

CHAPTER 2

LITERATURE REVIEWS

In this chapter, we will review the literatures involving capital structure. There are hundreds of papers investigating financing decisions both theoretical and empirical since the breakthrough of the irrelevance capital structure proposed by Modigliani and Miller (1958). The earlier studies of capital structure were aimed at the firm-specific capital structure determinants. Each theoretical study focused on the specific capital structure determinants by assuming the other capital structure constant or insignificant. The empirical studies are of interest to investigate the relevant firm-specific capital structure determinants simultaneously. Most empirical evidences about capital structure policy have been conducted among the U.S. firms.

Later, the empirical evidences about capital structure are expanded to cover those of the other countries both developed and developing. The institutional factors are of interest to explain the capital structure differences among different countries. The start of institutional investigation may be the recognition by Rajan and Zingales (1995) that addressed the impact of the major institutional differences across countries on financing decisions. Booth et al. (2001) recognized the importance of institutional features and investigated the capital structure determinants among developing countries, compared with those among G-7 countries investigated by Rajan and Zingales (1995). There are also several researches focused on capital structure determinants among firms in the specific countries.

Not only the development of capital structure investigation expanded toward new sample among countries other than U.S. but also the methodologies were improved. The traditional studies of capital structure were done via the use of static

model, which assumed the observed capital structure to be the optimal capital structure. This assumption was raised as the cause of unexpected relation between leverage and capital structure determinants found in many empirical studies. Due to the development of the generalized method of moments and the improvement of the computer system, the alternative methodology was proposed recently with the use of target adjustment model or dynamic model, which incorporated the effect of leverage-adjustment costs.

The recent empirical evidences especially among U.S. firms show that the capital structure set by listed firms is too conservative. Several explanations other than trade-off theory are raised to explain the \square underleverage by listed firms. On the other hand, few researches suggested the limited access to capital market by non-listed firms which may induce them to use too aggressive capital structure policy.

We would like to organize this chapter by grouping the literatures into five sections. In the first section, we will review the theoretical developments involving capital structure since the breakthrough of capital structure theory proposed by Modigliani and Miller (1958) as well as the empirical evidences of capital structure decisions focusing on the firm-specific factors particularly among U.S. firms. The institutional influences will be shown in the second section of this chapter. The third section of this chapter will present literature reviews focusing on the findings toward conservative capital structure policy among listed firms and the financial constraints among non-listed firms. These two groups of researches may be applied to explain the capital structure differences between listed and non-listed Thai firms. The fourth section of this chapter will be dedicated to the relationship between capital structure and firm performance. The last section of this chapter will be dedicated to the empirical evidences of capital structure among Thai firms.

2.1 Firm-specific Determinants of Capital Structure

Different firm-specific factors have been proposed as the capital structure determinants by different theoretical model (e.g., trade-off theory, agency theory and pecking order theory). We organize this section by grouping the literatures based on the factors underlying the theoretical models. However, we must bear in mind that the specific variables which describe each theoretical model may be similar. Recent empirical researches have focused on explaining capital structure by employing a variety of variables that can be justified using any or all of the three theories as suggested by Booth et al. (2001). Capital structure determinants in this study will be described in the following sequences: tax-related issues, bankruptcy costs, agency costs, asymmetric information and product market interactions. In each subsection, we will chronologically present the theoretical models followed by the empirical evidences.

2.1.1 Tax Advantages of Debt

One of the most recognized advantages of debt is the tax deductibility of interest expenses. The theoretical papers have generally supported this viewpoint. However, there is no unambiguous answer for the amount of tax advantages due to the complex tax legislation and the existence of personal tax rate and other expenses that are tax deductible⁴.

The earlier research papers found no significant tax effect toward capital structure as suggested by Bradley, Jarrell and Kim (1984), Titman and Wessels (1988),

⁴ One of the first and most cited research papers about tax advantages of capital structure was proposed by Modigliani and Miller (1963). They corrected their first capital structure irrelevance paper, Modigliani and Miller (1958), by including the effects from corporate taxation and found that value of levered firm would be higher than value of unlevered firm. The advantages of corporate tax shield were suggested to be the multiplication of tax rate and debt level. However, tax advantages were suggested to be lower with the incorporation of the personal taxes as suggested by Miller (1977) as well as the non-debt corporate tax shields as suggested by DeAngelo and Masulis (1980).

Fischer, Heinkel and Zechner (1989) and Fama and French (1998). There are two major reasons for the insignificant tax advantages. Firstly, it is due to the inability to calculate the marginal corporate tax rate. The other is due to the use of regression between leverage ratio and tax proxy.

It is difficult to test whether marginal tax rates affect a firm's debt policy due to the nearly constant time-series statutory corporate tax rates. Furthermore, there are difficulties in measuring the cross-sectional effective marginal tax rates without access to confidential tax returns and extremely complex calculations that take into account the dynamics of loss carryforwards, accelerated depreciation and so forth. The use of only depreciation to investigate tax effects may fail to confirm the tax advantages because depreciation is only partial of all tax-deductible expenses. The negative relationship between depreciation and leverage, as expected by the tax theory, may be interfered by the positive correlation between depreciation and fixed assets.

The use of regression between leverage ratio and tax proxy does not indicate whether changes in the firm's capital structure is due to the tax rate in that period or reveals the cumulative leverage and tax proxy. One of the mitigation is to use the change in leverage rather than the level, the other is to use the dynamic model that incorporates the leverage adjustment process which will be employed in this study. The tax effects favoring levered capital structure were found by MacKie-Mason (1990) and Graham (1996a) who investigated the changes of debt rather than the level⁵.

⁵ MacKie-Mason (1990) obtained positive relation between tax shields and debt policy. Graham (1996a) reported a positive relation between the simulated marginal tax rates and the use of debt. However, due to the difficulty or of the simulated "true" marginal tax rate, Graham (1996b) proposed the other alternative proxies as the trichotomous variable concerning net operating loss carryforward and negative taxable income, the contemporaneous statutory marginal tax rate and the taxable income dummy variable. By regressing future operating profitability on firm value, debt and other controlled variables, Kemsley and Nissim (2002) argued that the other effects toward the unobservable value of firm would be controlled, leading to the significantly positive debt-tax shields evidences as well.

In conclusion, the study of incremental financing decisions by focusing on actual decisions, made at the margin, is likely to provide more powerful tests than the studies of leverage ratios because the ratios cumulate numerous decisions made over years, taken under varying circumstances. Alternatively, the study of tax effects toward capital structure decisions should take into account the leverage adjustment costs by employing the dynamic model, which is used in this study. Although debt is useful because interest is tax deductible, debt brings with it costs associated with actual or potential bankruptcy. The traditional trade-off theory of capital structure suggests that the optimal capital structure strikes a balance between the tax benefits of debt and the costs associated with bankruptcy as quoted by Brigham and Ehrhardt (2002) and Ogden, Jen and O'Connor (2003). We will discuss the bankruptcy cost explanation in the next subsection.

2.1.2 Bankruptcy Costs

Although the use of debt yields significant advantages from tax deductibility of interest expenses, firms may not set capital structure by borrowing 100% leverage. Borrowing too much may lead the firm to bankruptcy. Bankruptcy will bring some direct costs to the firm such as legal fees to handle the bankruptcy process and other relating costs. In addition, there will be the indirect costs of bankruptcy due to the unwillingness to make any transaction with nearly bankrupt firms by the suppliers, customers and other stakeholders. The trade-off theory suggests the optimal capital structure to trade-off between tax shields and bankruptcy costs⁶.

Although different studies resulted in different amount of bankruptcy costs due to different samples and different methodologies to quantify bankruptcy costs

⁶ Firms would reach the optimal capital structure from the trade-off of these two effects as suggested by Baxter (1967), Stiglitz (1972), Kraus and Litzenberger (1973) and Kim (1978). Furthermore, Bradley et al. (1984) showed the inverse relation between debt ratio and the costs of financial distress from the simulation model.

Especially the indirect costs. However, results showed the significant bankruptcy costs, which cannot be ignored⁷. Several variables were used to proxy for the bankruptcy costs such as dummy variable indicating negative equity, variance of earnings, probability of bankruptcy, asset uniqueness and size. The empirical evidences involving bankruptcy costs as the leverage-related costs are mixed⁸.

