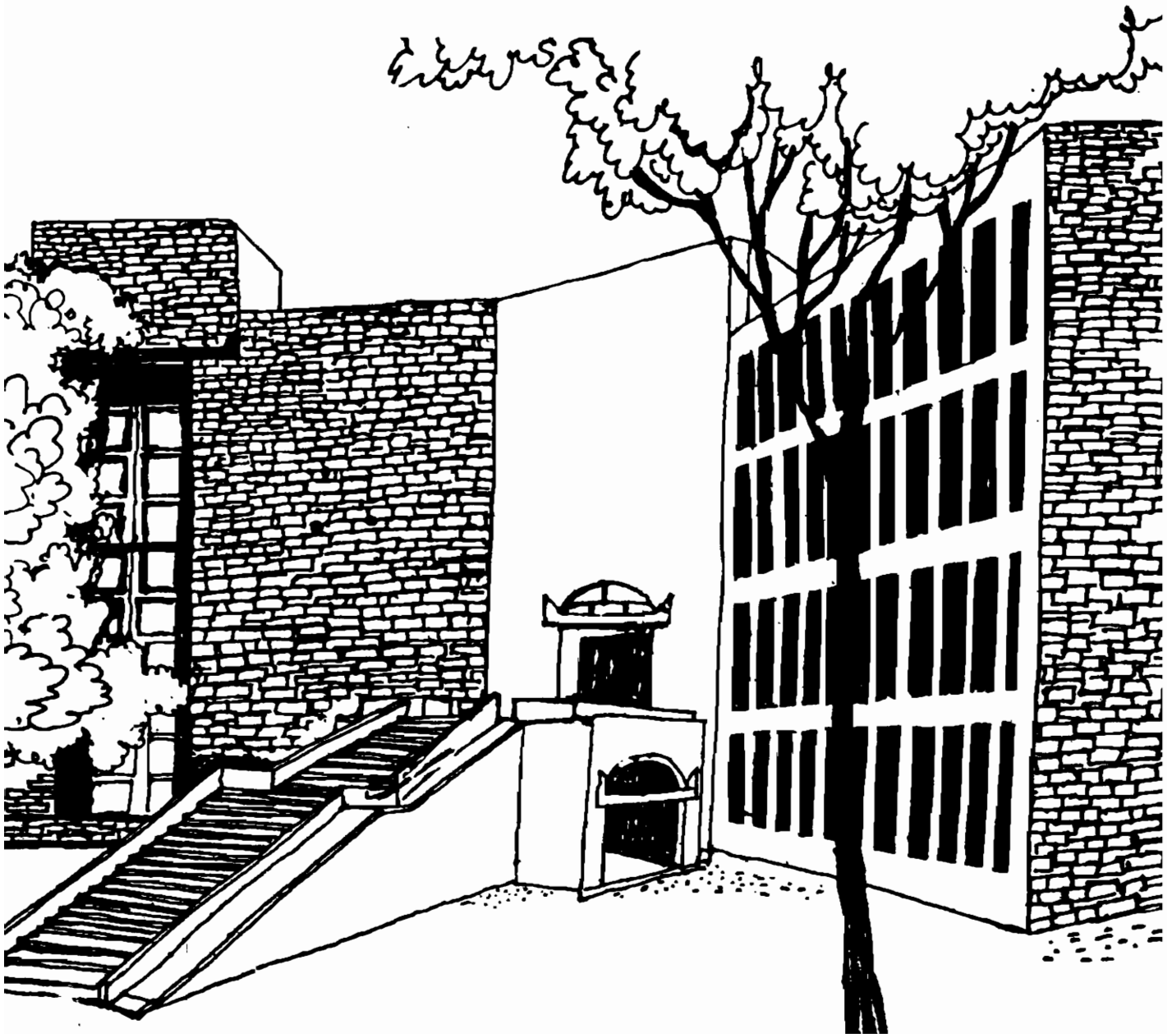




Working Paper



**CAPITAL STRUCTURE POLICIES OF COMPANIES IN
AN EMERGING ECONOMY: A STUDY OF THAI
COMPANIES**

By

**Indra M. Pandey
Tosporn Chotigeat
&
Manoj K. Manjeet**

**W.P. No. 98-05-06
May 1998**

1998 / 1449

WP1449



WP

98-05-06

(1449)

**The main objective of the working paper series of the
IIMA is to help faculty members to test out their
research findings at the pre-publication stage.**

**INDIAN INSTITUTE OF MANAGEMENT
AHMEDABAD - 380 015
INDIA**

PURCHASED

APPROVAL

GRATIS/EXCHANGE

PRICE

ACC NO.

VIKRAM SARABHAI LIBRARY

V. L. M., AHMEDABAD

ABSTRACT

This paper addresses to the question: How do firms in emerging economy choose their capital structures? Thai firms' capital structures were empirically investigated to find their patterns over the period of the country's financial liberalisation and economic success. Also, the attributes of the firms' capital-structure-determinants were tested and analysed, including managers' financial policy practice. Data used in this study were derived from the 221 Thai manufacturing firms listed on the Stock Exchange of Thailand for the period 1990 to 1995 and from a questionnaire survey of the chief financial officers.

The results show that Thai firms have a distinct preference for debt; in general, debt has been used to finance more than half of their assets during 1990 to 1995. Firms employ more short-term debt than long-term. The share of long-term debt has, however, increased in the recent years. As regards the capital structure determinants, a positive relationship exists between debt ratio on the one hand and tangible assets, growth, and size, on the other hand. The negative relationship is found between debt ratio and profitability, interest coverage, debt-service coverage and the firm's uniqueness (intangible).

Thai managers consider survival as the main consideration in making financing decisions. The second important consideration is maintaining the firm's liquidity. They do not worry too much about the external factors. They put more faith in their firms' growth prospects and competitiveness and are governed by their past experience. Thai managers are rather reluctant in making public offer of debt or equity. They think that Thai capital market is slow and raising funds consumes a lot of time. It is hoped that the financial deregulation, the establishment of a credit rating agency and the capital market reforms will result in financial restructuring of the Thai firms.

CAPITAL STRUCTURE POLICIES OF THAI COMPANIES

INTRODUCTION

The capital structure of a firm assumes vital significance to corporate financial management as it influences both return and risk of shareholders. The choice between debt and equity to finance a firm's assets involves a trade-off between risk and return. The excessive use of debt may endanger the survival of the firm, while a conservative use of debt may deprive the firm in leveraging return to equity owners.

