median. The credit rating-estimated models are Altman model, Blume model, Campbell model, Shumway model and Zmijewski model. Year 2008 is used to as an out-of-sample year testing.

	Credit Rating Model					
	Altman	Blume	Campbell	Shumway	Zmijewski	Median
Observations	156	156	156	156	156	156
Correct	111	95	98	99	109	114
Correction rate	71%	61%	63%	63%	70%	73%

Table 12

Regression Result: The Cost of Equity on Beta, Size and Market to Book

This table shows validity result of the cost of equity model by regressing cost of equity on the beta, size and market to book ratio. The cost of equity is estimated by four models, namely CAPM (CE1), Three-factor asset pricing model (CE2), Dividend discount model (CE3) and Easton model (CE4). The independent variables are Beta, Size, and market to book ratio (MB). My sample is over the period of 2000 to 2007.

	Cost of Equity			
Independent Variables	CE1	CE2	CE3	CE4
Intercept	0.02***	0.14***	0.16***	0.28***
	(49.34)	(18.08)	(4.35)	(18.94)
BETA	0.07***	0.12***	-1.63E-03	0.03***
	(288.73)	(35.13)	(-0.14)	(6.10)
SIZE	-5.57E-05	-0.01***	-2.96E-03	-0.02***
	(-0.69)	(-9.22)	(-0.66)	(-9.23)
MB	5.91E-04***	-0.01***	0.02***	-6.53E-03***
	(4.77)	(-3.45)	(3.05)	(-2.73)
Observations	2548	2548	720	773
R^2	0.97	0.33	0.06	0.25

Note: Coefficients are presented in boldface. t-Statistic values are in parentheses. *, ** and*** indicate significance at 10%, 5%, 1% level, respectively.

Table 13

Regression Result: The Cost of Debt on Corporate Governance Index (CGI) and Other Control Variables

This table shows fixed effect regression result of the equation 10. The cost of debt (CD) is estimated by the median of the Altman, Blume, Shumway, Campbell, Zmijewski model. The independent variables are Corporate Governance Index (CGI), Leverage (LEV) Return on asset ratio (ROA) and interest coverage ratio (INTCOV). My sample is over the period of 2000 to 2007.

Independent Variables	Cost of debt
	CD
Intercept	0.05***
	(99.43)
LEV	1.32E-03***
	(11.18)
ROA	-2.11E-03***
	(-7.12)
INTCOV	-2.98E-07***
	(-5.73)
CGI	-2.01E-03**
	(-2.53)
Observations	2548
R^2	0.86

Note: Coefficients are presented in boldface. t-Statistic values are in parentheses. *, ** and*** indicate significance at 10%, 5%, 1% level, respectively.

Table 14

Regression Result: The Cost of Equity on Corporate Governance Index (CGI) and Other Control Variables

This table shows fixed effect regression result of the equation 11. After ignorance of the invalid model, Three-factor asset pricing model (CE2) and Easton model (CE4) are used as a proxy of cost of equity. The independent variables are Corporate Governance Index (CGI), Beta, Size, and market to book ratio (MB). My sample is over the period of 2000 to 2007.

	Cost of Equity	
Independent Variables	CE2	CE4
Intercept	0.15***	0.30***
	(16.52)	(17.31)
BETA	0.12***	0.03***
	(35.26)	(6.27)
SIZE	-0.01***	-0.02***
	(-8.38)	(-8.84)
MB	-0.01***	-6.87-03***
	(-3.45)	(-2.88)
CGI	-0.05***	-0.05**
	(-3.02)	(-2.15)
Observations	2548	773
R^2	0.34	0.25

Note: Coefficients are presented in boldface. t-Statistic values are in parentheses. *, ** and*** indicate significance at 10%, 5%, 1% level, respectively.

Table 15

Regression Result: The Cost of capital on Corporate Governance Index (CGI) and Other Control Variables

This table shows fixed effect regression result of the equation 12. After ignorance of the invalid model, Three-factor asset pricing model (CC2) and Easton model (CC4) are used as a proxy of cost of capital. The independent variables are Corporate Governance Index (CGI), Beta, Size, market to book ratio (MB), leverage (LEV) return on asset ratio (ROA) and interest coverage ratio (INTCOV). My sample is over the period of 2000 to 2007.