The excuse for the mixed results may be due to the inaccurate proxies and different samples as suggested above. Since no specific one factor can be used to proxy bankruptcy effects, both bankruptcy costs and the probability of bankruptcy have to be taken into account in order to investigate the effects from bankruptcy toward capital structure. Asset uniqueness, measured as selling expenses to sales ratio,

⁷ The direct costs of bankruptcy were found to be trivial about 5%, 6% and 3.1% of the market value of the firm prior to bankruptcy as proposed by Warner (1977), Altman (1984) and Weiss (1990) respectively. However, Guffey and Moore (1991) showed the average direct bankruptcy costs about 9.12% of the book value of total assets as of the year before filing. Since the indirect costs of bankruptcy are unobservable, there is still no consensus in the specific methodology to calculate them. Altman (1984) measured the indirect bankruptcy costs as the forgone sales and profits and found the average bankruptcy costs about 12.1% and 16.7% relative to the total value of the firm 3-year prior to bankruptcy and at bankruptcy date respectively. Opler and Titman (1994) argued that the assumption of observed sales drops due to financial distress may be reversed and proposed to focus the economic distress of the industries rather than the financial distress of firms. They showed that, the top leverage decile firms would have 26% higher sales decreases than do the bottom leverage decile firms for the economically distressed industries. Additionally, Andrade and Kaplan (1998) criticized Altman's methodology that it did not distinguish the indirect bankruptcy costs from the adverse effects of economic distress. They investigated the financial distress costs from the changes in operating performance among the financially distressed but not economically distressed highly leveraged transactions (HLTs). They found the net costs of financial distress to be 10-20 % of initial value and decline with firm's value, suggesting the fixed component of financial distress costs.

⁸ The relation between the variance of earnings and leverage was found to be significant by MacKie-Mason (1990), however; the relation between the standard deviation of earnings and leverage was found to be insignificant by Mehran (1992). The relation between the inverse of the modified Z-score and leverage was found to be insignificant by MacKie-Mason (1990) and Graham (1996a). However, Minton and Wruck (2001) found that low-leverage firms had higher modified Z-score that was consistent with the explanation by Graham et al. (1998) that firms in financial distress had high leverage because of the deterioration in equity value. Graham et al. (1998) and DeMiguel and Pindado (2001) showed the negative and statistically significant relation between financial distress costs and leverage. Size was found to be statistically significant and positive related with leverage as found by Berger, Ofek and Yermack (1997) and Hovakimian et al. (2001).

Reflects the indirect bankruptcy costs since these expenses involve the investment in the intangibility of firms which may be totally lost if firms go bankrupt as suggested by Titman and Wessels (1988). Firm size was also used as the proxy for bankruptcy costs due to the fact that larger firms were less prone to bankruptcy and there are fixed components of financial distress costs which reduce the significance of bankruptcy costs toward large firms as suggested by Titman and Wessels (1988). Both variance of earnings and Altman's Z-score reflect firm's risk, leading to the redundancy of the simultaneous inclusion in the model. Therefore, only one measure should be taken into account for firm's risk. The use of variance of earnings or stock returns may not be appropriate due to the use of few observations and may not be sufficient to calculate variance. Furthermore, the use of many observations may include the effects from the past, which may not coincide with the present probability of bankruptcy as well.

In conclusion, bankruptcy costs were found to affect capital structure although there is ambiguity in their amount. In order to investigate the effects of bankruptcy on capital structure, both bankruptcy probability and bankruptcy costs should be taken into account. Since capital structure can be used as the corporate governance mechanism to mitigate the conflict of interest among different investors in the firm as suggested by the agency theory, tax advantages and bankruptcy costs are not enough to explain capital structure decisions. The next subsection will be dedicated toward the agency costs explanation of capital structure.

2.1.3 Agency Cost

The use of debt can mitigate and induce the agency problem simultaneously. Debts can be used to solve the conflict of interests between manager and shareholders

due to the lower incentive to expropriate and the higher monitoring from creditors⁹. On the other hand, the higher leverage may induce the conflict of interests between shareholders (and the manager assumed to act in the best interest of shareholders) and creditors due to the asset substitution and the underinvestment problems¹⁰. The agency theory proposed the optimal capital structure as the tradeoff between agency costs of equity and agency costs of debt. Therefore, the optimal capital structure is the point that total agency costs are minimized as suggested by Jensen and Meckling (1976).

No research paper has ever studied the role of capital structure in mitigating the agency costs of equity from the agency costs of equity per se. Managerial ownership, free cash flow and cash flow deficit were often investigated and showed the mixed empirical evidences¹¹. We think that the ambiguous evidences may have resulted from the use of incomplete proxy. We do not reject the managerial ownership as the factors in affecting agency costs of equity. Higher ownership may induce manager to expropriate to a less extent. However, the agency costs of equity may be higher if it is difficult to separate the perquisites consumption from the business operating

⁹ Jensen (1986) argued that debt could mitigate the conflict of interest between manager and shareholders by reducing the free cash flow that manager could expropriate or overinvest.

¹⁰ The agency costs of debt may involve the underinvestment problems proposed by Myers (1977). Additionally, Diamond (1989) suggested that firms with longer track records would have lower default rates and lower costs of debt than firms with shorter histories since a firm tried to build a reputation for having only the safe project by not defaulting. By viewing debt as a disciplining device and an information provider, Harris and Raviv (1990) proposed that firms with higher liquidation value or tangible assets would have more debt, higher yield, more likely to default, and higher market value than similar firms with lower liquidation value.

¹¹ The empirical evidences showed both the positive and negative relation between managerial ownership and leverage. On the one hand, higher ownership would reduce the agency costs of equity due to the more closely aligned incentives of managers with shareholders as suggested by Jensen, Solberg and Zorn (1992) and Berger et. al. (1997). On the other hand, Mehran (1992) argued that the manager's incentive to reduce risk via underleveraging may lead to the positive relation between managerial ownership and leverage. The empirical evidences for Jensen (1986) free cash flow problem were also mixed. Cash-flow deficit was found to be statistically significant and negatively related with leverage by MacKie-Mason (1990). However, the free cash flow variable was also found by Graham (1996a) to be statistically significant and negatively related to leverage.

Expenses. The ownership by large stakeholders may also affect the agency costs of equity. Free cash flow and cash flow deficit may reflect not only the capital available for expropriation but also the profitability. Firms with large free cash flow or few cash flow deficits have less need for external funds and, thus, show the negative relation with leverage, which is contradictory to the agency costs explanation. Therefore, the use of percentage of ownership, free cash flow and cash flow deficit may not represent the complete agency costs of equity. The agency costs of equity should be investigated via the use of factors that capture the actual agency costs.

Although the use of debt can decrease the agency costs of equity, the asset substitution problem and the underinvestment problem still remain. Firms with higher fixed assets as collateral are more difficult to shift risk from shareholders to creditors. Most empirical evidences confirmed the positive relationship between leverage and ratio of plant and equipment to total assets as found by Titman and Wessels (1988), MacKie-Mason (1990), Jensen et al. (1992), Graham (1996), Graham et al. (1998), Shyam-Sunder and Myers (1999) and Frank and Goyal (2003).

Firms with large investment opportunities should set the conservative capital structure to mitigate the underinvestment problem. The empirical evidences of the relationship between leverage and underinvestment are mixed because of no straightforward variable to proxy the ex ante growth opportunities¹². Several proxies

¹² Titman and Wessels (1988) and Graham et al. (1998) found the empirical evidences consistent with the agency costs of debt explanation by using growth in total assets and market-to-book ratio respectively. MacKie-Mason (1990) argued for the statistically significant but positive relation between advertising expenditures and leverage that this variable may proxy for the asymmetric information problem while Graham (1996a) did not find the statistically significant relationship. Bradley et al. (1984), Titman and Wessels (1988) and Jensen, Solberg and Zorn (1992) and Mehran (1992) found the statistically significant and negative relation between R&D expenditures and leverage while Graham (1996a) found the positive relationship and MacKie-Mason (1990) found no statistically significant relationship.

Were used to indicate future growth opportunities such as market-to-book ratio, total assets growth, advertising expenditures and research and development expenditures¹³ We have to take into consideration that the manager-shareholder may easily manipulate these proxies.

In conclusion, the theoretical models unambiguously show the positive and negative effects from the agency costs of equity and the agency costs of debt toward capital structure respectively. However, the empirical evidences are not clear because it is hard to find the accurate proxies for these capital structure determinants. Up to this point, we have shown the capital structure determinants from the trade-off theory and the agency theory. The next subsection will be dedicated the capital structure determinants from the pecking order theory.

2.1.4 Asymmetric Information or Signaling Effects

Firms may be tempted to determine the targeted capital structure by weighing the benefits of debt from tax shields and agency costs of equity mitigation with the disadvantages of debt from bankruptcy costs, asset substitution problem and suboptimal investment decisions. However, firms are not free to do so because of the asymmetric information between the managers and outside investors. Because of the better-informed managers and the limitation of information revelation, capital structure is interpreted as the signal of firm's quality¹⁴. Therefore, firms would tend to rely on internal source of funds and prefer debt to equity if external financing was required as suggested by Myers and Majluf (1984).