Modigliani and Miller (MM) (1958) were first to point out that in a tax less, well functioning (perfect) capital market, the value of a firm is independent of its capital structure. This implied that the firm cannot change the total value of its securities just by splitting its cash flows into different streams. The firm's value is determined by its real assets, and not by the manner of financing the assets. Besides, MM pointed out that although borrowings may increase the expected rate of return on shareholders' investment, they also increase the risk of the firm's shares and this will exactly offset the increase in the expected return, leaving the stockholders no better or worse off.

When one or more of the MM's assumptions are relaxed, many authors showed that the capital structure decision was relevant. For example, it is argued that the market imperfections make personal borrowing excessively costly, risky and inconvenient for investors. Thus firms in practice would carry out borrowings to realise the premium to the shareholders (Brealey, Myers and Marcus, 1995). Corporate tax systems of most countries allow interest to be deducted as cost, which provides a significant tax advantage to the use of debt finance. There is, however, a trade-off since too high a level of debt increases the risk of financial distress, particularly in an economic downturn. This simple trade-off leads to an optimal debt-equity ratio for the firm that maximises its stock market valuation. It is suggested that a firm should select capital structure depending on factors that determine various costs and benefits associated with debt and equity financing.

What are the determinants of capital structure in practice? Corporations base their equity and debt decisions on the need for permanent capital and on their long-term debt capacity (Taggart, Jr., 1977). The study by Paul (1982) demonstrates that companies are heavily influenced by market conditions and the past history of security prices in choosing between debt and equity. The study predicts that the overall target will be a function of bankruptcy risk and tax, and that the composition of debt will depend on the company's size, asset composition, and uncertainty about future inflation rates. Besides, when choosing between financing instruments, corporations appear to try to maintain long-term target debt levels, although they may deviate from these in the short run in responses to timing considerations and capital market conditions.

Titman and Wessels (1988) have provided a comprehensive framework to analyse the determinants of capital structure. They have extended the empirical work on capital structure in three ways. First, the attributes under their analysis include asset structure, non-debt tax shields, growth,

uniqueness, industry classification, size, earnings volatility, and profitability. Secondly, because of the fact that some of the theories have different empirical implications with regard to different types of debt instruments, Titman and Wessels analyse separate measures of short-term, long-term, and convertible debt rather than an aggregate measure of total debt. Third, they have used linear structural modelling technique for analysis to mitigate the measurement problems of unobservable theoretical attributes. Their major findings as follows: (i) smaller firms have a tendency to use significantly more short-term debt than larger firms; (ii) there is no variation in convertible debt ratios across firms; (iii) there is no evidence to support theoretical work that predicts that debt ratios are related to the firm's expected growth, non-debt tax shields, volatility, or the collateral value of its assets, and (iv) there is limited support for the proposition that profitable firms have relatively less debt relative to the market value of their equity.

The development and maturity of the financial market, particularly equity market has important influence on the corporate financing practices. The study of Kunt and Maksimovic (1966) suggests that in general there is a significant positive relationship between bank development and leverage, and a negative but significant relationship between stock market development and leverage. Initially, the debt-equity ratio of the firms increases with the development of stock market and as the market grows further the ratio decreases, firms begin to substitute equity for debt. Further, in developing stock markets, large firms benefit much more than small firms as the stock market develops.

In developing markets, the inadequate or no disclosure of information about the firm results into the under-valuation of the firm's assets. The issue of shares under such situation will cause loss to the existing shareholders and consequently, profitable investment opportunities may be foregone. The firm uses internal funds or issues debt to avoid issuing the undervalued shares. Myers¹ (1984) refers to this phenomenon as the "pecking order" theory of financing .

In the context of a developing country - India, a study (Pandey, 1985) showed that the type of industry did not have an impact on the firms' debt level. It was also revealed that large firms' did have high levels of debt. But a number of small firms also had high level of debt. The study also did not find a strong relationship between debt and profitability and growth. It was also found in another study that capital structure and the cost of capital were negatively related (Pandey, 1981).

Firms in practice tend to select their capital structures depending on attributes that determine various costs and benefits associated with debt and equity financing. However, the attributes and their validation, which are highly subjective, may change from one business environment for another. The real challenge is to determine the relative importance of these factors in different environments.

Fast developing countries like Thailand are facing changes in financial environment. The rapid development of the financial market of Thailand, especially the stock market, in the last few years, we suppose, has had its influence on the capital structure of Thai firms. This research presents evidence on the pattern and movement, if any, in the capital structure of Thai listed manufacturing firms during the period 1990-1995. We also analyse the determinants, as postulated by academicians, of capital structures

of the Thai companies. We also present results of the questionnaire survey with Thai CFOs on their general pattern of making financing decisions.

DATA AND METHODOLOGY

The first objective of this study is to analyse the capital structure trends and patterns of the Thai listed manufacturing companies as a whole during the period of 1990-1995 and two sub-periods, viz., the pre-financial liberalisation period of 1990-92 and the post-financial liberalisation period of 1993-95. The major financial reforms before or around 1992 include: (1) The abolition of all interest rate ceilings and bond-holding reserve in June 1992. (2) Introduction of Stock Exchange Commission Act -effective May 1992. (3) Tax relaxation of foreign exchange control in May 1990. (4) Establishing of credit rating agency, Thai Rating And Information Services.

To provide a descriptive picture of the capital structural patterns of the Thai manufacturing companies during the period 1990-1995 and the sub-periods 1990-92 and 1993-95, we have analysed mean, median, 1st-quartile, 3rd-quartile, maximum, and minimum values of three debt ratios: (1) debt-equity ratio (D/E); (2) total debt-to-total net assets (D/A ratio and (3) long-term debt-to-short-term debt ratio (LTD/STD). Statistical paired-samples "t"-test are also calculated to ascertain whether there existed any significant difference in the capital structure practices of these companies during the two phases, the pre-financial liberalisation period of 1990-1992 and the post-financial liberalisation period of 1993-1995. A paired test is assumed to be appropriate since the average values of the targeted companies in the two sub-periods (1990-1992 and 1993-1995) constitute matched observations. The null hypothesis is that the population means of the two periods are equal, i.e. AVG90-92 equals to AVG93-95. The statistics used to test the hypothesis that the mean difference in the population is 0 is

$$t = D / (\sigma/\sqrt{N})$$

where, D is the observed difference between the two mean, σ is the standard deviation of the differences of the paired observations, and N is the number of pairs.