	Cost of Capital	
Independent Variables	CC2	CC4
Intercept	0.08***	0.19***
	(12.80)	(17.97)
BETA	0.05***	0.01***
	(21.28)	(3.88)
SIZE	-2.64E-03***	-9.20E-03***
	(-3.22)	(-7.25)
MB	1.10E-03	4.07E-03**
	(0.91)	(2.32)
LEV	-0.01***	-0.02***
	(-10.41)	(-8.27)
ROA	-0.03**	-0.04*
	(-2.03)	(-1.93)
INTCOV	7.59E-07	1.73E-06
	(1.40)	(1.30)
CGI	-0.01*	-0.04***
	(-1.81)	(-3.83)
Observations	2548	773
R^2	0.23	0.17

Note: Coefficients are presented in boldface. t-Statistic values are in parentheses. *, ** and*** indicate significance at 10%, 5%, 1% level, respectively.

Table 16

Regression Result: The Cost of capital on Sub-Indices of Corporate Governance Index (CGI) and Other Control Variables

This table shows the relationship between the cost of capital and sub-indices of corporate governance index. Three-factor asset pricing model (CC2) and Easton model (CC4) are used as a proxy of cost of capital. The independent variables are Beta, Size, market to book ratio (MB), leverage (LEV) return on asset ratio (ROA), interest coverage ratio (INTCOV), and sub-indices of corporate governance level namely Board Structure, Conflict of Interest, Board Responsibilities, Shareholder Rights and Disclosure and Transparency. My sample is over the period of 2000 to 2007.

Panel A: Three-factor model (CC2)						
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.07***	0.08***	0.08***	0.07***	0.08***	0.08***
	(13.54)	(14.72)	(13.71)	(14.31)	(15.06)	(13.26)
BETA	0.05***	0.05***	0.05***	0.05***	0.05***	0.05***
	(22.11)	(22.55)	(22.53)	(22.48)	(22.74)	(22.36)
SIZE	-3.29E-03***	-3.06E-03***	-3.23E-03***	-3.45E-03***	-2.77E-03***	-2.91E-03***
	(-4.26)	(-3.85)	(-4.17)	(-4.36)	(-3.51)	(-3.57)
MB	5.78E-04	5.07E-04	5.85E-04	6.40E-04	5.44E-04	5.91E-04
	(0.49)	(0.43)	(0.50)	(0.54)	(0.46)	(0.50)
LEV	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***
	(-10.30)	(-10.28)	(-10.33)	(-10.28)	(-10.30)	(-10.18)
ROA	-4.09E-03	-4.08E-03	-4.12E-03	-4.11E-03	-3.97E-03	-4.00E-03
	(-1.29)	(-1.29)	(-1.30)	(-1.30)	(-1.25)	(-1.27)
INTCOV	5.83E-07	5.91E-07	5.81E-07	5.81E-07	6.00E-07	5.79E-07
	(1.09)	(1.11)	(1.09)	(1.09)	(1.12)	(1.09)
Board Structure	4.19E-04					2.78E-03
	(0.08)					(0.51)
Conflict of Interest		-8.11E-03				-4.94E-03
		(-1.18)				(-0.66)
Board Responsibilities			-4.87E-03*			1.14E-03
			(-1.82)			(0.17)
Shareholder Rights				5.53E-03		0.02
				(0.89)		(1.20)
Disclosure and Transparency					-0.02***	-0.02***
					(-3.03)	(-3.36)
Observations	773	773	773	773	773	773
R^2	0.23	0.23	0.23	0.23	0.23	0.23

Note: Coefficients are presented in boldface. t-Statistic values are in parentheses. *, ** and*** indicate significance at 10%, 5%, 1% level, respectively.

Table 16

Regression Result: Cost of capital on Sub-Indices of Corporate Governance Index (CGI) and Other Control Variables (*continue*)