¹³ Research and development expenditures were subject to more managerial discretion, resulting to the higher agency costs of debt as suggested by Bradley et al. (1984).

¹⁴ Several theoretical papers reviewed by Harris and Raviv (1991) confirmed that stock issuance sent negative signal (e.g., Krasker (1986) and Brennan and Kraus (1987)) but debt issuance sent positive signal (Narayanan (1988) and Poitevin (1989)). Furthermore, they gathered the theoretical implications that leverage would increase with the extent of informational asymmetry and bankruptcy probability.

There were two groups of empirical studies that examined the pecking order theory. The direct test of pecking order theory showed mixed results. On the other hand, the indirect tests of pecking order theory generally confirmed the financial hierarchy especially via the use of profitability to proxy the internal funds¹⁵. Highly profitable firms with larger internal funds were found to follow conservative financial policy while less profitable firms may be forced to borrow as a source of financing funds.

2.1.5 Product/Input Market Interactions

Product/input market interactions are the least developed areas for capital structure determinants. Few theoretical models were proposed. The competition strategy in the product market or the product characteristics may influence capital structure decisions as suggested by Harris and Raviv (1991). Oligopolists would tend to have more debt than monopolists or firms in competitive industries. Less leverage would be used for the firms with more unique products or more reputation effects.

Industry classification is generally used to empirically investigate the product/input market interactions. Industry classification and product market competition were found to determine capital structure¹⁶.

¹⁵ Titman and Wessels (1988) and Jensen et al. (1992) showed the statistically significant and negative relation between profitability and leverage. MacKie-Mason (1990) and Graham et al. (1998) did not find empirical results supporting the pecking order theory via the proxy of dividend-paying dummy variable and regulated industries dummy variable respectively. Paying dividends may signal the healthy financial status, leading to higher borrowing capacity. Furthermore, many industries were classified as regulated; leaving the product /market interactions affecting capital structure decisions as well. Minton and Wruck (2001) found conservative firms to follow the financial hierarchy. However, financial conservatism was largely transitory and not an industry-based phenomenon. Almost 50% of conservative firms substantially increased their leverage after five years.

¹⁶ Phillips (1995) found the significant effect of capital structure toward its own and competitors' output and product pricing decisions in four industries: the fiberglass, tractor trailer, polyethylene and gypsum industries. Furthermore, the casual relationship between capital structure and product market competition was investigated by Zingales (1997). This endogeneity problem was studied for the trucking industry experiencing the deregulation. Leverage was found to statistically significant and negatively affect firms' survival. The underinvestment problem due to leverage was proposed to force firms out of the market.

In conclusion, leverage has both advantages and disadvantages in which the optimal capital structure will be reached by trading off leverage-related costs and leverage-related benefits. Tax advantages, the agency costs of equity and the asymmetric information will induce firm to borrow. However, borrowing too much will excessively increase the bankruptcy costs and the agency costs of debt, which will decrease value of firm. The product/input market interaction will also affect the capital structure decisions. Most of these theoretical models are separately derived without taking into account other capital structure determinants simultaneously. There is still no theory incorporating all capital structure determinants into a single model. Therefore, we cannot unambiguously determine which capital structure determinants will be most important. In addition, the interaction among capital structure determinants will differently affect different firms in different financial environment.

We would like to end this subsection with the comprehensive review of capital structure investigation by Harris and Raviv (1991). On average, leverage is positively related with non-debt tax shields, while size and fixed assets and negatively related with asset uniqueness, bankruptcy probability, growth opportunities and profitability. However, the empirical evidences of the capital structure determinants are not unambiguous. They raised the causes of no unambiguous answer that "*These inconsistencies cannot, however, be regarded as conclusive, because the empirical studies were not designed specifically to test the models and were, therefore, not careful about satisfying the ceteris paribus conditions.*" Therefore, it is interesting to investigate the capital structure decisions among firms in different countries, which have different ceteris paribus, conditions as the differences in institutional factors. The next section will be dedicated to the institutional factors that determine capital structure.

2.2 Institutional Effects toward Capital Structure

Although firm-specific factors such as asset tangibility, market-to-book ratio, profitability and size may determine the capital structure decisions as shown in the previous section, the cross-country variation in leverage ratios suggests the important influences from institutional features or country-specific factors toward capital structure. These institutional factors are proposed to be the legal environment including tax system, bankruptcy laws, the preparation of financial statements, corporate governance system, ownership structure, bond and stock markets development of and the availability of different forms of financing as found in the recent empirical evidences especially the studies by Rajan and Zingales (1995) and Booth et. al. (2001)¹⁷.

¹⁷ Rajan and Zingales (1995) investigated the capital structure among G-7 countries and suggested a better understanding of the influence of institutions such as the tax code, bankruptcy laws, the state of development of bond markets, and patterns of ownership to explain the inter-country variation of the capital structure. Booth et. al. (2001) extended the investigation toward the developing countries (e.g. Brazil, India, Jordan, Malaysia, Mexico, Pakistan, South Korea, Thailand, Turkey and Zimbabwe). They reported the similarity of the capital structure determinants among developed and developing countries with the persistent differences across countries due to the institutional framework governing bankruptcy, the preparation of financial statements, and the availability of different forms of financing. La Porta, et. al. (1997) suggested that the external financing decisions would be affected by the legal environment of capital markets. Demircuc-Kunt and Maksimovic (1998) stated that firms in countries having active stock markets and high ratings for compliance with legal norms were able to obtain external fund and grow faster. Gleason et. al. (2000) found that tax environment affected capital structure decisions which were shown to influence firms' performances for the retailers in 14 European countries. Levy (2000) argued that household demand for securities would be increased during economic contractions because leveraged managers receive a relatively small share of wealth. Inflation uncertainty was also found by Hatzinikolaou (2002) to reduce the debt-to-equity ratio and cause a loss of value to the firm's stockholders due to the loss of the tax advantage associated with the use of more debt. Korajczyk and Levy (2002) also found that financing decisions reflected the state of economy. Wanzenried (2002) found that the differences in corporate governance systems would affect capital structure decisions among U.K. and continental European firms. Bartholdy and Mateus (2003) proposed less significant bankruptcy costs in the bank-based financing system due to less renegotiation impediments and less free-rider problems. Asymmetric information and agency costs of debt would be less severe in the bank-based financing system due to monitoring role and information provider role of banks. Bank-based financial systems also provided some form of power over borrowing firms via the implicit and explicit ownership. Thus, there would be less constraints for corporate borrowings among bank-based systems.

Due to the distinct institutional features among Thai firms, they may set capital structure differently from firms in other countries. The remaining of this section will be dedicated to analyzing the distinct institutional influences among Thai firms toward firm-specific capital structure determinants. The first subsections will analyze the distinct institutional features among Thai firms compared with those among other countries. Then, we will compare the institutional factors between listed and non-listed Thai firms. In each subsection, we would like to analyze the institutional influences on tax advantages, bankruptcy costs, agency costs and asymmetric information respectively.

2.2.1 Distinct Institutional Features among Thai Firms

The major institutional differences among firms in different countries are the ownership concentration and the working of market for corporate control as suggested by Rajan and Zingales (1995). Ownership, among firms in the developed countries, is dispersed with shareholders owning a small percentage of total outstanding shares. The corporate governance mechanisms among firms in the developed countries are rely on formal legal contracting, government regulation, and private litigation for controlling corporate behavior and resolving business conflicts as shown by Megginson (1997). On the other hand, there is less reliance on formal regulation and legal contracting but greater reliance on long-term and informal business relationships among firms in developing countries than among U.S. firms. Furthermore, there exists relatively inactive market for corporate control among firms in developing countries. In this subsection, we would like to analyze how the distinct institutional features among Thai firms affect capital structure decisions differently from firms among other countries especially the U.S.. The institutional influences on tax advantages,

bankruptcy costs, agency costs and asymmetric information will be examined respectively.

The lower corporate income tax rate reduces the tax advantages from interest expenses deductibility among Thai firms than among firms in G-7 countries as shown in corporate tax rate survey by KPMG presented in Table A.1¹⁸. Furthermore, there should be less leverage adjustment among Thai firms than those among G-7 countries, except for the U.S., due to no changes in Thai corporate income tax rates. KPMG argued that developing countries used lower tax rate to attract foreign investments. In order to compare the relative tax burdens imposed by different governments, not only the tax rate but also the tax base has to be taken into account. The distinctive non-debt tax shield allowance of Thai corporate income tax code makes the capital structure determinants be worth to investigate among Thai firms¹⁹.