The industry-wise analysis of debt ratios is also included. The classification of industries is as per the Stock Exchange of Thailand classification. It is hypothesised that the nature of the industry should have significant impact on the capital structure decision of the companies. ANOVA (analysis of variance) is applied to test the null hypothesis of no difference between the means of the debt-to-assets ratios of the various industries. In short, this techniques examines the variability of the observation within each group (measured by the within-group mean square) as well as the variability between the group means (measured by the between-group mean square).

The study sample includes 223 listed manufacturing companies under 14 industrial sectors. Only two companies are listed under the pharmaceuticals and cosmetics industry, and therefore, it is not included in the analysis. It should be noted that the sample sizes vary from year to year due to the

availability of data and existence of the company in that year. The companies' data used for the analysis have been collected from the Stock Exchange of Thailand (SET) for the period from 1990 to 1995. The data were analysed on the yearly basis.

The second objective of this study is to analyse the capital structure choice of the Thai listed manufacturing companies in relation to the following attributes: collateral assets, growth rate, size, profitability, default risk, uniqueness, and volatility. For this purpose, we use methodology of Titman and Wessel (1988). The variables influencing capital structure are defined below.

Collateral assets. It is argued that the type of assets owned by a firm affects its capital structure choice. Firms with assets that can be used as collateral are expected to issue low-cost debt (Myers, 1984; Titman and Wessels 1988). Thus the firm's debt level and collateral assets should have a positive relationship. To measure this relationship, we correlated debt-to-assets ratio and long-term debt-to-assets ratio with (tangible) fixed assets-to-total assets ratio.

Growth rate. A fast growing firm needs more funds. The greater the future need for the funds, the more likely that the firm will retain earnings or issue debt. The firm is expected to rely on debt financing to maintain its debt ratio as its equity increases due to the large retention of earnings. Thus the firm's debt level and growth rate are expected to have positive relationship. The impact of growth on the firm's debt level is ascertained by correlating two measures of growth - annual sales growth and capital employed growth with debt-to-assets ratio.

Firm's size. A large, well-established firm has easy access to capital markets, while a small or a new firm does not. The easy accessibility to capital markets provides greater flexibility to large firms to raise funds on short notice. The large firms tend to become diversified and less prone to bankruptcy, so they may be highly levered. They can afford to have a higher debt than the small firms as well as can have higher debt-rating in the market. The size of a firm is a proxy of its relative risk. Size can be measured in many ways. We have used three different measures of size in this study: total sales, the book value of assets and capital employed (long-term debt plus equity). These measures of size have been correlated with total debt.

Profitability. The pecking order hypothesis implies that firms prefer raising capital, first from retained earnings, second from debt, and third from issuing new equity (Myers, 1984). This behaviour may be due to the high costs of issuing new equity. Thus the past profitability of a firm, and hence the amount of earnings available to be retained should be an important determinant of capital structure. A negative relationship between the firm's debt level and its profitability can be expected. The return on equity (ROE) is used as the measure of profitability of a firm. Profitability is correlated with three measures of debt level, viz., debt-to-equity ratio, long-term debt-to-equity ratio and short-term debt-to-equity ratio.

Default risk. Debt increases risk due to the legal obligation of the fixed interest payments. If a firm fails to meet its debt obligations, lender may force legal action. The coverage ratios (interest coverage and debt-service coverage) can be used to measure a firm's default risk. Low coverage ratio with high debt level indicates the high default risk of debt financing. Thus the relationship between the firm's debt level and default risk should be negative. The firm's interest coverage ratio is correlated with debt-to-assets ratio and debt-to-equity ratio. The debt service coverage ratio is correlated with debt-to-assets ratio, long-term debt-to-assets ratio, long-term debt-to-equity and debt-equity ratio.

Uniqueness. Titman and Wessels (1988) explain that uniqueness is reflected in the firm's research and development (R&D) expenditure, selling expenses, and the rate at which employees voluntarily leave their job. Uniqueness may result into specialised skills of workers and suppliers, and supply of unique products or services to customers. The firm may accumulate more intangible assets that may have low collateral value. Thus uniqueness may be negatively related to the debt ratio. In this study, we assume that firms with relatively unique products are expected to advertise more and, in general, spend more in promoting and selling their products. Since separate data for R&D, advertising and selling and marketing expenses is not available for the Thai companies, sales and administration expenses-to-sales ratio has been used as a proxy for uniqueness. The relationship between sales and administration expenses-to-sales with debt-to assets ratio is tested.

Volatility. The volatility of a firm's operations (sales or operating income) indicate its operating risk. If the firm's volatility is high, it will have a high risk. In other words, a negative relationship between the firm's debt level and volatility is expected. Titman and Wessels (1988) emphasise that the standard deviation of the percentage change in operating income is an appropriate indicator of volatility since it cannot be directly affected by the firm's debt. We consider sales variability to be a more fundamental and pertinent measure of a firm's operating risk. Therefore, in this study, the standard deviation of the percentage change in sales has been taken as a measure of volatility and correlated with average debt-equity ratio and average debt-asset ratio for the period of 1990-1995.

Assuming a linear relationship between the dependent and independent variables, the 5% significant level Person test are used. The null hypothesis is that there is no correlation between the independent and dependent variables.

To understand the attitudes of the Chief Financial Officers (CFOs) vis-à-vis capital structure policies of the Thai listed companies, a questionnaire-based survey, similar to Pinegar and Wilbrich (1989) study, was also conducted. The questionnaire contained objective type questions (mostly multiple-choice) and related to the financing policies and choices. The questionnaires were sent to CFOs of 223 manufacturing firms. Despite two reminders, the response rate was very poor. Only 14 companies responded. The results of the survey as reported here are meant merely to provide a general idea of the thinking of some of the CFOs on their companies' financing policies and practices. No attempt is made to arrive at any generalised conclusion. Each answer has been weighted on a 5-point scale. The choice of

“most important” answer is given a weight of five (5), and of “least important” a weight of one (1). A weighted average score of each answer is calculated for the purpose of ranking.

RESULTS

Capital Structure Patterns: An Aggregate Analysis

Both debt-equity ratio and debt-to-assets ratio indicate that debt has been an important source of financing total assets of the Thai manufacturing companies during the period of 1990-1995. Debt finances more than half of the total assets. The debt-to-assets ratio results are virtually the same on the basis of mean and median values. The first quartile value of 0.41 and the third quartile value of 0.64 suggest that in general 50% of the sample companies have their total assets financed within the range of 41% to 64% through debt financing during 1990-95 period.