Panel B: Easton model (CC4)						
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.18***	0.17***	0.18***	0.18***	0.18***	0.18***
	(17.46)	(17.72)	(17.95)	(17.94)	(18.04)	(15.31)
BETA	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***
	(3.92)	(3.69)	(3.97)	(3.71)	(3.99)	(3.96)
SIZE	-9.92E-03***	-9.40E-03***	-9.72E-03***	-9.27E-03***	-9.01E-03***	-9.60E-03***
	(-7.84)	(-7.23)	(-7.69)	(-7.27)	(-7.02)	(-7.18)
MB	3.46E-03**	3.19E-03*	3.57E-03**	3.28E-03*	3.58E-03**	4.32E-03**
	(2.02)	(1.85)	(2.08)	(1.91)	(2.09)	(2.41)
LEV	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***
	(-7.85)	(-7.73)	(-8.36)	(-8.10)	(-8.15)	(-8.71)
ROA	-0.02	-0.03	-0.02	-0.03	-0.03	-0.03
	(-1.27)	(-1.37)	(-1.34)	(-1.40)	(-1.42)	(-1.62)
INTCOV	1.78E-06**	1.78E-06**	1.56E-06*	1.73E-06**	1.84E-06**	1.72E-06**
	(2.07)	(2.07)	(1.81)	(2.01)	(2.14)	(1.97)
Board Structure	-0.01**					9.45E-04
	(-2.03)					(0.12)
Conflict of Interest		-0.01				8.46E-03
		(-1.39)				(0.87)
Board Responsibilities			-0.02***			-0.01*
			(-3.73)			(-1.74)
Shareholder Rights				-0.02***		-4.80E-03
				(-2.99)		(-0.45)
Disclosure and Transparency					-0.03***	-7.01E-03
					(-3.52)	(-0.68)
Observations	773	773	773	773	773	773
R^2	0.15	0.15	0.16	0.16	0.17	0.16

Note: Coefficients are presented in boldface. t-Statistic values are in parentheses. *, ** and*** indicate significance at 10%, 5%, 1% level, respectively.

Chapter VI

Conclusion

This study provides empirical evidence regarding the relationship between corporate governance and the cost of capital by using Thai compananies listed in the Stock Exchange of Thailand (SET) over the period 2000-2007 with 441 firms as a sample. The author also separates the cost of capital into the cost of debt and the cost of equity and investigates the relationship between them and corporate governance. The relationship between corporate governance and the cost of capital is estimated by a fixed-effect regression model. Corporate governance index (CGI) is used as a proxy of the corporate governance level and constructed based on Ananchotikul's (2006) approach, which consisted of five sub-indices: 1) Board Structure 2) Conflict of Interest 3) Board Responsibilities 4) Shareholder Rights, and 5) Disclosure and Transparency. The cost of debt is based on yield spread technique after the credit rating is predicted. The cost of equity is estimated from CAPM, three-factor model, DDM and Easton model. Lastly, the cost of capital is the weight average between cost of debt and cost of equity.

After an accuracy test for credit rating estimated, the median of five models namely Altman model, Blume model, Campbell model, Shumway model and Zmijewski model is used as a credit-rating estimated model because it is the most accurate model after comparing it to the other five models. The cost of equity models are tested for the validity as well. The result shows that only three-factor model and Easton model are valid in the Thai capital market because these models relate to beta, size and market-to-book ratio that are similar to the Fama and French (1992). However, CAPM and DDM fail to meet the criteria, which are considered to be an invalid model.

The regression results show that corporate governance level is negatively related to the cost of debt, the cost of equity and the cost of capital in all models. These results can be interpreted that corporate governance can reduce the cost of capital and the results are consistent with prior researches. According to Ashbaugh-Skaife et al. (2006), there is a positive relationship between corporate governance and firms' credit ratings after controlling for firm-specific risk characteristics. Weak

corporate governance is the main reason for the recent well-known cases of corporate fraud. Firms that have a tendency to be fraudulent will have a low credit rating or high cost of debt. Reverte (2007) shows the evidence that stronger governance firms have statistically significant lower cost of equity with respect to weaker governance firms after controlling for beta, size and market-to-book ratio. Anuchitworawong (2008) examines the relationship between corporate governance and the cost of capital in the Thai capital market and concludes that better governance practices firm enjoys the reduction in cost of capital. Theses results will inform managers and practitioners about the reduction of cost of capital by improving corporate governance is another channel that can enhance firm value.

Even so, my research still has limit. My research uses yield spread from the US. bond market to estimate cost of debt instead of the Thai bond market because of the unavailable data. Once the Thai bond market is developed, future research should use yield spread from Thai bond market or bond yield to maturity of the firm to assess the cost of debt of the firm.