Legal system influences capital structure because it reflects the protection of the right of suppliers of funds both creditors and shareholders as suggested by Rajan and Zingales (1995) and Booth et al. (2001). La Porta et al. (1996) found legal differences, both the character of legal rules and the quality of law enforcement,

¹⁸ There are significant differences in corporate income tax rate among different countries. Table A.1 presents corporate tax rate survey by KPMG during 1997 to 2001 among G-7 countries and developing countries. Firms in G-7 countries, on average, face corporate income tax rates around 30% to 57%, which are higher than those among developing countries. The corporate income tax rates among developing countries are around 25% to 44%. During the period under consideration, there are no changes in corporate income tax rate among South Korea, Thailand and the U.S.. Considering only tax advantages, Thai firms should have more stable leverage than those among other countries. Although Thai firms face lower corporate income tax rate compared to firms in other countries, the 30% corporate income tax indicates the significant debt tax shields that cannot be ignored.

¹⁹ The Thai corporate income tax code provides for several deductions. Deductible expenses are as follows:- full amount of ordinary and necessary expenses, interest, taxes, bad debts, wear and tear, donations, provident fund contributions, entertainment expenses, depreciation and net losses carried forward, but not backward, from the last five accounting periods. 200%, 150% and 200% deductions are allowed for research and development expenses, job training expenses and disabled equipment provision respectively. Donations can be deducted up to 2% of net profits. Entertainment expenses can be deducted up to 0.3% of gross receipt but not exceeding 10 million Baht.

across countries²⁰. Therefore, firms among countries with different rules of law and different enforcement will be expected to have different capital structure decisions. Although Thailand and U.S. have the similar English legal origin, Thai bankruptcy codes seem to be more creditor-friendly as suggested by Claessens et al. (2002)²¹. On the other hand, Thai enforcement of law may be less effective than those of U.S since U.S. has a much higher average CPI than that of Thailand as shown in Table A.2 in the appendix²². Therefore, we query the different effects of bankruptcy law between Thai firms and firms in other countries.

Ownership concentration may reduce the severity of agency costs of equity due to less incentive to expropriate. Due to concentrated ownership among Thai firms as found by La Porta et al. (1997) and the weak pressure from the takeover market, the

²⁰ These rules were suggested to vary systematically by legal origin, either English, French, German, or Scandinavian. English common law countries protected both shareholders and creditors the most since it gave creditors the power to replace existing managers. Legal rules in the common law system are usually made by judges. New situations with no described specific conduct in the statutes will be ruled by applying general principles. French civil law countries protected both shareholders and creditors the least due to the allowance of current managers to continue managing the firms during reorganization negotiations. Since legal rules in the civil law system are not supposed to go beyond the statutes, corporate insider may fearlessly expropriate in a way not explicitly forbidden. Therefore, English common law countries should appear to be more levered than other legal groups. Furthermore, richer countries were found to have better law enforcement than poorer countries.

²¹ After the financial crisis, the bankruptcy codes in Thailand were amended in April 1998. These bankruptcy reforms increased the number of bankruptcy filings by allowing for easier Chapter 11-type reorganization and establishing separate bankruptcy courts. The new bankruptcy codes give no timetable to render a judgment, no management stay in bankruptcy and no automatic stay as suggested by Claessens et al. (2002). Secured creditors do not get first priority but get the remaining from proceedings cost, taxes and wage claims. The process of liquidation is easy and not expensive. The bankruptcy codes in Thailand have some differences from those in the U.S.. The U.S. bankruptcy codes give management substantial rights such as the management stay in bankruptcy.

²² Table A.2 in the appendix shows the legal origin and the Corruption Perception Index (CPI), used as proxy for the law enforcement, among G-7 and developing countries. The Transparency International (TI) Corruption Perception Index is an initiative taken by the Berlin-based international non-governmental organization together with Dr. Johann Graf Lambsdorff, an economist with the University of Goettingen. It is an attempt to assess the level at which corruption is perceived by businessmen as impacting on commercial life.

Use of capital structure to mitigate agency costs of equity may not be highly needed as among firms in U.S.²³.

Conflicts of interests not only exist between manager and shareholders but also between manager-shareholders and creditors. There will be less conflict of interest between manager-shareholders and creditors among firms with higher usage of private debt because of the greater monitoring by private lenders as proposed by DeMiguel and Pindado (2001). Private lenders have advantages over public investors because of the soft information they can generate from the access to non-public information. Table A.3 in the appendix shows the size of Thai financial markets and the comparative significance among banking sector, bond market and stock market. Thai firms are found to finance mostly via the domestic banking sector because Thai equity market and especially Thai bond market are found to be less developed than those of the U.S.²⁴. As such, the asset substitution problem would be less significantly affect the capital structure decisions among Thai firms compared to U.S. firms.

With regards to the higher significance of the banking sector and the lower significance of the bond market and stock market as shown in the previous subsection, the pecking order theory may have less influence in explaining the capital structure decisions among Thai firms. The more widely used private debt may lessen the asymmetric information between lenders and firms because banks can access the non-public

²³ Claessens et al. (2001) found that Thai firms were mainly family-controlled and state-controlled. Smaller firms were more likely family-controlled, as were older firms. The largest ten families in Thailand controlled half of the corporate sector market capitalization.

²⁴ Rajan and Zingales (1995) reported the ratios of total capitalization of U.S. corporate equity market, total bank loans in U.S. and total capitalization of U.S. corporate bond market to the gross domestic product (GDP) as 0.50, 0.71 and 0.23 respectively. The last three rows in Table A.3 report the average ratios of total capitalization of Thai corporate equity market, total bank loans and total capitalization of Thai corporate bond market to the gross domestic product (GDP) during 1997 and 2001 as 0.31, 1.06 and 0.07 respectively.

information among many borrowers including the suppliers, customers and even the competitors of the borrowers. Furthermore, there is higher transaction cost associated with public debt than private debt as suggested by De Miguel and Pindado (2001). Therefore, Thai firms may adjust their actual capital structure toward the optimal capital structure faster than U.S. firms.

In conclusion, due to various distinctive Thai institutional features, the agency theory and the pecking order theory may have less explanatory power toward capital structure among Thai firms compared to firms in developed countries. Due to the different leverage-related costs and benefits among Thai firms, we cannot expect capital structure decisions among Thai firms to be similar as among U.S. firms. In the next subsection, we would like to expand on the institutional analysis toward listed and non-listed Thai firms.

2.2.2 Institutional Comparison among listed and non-listed Thai Firms

Listed firms are limited liability corporations with transferable claims that can be traded on public capital markets. They have a variety of access to financing sources. They are usually operated by professional managements. Firms listed on the stock exchanges have both advantages and disadvantages as suggested by Megginson (1997). The key advantage is the access to public capital markets for external financing. On the other hand, the significant disadvantage is the deviation from shareholders' wealth maximization due to the separation of ownership and control among listed firms. This conflict of interest between manager and shareholders are especially significant among listed firms having enough free cash flow. Capital markets have ineffective disciplining role toward managers among firms having enough free cash flow because they do not have to raise capital through public security sales. Rather than concentrating on creating value, professional managers may have a

strong incentive in protecting their tenure in office (entrenchment). The conflict of interest from the separation of ownership and control can be mitigated by allowing institutional investors especially creditors to take an active role in monitoring and disciplining corporate managers. These large investors have both the expertise and the proper incentives to act as monitors. However, the effectiveness of the disciplining role by large investors depends on the extent of allowance of takeover market from the laws.

Non-listed firms are characterized by non-tradable shares, a very tight ownership structure consisting of a handful of major shareholders, and less-than-perfect access to public capital markets. Megginson (1997) suggested that non-listed firms especially among European and Asian countries could rely on banking relationship for intermediated debt and equity financing and are not forced to sell shares publicly in order to finance continued growth. They tend to be smaller than listed firms in the same industry, and many are still controlled by their entrepreneur/founders, or by the founders' families. Since managers and shareholders tend to be the same people (or very close associates), the competitive advantage of the non-listed firms is the less agency problems from the separation of ownership and control. On the other hand, non-listed firms are prone to be financially constrained and have less optimal levels of corporate investment. They typically raise funds from retained earnings or private debt issues because it is expensive and difficult, if not impossible, to raise new equity capital through private equity sales. These institutional differences between listed and non-listed firms will be examined in regards to tax advantages, bankruptcy costs, agency costs and asymmetric information respectively.

The tax rate applied to Thai firms both listed and non-listed is of the same amount as 30% except for the firms engaged in prospecting for, and production of,

petroleum which are subject to 50% tax rate²⁵. There should be no differences in capital structure decisions among listed firms and non-listed firms due to tax advantages per se.

Thai bankruptcy codes and enforcement are applied similarly between listed and non-listed firms. Therefore, there should be no different responses from bankruptcy costs per se toward capital structure decisions between listed and non-listed Thai firms.