The mean D/E ratio ranged between 2.29 (1990) to 1.45 (1995). There are large variations in the debt-equity ratios of the Thai companies; although this range has been narrowing down over years. The pattern of movement in both debt-equity ratio and debt-to-assets ratio show that the Thai listed manufacturing firms started using more equity in the post-financial liberalisation. The two-tailed probability tests indicate that there are significant differences in the mean values of the debt-equity and debt-to-assets ratios during the pre-financial liberalisation period (1990-1992) and during the post-financial liberalisation period 1993-95. It may be reasonable to conclude that major changes in the Thai financial systems, especially the coming of the Stock Exchange Commission Act and the setting up of the credit rating agency, seem to have significant impacts on the capital structure practices of the Thai manufacturing companies

Our results reveal that listed Thai manufacturing companies were using more short-term debt than long-term debt over the last six year period from 1990-1995. It is noted that 50% of the listed Thai manufacturing companies had no long-term debt or had long-term less than one tenth of the short-term debt. Furthermore, the first and the third quartile values of 0.00(Q1) and 0.33(Q3) suggest that, in general, 50% of the sample companies had share of long-term debt below 33% of short-term debt, and 75% of the sample companies had share of long-term debt less than 35% of the short-term debt. In short, the results manifest that the Thai listed manufacturing companies employed very high amount of short-term loans in their capital structure. It can be observed from the two-tailed probability test that there has been no significant difference in the long-term debt to short-term debt composition of the Thai listed manufacturing companies during the pre-financial liberalisation period (1990-1992) and during the post-financial liberalisation period 1993-95.

Debt constitutes the major source of financing for 13 manufacturing industries. All of them have had debt-to-asset ratio of more than 40% in most years of the study. However, there exist differences in the use of debt among different industries. ANOVA test confirms that the 13 industries have significant variations in the average debt- to-assets ratios

The debt level of chemical, electrical products and computer, electronic and packaging, agribusiness industries has been declining. On the contrary, the debt-to-assets ratios of machinery equipment, and building and furnishing has been increasing during the study period. The textile industry has the lowest amount of debt among all industries.

Capital Structure Determinants

Collateral assets. Our results show a significantly positive correlation between fixed-to-total assets ratio and debt-to-assets ratio for the aggregate of Thai listed manufacturing companies. However, at the individual industry level, only three (chemicals and plastics, machinery, and packaging) out of 13 industries have statistically significant relationship between fixed-to-assets ratio and debt-to-assets ratio. Similarly, only six out of 13 specific industries (agribusiness, building and furnishing material, chemicals and plastics, household goods, and textiles clothing, footwear) pass the 5%-significant test of the correlation between the firm's fixed assets-to-assets ratio and long-term debt-to-assets ratio. The correlation between debt-to-assets ratio and fixed assets-to-assets ratio is less significant in comparison to the long-term debt-to-fixed assets ratio. It can be inferred from the results that the short-term debt is less fastened to fixed assets of the Thai manufacturing firms.

Growth. The results reveal that in most industries there is a positive relationship between the firm's debt level and its growth rate. Three out of 13 industries (food and beverages, household goods, and pulp and paper) do not have any significant relationship between sales growth and debt ratio. Four (electric product and computers, electric components, food and beverages, machinery equipment, and vehicles and parts) of 13 industries do not have any significant relationship and one (food) has a negative relationship between capital employed growth and debt ratio. The increase of debt with growth in sales and capital employed may signal that there is a shortage of internal funds to keep pace with increasing demand of funds of the growing Thai firms. Furthermore, as shown earlier, Thai manufacturing firms are using considerable amount of short term debt for their growth.

Size. The results obtained are strongly in favour of the hypothesis that the firm's debt level has a positive relationship with the its size, no matter what indicator is used to measure the size of the firm: assets, or sales, or capital employed. Except for the pulp and paper industry, all other industries showed a strong significant positive relationship in all the three tests. Our results confirm the hypothesis that the large or diversified firms have better and easier access to capital market, perhaps due to high credit ratings for their debt issues.

Profitability. The pecking order theory of financing is confirmed in the Thai context. The aggregate of all the industries as well as five individual industries showed strong negative relationship between profitability (ROE) and debt-equity ratio. Five industries showed weak negative relationship. Our results also showed a very strong correlation between the short-term debt-to-equity and total debt-to-total equity with the return on equity.

It is important to note that, in aggregate, the Thai manufacturing companies' return on equity and debt-to-equity ratio is significantly negatively correlated. It is implied that the high debt-to-equity ratios have an adverse impact on the profitability of the Thai manufacturing companies. Companies with higher debt-to-equity ratios have less return on equity. It can be inferred that debt capacities of the Thai manufacturing companies are not used pragmatically.

The correlation between the profitability measured in terms of PBIT and the corporate debt level is less significant and has much smaller correlation coefficient (-0.07 to -0.30). However, in general, our findings show a negative relationship between the firm's debt level and its profitability for the Thai listed manufacturing companies as a whole. Thus the pecking order theory is confirmed. In terms of specific industries, there is inconsistency in the results. Only less than show significantly negative relationship in each test, whereas one (electrical products and computer sector) is even significantly against the hypothesis.

Default risk. As many as 12 among 13 industries that we have studied, showed negative relationship between interest coverage ratio and debt-to-asset ratio (Table 6.5). *Inter-se*, 8 industries showed strong negative relationship. Three other showed weak negative relationship. The aggregate of all companies showed a significant negative relationship between interest coverage ratio and debt-to-asset ratio.

Although results are in favour of the hypothesis that default risk (interest coverage ratio) and debt level has negative relationship, in aggregate, statistically it is very feeble relationship. Interest coverage ratio and debt-equity ratio showed similar result with less significant level. Similarly, our results show that the firm's debt level has a negative relationship with the debt service coverage ratio.

In summary, the aggregate of Thai manufacturing listed companies as well as the majority of 13 industrial sectors confirm the hypothesis of a negative relationship between the firm's debt level and its coverage ratios (either interest coverage or debt service ratios). However, the number of the sectors falling under each level of relationship varies in different test depending on the proxies of the two variables which are used in the measurement.

Uniqueness. For the Thai listed manufacturing companies as a whole, the results showed a weak positive relationship between uniqueness and debt. For specific industries, eight industries showed negative relationship of which two industries (packaging, and building and furnishing material) showed moderately negative relationship, six industries have weak negative relationship. From the results we can infer that, in general, Thai packaging and building and furnishing material industries are manufacturing unique products.

Volatility. The results obtained do not confirm the hypothesis that volatility and debt level are negatively correlated. The earnings volatility and debt-equity ratio and earnings volatility and debt-asset ratio relationship in 9 out of 13 industries show very weak negative relationship. The relationship is positive in the remaining four industries.