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Appendix

A: Data requirement for estimate firm's credit rating

	Altman	Blume	Campbell	Shumway	Zmijewski
WC/TA	✓				
EBIT/TA	✓				
ME/TL	✓				
AGE	✓				
OPTMAR		✓			
LTD/TA		✓			
TD/TA		✓			
BETA		✓			
SE		✓			
NI/TA				✓	✓
NI/MTA			✓		
TL/TA				✓	✓
TL/MTA			✓		
CA/MTA			✓		
EXRET			✓	✓	
RSIZE			✓	✓	
SD			✓	✓	
MB			✓		
PRICE			✓		
CA/CL					✓

Appendix A represents the explanatory variables that used to estimate the credit rating of the firm. The explanatory variables are from Altman's model, Blume's model, Shumway's model, Campbell's model, and Zmijewski's model.

where WC is the net working capital, EBIT is the earnings before interest and tax, ME is the market value of equity, TL is the total liabilities, AGE is the number of years since a firm has been first rated by a rating agency, OPTMAR is operating profit margin, LTD is long-term debt, TD is total debt, SE is standard error estimated by using 200 daily returns, NI is net income, MTA is the market value of total asset and equal to the combination of market value of equity and book value of liability, CA is current asset, CL is current liabilities, EXRET is measured as a monthly log excess on each firm's equity relative to SET index, RSIZE is relative size of each firm which calculated as the log ratio of its market capitalization to that of the SET index, SD is standard deviation of each firm's daily stock returns over the past three months, MB is the ratio of market to book value of equity, and PRICE is the natural logarithm of the stock price.

B. Questions for corporate governance index construction

Code	Questions	Scoring Rule		Max. Score	Weight
A. Board Structure				**6.00**	**20%**
A1	What is the size of the board of directors?	1 if 5 <=a1<=12;	;0 otherwise	1.00	
A2	What is the size of executive board?	1 if a2 <= 12	;0 otherwise	1.00	
A3	How many directors are also managers?	1 if a3/a1 < 1/3	;0 otherwise	1.00	
A4	How many directors are dependent?	1 if a4/a1 > 1/3	;0 otherwise	1.00	
A5	Does the firm state the definition of independence in the disclosure report?	1 if a5=1	;0 otherwise	1.00	
A6	How many directors have attended director training programs by the Thai Institution of Directors Association?	1 if a6/a1 >1/2	;0 otherwise	1.00	
B. Conflict of Interest				**8.00**	**25%**
B1	Is the chairman is the same person as CEO?	1 if b1=0	;0 otherwise		
B2	Is the chairman independent?	1 if b2=1	;0 otherwise		
B3	How many public companies dose the chairman currently serve as a director or a manager?	1 if b3<=3	;0 otherwise		
B4	Does an audit committee exist?	1/2 if b4=1	;0 otherwise		
B5	- Chair by independent director?	1/6 if b5=1	;0 otherwise		
B6	- Role and responsibilities clearly stated?	1/6 if b6=1	;0 otherwise		
B7	- Performance or meeting attendance disclosure?	1/6 if b7=1	;0 otherwise		
B8	Does a nominating committee exist?	1/2 if b8=1	;0 otherwise		
B9	- Chair by independent director?	1/6 if b9=1	;0 otherwise		
B10	- Role and responsibilities clearly stated?	1/6 if b10=1	;0 otherwise		
B11	- Performance or meeting attendance disclosure?	1/6 if b11=1	;0 otherwise		
B12	Does a remuneration committee exist?	1/2 if b12=1	;0 otherwise		
B13	- Chair by independent director?	1/6 if b13=1	;0 otherwise		
B14	- Role and responsibilities clearly stated?	1/6 if b14=1	;0 otherwise		
B15	- Performance or meeting attendance disclosure?	1/6 if b15=1	;0 otherwise		
B16	Does a corporate governance committee exist?	1/2 if b16=1	;0 otherwise		
B17	- Chair by independent director?	1/6 if b17=1	;0 otherwise		
B18	- Role and responsibilities clearly stated?	1/6 if b18=1	;0 otherwise		
B19	- Performance or meeting attendance disclosure?	1/6 if b19=1	;0 otherwise		