Less conflict of interest between manager and shareholders were found among non-listed firms compared to listed firms due to the more concentrated ownership and more active management role by shareholders as suggested by Jensen (1986), Lehn and Poulsen (1989) and Ball and Shivakumar (2002)²⁶. Therefore, we expect the agency costs of equity among listed firms to have higher influences toward capital structure than among non-listed firms.

Underinvestment and asset substitution problems were suggested to be less important for non-listed firms because of their concentrated ownership. Owner- manager among non-listed firms, fearful to lose control or unable to issue new equity, may choose to fund growth opportunities with leverage and care less about underinvestment problems. There is evidence of positive relationship between growth opportunities and

²⁵ Corporate income tax rate will be reduced to 25% for the net profits less than or equal to 300 million Baht among firms listed on the SET before 6 September 2001 for 5 years starting from the accounting period on or after 6 September 2001.

²⁶ Jensen (1986) suggested that going private transactions mitigated agency problem in firms with substantial free cash flow. Going private transactions enhanced the productivity of the firm because of the concentrating residual claims among management or an outside monitor. Lehn and Poulsen (1989) confirmed the free cash flow hypothesis. The going private probability was found to be directly related to the ratio of undistributed cash flow to equity value and the premiums paid to shareholders in going private transactions were positively and significantly related to undistributed cash flow. Ball and Shivakumar (2002) argued that non-listed firms were more closely held, had greater managerial ownership and more active management role by shareholders.

Leverage for non-listed firms with concentrated ownership as found by Giannetti (2003). Therefore, we query whether the different institutional features between listed and non-listed firms may result in the positive and negative relationship between leverage and growth among non-listed and listed firms respectively.

Non-listed firms cannot raise equity from public investors and very rarely issue public debt. Although Thai law permits private firm to issue debentures, Thai private firms rarely borrow from the public. Among 146 debentures registered in the Thai Bond Dealing Centre (ThaiBDC) as of 23 February 2004, there are only 12 non-listed firms that issued public debt in which 5 of 12 firms are utility firms or financial institutions. On the other hand, managers among listed firms have to be more cautious of their financial activities because the public investors interpret every financial decision as the significant signal. Therefore, the pecking order theory would apply less to the non-listed firms compared to listed firms because there are no public investors involved in the financing decisions among non-listed firms.

In conclusion, no differences in capital structure decisions from tax advantages and bankruptcy costs should be found between listed and non-listed Thai firms. Agency costs of equity and asymmetric information may not be as important in determining capital structure among non-listed Thai firms as among listed Thai firms. Underinvestment problem may lead to less leverage among listed Thai firms but higher leverage among non-listed Thai firms.

2.3 Capital Structure Differences between Listed and Non-listed Firms

Due to the differences in the institutional features between listed (publicly traded) firms and non-listed (private) firms, Damodaran (1997) proposed the relatively lower leverage among private firms compared to similar publicly traded firms. They

argued that private firms operated under far more constraints than did publicly traded firms. Private firms had less access to capital, and their owners were more exposed to risk that would be diversified away by a stockholder in a publicly traded firm. The perception of financial trouble could be much more damaging to small, private firms. The owners of the private firm were exposed much more frequently to unlimited liability. Therefore, taking on debt increased default risk and expected bankruptcy cost much more substantially for small, private firms than for larger, publicly traded firms. Taking on debt yielded a much smaller advantage in terms of disciplining decision makers in the case of privately run firms since there was no separation of ownership and management. Taking on debt generally exposed private firms to far more restrictive bond covenants and higher agency costs compared to publicly firms. Furthermore, the loss of flexibility associated with using excess debt capacity was likely to weigh much more heavily on private firms than public firms, owing to the lack of access to stock market among private firms. Barring the scenario in which the individual tax rate was substantially higher than the corporate tax rate and the tax benefits of debt were therefore substantially larger for private firms, all of the factors mentioned above would result in much lower debt ratios at private firms.

However, we cannot directly apply the above proposition by Damodaran (1997) among the sample in this study. There are different institutional features among firms in this study and those of Damodaran (1997). We limit our sample among non-listed firms that are organized as corporations. Therefore, the listed and non-listed firms in this study will have similar tax rates and similar existence of limited liability of equity investors. Furthermore, there should be no difference in bankruptcy costs between listed and non-listed firms in our study since we set the matching criteria for each non-listed firms to have the least differences in total assets with any specific SET

listed firms as well. However, the arguments for agency costs and value of flexibility by Damodaran (1997) can still be applied toward listed and non-listed firms in this study. Taking into account all of the factors mentioned above, there should be the empirical evidences for the lower debt ratios among non-listed Thai firms relative to SET listed firms.

Contrary to the above expectation, the stylized fact among Thai firms shows that the average and median leverage ratios of non-listed firms are higher than those of listed firms. It may be interpreted that non-listed firms set the overleverage capital structure or listed firms set the underleverage capital structure or both. In the rest of this section, we review research papers that can be used to explain the higher leverage among non-listed firms relative to that of listed firms. There are two groups of studies that can explain the capital structure differences between listed and non-listed Thai firms. The one involves the notion that listed firms intentionally follow conservative capital structure while the other is that non-listed firms have to borrow aggressively due to limited access to capital market. We will describe these two groups of papers respectively.

2.3.1 Listed Firms Intentionally Follow Conservative Capital Structure

Underleverage was found among listed firms as suggested by Berger, Ofek and Yermack (1997), Garvey and Hanka (1999), Graham (2000) and Minton and Wruck (2001). Results showed that listed firms reduced their leverage ratios when there was lower threat of hostile takeover. Firms that increased their leverage ratios would have higher values²⁷. However, no unambiguous answer was suggested to explain the underleverage by listed firms. The possible explanations will be described as trade-off theory, pecking order theory and entrenchment effects respectively.

Due to the trade-off theory, conservative firms should face high costs from debt financing. Firms with high leverage-related costs or low leverage-related benefits should follow conservative financial policy while firms with high leverage-related benefits or low leverage-related costs should follow aggressive financial policy. Graham (2000) showed that trade-off theory alone cannot be used to explain the financial conservative capital structure among listed firms²⁸.

Following the pecking order theory, firms use internal fund whenever possible and prefer debt to equity when external financing is needed. If listed firms use debt conservatism due to the pecking order theory, conservative firms should stockpile financial slack or debt capacity to finance future discretionary expenditures, particularly acquisitions and capital expenditures. The empirical evidences for this explanation were mixed²⁹.

Most capital structure theories assume that managers choose capital structure in order to maximize shareholders' wealth. However, recent researchers realize that manager's self-interest can lead to financial policies that do not maximize

²⁷ Garvey and Hanka (1999) contrasted firms' financing policies before and after they were covered by antitakeover laws. Protected firms were found to issue less debt and substantially reduce their leverage ratios over time while unprotected firms did the reverse. Firms with the largest increase in leverage following a failed takeover increased their operating cash flows, consistent with the earlier evidences (by Kaplan (1989), Smith (1990), and Denis and Denis (1993)) showing that the operating performance of firms improved following leverage-increasing recapitalizations as reported by Safieddine and Titman (1999). Furthermore, Graham (2000) found the additional gross tax benefits equal to about 15 percent of firm value if listed firms were to lever up to the point where their interest-deduction benefit functions first become downward sloping.

²⁸ Graham (2000) showed that large, liquid, profitable firms with low expected distress costs use debt conservatively, contradictory to trade-off theory. However, these conservatively financed firms had growth options and relatively few tangible assets, consistent with trade-off theory.

²⁹ Graham (2000) found that dividend-paying firms that had less severe information problems did issue debt more conservatively than non-dividend-paying firms. On the other hand, Minton and Wruck (2001) showed that conservative firms followed a pecking order style financial policy. Conservative firms had a high flow of funds surplus and large cash balances relative to more leveraged firms.

shareholders' wealth. Due to the underdiversified human capital, managers may have preference for low leverage in order to reduce firm's risk. Furthermore, the use of debt may reduce free cash flow and bring in the monitoring by creditors that increase value of firm but decrease manager's utility. The disciplining role of debt can constrain managers who, in turn, would prefer to issue less debt than shareholders desire as proposed by Grossman and Hart (1982), Stulz (1990), Hart and Moore (1995) as quoted by Garvey and Hanka (1999). Therefore, the optimal capital structure for managers may deviate from the ex ante efficient capital structure for shareholders due to the managers' incentive to maximize her tenure as suggested by Novaes and Zingales (1995). Managers may underlever if there are high costs of disciplinary mechanism. The empirical evidences involving managerial entrenchment effects were mixed³⁰.

This problem may not be important among non-listed firms due to their concentrated ownership. Non-listed firms have less separation of ownership and control due to the fact that managers of non-listed firms are being or closely controlled by the large shareholders. Therefore, we think that this □underleverage incentive may not happen to non-listed firms.