CFOs' Attitudes

The CFOs of the Thai manufacturing companies prefer to raise funds first by retained earnings and/or straight debt and then by external common equity. Eight of 14 respondents put retained earnings as their first option for raising finances. Convertible preferred stock is the least preferred financing option of the Thai companies.

The three top ranked guiding principles, in order of preferences, in making financial decisions are: ensuring long-term survival of the firm, maximise the firm's financial flexibility and maintaining financial independence. The principles like ensuring predictable source of funds, enduring comparability with other firms in the industry or obtaining high-debt rating are considered of less importance by the Thai CFO. It is noteworthy that maximising the market prices of the securities is the least important considerations in making financing decisions.

The view of the CFOs on the importance of capital structure is assessed by examining their choice of action on undertaking a new growth opportunity. Four available alternatives are: (i) forgo the growth opportunity, (ii) deviate from the target capital structure, (iii) cut dividend, or (iv) sell off other assets. The CFOs would not let the opportunity go. Eleven out of 14 respondents would not hesitate in deviating from the target capital structure or financial hierarchy to seize the growth opportunity.

Among variables that affect the financial decisions, the projected cash flow of the assets to be financed, debt covenants, and the avoidance of dilution effects on shareholders' claims have been accorded the first, second and third ranks, respectively, by the Thai CFOs. It seems that they evaluate investment and financing decisions simultaneously. External factors such as the pricing of outstanding securities and personal tax rate of the firm's debt-holders and equity-holders are of the least importance to the corporate financing decisions.

Low financial risk, flexibility in the financing decisions and less issuing cost are the three most important relevant debt characteristics of concern to the Thai CFOs. The flexibility in adjusting the covenants and the length of the term of loan are of less consequence to them.

The Thai CFOs are generally positively inclined towards borrowing. It is considered as essential for the future growth as well as contributing considerably to increasing the firm's value. The Thai CFOs do not believe that debt would help the firm avoid the stocks under-valuation. However, They are very reluctant to the public offering of debt instruments. The major reasons are that public offering often takes a longer time as compared to private placement and a longer legal process is involved.

In making project financing decisions, Thai CFOs are much more concerned about internal factors relating to the project (cost of debt, risk prevailing on the project and expected rate of return) than external factors (industry's or other similar firm's practices)

The Thai CFOs consider their experience as the most important basis for devising a capital structure decision procedure. Consultation from financial institutions and reference from the firm's

specific procedure are also often used. They give low consideration to the industry standards and to the advice of outside professional consultant in designing their capital structure policy.

The macro economic environment is cited as an important reason for significant changes in the firm's capital structure. Changes in the firm's financial policies and credibility are equally important.

SUMMARY AND CONCLUSIONS

In general, Thai manufacturing industries have been financing more than half of their total assets through debt during 1990-95. Half of the companies have no long-term debt or have less than one tenth of their short-term debt. Moreover, around one-fourth of the sample companies have no long-term debt at all in their capital structure during the period 1990 to 1995. This situation has improved recently - the share of the long-term debt to short-term debt has gone down from 40% in 1990 to 24% in 1994. Thai firms, in spite of financial liberalisation, are still not very enthusiastic about the public offering of debt or equity. It is hoped that the financial improvements including the deregulation, the establishment of a credit rating agency and other developments would result in financial restructuring with greater equity orientation in the future. Debt-equity ratios of Thai companies have marginally declined during the study period 1990-95. The debt level of Thai companies was higher in the pre-financial liberalisation period of 1990-92 than the post-financial liberalisation period of 1993-95. Thai listed manufacturing companies are exposed to high degree of operating leverage as well as financial leverage, and there are no sign of change after the financial liberalisation in 1992.

What are the determinants of capital structure of Thai listed manufacturing companies? The measures of capital structure were correlated to the firm's asset, size, business risk, growth, profitability and default risk. In case of nine out of 13 industries there was a significant positive relationship between the firm's debt and its tangible assets. Twelve out of 13 industries showed a positive relationship between the firm's debt and its growth rate. All industries revealed a strong relationship between the firm's debt and its size. In ten out of 13 industries we found a negative relationship between the firm's debt and its profitability, except electrical products and computer, and packaging industries which showed a strong positive relationship. Twelve out of 13 industries had negative relationship between the firm's debt and interest coverage ratio, eight industries showing a strong negative relationship. All industries showed a strong negative relationship between the firm's debt and debt service coverage ratio. In eight out of 13 industries there was a negative relationship between the firm's debt and its uniqueness, eight of them showing a strong negative relationship.

CFOs of the Thai manufacturing companies prefer to finance their assets first by retained earnings and/or straight debt (mostly private placement), and then by external common equity. They are reluctant in making a public offering of debt or equity. Besides, they also show a tendency to resort to more "traditional" instruments, than to more "complex" instruments such as convertible debt or convertible preferred stock. This may imply that they consider the Thai capital market as inefficient and

raising funds from the market as time consuming. For financing decisions, Thai CFOs consider the long-term survival of the firm as a prime objective, followed by maintaining liquidity of the firm. They worry less for the external considerations while making financial decisions. The pricing of securities and personal tax rate of firm's debt- and equity-holders are the least important variables in their capital structure decisions. CFOs strong faith in the growth prospect, competitiveness of their firms and weak attitude towards capital structure decisions make them to go for loans, particularly short-term loans. Most of the companies make their financing decisions primarily based on their previous experience.

Given the greater risk of the short-term loans and anticipated growth of the manufacturing industries, the Thai manufacturing companies need to go for better utilisation of debt and increase more equity in their capital structure. The study reveals a lack of CFOs confidence in Thai capital market. The deregulation of financial sector needs further push to aid in the greater information flow disclosure as well as educating investors about new financing instruments and enhancement of the existing instruments.