Code	Questions	Scoring Rule		Max. Score	Weight
B. Conflict of Interest				**8.00**	**25%**
B20	Does the firm has a policy that specifies a minimum number of independent directors?	1/3 if b20=1	;0 otherwise		
	Does the firm discuss the following internal-control issues in the disclosure report?				
B21	- Organization and control environment	2/15 if b21=1	;0 otherwise		
B22	- Risk management	2/15 if b22=1	;0 otherwise		
B23	- Management control activities	2/15 if b23=1	;0 otherwise		
B24	- Information and communication	2/15 if b24=1	;0 otherwise		
B25	- Monitoring and evaluation	2/15 if b25=1	;0 otherwise		
C. Board Responsibilities				**13.00**	**20%**
C1	Number of board meeting per year	1 if c1>4	;0 otherwise	1.00	
C2	Average director's meeting attendance	c2/c1	;0 otherwise	1.00	
C3	Average independent directors meeting attendance	c3/c1	;0 otherwise	1.00	
C4	Is there a board meeting solely for independent directors?	1 if c4=1	;0 otherwise	1.00	
C5	Number of audit committee meeting per year	1 if c5=>4	;0 otherwise	1.00	
C6	Average audit committee meeting attendance	c6/c5	;0 otherwise	1.00	
C7	Is there at least one accounting expert on the audit committee?	1 if c7=1	;0 otherwise	1.00	
C8	How many public companies does the chairman of audit committee serve as a director or manager?	1 if c8<=3	;0 otherwise	1.00	
C9	Does the firm clearly distinguish the role and responsibilities of the board and management?	1/3 if c9=1	;0 otherwise	0.33	
C10	Does the firm disclose that directors evaluation system exists?	1/3 if c10=1	;0 otherwise	0.33	
C11	Does the firm have an option scheme which incentivizes management?	1/3 if c11=1	;0 otherwise	0.33	
C12	Has there been any legal dispute where the firm was claimed to be a fault during the past year?	1 if c12=0	;0 otherwise	1.00	
C13	Has there been any sanction to the board, management, or other insider for violations of Securities and/or Corporations laws in the last two years?	3*(1-c13)	;0 otherwise	3.00	
D. Shareholder Rights				**7.00**	**10%**
D1	Does the firm hold an annual general shareholder meeting?	1 if d1=1	;0 otherwise		
D2	Does the firm employ one-share-one-vote rule?	1 if d2=1	;0 otherwise		
D3	Is cumulative voting allowed in electing directors?	1 if d3=1	;0 otherwise		

Code	Questions	Scoring Rule		Max. Score	Weight
D. Shareholder Rights				**7.00**	**10%**
D4	Is voting by mail allow?	1 if d4=1	;0 otherwise		
D5	How many days in advance does the company send out a notice of general meetings to shareholders?	d5/14	;0 otherwise		
D6	Is proxy voting allowed?	1 if d6=1	;0 otherwise		
D7	Does the firm disclosure a dividend policy?	1/3 if d7=1	;0 otherwise		
D8	What is the minimum dividend (as a percentage of net profit) according to the dividend policy?	1/3*d8/100	;0 otherwise		
D9	Does the firm provide an explanation/rationale for setting dividend at the specified level?	1/3 if d9=1	;0 otherwise		
E. Disclosure and Transparency				**13.00**	**25%**
	Does the firm disclose the following information in the disclosure report?				
E1	- Board meeting attendance of individual directors	1 if e1=1	;0 otherwise	1.00	
E2	- Board compensation and/or benefits of individual directors	1 if e2=1	;0 otherwise	1.00	
E3	- Directors shareholding	1 if e3=1	;0 otherwise	1.00	
E4	- Management shareholding	1 if e4=1	;0 otherwise	1.00	
E5	- Related party transaction in detail	1 if e5=1	;0 otherwise	1.00	
E6	- Corporate group structure	1 if e6=1	;0 otherwise	1.00	
E7	- Grouping of major shareholding who belong to the same family/economics unit	1 if e7=1	;0 otherwise	1.00	
E8	Does investor relation unit exist?	1 if e8=1	;0 otherwise	1.00	
E9	Does the firm mention its investor relations activity carried out during the past year?	1 if e9=1	;0 otherwise	1.00	
E10	Does the firm's Annual Report include a section devoted to corporate governance principles and implementations?	1 if e10=1	;0 otherwise	1.00	
E11	How many times in the last two years has the firm been charged for failures to publish company reports within the specified periods?	3-e23	;0 otherwise	3.00	

Biography

Mr. Kittituch Tannirandorn was born on October 10, 1986, in Bangkok. At the secondary school, he graduated from Chulalongkorn University Demonstration School. At the undergraduate level, he graduated from the faculty of Engineering, Chulalongkorn University in May 2008 with a Bachelor of Industrial Engineering degree. After that, he joined the Master of Science in Finance Program, Chulalongkorn University in June 2008.