In conclusion, listed firms were found to use low leverage. Listed firms that use low leverage may have high leverage-related costs or low leverage-related benefits. Trade-off theory alone cannot explain debt conservatism. The pecking order

³⁰ Berger et al. (1997) found the empirical evidences supporting this hypothesis. Leverage levels were found to be lower when manager did not face pressure from either ownership and compensation incentives or active monitoring. Furthermore, in the aftermath of entrenchment-reducing shocks to managerial security, leverage was increased. Graham (2000) found the empirical evidences supporting the entrenchment effect among regression that controlled only entrenchment variables. However, when the full set of control variables were used, the entrenchment effect was not confirmed.

Theory argues that listed firms that use low leverage may stockpile their financial slack for the future investment. Managerial entrenchment effect is proposed as the managers' incentive to maximize her tenure but not to maximize value of firm. These three hypotheses are ambiguous. The alternative explanation for leverage differences between listed and non-listed firms may be that non-listed firms borrow too much.

2.3.2 Non-listed Firms Have to Borrow Aggressively

The important benefit of being a listed firm from the access to equity market may be the alternative explanation for the findings that non-listed firms have higher leverage ratios than listed firms. Non-listed firms that borrow too high a leverage may be induced to rebalance their capital structure by listing in the stock market as suggested by Pagano, Panetta and Zingales (1998). Therefore, the still non-listed firms that borrow as the important financing source will have higher leverage compared to listed firms as suggested by Ball and Shivakumar (2002). The new capital issuance after going public was hypothesized by Giannetti (2003) to decrease the leverage ratios of listed firms compared with non-listed firms.

Since there is no clear answer for the capital structure differences between listed and non-listed firms, there should be further investigation whether these differences are due to the necessity of the non-listed firms to borrow aggressively or the intention by listed firms to follow conservative capital structure. These two viewpoints may affect the firms' performance as well. If non-listed firms that are financially constrained are forced by the external financing need to borrow a high leverage, the average performance of non-listed firms should be lower than that of the listed firms because of the lack of funds to invest. However, if listed firms intentionally lower their leverage, their performance should be worse than the performance of non-listed firms. In order to test these hypotheses, we have to control

for the other factors that affect firm performance as well. The next section will be dedicated to the investigation of the relationship between capital structure and the performance of the firm.

2.4 Capital Structure and Performance

The use of debt may benefit the firm by lowering tax expenses. In addition, the use of debt may affect a firm's performance because corporate financing structures performed important corporate governance functions. Capital structure may increase firm profitability due to the role of debt in mitigating agency problems between shareholders and managers. High-levered firms would be more efficient and more profitable than less-levered firms because of the role of debt in reducing the free cash flow that manager can expropriate as suggested by Jensen (1986).

On the other hand, the costs due to asset substitution problem and suboptimal investment problem as well as bankruptcy costs are increased with the leverage. Therefore, the relationship between value of firm and capital structure would be non-linear as suggested by Brigham and Ehrhardt (2002). At the very low level of financial leverage, the tax shelter effects totally dominate until the amount of debt reaches threshold level where bankruptcy costs become material. After this threshold debt level, financial distress and agency costs become increasingly important, offsetting some the tax advantages. At the optimal capital structure, the marginal tax shelter benefit of additional debt is exactly offset by the disadvantages of debt, and beyond the optimal debt level, the disadvantages outweigh the tax benefit. Therefore, it is interesting to investigate the net effects from leverage toward firm performance in Thailand.

The empirical evidences are mixed³¹. Danbolt, Rees and Shamsheer (1998), Gedajlovic and Shapiro (2001) and Harvey, Lins and Roper (2003) found the empirical evidences supporting the positive relationship between leverage and profitability. Alba, Claessens and Djankov (1998), Anderson and Reeb (2003) and Joh (2003) found the contradictory results. This may happen from the asset-substitution problem inducing high-levered firm to invest in the high return but high risk projects which are not profitable on average. Furthermore, the debt disciplinary effect would be low due to the insufficient free cash flow³².

Firm profitability is affected not only by the capital structure but also by the sources of capital. The use of capital from public sources may increase profitability due to the cheaper sources of funds and the increased bargaining power toward banks from the alternative sources as fund as suggested by Pagano, Panetta and

³¹ Danbolt, Rees and Shamsheer (1998) found that high-levered firms, especially from long-term debt use, experienced larger improvements in profitability during the following year than do low-levered firms. Financial leverage measured as the ratio of debt to capital employed was found to be positive related with profitability measured as the ratio of net income to total assets by Gedajlovic and Shapiro (2001) among Japanese corporations during 1986-1991. Harvey, Lins and Roper (2003) suggested that actively monitored debt created value for shareholders among firms that faced potentially extreme agency costs associated with misaligned managerial incentives and overinvestment problems. They focused on emerging market firms due to the fact that shareholders of emerging market firms typically suffered from misaligned managerial incentives, ineffective legal protection and underdeveloped markets for corporate control. Results showed that leverage mitigated the loss in firm value attributable to the separation of management control and ownership especially among firms having high asset tangibility or few growth opportunities.

³² Alba, Claessens and Djankov (1998) noted that decreasing productivity growth and high leverage were signs of deterioration in corporate performance before the financial crisis in 1997. Since firms experiencing deteriorating performance may have been involved with the asset substitution problem, extra outside financing may have been raised to undertake projects with possible high returns, but high risk. Results showed that the bank-corporate links had been less than arms-length. Firms with relatively worse performance got a disproportionately large share of financing. Mixed results were found among the Standard & Poor's 500 firms during 1992-1999 by Anderson and Reeb (2003). There were positive and negative relation between long term debt ratio and profitability measures with operating income and net income respectively. Joh (2003) found the positive relation between equity ratio and the accounting profitability measures among Korean firms during 1993-1997. Results were not different no matter the accounting profitability measures were calculated with the operating profit or the net profit.

Zingales (1998)³³.

In conclusion, there are mixed effects of debt on firm profitability. The advantages of debt are the reduction of the discretionary free cash flow that managers can expropriate and the monitoring role by creditors. On the other hand, the use of debt may induce the asset substitution problem and the underinvestment problem, which may reduce firm profitability. Mixed results were found between leverage and firm profitability. Therefore, it is interesting to investigate whether leverage decisions affect firm profitability positively or negatively among Thai firms.

2.5 Capital Structure Investigations among Thai Firms

There are few research papers directly investigating the capital structure decisions in Thailand. Furthermore, most research papers investigate only a small proportion of the three hundred firms that are listed on the SET, which may not represent the actual population of firms that are not listed on the SET. Few researchers study capital structure among SMEs (Small and Medium Enterprises) but no researcher examines capital structure among large non-listed firms. Therefore, we question whether these mixed results can be applied toward the rest of more than 400,000 private firms in Thailand.

The research papers involving capital structure among Thai firms may be classified into three groups. The majority of studies aim at understanding the capital

³³ Pagano, Panetta and Zingales (1998) found that going public enabled firms to borrow more cheaply. Around the IPO date the interest rate on their short-term credit fell and the number of banks willing to lend to them rose. The reduced cost of credit may stem from the improved public information associated with stock exchange listing or from the stronger bargaining position vis-à-vis banks determined by the availability of an outside source of funds.

Structure determinants. The second group tries to test the specific theory of capital structure among Thai firms. The last group of research papers is to investigate the effect of capital structure. Therefore, the organization of this section will be described with the following order: - the researches about capital structure determinants investigation, the tests for specific capital structure theory and the investigations of capital structure effects. The final section will be dedicated to the survey of financing behavior among Thai firms.

2.5.1 Capital Structure Determinants Investigation among Listed Thai Firms

Most of capital structure researches among Thai firms were done to investigate the capital structure determinants. Different researchers focused on a particular capital structure determinant. In this study, the investigation of capital structure determinants among Thai firms will be presented by grouping the literature based on the factors determining capital structure as the following order: - tax advantages, bankruptcy costs, agency costs and asymmetric information. Table 1 shows the summary for the empirical evidences investigated on the capital structure among Thai listed firms.

No specific attention is paid to the study of tax advantages. Most papers investigated tax effects from the non-debt tax shields as measured by ratio of depreciation to total assets³⁴. By investigating the non-debt tax shields, tax hypothesis was confirmed by Wiwattanakantang (1999), but Kamonpornphan (1997), Hongpan (2000), Patchanant (2001) and Yingyoskumjoinchai (2003) found no statistically significant relationship between non-debt tax shields and leverage. We think that the mixed results are caused by the inaccurate proxy for non-debt tax shields and the different samples. Furthermore, all studies used the static model, which may not yield the true relationship as explained in the section 2.1.1.