Table 1. Thai Listed Manufacturing Industries (1995)

	Industry Group	Number of Companies
1.	Agribusiness	30
2.	Building and Furnishing Material	33
3.	Chemicals and Plastics	15
4.	Electrical Products and Computer	15
5.	Electronic Components	10
6.	Food and Beverages	29
7.	Household Goods	11
8.	Machinery Equipment	6
9.	Packaging	16
10.	Pharmaceuticals and Cosmetics	2
11.	Printing and Publishing	9
12.	Pulp and Paper	5
13.	Textiles, Clothing and Footwear	32
14.	Vehicles and Parts	10
15.	Total	223

Table 2. Mean, median and quartile values of D/E of sample companies, 1990-1995

	1990	1991	1992	1993	1994	1995	1990-92	1993-95	1990-95
<u>Debt-to-equity Ratio</u>									
Number	170	197	210	218	219	220	210	220	220
Mean	2.29	1.62	1.70	1.65	1.45	1.65	2.054	1.594	1.75
Median	1.13	1.20	1.14	1.04	0.97	1.11	1.38	1.12	1.27
1 quartile	0.53	0.62	0.67	0.66	0.59	0.67	0.73	0.73	0.80
3 quartile	2.19	1.85	1.85	1.80	1.55	1.73	2.13	1.75	2.07
Max.	51.56	16.30	33.97	39.40	15.02	39.16	33.97	15.53	10.38
Min.	0.001	0.035	0.01	0.013	0.041	0.077	0.037	0.060	0.085
<u>Total debt-to-total assets ratio</u>									
Number	170	196	209	217	219	219	209	219	219
Mean	0.52	0.52	0.52	0.51	0.49	0.52	0.53	0.51	0.52
Median	0.53	0.54	0.53	0.51	0.49	0.53	0.55	0.52	0.53
1 quartile	0.35	0.38	0.40	0.40	0.37	0.40	0.41	0.41	0.42
3 quartile	0.69	0.65	0.65	0.64	0.61	0.64	0.65	0.62	0.64
Max.	1.05	0.94	0.97	1.19	1.10	1.45	0.97	1.15	0.97
Min.	0.00	0.03	0.01	0.01	0.04	0.07	0.04	0.06	0.08
<u>Long-term debt-to-short-term debt ratio</u>									
Number	170	196	209	217	219	219	209	219	219
Mean	0.40	0.32	0.31	0.32	0.24	0.35	0.34	0.30	0.32
Median	0.06	0.07	0.07	0.07	0.06	0.08	0.10	0.10	0.12
1 quartile	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03
3 quartile	0.34	0.33	0.25	0.29	0.27	0.33	0.33	0.33	0.33
Max.	19.11	4.01	7.79	10.52	2.97	4.35	8.41	5.28	4.55
Min.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 3. T-tests of Paired Samples of D/E, D/A and LTD/STD Ratios

D/E ratio						
Variable	Pairs	Correlation	2-tail Sig.	Mean	SD	SE of Mean
AVE90-92				2.0537	3.184	0.22
	210	0.19	0.01			
AVE93-95				1.5741	1.847	
Paired Differences						
Mean	SD	SE of Mean		t-value	df	2-tail Sig.
0.4796	3.36	0.23		2.07	209	0.04
D/A ratio						
Variable	Pairs	Correlation	2-tail Sig.	Mean	SD	SE of Mean
AVE90-92				2.05307537	.185	.013
	209	.611	.000			
AVE93-95				.5066	.173	.012
Paired Differences						
Mean	SD	SE of Mean		t-value	df	2-tail Sig.
.0241	.158	.011		2.20	208	.029
LTD/STD						
Variable	Pairs	Correlation	2-tail Sig.	Mean	SD	SE of Mean
AVE90-92				0.3	0.8	0.1
	209	0.6	0			
AVE93-95				0.3	0.6	0.1
Paired Differences						
Mean	SD	SE of Mean		t-value	df	2-tail Sig.
0.0426	0.67	0		0.93	208	0.4

Table 4. Debt to asset ratio of Thai listed manufacturing companies during 1990 to 1995

Industry group		1990	1991	1992	1993	1994	1995
1 Agribusiness	No of firms	23	30	30	30	30	30
	Mean	0.56	0.51	0.44	0.45	0.43	0.51
2 Building and Furnishing material	No of firms	27	29	31	33	33	33
	Mean	0.47	0.52	0.56	0.56	0.59	0.57
3 Chemicals and Plastics	No of firms	9	11	13	15	15	14
	Mean	0.59	0.56	0.51	0.47	0.45	0.44
4 Electrical Products and Computer	No of firms	10	11	12	14	14	14
	Mean	0.69	0.65	0.63	0.55	0.55	0.62
5 Electronic Components	No of firms	5	6	8	7	9	9
	Mean	0.55	0.62	0.59	0.45	0.48	0.45
6 Food and Beverages	No of firms	24	27	27	28	29	29
	Mean	0.57	0.51	0.52	0.57	0.54	0.56
7 Household Goods	No of firms	9	11	11	11	11	11
	Mean	0.55	0.58	0.53	0.55	0.53	0.52
8 Machinery Equipment	No of firms	2	3	5	6	6	6
	Mean	0.43	0.51	0.50	0.56	0.53	0.48
9 Packaging	No of firms	15	17	17	17	17	17
	Mean	0.52	0.45	0.47	0.46	0.45	0.47
11 Printing and Publishing	No of firms	9	9	9	9	9	9
	Mean	0.47	0.40	0.47	0.39	0.40	0.47
12 Pulp and Paper	No of firms	2	3	5	5	5	5
	Mean	0.25	0.39	0.69	0.69	0.55	0.58
13 Textiles, Clothing and Footwear	No of firms	28	29	30	30	30	30
	Mean	0.46	0.47	0.47	0.47	0.46	0.49
14 Vehicles and Parts	No of firms	5	9	10	10	10	10
	Mean	0.56	0.61	0.63	0.58	0.48	0.53
ANOVA							
Source of Variation	SS	df	MS	F	F-Prob.		
Between Groups	0.160556	12	0.01338	3.140817	0.00144		
Within Groups	0.276895	65	0.00426				
Total	0.437451	77					

Table 5. Firms Debt and Collateral Assets

Industry Group	Total Debt-to-Total Asset			Long-term Debt-to-Total Asset		
	Co-efficient	Significance (P)	Data size	Co-efficient	Significance (P)	Data size
Aggregate	0.06**	.029	1229	0.37***	.000	805
Agribusiness	0.02	.786	173	0.22**	.019	117
Building And Furnishing Material	0.02	.801	186	0.56***	.000	141
Chemicals And Plastics	0.24**	.036	78	0.65***	.000	54
Electrical Products And Computer	-0.19	.101	75	0.24*	.092	52
Electronic Components	-0.18	.238	45	0.09	.617	37
Food And Beverages	0.10	.192	164	-0.01	.891	109
Household Goods	0.10	.506	45	0.96***	.000	63
Machinery Equipment	0.65***	.000	28	0.37	.106	20
Packaging	0.42***	.000	100	0.48***	.000	70
Printing And Publishing	0.02	.892	54	0.07	.718	31
Pulp And Paper	0.32	.124	25	0.42*	.093	17
Textiles, Clothing And Footwear	-0.09	.242	177	0.32***	.003	81
Vehicles And Parts	-0.05	.740	55	-0.01	.942	32

* Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table 6. Firm's Growth and Change in Debt Level

Industry Group	Growth in sales			Growth in capital employed		
	Co-efficient	Significance (P)	Data size	Co-efficient	Significance (P)	Data size
Aggregate	0.50***	.000	1007	0.65***	.000	1011
Agribusiness	0.26***	.002	143	0.22***	.007	143
Building and Furnishing Material	0.57***	.000	153	0.83***	.000	153
Chemicals and Plastics	0.75***	.000	63	0.57***	.000	63
Electrical Products and Computer	0.61***	.000	61	0.08	.546	61
Electronic Components	0.67***	.000	36	0.24	.160	36
Food and Beverages	0.07	.414	135	-0.37***	.000	135
Household Goods	0.10	.486	54	0.82***	.000	54
Machinery Equipment	0.57***	.006	22	0.18	.435	22
Packaging	0.32***	.003	83	0.66***	.000	83
Printing and Publishing	0.36**	.014	45	0.39***	.008	45
Pulp and Paper	-0.30	.195	20	0.93***	.000	20
Textiles, Clothing and Footwear	0.34***	.000	147	0.59***	.000	147
Vehicles and Parts	0.68***	.000	45	-0.04	.800	45

* Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table 7. Firm's Size (Total Assets) and Total Debt Level

Industry Group	Assets		Sales		Capital Employed		Data Size
	Co-efficient	Significance	Co-efficient	Significance	Co-efficient	Significance	
		(P)		(P)		(P)	
Aggregate	0.98***	.000	0.83***	.000	0.95***	.000	1216
Agribusiness	0.98***	.000	0.75***	.000	0.90***	.000	173
Building and Furnishing Material	0.99***	.000	0.92***	.000	0.98***	.000	186
Chemicals and Plastics	0.96***	.000	0.91***	.000	0.91***	.000	78
Electrical Products and Computer	0.96***	.000	0.94***	.000	0.75***	.000	75
Electronic Components	0.95***	.000	0.95***	.000	0.73***	.000	44
Food and Beverages	0.94***	.000	0.68***	.000	0.72***	.000	164
Household Goods	0.28**	.023	0.83***	.000	0.65***	.000	64
Machinery Equipment	0.94***	.000	0.48***	.010	0.68***	.000	28
Packaging	0.95***	.000	0.58***	.000	0.87***	.000	100
Printing and Publishing	0.97***	.000	0.53***	.000	0.89***	.000	54
Pulp and Paper	0.97***	.000	0.31	.134	0.92***	.000	25
Textiles, Clothing and Footwear	0.95***	.000	0.58***	.000	0.84***	.000	177
Vehicles and Parts	0.93	.000	0.82***	.000	0.52***	.000	55

* Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table 8. Firm's Profitability (ROE) and Debt Level

Industry Group	Debt-to-equity			Debt-to-assets			STD/Equity	
	Co-efficient	Significance	Data	Co-efficient	Significance	Data	Co-efficient	Significance
		(P)	size	efficient	(P)	size		(P)
Aggregate	-0.97***	.000	1226	-0.54***	.000	807	-0.98***	.000
Agribusiness	-0.28***	.000	173	-0.35***	.000	117	-0.25***	.001
Building & Furnishing Mat.	-0.89***	.000	186	-0.07	.425	142	-0.90***	.000
Chemicals and Plastics	-0.08	.490	78	0.04	.764	54	-0.11	.323
Electrical & Computer	0.24**	.036	75	0.46***	.001	52	0.06	.619
Electronic Components	-0.46***	.002	44	-0.20	.240	36	-0.49***	.001
Food and Beverages	-1.00***	.000	164	-0.88***	.000	109	-1.00***	.000
Household Goods	0.15	.248	64	0.02	.885	63	0.07	.602
Machinery Equipment	-0.95***	.000	28	-0.72***	.000	28	-0.95***	.000
Packaging	0.43***	.000	100	0.06	.641	70	0.15	.124
Printing and Publishing	-0.20	.155	54	-0.05	.773	31	-0.38***	.005
Pulp and Paper	-0.23	.275	25	-0.14	.584	17	-0.23	.264
Textiles, Clothing & Footwear	-0.06	.409	177	0.03	.781	81	-0.08	.290
Vehicles and Parts	-0.12	.375	55	-0.43**	.014	32	-0.06	.672

* Significant at 10%; ** Significant at 5%; *** Significant at 1%. Table 7. Firm's Interest

Table 9. Coverage Ratio And Debt Level

Industry Group	Debt-to-assets			Debt-to-equity		
	Coefficient	Significance (P)	Data size	Coefficient	Significance (P)	Data size
Aggregate	-0.10***	.000	1217	-0.01	.780	1217
Agribusiness	-0.30***	.000	173	-0.05	.490	173
Building and Furnishing Material	-0.23***	.001	186	-0.04	.621	186
Chemicals and Plastics	0.19*	.098	78	0.03	.821	78
Electrical Products and Computer	-0.35***	.002	75	-0.20*	.079	75
Electronic Components	-0.58***	.000	43	-0.27*	.083	43
Food and Beverages	-0.16**	.036	162	-0.01	.880	162
Household Goods	-0.17	.277	45	0.06	.657	64
Machinery Equipment	-0.39*	.069	23	-0.10	.638	23
Packaging	-0.30***	.003	100	-0.05	.593	100
Printing and Publishing	-0.32**	.019	54	-0.27**	.047	54
Pulp and Paper	0.00	1.000	22	0.05	.839	22
Textiles, Clothing and Footwear	-0.52***	.000	177	-0.37***	.000	177
Vehicles and Parts	-0.10	.457	55	-0.04	.770	55

* Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table 10. Firm's Debt Service Coverage Ratio and Debt Level

Industry Group	Debt-to-assets			Debt-to-equity			LTD/equity	
	Coefficient	Significance (P)	Data size	Coefficient	Significance (P)	Data size	Coefficient	Significance (P)
Aggregate	-0.29***	.000	1230	-0.03	.225	1230	-0.14***	.000
Agribusiness	-0.62***	.000	173	-0.12	.125	173	-0.01	.903
Building & Furnishing Mat.	-0.62***	.000	186	-0.08	.255	186	-0.09	.301
Chemicals and Plastics	-0.27**	.016	78	-0.07	.555	78	-0.18	.189
Electrical & Computer	-0.64***	.000	75	-0.43***	.000	75	-0.19	.169
Electronic Components	-0.62***	.000	45	-0.26*	.084	45	-0.29*	.080
Food and Beverages	-0.68***	.000	164	-0.10	.196	164	-0.18*	.062
Household Goods	-0.17	.252	45	-0.33***	.008	64	-0.07	.606
Machinery Equipment	-0.77***	.000	28	-0.36*	.060	28	-0.46**	.014
Packaging	-0.53***	.000	100	-0.11	.258	100	-0.27**	.025
Printing and Publishing	-0.67***	.000	54	-0.59***	.000	54	-0.31*	.085
Pulp and Paper	-0.63***	.001	25	-0.27	.195	25	-0.35	.167
Textiles, Clothing & Footwear	-0.66***	.000	177	-0.49***	.000	177	-0.20*	.074
Vehicles and Parts	-0.83***	.000	55	-0.49***	.000	55	-0.45***	.010

* Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table 11. Firm's Uniqueness and Total Debt to Total Assets

Industry Group	Co-efficient	Significance (P)	Data size
Aggregate	0.01	.831	1216
Agribusiness	-0.10	.200	173
Building and Furnishing Material	-0.15**	.043	181
Chemicals and Plastics	-0.14	.233	75
Electrical Products and Computer	0.32***	.005	75
Electronic Components	-0.16	.286	44
Food and Beverages	0.10	.182	164
Household Goods	0.47***	.001	45
Machinery Equipment	-0.10	.599	28
Packaging	-0.25**	.013	100
Printing and Publishing	0.17	.207	54
Pulp and Paper	-0.26	.267	20
Textiles, Clothing and Footwear	0.17**	.027	177
Vehicles and Parts	-0.11	.444	55

* Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table 12. Sales Volatility and Debt Level

Industry group	Debt-to-equity ratio			Total debt-to-total assets ratio		
	Coefficient	Significance (P)	Data size	Coefficient	Significance (P)	Data size
Agribusiness	0.0635	.739	30	0.0902	.635	30
Building and Furnishing material	0.3016*	.093	32	0.3798**	.032	32
Chemicals and Plastics	-0.056	.849	14	0.1852	.526	14
Electrical Products and Computer	-0.0164	.956	14	-0.0943	.749	14
Electrical Components	-0.1519	.720	8	-0.3034	.465	8
Food and Beverages	0.0646	.744	28	-0.0598	.762	28
Household Goods	0.2036	.548	11	-0.1269	.710	11
Machinery Equipment	-0.2425	.643	6	-0.1289	.808	6
Packaging	-0.1513	.562	17	-0.2826	.272	17
Printing and Publishing	-0.0597	.888	8	-0.1924	.648	8
Pulp and Paper	-0.8149	.185	4	-0.8303	.170	4
Textiles, Clothing and Footwear	0.1118	.556	30	0.1411	.457	30
Vehicles and Parts	-0.2334	.546	9	-0.2698	.483	9

* Significant at 10%; ** Significant at 5%; *** Significant at 1%.

TABLE 13. Thai CFOs' Views on Financing Practices (Three Most Important Aspects)

PRACTICES	MEAN VALUE	RANK
<u>Financing preferences</u>		
Retained earnings	4.2	1
Straight debt	4.2	1
External common equity	2.7	3
<u>Financing principles</u>		
Ensuring long-term survival	4.6	1
Maximizing financial flexibility	4.4	2
Maintaining financial independence	3.8	3
<u>Growth opportunity</u>		
Deviate from target capital structure	3.6	1
Sell off other assets	2.4	2
Cut dividend	2.4	2
<u>Financing determinants</u>		
Expected cash flow	4.4	1
Debt covenants	3.8	2
Equity ownership dilution	3.6	3
<u>Debt preference</u>		
Commercial bank for term loan	-	1
Short-term bank borrowing	-	2
Debt issue	-	3
<u>Debt characteristics</u>		
Low financial risk	4.4	1
Flexible	4.1	2
Low issuing costs	4.0	3
<u>Impact of debt financing</u>		
Potential future growth	4.2	1
Increase in the firm value	3.8	2
Impact on EPS	3.6	3
<u>Raising funds from capital market</u>		
Takes long time	4.0	1
Long legal procedure	3.5	2
Internal policy	3.4	3
<u>Factors in project financing</u>		
Cost of debt	4.4	1
Project risk	4.1	2
Expected return	4.0	3
<u>Financing decision procedure</u>		
Past experience	3.8	1
Firm specific	3.5	2
Consultation from financial institutions	2.9	3
<u>Capital structure changes</u>		
Government policy changes	-	1
Firm's financial policy changes	-	2
Changes in firm's credibility	-	3

BIBLIOGRAPHY

1. Biggs, K. A., "Corporate Financing and Liquidity", *Cost and Management*, September-October, 1977, 20-24.
2. Brealey, R. A., Myers, S. C. and Marcus, *Fundamentals of Corporate Finance*, New York: McGraw Hill, Inc., 1995.
3. Demingue-Kunt, A. and Marksimovic, V., "Stock Market Development and Corporate Finance Decisions", *Finance and Development*, June 1996, 47-49.
4. Glen, J. and Pinto, B., "Capital Markets and Developing Countries", *Finance and Development*, March, 1995, 40-43.
5. Hansen, R. S. and Crutchley C., "Corporate Earnings and Financing: An Empirical Analysis", *Journal of Business*, vol. 63, no. 3, 1990, 348-371.
6. Modigliani, F. and M. H. Miller, "The Cost of Capital, Corporation Finance and the Theory of Investment", *American Economic Review*, vol. XLVIII, no. 3, June 1958: 261-297.
7. Myers, S. C., "The Capital Structure Puzzle", *Journal of Finance*, vol. XXXX, July 1984, 575-592.
8. Myers, S. C., "The Capital Structure Puzzle". *Journal of Finance*, Vol. XXXIX, July 1984, 575-592.
9. Pandey, I. M., "The Financial Leverage in India: A Study", *Indian Management*, March, 1985, 21-34.
10. Pandey, I. M., *The Capital Structure and the Cost of Capital*, New Delhi: Vikas Publishing House Pvt. Ltd., 1981.
11. Paul, M., "The Choice between Equity and Debt An Empirical Study", *Journal of Finance*, vol. XXXVII, March 1982, 121-144.
12. Singh, A. and Hamid, Javed, *Corporate Financial Structures in Developing Countries*, Technical Paper, International Finance Corporation, 1992.
13. Taggart, A., Jr., "A Model of Corporate Financing Decisions", *Journal of Finance*, vol. XXXII, no. 5, December, 1977, 1467-484.
14. Titman, S. and Wessels, R., *Journal of Finance*, vol. XLIII, March 1988, 1-19.