Table 1: Summary of Capital Structure Determinants among Thai Listed firms^a

This table summarizes the empirical evidences of capital structure determinants among Thai listed firms. The dependent variable is the leverage ratio while the independent variables are the capital structure determinants. The + and – sign indicates the statistically significant and positive and negative coefficient respectively. The ? sign indicates the insignificant coefficient.

Capital Structure Determinants	Kamompornphan (1997)	Wiwattanakantang (1999)	Hongpan (2000)	Vongvitavat (2001)	Asawarachan (2001)	Patchanant (2001)	Phornprapha (2002)	Yingyoskumjoinchai (2003)	Kalpagonchai (2003) ^b
Time Period under Investigation	1994 – 1996	1996	1999	1996 – 1999	1995 – 2000	1997 – 1999	1993 – 1996	1994 – 2001	1995 – 2001
Tax Advantages									
Effective tax rate			+						
Non-debt tax shields	?	-	?			?		?	
Bankruptcy Costs									
$\sigma_{\text{sale}}/\text{Total assets}$?	?						
$\sigma_{\text{Stock return}}$					-				
σ_{ROA}						?	?		
CV(EBIT)						?			
O-Score								+	
Product Uniqueness				?					? ^b
Size	+	+	+	+		+	+	+	+
Agency Costs of Debt									
Tangibility	?	?	?	?	?		+	?	? ^b
Growth	?				?	?			
Market to book		-	-			-			? ^b
Age		?	?						
Agency Costs of Equity									
Management compensation					?				
Managerial ownership		?	?	?	+		+		
Largest shareholder ownership		-	?	?		?			
Largest corporation ownership		-	?	+					
Largest bank ownership		?	?	?	?	?			
Family control		+	+						
Conglomerate firm		?	?						
Foreign firm		?	?			?			
State-owned firm		?	?						
Board size		?	?						
Asymmetric Information									
Profitability		-	-	-	?	?	-	-	?
Cash deficit	+								
Dividend	-				?		?		
Others									
Industry dummy		*					*		
Year dummy							?		

^a This table summarized only the major firm-specific capital structure determinants. Some capital structure determinants were omitted.

^b Some capital structure determinants were found to be affected by firm's financial constraints. Product uniqueness and asset tangibility were found to be positively and statistically related with leverage only among financial unconstrained firms while market-to-book ratio were found to be positively and statistically related with leverage only among financial constrained firms.

Due to the lack of complete and efficient methodology to calculate bankruptcy costs, different researchers investigate bankruptcy costs by using different proxies among different samples that may cause the empirical evidences to be mixed. The proxies used to investigate the bankruptcy costs were O-score, volatility of a firm's return, product uniqueness and size. O-score and volatility of firm's return are used to proxy the probability of bankruptcy while product uniqueness is used to proxy the bankruptcy costs. Product uniqueness should be negatively related with leverage because firms producing unique products may suffer high bankruptcy costs due to the specific skills of workers and suppliers and the limited servicing alternatives for customers. Selling expenses was used as the proxy for product uniqueness because firms with relatively unique products were expected to advertise more and spend more in promoting and selling their products. Size was suggested to proxy bankruptcy costs because larger firms may be more diversified and hence less likely to go bankrupt. Furthermore, larger firms would have less direct bankruptcy costs due to the findings of partially fixed direct bankruptcy costs³⁵.

³⁴ Hongpan (2000) investigated tax effects via the use of effective tax rate and found the statistically positive relation between leverage and the effective tax rate measured as income taxes paid to earnings before interest and taxes. The effective tax rate should not be used to test the tax effects on capital structure as suggested by Graham (1996a) that tax effects should be investigated through the marginal tax rate. Furthermore, the effective tax rate may instead be the proxy for profitability as suggested by Fama and French (1998). The rest of the investigations use the ratio of depreciation to total assets as the proxy for non-debt tax shields except for Yingyoskumjoinchai (2003) that used the sum of depreciation and amortization to total assets.

³⁵ Wiwattanakantang (1999) also argued that size may be inversely related to the level of information asymmetries because of the tendency to provide more information from larger firms. Furthermore, larger firms tended to have a higher capacity to borrow than smaller ones. However, Kalpagonchai (2003) argued that larger firms had smaller equity issuance costs, hence, there should be negative relation between size and leverage. Unambiguously positive relation between leverage and size was reported by Kamonpornphan (1997), Wiwattanakantang (1999), Hongpan (2000), Vongvitavat (2001), Patchanant (2001), Phorngrapha (2002), Yingyoskumjoinchai (2003) and Kalpagonchai (2003).

The empirical evidences about bankruptcy costs were mixed³⁶. The study of relation between O-score and leverage by using the static model may be not efficient due to the fact that the endogeneity problem between bankruptcy probability and capital structure may cause firms with higher leverage to have higher default risk. Furthermore, the inconsistent results may be caused by the inaccurate use of very short term volatility as the proxy for bankruptcy probability. The use of product uniqueness did not reveal the negative relation between bankruptcy costs and leverage as expected. The excuse may be that selling expenses used in the study did not include the research and development expenses due to data limitation. Only the relation between leverage and size as a proxy for the bankruptcy costs was unambiguously found to be positive which was also unanimously reported among researches in other countries.

Most empirical studies among Thai firms investigate the effects of agency costs of equity on capital structure via managerial ownership. Managers with lower ownership would have higher incentive to expropriate wealth from shareholders. Therefore, the more intense monitoring by creditors may mitigate this agency problem between shareholders and managers, leading to the expected negative relationship between managerial ownership and leverage as suggested by the agency theory. The empirical evidences did not seem consistent with the expectation³⁷. The expected negative relation between ownership and leverage from the agency costs of equity explanation

³⁶ Wiwattanakantang (1999) and Hongpan (2000) used volatility of a firm's return on assets as a proxy for bankruptcy costs. Patchanant (2001) and Phornprapha (2002) used the standard deviation of return on asset for the past 3-year period to proxy for business risk. Yingyoskumjoinchai (2003) used O-score developed by Ohlson (1980) as a proxy of default risk. Wiwattanakantang (1999), Hongpan (2000), Patchanant (2001) and Phornprapha (2002) found no statistically significant relationship between leverage and business risk proxies. Vongvitavat (2001), Kalpagonchai (2003) and Yingyoskumjoinchai (2003) showed the results against this expectation.

³⁷ Wiwattanakantang (1999), Hongpan (2000) and Vongvitavat (2001) found no significant relation between managerial ownership and leverage while the positive relation was found by Asawarachan (2001) and Phornprapha (2002).

May be offset by the positive relationship between managerial ownership and leverage due to the manager's willingness to protect their voting rights, leading to the insignificant or even positive relation.

Because of the asset substitution problem, asset tangibility should be positively related with leverage. We question whether the difference between the book value of fixed assets and the market value of fixed assets among Thai firms affect the insignificant relation. Furthermore, the use of personal guarantee may decrease the importance of fixed assets as collateral. Asset tangibility was not statistically related with leverage as found among firms in other countries as described in Section 2.1.3³⁸.

The asset-substitution problem was additionally investigated by age of firm as suggested by Wiwattanakantang (1999). Older firms may be less likely to invest in high-risk projects to prevent destroying their reputation, which had been built for a long history. On the other hand, the recently established firms with lesser reputation to lose would have higher incentive to engage in asset substitution. Therefore, a positive relationship between leverage and age of firm should be expected. However, the results showed the insignificant relation between leverage and age of firm.

The underinvestment problem was usually investigated via market to book ratio and growth. Firms with larger growth opportunities should have lower leverage

³⁸ Kamonpornphan (1997), Wiwattanakantang (1999), Hongpan (2000), Asawarachan (2001), Phornprapha (2002) and Kalpagonchai (2003) used the ratio of book value of fixed assets to book value of total assets to investigate the asset-substitution problems. Vongvitavat (2001) used the non-collateral value of assets to investigate the asset-substitution problems. The non-collateral values of assets were calculated as one minus the ratio between total fixed assets and total assets. Phornprapha (2002) found the statistically significant and positive relation between asset tangibility and leverage at the 90% confidence interval. Kalpagonchai (2003) found the statistically significant and positive relation between asset tangibility and leverage at the 90% confidence interval only among the unconstrained firms.

to avoid the underinvestment problems. The empirical evidences were mixed³⁹. The inconsistent results might have resulted from the lack of accurate proxies. Growth rates that are used for these studies are the previous growth rate and not the expected growth rate while the use of market-to-book ratio assumed the efficient capital market. Furthermore, the relationship between investment opportunities and leverage may be affected by the financial constraint. Financial constrained firms may have to increase leverage to raise funds for the investment opportunities, leading to the positive relation between growth and leverage. On the other hand, the financial unconstrained firms may reduce leverage to avoid the underinvestment problems, leading to the negative relationship between growth and leverage.

The asymmetric information effect on capital structure was investigated through profitability. Results showed a negative and strongly significant relationship between profitability and leverage, supporting the pecking order theory, as reported by Wiwattanakantang (1999), Hongpan (2000), Vongvitavat (2001) and Phornprapha (2002).

Not only the firm-specific factors but also the macroeconomic factors were investigated for their effects on capital structure. Results showed significant effects from macroeconomic factors in determining capital structure. Exchange losses were found by Chittaya (1997) to positively affect firms' leverage especially among small

³⁹ Wiwattanakantang (1999), Hongpan (2000) and Patchanant (2001) found the negative relation between the market-to-book ratio and leverage, consistent with the agency costs of debt explanation. However, Kalpagonchai (2003) found the positive and statistically significant relation between market-to-book ratio and leverage among financial constrained firms and the insignificant relation between market-to-book ratio and leverage among financial unconstrained firms. Kalpagonchai (2003) argued that firms with high market-to-book ratio would issue equity because of the equity price overvaluation. Kamonpornphan (1997) and Patchanant (2001) used growth in total assets and growth in return of assets and return on sales respectively as the indicators for investment opportunities. However, no statistically significant relation was found between growth and leverage.

Firms⁴⁰. The target leverage was also found to be pro-cyclical for the constrained firms but counter-cyclical for the unconstrained firms by Kalpagonchai (2003)⁴¹.

In conclusion, leverage was found to be positively and negatively related to size and profitability respectively, consistent with the bankruptcy cost explanation and the pecking order theory. However, there were mixed results for the tax theory and agency theory. The lack of significant relationship as expected from these theories may be due to the use of static model. The use of dynamic model is cast doubt to reveal the more accurate relationship between leverage and capital structure determinants.

2.5.2 Test of Capital Structure Theory

The other group of empirical studies among Thai listed firms is aimed to directly test for specific capital structure theories as the pecking order theory and the market timing theory. The direct test for pecking order was examined by Leardsaktanakul (2001) and Buranasakda (2003) while Thuwajaroenpanich (2003) tested the market timing theory.

The empirical tests for pecking order were mixed. Leardsaktanakul (2001) found no financial hierarchy among Thai firms during 1975 and 1996 while Buranasakda (2003) found empirical evidences supporting the pecking order theory during 1992 and 2001. The different results may be due to the different time period because after separating the sample into 2 groups as before the crisis (1992 – 1996) and after the crisis (1999 – 2001), Buranasakda (2003) confirmed the pecking order only after the crisis.

⁴⁰ Chittaya (1997) focused on the effects of exchange losses toward capital structure among 270 listed firms during 1996 and 1997.

⁴¹ Kalpagonchai (2003) investigated the roles of macroeconomic conditions from manufacturing production index, private consumption index, private investment index and capacity utilization index among 230 listed firms during 1995 and 2001. Financial constrained firms are defined as the ones with no dividend paid and Tobin's Q greater than 1. Firms that are not constrained are classified as the unconstrained firms.

2.5.3 Investigation of Capital Structure and Firm Performance

Firms with high debt level may have less growth due to the underinvestment problem. This suboptimal investment decisions may decrease firm's profitability due to the ignorance of positive net present value project. On the other hand, firms that follow aggressive capital structure are hypothesized to have greater profitability. High leverage may bring in the firm greater monitoring by creditors and less free cash flow that managers can expropriate.

The empirical evidences investigating the relationship between capital structure and performance among Thai firms were few. Leverage was found to be negatively related with growth but not related to a firm's profitability as reported by Vongvitavat (2001), Tanopajai (2002) and Laochareonrian (2002). It may be implied that profitability is an essential factor to determine capital structure but not vice versa. Profitable firms usually have low leverage while high-leveraged firms do not usually have high profitability. There should be additional investigation of the relation between capital structure and performance.

In conclusion, capital structure among Thai firms were found to be principally affected by size and profitability. The explanation is that larger firms can borrow more due to the lower bankruptcy costs and less probability of bankruptcy from the greater diversification. However, there are other arguments that larger firms may have lower costs of external financing and higher borrowing capacity. The explanation for the less use of leverage by the higher profitable firms is due to their greater internal sources of funds, consistent with the pecking order theory.

Proxies for tax advantages and agency costs were not found to significantly affect capital structure decisions. There is the important drawback of all empirical studies among Thai firms. All researches implicitly assumed the observed capital

structure to be the optimal or targeted capital structure. However, the presence of frictions in adjusting capital structure in a dynamic economy makes the leverage of most firms, most of the time, to be likely to differ from the optimum leverage at the time of readjustment as suggested by Strebulaev (2003). Financial managers among Thai firms were found by Kalpagonchai (2003) not to issue the new securities with the aim of adjusting the capital structure to converge to their optimal level. This finding implies the transaction and adjustment costs prevailing in Thai capital market. Therefore, the proper study of capital structure requires a model that incorporates the dynamic optimal capital structure.

2.5.4 Survey of Financing Behavior among Thai Firms

There are two ends of financing behavior survey among Thai firms. One involves the survey among listed firms while the other focuses the survey among SMEs. No survey has been done among large non-listed firms. The survey among listed firms was set out to understand how the executives made capital structure decisions. On the other hand, the direction of the majority of the surveys among SMEs was to show the financing problem especially the limited access to capital. In this subsection, we describe the survey among listed firms and SMEs respectively.

Capital structure was believed to be relevant among listed firms as surveyed by Arsiraphongphisit, Kester and Skully (2000) among the largest 204 listed Thai firms. The survey resulted in 46 responses, a response rate of 22.5%. The executives among listed firms thought that capital structure affected a firm's borrowing costs, cost of capital and value of firm. However, capital structure decisions were less binding than investment and dividend decisions. The two most important considerations affecting a firm's financing decisions were to ensure the long-term survivability and to maintain the flexibility of the firm. The maximization of security

prices was not ranked as an important factor governing a firm's financing decisions by Thai executives. The responding executives indicated a preference for following a financing hierarchy rather than adhering to a target capital structure. They ranked internal equity as their first choice for long-term financing and, if external financing was obtained, they ranked debt ahead of new common shares. This result was consistent with the pecking order theory. The majority of respondents indicated that their firms' capital structure had not changed as a result of the financial crisis which began in Thailand in mid-1997.

Firms can raise external funds via liabilities and equity, however, only listed firms can have access to the stock market. To assist SMEs, which do not have access to the stock market, in obtaining external fund, the new stock market was established in 2001 as Market for Alternative Investment (MAI). It is intended to provide SMEs entrepreneurs with an access to long-term loans, through sales of security to the public. There had also been the financial institution established to fund the small and medium enterprises, the Small Industry Finance Corporation (SIFC), which was converted into SME Development Bank of Thailand in 2002.

The majority of fund among SMEs are owners' equity. The research by the Ministry of Industry in 2001 showed that 57.3 percent of beginning fund were raised from owners' equity and the other 20.8 percent of beginning fund were raised from relatives and family. The other 15.5 percent of beginning fund were raised from commercial banks and government banks. Retailed business raised funds from owners' equity the most. The smaller the sizes of firms were, the larger the funds from owners' equity were raised. After the establishment, the owners' equity was still the most important source of fund but with a decreasing percentage. 44.9 percent of funds were raised from owners. The next most important sources of funds were borrowing

from commercial banks and financial institutions and retained earnings that were approximately 16.3 percent and 15.1 percent respectively. The additional sources of nearly 10 percent of funds were raised from trade credits.

The most important financing problem among private firms was due to the high level of interest rate as found by the research from the Ministry of Industry in 2001. The other important financing difficulties were the subtle borrowing process, the inadequate credit from banks, the lack of collateral, the short maturity and the need for relationship with credit officers.

The other interesting statistics was that 42.8 percent of SMEs had never use the sources of funds from the formal financial markets and financial institutions. A large number of private firms were recognized to face difficulties in accessing the formal sources of funding because of limitations related to their characteristics such as small sizes, lack of fixed assets, lack of systematic accounting and lack of business plans. Such limitations led to difficulty in obtaining loans from financial institutions. In 2001, the Thai Farmers Bank Research Center estimated that the loans needed by SMEs were at least 220,000 million baht while the government financial institutions and commercial banks targeted to provide them a loan of only 166,900 million baht. This means the SMEs were short of 53,100 million baht loan.

In conclusion, private firms are found to face difficulties in accessing the external sources of funds. Furthermore, private firms that can raise external fund seem to face high interest rate. Therefore, capital structure decisions between listed and non-listed firms may be different due to different accessibility to external sources of funds.